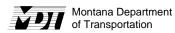




# **APPENDIX A**

**Bridge Inspection Reports** 



Form: bms001d

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# Printing Date: Thursday, May 22 2014

#### 100015279+09761

**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS**  Division Code, Location:31

**GREAT FALLS** 

County Code, Location: 013

**CASCADE** 

City Code, Location: 32800

**GREAT FALLS** 

Kind fo Hwy Code, Description: 1

1 Interstate Hwy

Signed Route Number: 00015

**State Highway Agency** 

Str Owner Code, Description: 1

State Highway Agency

Maintained by Code, Description:1 Kilometer Post, Mile Post:

Intersecting Feature: SUN RIVER

Latitude: 47°29'58"

450.57 km

279.97

Structure on the State Highway System: Structure on the National Highway System:

Construction Project Number: I 15-5(22)273

**Construction Data** 

Str Meet or Exceed NBIS Bridge Length:

Longitude: 111°20'34"

Construction Drawing Number: 6903

Construction Year: 1966

Construction Station Number: 589+50.00

Current ADT: 9,150

**Traffic Data** 

ADT Count Year: 2009

2 % Percent Trucks:

Reconstruction Year:

# Structure Loading, Rating and Posting Data

### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design :	32.6 mton	A LFD Assigned
Operating Load, Design:	33.5 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data :	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	58.32		

# Structure, Roadway and Clearance Data

### Structure Deck, Roadway and Span Data:

Structure Length: 147.83 m

Deck Area: 1,442.00 m sq 8.53 m

Deck Roadway Width: 11.28 m Approach Roadway Width:

Median Code, Description: 0 No median

# Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

N Feature not hwy or RR Reference Feature for Vertical Clearance:

0.00 m Vertical Clearance Under the Structure:

N Feature not hwy or RR Reference Feature for Lateral Underclearance:

0.00 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

# Main Span

Number Spans: 5

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 9.75 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 0.00 m Skew Angle: 15°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-directio	nal Travel	North or East Travel			
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
Route On Structure	100015	N/A			North	99.99 m	8.53 m	
I-15 NB								



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#### 100015279+09761 Continue

**Inspection Data** 

Inspection Due Date : 19 December 2014

Next Under Water Insp : 15 Nov 2016

Sufficiency Rating: 78.5

Structure Status : Func Obs - Elg Rehab

(91) Inspection Frequency (months) : 24 Under Water Insp Type : Type II

<b>NBI</b> Inspection Da	ata							
(90) Date of Last Insp	pection : 19 December	er 2012		La	Last Inspected By: Charles Pepos - 107			
(90) Inspectio	n Date :				Inspected By :			
(58) Deck	Rating : 7	(68) Deck Geor	metry : 3	(36A)	Bridge Rail Rating :	1	(62) Culver	t Rating : N
(59) Superstructure	Rating : 7	(67) Structure R	ating : 6	(36B	) Transition Rating :	1	(61) Channe	I Rating : 6
(60) Substructure	Rating : 6	(69) Under Clear		(36C) Ap	proach Rail Rating :	(71) Waterway Adequacy :8		
(72) App Rdwy	/ Align : 7	(41) Posting S		(36	D) End Rail Rating :	1	(113) Scour	Critical : 5
	Unrepaired S	palls: 0 m s	sq		Deck	Surfacing I	Depth : 1.0	00 in
<b>Inspection Hours</b>								
Crew Hours for inspec	tion: 2	2	Snoo	per Required	: <b>N</b>			
Helper Ho	ours :	Sr	nooper Hours	for inspection	. 0		7	
Special Crew Ho	ours :		F	Flagger Hours	: 0		7	
Special Equipment Ho	ours :							
Inspection Worl	k Candidates			Effected	Scope of			Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work		Action	Condition States

Late Reason:

Inspection Date: 12/19/2012



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Printing Date : Thursday, May 22 2014

#### 100015279+09761 Continue

### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 22 - P Conc Deck/Rigid Ov X 3 1441 sq.m. 100 % % Previous Inspection Notes: 12/19/2012 - Random, tight cracks in all of the Spans. Minor studded tire wear in the wheel paths. 12/27/2010 - 9.75 \* 147.83 = 1441.34 Deck had 1" milled off and then placed 2" of silica fume concrete in 2010. Deck looks Good today. Some cracking near Abutment 1 that were sealed during construction. Inspection Notes: Element 109 - P/S Conc Open Girder 739 100 % % Previous Inspection Notes : 12/19/2012 - Good condition. Spall is unchanged in Span 5 and no new hits were observed. 12/27/2010 - Good condition. Small spall on the Right girder in Span 5 has not changed. 12/02/2008 - Good Condition. Same on the Right most girder in Span 5. 11/02/2006 - Right girder in Span 5 has been hit by overheight equipment and caused a small spalled area. No cracking or visible strands in this 10/18/2002 - 147.83 \* 5 = 739.15m No change. Inspection Notes: Element 210 - R/Conc Pier Wall Piers 2 thru 5 3 41 m. 90 % % % Previous Inspection Notes: 12/19/2012 - Some tight vertical cracking. Small spalls along the backside of the ice breakers. Small delamination on the face of Pier 4 near the waterline. Some surface scale on the Pierwalls near the waterline. 12/27/2010 - Tight mapping cracks in the Pierwall faces. Some small spalls along the ice breakers. Some small delaminated areas observed during last snooper inspection in the worst cracked areas. There are no additional comments from the underwater inspection by Infrastructure Engineers on 11/15/2011. CRH 12/02/2008 - Small spalls, Condition State 2, and some small delaminations, Condition State 3. 11/02/2006 - Minor concrete spall at the waterline near the Pier noses. Several areas of tight mapping cracks in all (4) Pier walls. Ice breakers painted this past summer. Per Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant structural defects below the high waterline. There are vertical cracks up to 1/16" wide with light efflorescence on both the north face and south face of pier 3 starting at the waterline and extending up 10 feet. 10/18/2002 - 10.14 \* 4 = 40.56m Same as snooper inspection of 05-29-2001. 04/13/1998 - Snooper Inspection of 5-29-2001: Some minor section loss at the water line from debris and ice. Some drift at the nose of the pier shafts. Ice breakers could be painted. 02/01/1994 - None Inspection Notes:

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Smart Flag	scription									
۰	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 215	- R/Conc Abutr	ment 1 and	16				<u>.</u>		·	
	1	1	27	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :									
		Abutment 6	is delaminated	l. Small	spalls at the	backwall to cap	area.			UZG
					·	·		alls near girder e	embedments. Tigh	
hrinkage cr	acks in both bad	ckwalls.								
2/02/2008 · lone are a i		s a small d	elminaiton on t	ne Left (	end of the ca	ip; Condition Sta	ite 3. Tight crack	s in both backwa	alls; Condition Stat	e 2. DZG
1/02/2006		cracks in I	both Abutments	s. Both	backwalls ha	ave a couple of s	mall spalls near	the bearings whe	ere girder are	CKE
mbedded.	- (10.14 * 2) (4	* 17 75) =	27 28m ok							VZJ
		17.70) =	Z7.ZOIII OK							V 20
Inspection	Notes:									
	D/C C	Diana O thu								
ement 232	- R/Conc Cap					2.0		_	-	
	1	1	41	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :		•						·	
				Span 4	side of Pier	5's cap. Small	spalls in random	areas along the	edges of the caps;	UZG
	oroblem. Bird de Small delamina			f Bent 5	's cap. Som	e minor spalls.	Bird debris on the	e caps.		ZBC
			•			·	ations; Condition	·		DZG
									some small surface	ce CKE
spalling.										
0/18/2002	- Change Env. S	state to a "1	I" as the leaky	oints ha	ave been ren	noved. Rest is the	ne same as last s	several reports.		VZJ
	Notes:									
Inspection										
Inspection										
•										
•	3 - Assembly Joi	nt/Seal Pie	er 2 and 5 - Ne	w in 201	0					
•		nt/Seal Pic	er 2 and 5 - Ne		0	100	0	0		
•	3 - Assembly Joi				0	100	0 %	0	%	
Element 303	3 - Assembly Joi	3			0				%	
element 303	3 - Assembly Joi 1 pection Notes :	3	20	m.			%		%	UZG
lement 303 revious Ins	3 - Assembly Joi 1 pection Notes : - Sanding mater	3 rial is packe	20 ed in the joint gl	m. ands. S	Steel sound s	% solid when tappe	% d on.	%	%	UZG ZBD
Previous Ins 2/19/2012	3 - Assembly Joi 1 pection Notes : - Sanding mater - All of the steel	ial is packe	ed in the joint gl	m. ands. S	Steel sound s	% solid when tappe	d on. workmanship pa	% thces.	% eakage observed.	
Previous Ins 2/19/2012 2/27/2010	3 - Assembly Joi 1 pection Notes : - Sanding mater - All of the steel - Steel sounds s	ial is packe looks Good	ed in the joint gld. Ends of the papped on. Sor	m. ands. S joints ar me smal	Steel sound sea at the cur	% solid when tappe b shows sloppy g the stell. Glan-	% d on. workmanship pa	% thces. g material. No le		ZBD
Previous Ins 12/19/2012 12/27/2010 12/02/2008 11/02/2006 apparent fro	3 - Assembly Joi 1 pection Notes: - Sanding mater - All of the steel - Steel sounds s - Joint area is pa	ial is packe looks Good solid when t	ed in the joint gld. Ends of the capped on. Sor f sanding mate	m. ands. Sioints are smalrial. So	Steel sound see at the cur I spalls along me spalling a	% solid when tappe b shows sloppy g the stell. Glanalong the joint st	d on. workmanship padd is full of sandingeel. Steel sound	% thces. g material. No le	eakage observed.	ZBC DZG g is CKC
Previous Ins 2/19/2012 2/27/2010 2/02/2008 1/02/2006 apparent fro	3 - Assembly Joi 1 pection Notes: - Sanding mater - All of the steel - Steel sounds s - Joint area is pa	ial is packe looks Good solid when t	ed in the joint gld. Ends of the capped on. Sor f sanding mate	m. ands. Sioints are smalrial. So	Steel sound see at the cur I spalls along me spalling a	% solid when tappe b shows sloppy g the stell. Glan-	d on. workmanship padd is full of sandingeel. Steel sound	% thces. g material. No le	eakage observed.	ZBD

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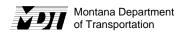
-	•									
-	Saala Faatan									
=lamant 211 - N	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	Moveable Bea	aring								
	1	2	25	ea.		90	10	0		
						%	%	%	%	(
Previous Inspec	ection Notes :									
12/19/2012 - Ali	lignment is ok	Spot rus	st, paint loss, an	d fadeo	paint.					UZGZ
12/27/2010 - Sp	_									ZBDZ
12/02/2008 - Sc										DZGZ
11/02/2006 - Blo										CKDP
10/18/2002 - No										VZJZ
	_	ction of 5-2	29-2001: Some	rust, pi	tting, and mi	nor paint loss; m	ostly on the north	n most pier.		RHGY
02/01/1994 - No					0.		·	·		REFI
Inspection Note	toc.									
Element 313 - F	Fived Rearing	1								
-lement 313 - 1	_		25			00	4.0	0		
	1	2	25	ea.		90	10	0		
						%	%	%	%	•
Previous Inspec	ction Notes :									
12/19/2012 - Sp	pot rust, paint	loss, and	faded paint.							UZGZ
12/27/2010 - Sp	pot rust and p	aint loss.	Bird debris.							ZBDZ
12/02/2008 - Sc	ome spot rust	and bird o	debris.							DZGZ
11/02/2006 - Blo	lown off and o	vercoat pa	ainted in 2006.							CKDP
10/18/2002 - No	lo change fron	n last repo	rt.							VZJZ
Inspection Note	tes:									
Element 331 - C	Conc Bridge F	Railing								
	1	3	296	m.		95	5	0	0	
	· ·	- O	200		_					
						%	%	%	%	•
Previous Inspec										
				nrinkage	e cracks. Sp	alling on the bac	kside of the barri	er where the W-	Beam bolts up.	UZGZ
12/27/2010 - Ur	Inchanged froi	m previous	s inspections.							ZBDZ
			s and add that th ice spall near th			pgraded to new	rail shoes since	the last inspection	on. Curbs under the	ne DZGZ
						ome cracks also	along the rebar in	n random spots	on the backside of	the CKDP
ail. Some rubs				alia an	daaranaa F	ن محمولہ مصیر انما	front of the met	al bridge reil in 1	1000	VZJZ
		JJ. UJIII IVI	mor, vertical cra	acks an	u scrapes. F	an was piaced i	n front of the met	ar bridge rail in 1	1999.	VZJZ
Inspection Note	tes:									



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Element 334 - Metal Rail Coated Steel Posts and Top Round Pipe Now behind the Concrete Rail  1 3 296 m. 90 10 0 0  Previous Inspection Notes:  2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube.  2/2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  2/2/202008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail posts and top rail pipe. W-beam has rusty spots hroughout.  1/1/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail posts and top rail pipe. W-beam has rusty spots hroughout.  1/1/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe.  1/2/2/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible o						Span . I	Main-0 - (COnt.	.)			
Element 334 - Metal Rail Coated Steel Posts and Top Round Pipe Now behind the Concrete Rail  1 3 296 m. 90 10 0 0  76 % % % %  Previous Inspection Notes:  2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube.  2/2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  2/2/202/2088 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/4/13/1998 - None  1/2/01/1994 - None  1/2/01/1994 - None  1/2/01/1994 - None  2/2/01/2012 - Some reflective cracking was visible today.  2/2/27/2010 - Milled off 1* and replaced with 2" of new silica fume concrete.  2/2/27/2008 - Due to quantity and need to start tracking.	Element Des	cription									
1 3 296 m. 90 10 0 0  Previous Inspection Notes:  2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube.  2/2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  2/2/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail posts and top rail pipe. W-beam has rusty spots viroughout.  1/03/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots viroughout.  1/03/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots viroughout.  1/03/2006 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/03/2006 - None  Recommend 358 - Deck Cracking SmFlag  2/01/1994 - None  Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/2/27/2010 - Milled off 1* and replaced with 2" of new silica fume concrete.  2/2/27/2010 - Due to quantity and need to start tracking.	٦			, ,					Pct Stat 3	Pct Stat 4	Pct Stat 5
Previous Inspection Notes:  2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube. 2/2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail. 2/2/20/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  DZ/ 2/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots roughout.  0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  4/13/1998 - None  Referent 358 - Deck Cracking SmFlag  X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today. 2/27/2010 - Milled off 1* and replaced with 2* of new silica fume concrete.  2/20/2008 - Due to quantity and need to start tracking.	lement 334	- Metal Rail Co	ated Steel	Posts and Top	Round	Pipe Nov	w behind the Cor	crete Rail		·	
Previous Inspection Notes:  2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube.  2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  ZBI 2/02/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/2/13/1998 - None  1/2/13/1994 - None  1/2/13/1994 - None  2/2/19/1994 - None  2/2/19/2012 - Some reflective cracking was visible today.  2/2/19/2012 - Some reflective cracking was visible today.  2/2/27/2010 - Milled off 1* and replaced with 2* of new silica fume concrete.  2/2/2/2008 - Due to quantity and need to start tracking.		1	3	296	m.		90	10	0	0	
2/19/2012 - Rusty spots, paint loss, and scale on the rail posts and top pipe tube.  2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  2/20/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots broughout.  0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/20/1/1994 - None  2/20/1/1994 - None  2/20/1/1994 - None  2/20/2008 - Deck Cracking SmFlag  X 1 3 1 ea. X 100 0 0 0  2/20/2008 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail pipe. W-beam has rusty spots of the rail psots and top rail psots							%	%	%	%	
2/27/2010 - Removed W-Beam in 2010. Rust spots, minor surface pitting, and paint loss on the posts and top rail.  2/02/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  4/13/1998 - None  Inspection Notes:  Element 358 - Deck Cracking SmFlag  X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.	revious Insp	pection Notes :									
2/02/2008 - Rust, paint peel, some surface pitting, and exposed base coat.  1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout.  1/02/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/03/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  1/03/2004 - None  1/03/1998 - None  1/03/1994 - None  1/03/1994 - None  1/03/1994 - None  2/03/1994 - None  2/03/1	12/19/2012 -	Rusty spots, pa	aint loss, ar	nd scale on the	rail pos	ts and top pi	ipe tube.				UZG
1/02/2006 - Rusty, pitting, faded paint, peeling paint, and some prime coat visible on the rail psots and top rail pipe. W-beam has rusty spots hroughout. 0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout. 1/13/1998 - None 12/01/1994 - None Inspection Notes:  Element 358 - Deck Cracking SmFlag  X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today. 2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete. 2/102/2008 - Due to quantity and need to start tracking.	2/27/2010 -	Removed W-B	eam in 201	0. Rust spots,	minor s	urface pitting	g, and paint loss	on the posts and	top rail.		ZBD
hroughout. 0/18/2002 - 147.83 * 2 = 295.63m Rust, pitting, and paint loss throughout.  14/13/1998 - None 12/01/1994 - None 1Inspection Notes:    Clement 358 - Deck Cracking SmFlag   X	2/02/2008 -	Rust, paint pee	el, some su	rface pitting, an	id expos	sed base coa	at.				DZG
Al/13/1998 - None	throughout.							ail psots and top	rail pipe. W-bea	ım has rusty spots	
Inspection Notes:			95.63m Ri	ust, pitting, and	paint lo	ss throughou	ut.				
Inspection Notes:  Element 358 - Deck Cracking SmFlag  X	. ,, ,										RHG
Element 358 - Deck Cracking SmFlag  X	)2/01/1994 -	None									REF
X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.	Inspection N	lotes:									
X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.											
X 1 3 1 ea. X 100 0 0 0  Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.											
Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.	Element 358	- Deck Crackin	g SmFlag								
Previous Inspection Notes:  2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.	Х	1	3	1	ea.	X	100	0	0	0	
2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.							%	%	%	%	
2/19/2012 - Some reflective cracking was visible today.  2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.  2/02/2008 - Due to quantity and need to start tracking.	Previous Ins	ection Notes :									
2/27/2010 - Milled off 1" and replaced with 2" of new silica fume concrete.ZBI2/02/2008 - Due to quantity and need to start tracking.DZC				was visible toda	av.						UZG
2/02/2008 - Due to quantity and need to start tracking.			•		•	me concrete	<u>.</u>				ZBC
. ,			•								DZG
Inspection Notes:			-		,						
	Inspection is	lotes:									

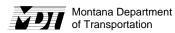


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# 100015279+09761

Continue

2/19/2012 - Good markers on both sides of Abutment 1 today.	UZGZ
2/27/2010 - NBI 72, roadway alignment, rated a "7" as bridge is narrower than the approach roadway.  300d markers on Left and Right corners of Abutment 1.  2/02/2008 - Good markers on the approach section.	ZBDZ DZGZ
1/02/2006 - Markers on both side of the approach and they are in Good condition.  teel bridge rail could be removed as it is not serving any purpose. Deck will be needing periodic patching and would be a Good candidate for a	CKDP
er Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant tructural defects below the high waterline. There is no significant local or general scour present. There are no significant restrictions in the hannel that will adversely impact flow. There is light timber debris at the upstream nose of pier 3. The channel bottom consists of mud/silt, and prap. NBI ITEM 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.  0/18/2002 - NBI 36 is up to current standards; 26A is now concrete barrier rail.	VZJZ
4/13/1998 - 5-29-2001: Snooper inspection this pm. Should remove the trees that are going up near and under the bridge on both ends.	RHGY
2/01/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:28 ufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:02	REFI
9/01/1991 - Updated with tape 1994	NB94
2/01/1990 - Updated with tape 1991	NB91
2/01/1988 - Updated with tape 1989	NB89
2/01/1986 - Updated with tape 1987	NB87
1/01/1984 - Updated with tape 1985	NB85
8/01/1981 - Updated with tape 1984	NB84
3/01/1979 - Updated with tape 1980	NB80



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**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

Percent Trucks:

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015

State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: SUN RIVER Kilometer Post, Mile Post: 450.57 km 279.97

2 %

Structure on the State Highway System: Latitude: 47°29'58"

Structure on the National Highway System: Longitude: 111°20'35"

Str Meet or Exceed NBIS Bridge Length:

**Construction Data** 

Construction Project Number: I 15-5(22)273 Construction Station Number: 589+50.00

Construction Drawing Number: 6903

Construction Year: 1966 Reconstruction Year: 1977

# Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Current ADT: 9,150

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design :	32.6 mton	A LFD Assigned
Operating Load, Design:	33.5 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

ADT Count Year: 2009

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	58.32		

# Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 147.83 m Deck Area: 1,442.00 m sq

8.53 m Deck Roadway Width: 11.28 m Approach Roadway Width:

Median Code, Description: 0 No median

# Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

N Feature not hwy or RR Reference Feature for Vertical Clearance:

0.00 m Vertical Clearance Under the Structure:

N Feature not hwy or RR Reference Feature for Lateral Underclearance:

0.00 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 5

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 9.75 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: Skew Angle: 15°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	North or East Travel			
Name	Name Route		Vertical	Horizontal	Direction	Vertical	Horizontal	
Route On Structure	100015	South	99.99 m	8.53 m	N/A			
I-15 SB								



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**Inspection Data** 

Inspection Due Date: 19 December 2014 (91) Inspection Frequency (months): 24

Next Under Water Insp : 17 Nov 2016

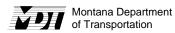
Under Water Insp Type : Type II

Sufficiency Rating: 78.5
Structure Status: Func Obs - Flg Ref

Structure Status . Full	iic Obs - Eig Keilab								
NBI Inspection Da	ata								
(90) Date of Last Ins	pection : 19 December	er 2012		Las	Last Inspected By: Charles Pepos - 107				
(90) Inspection	on Date :				Inspected By :				
(58) Deck	Rating : 7	(68) Deck Geo	ometry : 3	(36A) E	Bridge Rail Rating : 1	(62) Culver	t Rating : N		
(59) Superstructure	cture Rating : 7 (67) Structure Rating :			(36B)	Transition Rating : 1	(61) Channe	el Rating : 6		
(60) Substructure Rating : 6 (69) Under Cle			rance : N	(36C) App	proach Rail Rating :1	(71) Waterway A	dequacy :8		
(72) App Rdw	y Align : (69) Under Clearance : N  (41) Posting Status : A			(36D	) End Rail Rating : 1	(113) Scou	r Critical : 5		
	Unrepaired Sp	oalls: 0 m	sq		Deck Surfacing	Depth: 1.0	00 in		
Inspection Hours									
Crew Hours for inspec	ction: 2	!	Snoo	oper Required :	N				
Helper H	ours :	s	nooper Hours	for inspection :	0				
Special Crew H	ours :		1	Flagger Hours :	0				
Special Equipment H	ours :				<u> </u>				
Inspection Wor	k Candidates	01-1	Dail a aite a	Effected	Scope of	A - 41	Covered		
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States		
D31-FY2007-000037	26 December 2006	Approved	High	M Main	334 Metal Rail Coated	Repl Paint			
lean and paint the rail	and posts.								
pproved. DRC									
D31-FY2013-000018	20 December 2012	Not Approved	Medium	M Main	210 R/Conc Pier Wall	Min Repair			
emove the drift at the	nose of Pier 3.								
							·		

Late Reason:

Inspection Date: 12/19/2012



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### **Element Inspection Data**

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 22 - P Conc Deck/Rigid Ov Silica Fume Concrete oOverlay in 2010 3 1441 sq.m. 100 % % Previous Inspection Notes: 12/19/2012 - Some minor studded tire wear in the wheel paths. Some reflective cracking. 12/27/2010 - 9.75 \* 147.83 = 1441.34 Deck had 1" milled off and then placed 2" of silica fume concrete in 2010. Deck looks Good today. Some cracking near Abutment 1 that were sealed during construction. Inspection Notes: Element 109 - P/S Conc Open Girder 739 100 % % Previous Inspection Notes: 12/19/2012 - Good condition. 12/27/2010 - Good condition. 12/02/2008 - Good condition. Same on the scrapes in Span 5. 11/02/2006 - No problems observed. A couple of the girders in Span 5 have scrapes on their bottoms from overheight equipment. 10/18/2002 - 5 \* 147.83 = 739.15m Inspection Notes: Element 210 - R/Conc Pier Wall Piers 2 thru 5 3 42 m. % % Previous Inspection Notes: 12/19/2012 - Small spalls behind the ice breakers. Pier 4 has a small delaminated area in the underwater inspection; photo. Tight cracks in the 12/27/2010 - Unchanged from previous inspections. The 11/15/2011 underwater inspection by Infrastructure Engineers shows that this element is in the same condition with the same minor defects noted in the 2006 inspection. CRH 12/02/2008 - Condition State 3 for shallow surface delaminations and Condition State 2 for minor spalls and cracking. Wear at the waterline. 11/02/2006 - Minor wear/scaling of the concrete at the waterline and behind the ice breakers. Some areas of tight mapping cracks in the Pier walls sides. Patched areas appear to be holding up well, but some delamiantion also noted. Ice breakers overcoat painted in 2006. Per Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant structural defects below the high waterline. Pier 3 and 4 have light concrete scale up to 1/32" deep and light algae growth. 10/18/2002 - 4 \* 10.14 = 40.56m Same as previous reports. 04/13/1998 - Snooper Inspection of 5-29-2001: Some of the repaired areas are ok, some are questionable in their attachment to the existing concrete. Some wear and minor deterioration at the water line. Some drift at the nose of the peir shafts. 02/01/1994 - None Inspection Notes:

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# Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 215 - R/Conc Abutment 1 and 6 27 m. 95 % Previous Inspection Notes: 12/19/2012 - Small spalls by some of the girder embedments and along the cap to backwall area. 12/27/2010 - Small spalls near girder embedments. Abutment 1 has some plywood on the chamfered area from past construction. 12/02/2008 - Some tight cracks in both backwalls and small spalls near the girder embedments. 11/02/2006 - Both backwalls have a small spall near the bearings where the ends of the girders are embedded. Both caps have a couple of tight cracks that are not a problem. 10/18/2002 - 10.14 \* 2) (4 \* 1.75) = 27.28Inspection Notes: Element 234 - R/Conc Cap Piers 2 thru 5 1 41 m. 90 % % Previous Inspection Notes: 12/19/2012 - Small spall on the Left end of Pier 2's cap. Some staining from past joint leakage. Some bird nests/debris on top of the caps. Small spall on the caps of Pier 3 and 5. 12/27/2010 - Unchanged from previous inspections. Pier 2 and 5 were cleaned off this past summer. 12/02/2008 - Cap at Bent 2 has a small spall and delaminated area. Some cracks; none are a problem. 11/02/2006 - Stained from prior leaky joints. Some tight cracking under the girders and a couple of shallow tie wires are visible. Some CZDP delaminated patched areas also found. 10/18/2002 - Dropped Env. State as no longer un leaky joints; YET. 4 \* 10.14 = 40.56m No change from previous reports. Inspection Notes: Element 303 - Assembly Joint/Seal Pier 2 and 4 - New in 2010 3 100 % % % % Previous Inspection Notes: 12/19/2012 - Joint is packed with sanding material today. No apparent leakage. Steel is solid when tapped on. 12/27/2010 - Underside of deck at curbs shows poor workmanship in construction patches. 12/02/2008 - Steel sounds solid when tapped on. Small spalls along the joint edge. Full of sanding material. No leaking observed. 11/02/2006 - Joint gland is full of sanding material. No apparent leaking. Joint steel sounds solid when tapped on. Some spalling and delamiantion concrete along the joint steel. 10/18/2002 - 2 \* 10.14 = 20.28m Mostly full of sanding material. Inspection Notes:



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\*\*\*\*\*\* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \*

					Opan.	Maili-0 - (COIII	•••			
Element Des	•									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Be	aring								
	1	1	25	ea.		90	10	0		
						%	%	%	%	C
Previous Ins	pection Notes :									
	· Alignment is G		loss, spot rust.	and bir	rd debris.					UZGZ
	Spot rust, pain			u						ZIDZ
	Spot rust and I									DZGZ
	· Blown off and									CZDP
				er a leak	cv ioint <sup>.</sup> YFT	Rest is the sar	ne as the last sev	reral reports		VCKA
		Oldio 2 do	no longor unac	n a loai	, joint, 121	. Troot to the oar		orar roporto.		70101
Inspection I	Notes:									
Element 313	- Fixed Bearing	g								
	1	1	25	ea.		90	10	0		
						%	%	%	%	•
Previous Ins	pection Notes :									
12/19/2012 -	Paint loss, spo	t rust, and	birde debris.							UZGZ
	Spot rust, pain									ZIDZ
	Spot rust and I									DZGZ
	Blown off and									CZDP
				leakv io	int: YET. R	est is the same a	as previous report	S.		VCKA
			<b>J</b>	· · · , , ·	•,					
Inspection I	Notes:									
Floment 221	Cana Bridge	Dailing								
Element 331	- Conc Bridge						_	al		
	1	3	296	m.		95	5	0		
						%	%	%	%	•
Previous Ins	pection Notes:	•			_				<u> </u>	
12/19/2012 -	Patch on the R	Right barrie	at Abutment 6	looks (	Good and is	holding up well.	Some random sh	rinkage cracks.	Spalls at the W-B	eam UZGZ
to barrier co	nnection. · Unchanged fro	m previous	inenactions							ZIDZ
	_			acke =	nde have he	en undated sinc	e the past inches	tions for new au	ardrail. Both curbs	
Good with si	mall surface spa	all near the	deckline.			·		•		5 IOUK DZGZ
				cal crac	king on both	sides with the b	ackside at some	of the rebar loca	tions.	CZDP
10/18/2002	147.83 * 2 = 29	95.66m S	ome dings and	scrapes	s with some	vertical shrinkag	e cracks througho	out.		VCKA
Inspection I	Notes:									
-										



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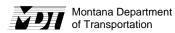
Element Description Smart Flag   Scale Face Element 334 - Metal Rate   1	il Coated Steel  3 es: ts, paint loss, auts, paint loss, auts, peeling paint	296 and some scale of the some minor s	m. n the pos		Pct Stat 1 e Concrete Rail 90 %	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Previous Inspection No 12/19/2012 - Rusty spo 12/27/2010 - Rusty spo 12/02/2008 - Rusty spo 11/02/2006 - Rusty, pitt	il Coated Steel  3 es: ts, paint loss, auts, paint loss, auts, peeling paint	Posts w\ Round 296  and some scale of the some minor scale of the sca	m. n the pos	il behind th	e Concrete Rail	10	0	0	
Previous Inspection No 2/19/2012 - Rusty spo 2/27/2010 - Rusty spo 2/02/2008 - Rusty spo 1/02/2006 - Rusty, pitt	res : ts, paint loss, ants, paint loss, ants, peeling paint	296 and some scale of the some minor s	m.		90				
Previous Inspection No 2/19/2012 - Rusty spo 2/27/2010 - Rusty spo 2/02/2008 - Rusty spo 1/02/2006 - Rusty, pitt	tes : ts, paint loss, and ts, paint loss, and ts, peeling paint	nd some scale o	n the pos	ate and ton					
2/19/2012 - Rusty spo 12/27/2010 - Rusty spo 12/02/2008 - Rusty spo 11/02/2006 - Rusty, pitt	ts, paint loss, and ts, paint loss, and ts, peeling paint	nd some minor s	•	ate and ton	%	%	%	%	
2/19/2012 - Rusty spo 12/27/2010 - Rusty spo 12/02/2008 - Rusty spo 11/02/2006 - Rusty, pitt	ts, paint loss, and ts, paint loss, and ts, peeling paint	nd some minor s	•	ate and ton					
2/27/2010 - Rusty spo 2/02/2008 - Rusty spo 1/02/2006 - Rusty, pitt	ts, paint loss, and ts, peeling paint	nd some minor s	•	oto and tan					
2/27/2010 - Rusty spo 2/02/2008 - Rusty spo 1/02/2006 - Rusty, pitt	ts, paint loss, and ts, peeling paint	nd some minor s	•	sis and lob	pipe rail.				UZGZ
1/02/2006 - Rusty, pitt	., .,	t, fading paint, a		•		op pipe. W-Bear	n removed in 20	10.	ZIDZ
***	ed, paint loss, fa		nd minor	surface pit	ting.				DZGZ
0/18/2002 - 147.83 * 2		aded paint, and	prime coa	at visible or	n the rail posts a	nd top pipe rail.	W-Beam has rus	sty spots.	CZDF
	= 295.66m M	ore rust, pitting,	and pain	t loss.					VCKA
4/13/1998 - Snooper i				the last spa	an, the 5th post	on the right, back	from the pier ha	as spalled concrete	at RHG
's attachment point to 2/01/1994 - None	he deck. It is b	ehind barrier rai	l now.						REFI
Inspection Notes:									
- <b>r</b>									
Element 358 - Deck Cra	cking SmFlag								
X 1	3	1	ea.	Х	100	0	0	0	
Λ '		i	ou.	^	%	%	%	%	
					70	70	70	70	
revious Inspection No									
2/19/2012 - Some refl	ective cracking	throughout the c	verlay in	all the Spa	ns.				UZGZ
2/27/2010 - Milled off	I" and overlaye	d with 2" of silica	a fume co	ncrete in 2	010.				ZIDZ
	ocity and aiza a	f the cracks: esc	ecially in	the areas	where the delan	ninations are star	ting to spall.		DZGZ
2/02/2008 - Due to de	isity and size o	0							



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7/2010 - NBI 72, roadway alignment, rated a "7" as bridge is narrower than the approach roadway.  d markers on both sides of Abutment 6.  2/2008 - Good markers on the approach corners.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  d bridge rail could be removed as it is not serving any purpose. Bridge deck has had some patched spalls and will be needing more. This id be a Good candidate for a deck re-hab.  Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant stural defects below the high waterline. There is no significant local or general scour present. There are no significant restrictions in the signed that will adversely impact flow. NBI 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.  8/2002 - NBI 36 is now up to current standards; 36A upgraded to concrete barrier rail now.  3/1998 - 5-29-2001: Snooper inspection this am. Should clean out the trees & brush that is going next to and underneath the structure.  1/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:28  ciency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:03  No. 1/1999 - Updated with tape 1994  1/1990 - Updated with tape 1999  No. 1/1998 - Updated with tape 1999	27/2010 - NBI 72, roadway alignment, rated a "7" as bridge is narrower than the approach roadway.  21D2 22/2008 - Good markers on the approach corners.  22D2 23D2 24D2 24D2 25D2 26D2 26D2 26D3 26D2 26D3 26D3 26D3 26	General Inspection Notes	
d markers on both sides of Abutment 6. 2/2008 - Good markers on the approach corners.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  2/2006 - Markers on the Left and Right sides of the approach end and some patched spalls and will be needing more. This lide to be a Good canditales and will be needing more.  2/2006 - Markers on the Left and spalls and will be needing more.  2/2006 - Markers on the Left and spalls and will be needing more.  2/2006 - Markers on the Left and spalls and will be needing more.  2/2007 - Markers on the Left and spalls and will be needing more.  2/2007 - Markers on the Left and spalls and will be needing more.  2/2007 - Markers on the Left and spalls and will be needing more.  2/2007 - Markers on the Left and spalls and will be needing more.  2/2007 - Markers on the Left and spalls and will be n	od markers on both sides of Abutment 6.  02/2008 - Good markers on the approach corners.  D2G  02/2006 - Markers on the Left and Right sides of the approach end and in Fair to Good condition.  el bridge rail could be removed as it is not serving any purpose. Bridge deck has had some patched spalls and will be needing more. This uld be a Good candidate for a deck re-hab.  Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant restrictions in the unfel that will adversely impact flow. NBI 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.  18/2002 - NBI 36 is now up to current standards; 36A upgraded to concrete barrier rail now.  VCK.  13/1998 - 5-29-2001: Snooper inspection this am. Should clean out the trees & brush that is going next to and underneath the structure.  RHG  01/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:28  ficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:03  01/1991 - Updated with tape 1994  01/1998 - Updated with tape 1999  01/1988 - Updated with tape 1989  01/1986 - Updated with tape 1985  NB8  01/1981 - Updated with tape 1985  NB8  01/1981 - Updated with tape 1984  NB8	2/19/2012 - Good markers on both sides of Abutment 6.	UZGZ
Ibridge rail could be removed as it is not serving any purpose. Bridge deck has had some patched spalls and will be needing more. This lid be a Good candidate for a deck re-hab.  Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant stural defects below the high waterline. There is no significant local or general scour present. There are no significant restrictions in the innel that will adversely impact flow. NBI 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.  8/2002 - NBI 36 is now up to current standards; 36A upgraded to concrete barrier rail now.  3/1998 - 5-29-2001: Snooper inspection this am. Should clean out the trees & brush that is going next to and underneath the structure.  1/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:28  ciency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:03  Note: The control of th	el bridge rail could be removed as it is not serving any purpose. Bridge deck has had some patched spalls and will be needing more. This uld be a Good candidate for a deck re-hab.  1 Infrastructure Engineers August 22, 2006 underwater inspection, the substructure units are in good condition. There are no significant local repensal scour present. There are no significant rectural defects below the high waterline. There is no significant local or general scour present. There are no significant rectural defects below the high waterline. There is no significant local or general scour present. There are no significant restrictions in the unnel that will adversely impact flow. NBI 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.  18/2002 - NBI 36 is now up to current standards; 36A upgraded to concrete barrier rail now.  VCK  13/1998 - 5-29-2001: Snooper inspection this am. Should clean out the trees & brush that is going next to and underneath the structure.  RHG  01/1994 - Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:03  NB9  01/1991 - Updated with tape 1994  01/1990 - Updated with tape 1994  01/1998 - Updated with tape 1989  01/1986 - Updated with tape 1985  NB8  01/1984 - Updated with tape 1985  NB8  01/1981 - Updated with tape 1984  NB8	2/27/2010 - NBI 72, roadway alignment, rated a "7" as bridge is narrower than the approach roadway. ood markers on both sides of Abutment 6. 2/02/2008 - Good markers on the approach corners.	ZIDZ DZGZ
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1/1990 - Updated with tape 1991 1/1988 - Updated with tape 1989	01/1990 - Updated with tape 1991       NB9         01/1988 - Updated with tape 1989       NB8         01/1986 - Updated with tape 1987       NB8         01/1984 - Updated with tape 1985       NB8         01/1981 - Updated with tape 1984       NB8	2/01/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:28  ufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:03	REFI
1/1988 - Updated with tape 1989	01/1988 - Updated with tape 1989       NB8         01/1986 - Updated with tape 1987       NB8         01/1984 - Updated with tape 1985       NB8         01/1981 - Updated with tape 1984       NB8	9/01/1991 - Updated with tape 1994	NB94
and the second of the second o	01/1986 - Updated with tape 1987       NB8         01/1984 - Updated with tape 1985       NB8         01/1981 - Updated with tape 1984       NB8	2/01/1990 - Updated with tape 1991	NB91
1/1986 - Updated with tape 1987	01/1984 - Updated with tape 1985       NB8         01/1981 - Updated with tape 1984       NB8	2/01/1988 - Updated with tape 1989	NB89
	01/1981 - Updated with tape 1984	2/01/1986 - Updated with tape 1987	NB87
1/1984 - Updated with tape 1985		1/01/1984 - Updated with tape 1985	NB85
1/1981 - Updated with tape 1984	01/1979 - Updated with tape 1980 NB8	8/01/1981 - Updated with tape 1984	NB84
1/1979 - Updated with tape 1980		3/01/1979 - Updated with tape 1980	NB80



**General Location Data** 

# **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

**Location: GREAT FALLS Structure Name:** 

100015280+00941

MDT Maintenance Section: 31-01 Great Falls

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Form: bms001d

Printing Date: Thursday, May 22 2014

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015

Str Owner Code, Description: 1 State Highway Agency **State Highway Agency** Maintained by Code, Description:1

Intersecting Feature: SEP 5TH AVE SW Kilometer Post, Mile Post: 450.76 km 280.09

Structure on the State Highway System: Latitude: 47°30'04" **Construction Data** 

Structure on the National Highway System: Longitude: 111°20'34" Construction Project Number: IG 15-5(27)274 Str Meet or Exceed NBIS Bridge Length: Construction Station Number: 595+55.00

Construction Drawing Number: 7092 **Traffic Data** 

Construction Year: 1967

Current ADT: 9,150 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

# Structure Loading, Rating and Posting Data

### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	36.2 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	83.84		

# Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 38.10 m

455.00 m sq Deck Area:

11.35 m Deck Roadway Width: 11.89 m Approach Roadway Width:

Median Code, Description: 0 No median

#### Structure Vertical and Horizontal Clearance Data: Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

4.60 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 3.66 m 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 3

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 11.95 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.05 m 0.05 m Skew Angle: "

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	L07544	Both	4.60 m	10.36 m	N/A		
5TH AVE. SW	]						
Route On Structure	100015	N/A			North	99.99 m	11.35 m
I - 15 NB							



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#### 100015280+00941 Continue

**Inspection Data** 

Sufficiency Rating: 96.6
Structure Status: Not Deficient

Inspection Due Date: 15 October 2014
(91) Inspection Frequency (months): 24

Structure Status : Not	Deficient								
NBI Inspection Da	nta								
(90) Date of Last Insp	pection : 15 October :	2012		La	ast Inspected By: Charles	es Pepos - 107			
(90) Inspectio	n Date :				Inspected By :				
(58) Deck I	Rating : 7	(68) Deck Geo	metry : 5	(36A)	(36A) Bridge Rail Rating : 1 (62) Culvert Rating : N				
(59) Superstructure F	Rating : 7	(67) Structure R	Rating: 7	(36B	) Transition Rating : 1	(61) Channe	l Rating : N		
(60) Substructure F	Rating : 7	(69) Under Clear		(36C) Ap	pproach Rail Rating :1	(71) Waterway A	dequacy : N		
(72) App Rdwy	Align : 8	(41) Posting S		(36)	D) End Rail Rating : 1	(113) Scour	Critical:		
Inspection Hours	Unrepaired S	palls: 0 ms	sq		Deck Surfac	cing Depth : 1.0	00 in		
Crew Hours for inspec	tion :		Snoo	oper Required	: <b>N</b>				
Helper Ho	ours :	Sr	nooper Hours	for inspection	: 0				
Special Crew Ho	ours :		1	Flagger Hours	: 0				
Special Equipment Ho	ours :								
Inspection Work	c Candidates	Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition		
Candidate ID	Date Requested	Status	Priority	Unit	WOIK	Action	States		
D31-FY2004-000064	28 January 2004	Approved	Medium	All Spans	Bridge	Spot Paint (flex)			
Clean around bearings a	and repaint.								

Late Reason:

Inspection Date: 10/15/2012



Inspection Notes:

# INITIAL ASSESSMENT FORM FOR STRUCTURE:

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# 100015280+00941

Continue

Element I	nspection Da	ata	* *	* * * *	* * * * Coo	n : Main-0 - * '	* * * * * * * * *			
Element De	escription				Spa	ırı . Main-u -				
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	? - P Conc Deck/I		,							
	1	3	455	sq.m.	X	100	0	0	0	
						%	%	%	%	Q
Previous In	spection Notes :									
10/15/2012	! - Minor wear in	the wheel p	aths. Tight trai	nsverse	cracks over	both Bent 2 and	3. Random crad	cking in Span 1.		QZHZ
10/18/2010	- 11.95 * 38.10 :	= 455.30 1	I" milled off, A a	and B re	epairs done,	and 2" overlay th	en placed. Good	d condition today		SODZ
Inspection	Notes:									
Element 10	9 - P/S Conc Op	en Girder								
	1	1	191	m.		100	0	0	0	
						%	%	%	%	(
Previous In	spection Notes :									
10/15/2012	: - Unchanged fro	m past insp	pections and ge	enerally	in Good con	dition.				QZHZ
10/18/2010	- Generally Goo	d condition	. Minor rubs fro	om ovei	rheight loads	and some mino	r cracking on end	ls of the girders r	noted at Bents 2 a	and 3. SODZ
10/15/2008	- Good condition	n. Some m	inor rubs and s	crapes	from overhei	ght loads.				QZGZ
10/24/2006	- Good condition	n. Minor cra	acks from back	side of	the embedde	ed bearing plate	to the ends of se	veral of the girde	rs.	ZZGZ
10/08/2002	2 - 38.10 * 5 = 19	0.5m								IZDK
Inspection	Notes:									
<u> </u>										
Element 20	5 - R/Conc Colu	mn Bent 2	and 3							
	1	1	4	ea.		95	5	0	0	
						%	%	%	%	C
Previous In	spection Notes :									
 10/15/2012	· ! - All (4) are gen	erally in Go	od condition wi	th a sm	all spall on th	ne Right column	of Bent 3.			QZHZ
	- Good condition									SODZ
	- Generally Goo				~	cks.				QZGZ
	- Tight surface s		_							ZZGZ
		mininago o								2262

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#### 100015280+00941 Continue

Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 215 - R/Conc Abutment 1 and 4 2 30 m. 95 % Previous Inspection Notes: 10/15/2012 - Tight cracks in both of the backwalls and caps. Small spalls on the cap to backwall connection area and a couple of the embedded bearings. 10/18/2010 - Minor and tight cracks in both backwalls. Small spalls near a couple of the girder embedded bearings. 10/15/2008 - Small spall near the bearings in the backwalls. Tight cracks in both of the backwalls and caps. 10/24/2006 - Damp at the backwall to cap joint and around the bearings. A couple of small spalls where the girders are embedded in the backwalls. 10/08/2002 - (11.95 1.50 1.50) \* 2 = 29.90m Minor, tight cracks in backwalls. Env. State 2 due to wet soil in median near the bridge ends. 04/13/1998 - None 02/01/1994 - None Inspection Notes: Element 234 - R/Conc Cap Bent 2 and 3 90 1 24 m. % % % % Previous Inspection Notes: 10/15/2012 - Small delaminations on the Right ends of both of the Bent caps. Minor surface spalls on the underside of both caps from rebar chair feet. Stains from past joint leakage. 10/18/2010 - Same comments as past inspections. Small delamination on Right ends of Bent 2 and 3's caps. Very minor surface distress in these 10/15/2008 - Left end of the cap at Bent 2 has a small delaminated area, 6" x 14"; Condition State 3. Tight cracks at the steps. Small surface spall on the underside of the caps from exposed rebar chair feet. 10/24/2006 - Minor surface spalls on the underside of the caps from exposed/rusty rebar chairs. 10/08/2002 - 11.95 \* 2 = 23.90m Minor stains from exposed rebar chairs. Underside of left end of cap at Bent 3 has minor popouts along rebar chairs. Inspection Notes: Element 313 - Fixed Bearing Bent 2 and 3 1 1 20 90 10 ea. % % % % Previous Inspection Notes: 10/15/2012 - Spot rust, paint loss, and some debris. 10/18/2010 - Spot rust and paint loss. 10/15/2008 - Spot rust and paint loss. 10/24/2006 - Spot rust throughout. Bents 2 and 3's have pigeon debris around them. 10/08/2002 - Rusty spots throughout. Inspection Notes:



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### 100015280+00941 Continue

									cription	Element Des
Pct Stat 5	Pct Stat 4	Pct Stat 3	Pct Stat 2	Pct Stat 1	Insp Each	Units	Quantity	Env	Scale Factor	Smart Flag
						osts	eam w\ Steel Po	ated W-Be	- Metal Rail Co	Element 334
	0	5	10	85		m.	76	3	1	
	%	%	%	%						
									ection Notes :	Previous Insp
QZHZ	sts show rusty	ed blocks. Rail	Loose and twist	ear Abutment 1	t rail is bent n	es. Left	ubs on both side	lings and ru		
	,					ion.	in Good conditi	Curbs are	and paint loss.	spots, scale,
SODZ	ent area.		Left rail near A					•		
QZGZ			. Curbs are in G				•			
ZZGZ	1.		areas. Curbs are							
IZDK		•	Rust on the posts	nout both rails.	rapes throug	and sc	y spots, pitting,	20m Rust		
RHGR										)4/13/1998 -
REFI									None	)2/01/1994 -
									otes:	Inspection N
								Notes	nspection N	General I
QZHZ			Ave. SW.	travellers on 5th	ne bridge for	les of th	gns on both sid			
SODZ		d.	o retro-fit" neede	eau's policy of "r	e Bridge Bure	eets the	ed a "1" as if m	e rail, is rat	NBI 36A, bridge	0/18/2010 -
			andha anda af ii	oncrete in 2010.						
		ne girders.	on the ends of t	and tight crack			to rubs on the bidsides of the brid			
QZGZ					e structure fo	es of the	gns on both side	erheight sig	Good 14'-2" ove	0/15/2008 -
							nt testing of the			
				<b>3.</b>	sents 2 and 3	over B	to wide cracks		ск cracкing sm: utment bearing.	
ZZGZ							due to wear and	ated a "6" o	NBI 58, deck, ra	0/24/2006 -
0	rebar chairs. Als	om exposed/rus	Bents 2 and 3 fi	ide of the caps a			small surface s girders are eml			
							or 5th Ave. SW	nce signs fo	14' - 2" clearar	Posted with a
IZDK	curbs tapers on	proach section a	n rail, Bridge app	ce. 36B, transiti	o the curb fac	ed out to	W-beam blocke	O" as rail is	NBI 36A to a "0 Is of the structu	0/08/2002 -
							rehab project.		was removed d	
RHGR							. ,	Ü		)4/13/1998 -
REFI							ation Accepted b			
				1	9/97 14:15:04	4 at 2/19	d by ops\$u9004	on Accepted	ating Calculatio	Sufficiency R
NB94								ape 1994	Updated with ta	1/01/1992 -
NB91								ape 1991	Updated with ta	3/01/1990 -
NB89								ape 1989	Updated with ta	2/01/1988 -
NB88								ape 1988	Updated with ta	2/01/1986 -
NB85									Updated with ta	
NB84									Updated with ta	
NB80									Updated with ta	



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Printing Date: Thursday, May 22 2014

#### 100015280+00942

**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015

State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: SEP 5TH AVE SW Kilometer Post, Mile Post: 450.76 km 280.09

Structure on the State Highway System: Latitude: 47°30'04"

Structure on the National Highway System: Longitude: 111°20'35"

Str Meet or Exceed NBIS Bridge Length:

**Traffic Data** 

Current ADT: 9,150 ADT Count Year: 2009 2 % Percent Trucks:

**Construction Data** 

Construction Project Number: IG 15-5(27)274 Construction Station Number: 595+55.00

Construction Year: 1967

Construction Drawing Number: 7092

Reconstruction Year:

# Structure Loading, Rating and Posting Data

### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	34.4 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data :	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	83.84		

# Structure, Roadway and Clearance Data

### Structure Deck, Roadway and Span Data:

Structure Length: 38.10 m Deck Area: 455.00 m sq

11.35 m Deck Roadway Width: 11.89 m Approach Roadway Width:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

4.57 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 3.66 m 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 3

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

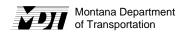
### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 11.95 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.05 m 0.05 m Skew Angle: "

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	L07544	Both	4.57 m	10.36 m	N/A		
5TH AVE. SW							
Route On Structure	I00015	South	99.99 m	11.35 m	N/A		
I - 15 SB							



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#### 100015280+00942 Continue

**Inspection Data** 

Sufficiency Rating: 96.6 Structure Status: Not Deficient Inspection Due Date: 15 October 2014
(91) Inspection Frequency (months): 24

Structure Status : Not	Deficient							
NBI Inspection Da	ata							
(90) Date of Last Insp	pection: 15 October:	2012		La	st Inspected By: Charles Pepos - 107			
(90) Inspectio	n Date :				Inspected By :			
(58) Deck I	Rating : 7	(68) Deck Geor	metry : 5	(36A)	Bridge Rail Rating	g : <b>1</b>	(62) Culver	t Rating : N
(59) Superstructure I	Rating : 7	(67) Structure R	ating:	(36B)	Transition Rating	ı : <b>1</b>	(61) Channe	Rating : N
(60) Substructure I	Rating : 7	, ,		(36C) Ap	proach Rail Ratin	g : <b>1</b>	(71) Waterway A	dequacy : N
(72) App Rdwy	/ Align : 8	(69) Under Cleara (41) Posting S		(361	(36D) End Rail Rating : 1		(113) Scour Critical : N	
	Unrepaired S	palls: 0 m s	sq	一	De	ck Surfacing	Depth : 1.0	00 in
Inspection Hours								
Crew Hours for inspec	tion: 2		Snoo	per Required	: <b>N</b>			
Helper Ho	ours : C	Sr	nooper Hours	for inspection	: 0			
Special Crew Ho	ours :		F	Flagger Hours	: 0			
Special Equipment Ho	ours :				-			
Inspection World	k Candidates	<b>6</b>	<b>.</b> ,	Effected	Scope			Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	(	Action	Condition States
D31-FY2004-000065	28 January 2004	Approved	Medium	All Spans	Bridg	е	Spot Paint (flex)	
Clean around bearings a	and repaint.							

Late Reason:

Inspection Date: 10/15/2012



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#### 100015280+00942 Continue

### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 22 - P Conc Deck/Rigid Ov X 100 3 455 sq.m. % % Previous Inspection Notes: 10/15/2012 - Minor wear in the hweel paths. Random cracking on the Left side of the deck near Abutment 4 in Span 3. 10/18/2010 - 11.95 \* 38.10 = 455.30 Milled off 1", Class A and B repair, and then placed a 2" Silica Fume Concrete overlay in 2010. Good condition today. Inspection Notes: Element 109 - P/S Conc Open Girder 191 100 m. % % Previous Inspection Notes : 10/15/2012 - Unchanged from past inspections and in Good condition. 10/18/2010 - Gernally Good condition. Minor scrapes and rubs from overheight loads on the bottom of the girders. Tight cracks on the ends of the girders at Bent 2 and 3. 10/15/2008 - Generally in Good condition. Minor scrapes to the Left two girders from overheight loads. 10/24/2006 - Minor scrape to the Left girder in Span 2 from overheight load. Several of the girders have minor cracks from the backside of the embedded bearing plate to the ends of the girders. 10/08/2002 - 38.10 \* 5 = 190.5mInspection Notes: Element 205 - R/Conc Column Bent 2 and 3 1 95 ea. % Previous Inspection Notes: 10/15/2012 - All are generally in Good condition with small spalls on (2) columns from construction activity. 10/18/2010 - Good condition. 10/15/2008 - Good condition. Small scrape on the Left column of Bent 2. 10/24/2006 - No major probelms noted with minor and tight surface shrinkage cracks. 10/08/2002 - Minor, tight shrinkage cracks. Inspection Notes:

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### 100015280+00942 Continue

\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*\*

Element Description  Smart Flag   Scale Factor   Env   Quantity   Units   Insp Each   Pct Stat 1   Pct Stat 2   Pct Stat 3   Pct Stat 4    Element 215 - R/Conc Abutment 1 and 4  1 2 30 m. 95 5 0 0  % % % %  Previous Inspection Notes:	Pct Stat 5
Element 215 - R/Conc Abutment 1 and 4  1 2 30 m. 95 5 0 0  % % % %	
1 2 30 m. 95 5 0 0 0 % % % % %	
% % % %	
Previous Inspection Notes :	9
10/15/2012 - Tight cracks in both of the backwalls and caps. Small spalls near the cap to backwall connections and at a couple of the embed	lded QZHZ
bearings. 10/18/2010 - Generally Good condition. Tight cracks in both backwalls.	SZDZ
10/15/2008 - Same as prior inspection and add some tight cracks in both caps and backwalls of the Abutments.	QZGZ
10/13/2006 - Same as phormspection and add some tight cracks in both caps and backwalls of the Abduments.  10/24/2006 - Minor seepage at the bearings and along the cap to backwall joint. A couple of small spalls where the girders are embedded in the Abduments.	
to/24/2000 - Millor seepage at the bearings and along the cap to backwall joint. A couple of small spalls where the girders are embedded in the backwalls.	lile 2002
10/08/2002 - (11.95 - 1.50 - 1.50) * 2 = 29.90m Env. State 2 as some moisture coming from between the backwall to cap connection on this cand wet soil in median area.	date ISDL
03/13/1998 - None	RHGT
02/01/1994 - None	REFI
Inspection Notes:	
maposition recion.	
Element 234 - R/Conc Cap Bent 2 and 3	
1 1 24 m. 90 5 5 0	
Previous Inspection Notes :	
10/15/2012 - Minor surface spalls on the underside of both caps from rebar chair feet. Right end of Bent 3's cap has a small surface delamina and both caps show tight cracking on their ends. Spall with exposed rebar on the Left end of Bent 2's cap.	
10/18/2010 - Minor surface spalls on the underside of both caps. Spall with exposed rebar ends on the Left end of Bent 2's cap.	SZDZ
10/15/2008 - Surface spalls on the underside of both caps. Tight cracks on the ends of both caps.	QZGZ
10/24/2006 - Minor and small surface spalls where rebar chairs are exposed on the underside of the caps. Staining from leakage in the past.	
10/08/2002 - 2 * 11.95 = 23.90m Minor staining from areas where the rebar chairs are exposed.	ISDL
Inspection Notes:	
Element 313 - Fixed Bearing Bent 2 and 3	
1 1 20 ea. 90 10 0	
% % % %	(
Previous Inspection Notes :	
10/15/2012 - Spot rust, paint loss, and some debris.	QZHZ
10/18/2010 - Spot rust and paint loss.	SZDZ
	QZGZ
10/15/2008 - Spot rust and paint loss.	
	ZCGZ
10/24/2006 - Spot rust on the bearings. Pigeon debris on the bearings at Bents 2 and 3.	ZCGZ ISDL
10/15/2008 - Spot rust and paint loss.  10/24/2006 - Spot rust on the bearings. Pigeon debris on the bearings at Bents 2 and 3.  10/08/2002 - Rusty spots throughout.	
10/24/2006 - Spot rust on the bearings. Pigeon debris on the bearings at Bents 2 and 3.	

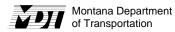


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### 100015280+00942 Continue

\*\*\*\*\*\* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* \*

			****	****	* Span : ı	Main-0 - (cont	t.) * * * * * * * *	* * *		
Element Des	cription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 334	- Metal Rail Co	ated W-B	eam w\ Steel P	osts					·	
	1	3	76	m.		90	10	0	0	
						%	%	%	%	
Previous Ins	pection Notes :									
10/15/2012 -	Curbs are in G	ood condit	ion with some r	ninor sp	alls and crad	ckina. Rustv spo	ots. paint loss. ar	nd scale on the ra	ail posts. W-Bean	n has QZHZ
rubs and din	gs on both sides	S.		·		n Good condition				SZDZ
10/15/2008 -	Rusty spots on	the rail po	sts and W-Bea	m. Righ	nt curb has b	peen repaired. C	Curbs are now in	Good condition.		QZGZ
Right side at	Abutment 4.					hit in a couple o		nt post and broke	en curb concrete o	on the ZCGZ
03/13/1998 -				·			·			RHG <sup>-</sup>
02/01/1994 -	None									REFI
Inspection N	Notes:									
Canaral	Inonaction N	Motos								
	Inspection I		inna an bath air	41.			- 014			0711
			ŭ		ŭ	traffic on 5th Av		a d		QZHZ SZDZ
NBI 58, deck NBI 59, supe Good 14' - 2'	rated a "8" due rstructure, rated clearance sign	e to new or d a "7" due ns on both :	verlay. Overlaid to rubs on the sides of the brid	d with S bottom dge for 5	ilica Fume C of the girder oth Ave. SW	Concrete in 2010 s and tight crack	s on the ends of			
Consultant's Close to a de 10/24/2006 - NBI 60, subs where girder	crew doing chlo eck cracking sm NBI 58, deck, r	oride conte lart flag du rated at a " a "7" due to d in both A	nt testing of the e to wide crack: 6" due to wear o minor spalls o butments.	structu s over B in the w	re's deck ye ents 2 and heel paths a	3. and some spallin	g/delamiantions.		irs. Also small sp	QZGZ ZCGZ alls
10/08/2002 - section/curb	NBI 36A is a "0 taper are on the - These were re	)" because e approach	rail is W-beam end of the stru	cture or	ıly.	the face of the c	urbs. 36B-Trans	sition rail and brid	ge approach	ISDL RHG
	Sufficiency Rat	ting Calcul	ation Accontad	by one	u5062 at 2/	11/07 10:44:20				REF
	Rating Calculation									
01/01/1992 -	Updated with ta	ape 1994								NB94
03/01/1990 -	Updated with ta	ape 1991								NB91
02/01/1988 -	Updated with ta	ape 1989								NB89
02/01/1986 -	Updated with ta	ape 1988								NB88
01/01/1984 -	Updated with ta	ape 1985								NB85
08/01/1981 -	Updated with ta	ape 1984								NB84
03/01/1979 -	Updated with ta	ape 1980								NB80



2 %

Location: 1M N GREAT FALLS Structure Name:

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**General Location Data** MDT Maintenance Section: 31-01 Great Falls District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015 Str Owner Code, Description: 1 State Highway Agency **State Highway Agency** Maintained by Code, Description:1 Intersecting Feature: INT EMERSON, BNSF RR Kilometer Post, Mile Post: 454.70 km 282.54 Structure on the State Highway System: Latitude: 47°31'17" **Construction Data** Structure on the National Highway System: Longitude: 111°22'45" Construction Project Number: IG 15-5(27)274 Str Meet or Exceed NBIS Bridge Length: Construction Station Number: 724+45.00 Construction Drawing Number: 7104 **Traffic Data** Construction Year: 1967

Percent Trucks:

# Structure Loading, Rating and Posting Data

### Loading Data:

Current ADT: 9,280

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	34.4 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

ADT Count Year: 2009

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	63.18		

Reconstruction Year:

# Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 107.90 m Deck Area: 1,052.00 m sq

8.55 m Deck Roadway Width: 11.58 m Approach Roadway Width:

Median Code, Description: 0 No median

# Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

6.76 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

2.75 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 6

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 9.75 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 0.00 m Skew Angle: 30°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	North or East Travel			
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
One Route Under	N00123	Both	6.76 m	9.14 m	N/A			
VAUGHN ROAD								
Route On Structure	I00015	N/A			North	99.99 m	8.55 m	
I-15 NB / EMERSON JCT								



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Continue

**Inspection Data** 

Sufficiency Rating: 76.4

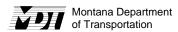
Inspection Due Date: 19 December 2014 (91) Inspection Frequency (months): 24

Structure Status : Func Obs - Elg Rehab

NBI Inspection D									
(90) Date of Last Ins	spection: 19 December	er 2012		La	ast Inspected By:	Charles Pep	os - 107		
(90) Inspection	on Date :				Inspected By:				
(58) Deck	Rating : 6	(68) Deck Geo	ometry : 3	(36A)	Bridge Rail Rating	1	(62) Culver	rt Rating : N	
(59) Superstructure	Rating: 7	(67) Structure F	Rating : 7	(36B	(36B) Transition Rating : 1 (61) Channel Rating : N				
(60) Substructure Rating : 7 (69) Under Clearance : 4		(36C) Ap	(36C) Approach Rail Rating: 1 (71) Waterway Adequacy: N			dequacy :N			
(72) App Rdw	y Align : <b>7</b>	(41) Posting S		(36)	D) End Rail Rating	: 1	(113) Scou	r Critical : N	
	Unrepaired S	palls: 0 m	sq		Dec	ck Surfacing	Depth: 0.	00 in	
Inspection Hours				<b></b>	_				
Crew Hours for inspe	ction : 2			oper Required			_		
Helper H	lours :	s	nooper Hours	for inspection	: 0				
Special Crew H	lours :		I	Flagger Hours	. 0		7		
Special Equipment H	lours :						_		
Inspection Wor	k Candidates	Status	Deiositus	Effected	Scope Work		Action	Covered Condition	
Candidate ID	Date Requested	Status	Priority	Structure Unit	VVOIK		Action	States	
D31-FY2007-000030	27 November 2006	Approved	Medium	M Main	Bridge	<del></del>	Spot Paint (flex)		
Clean and spot paint be	earings.								
Approved. DRC									
D31-FY2007-000029	27 November 2006	Approved	High	M Main	300 Strip Seal	Exp Joint	Min Repair		
Clean sanding material	from joints.								
Approved. DRC									
D31-FY2011-000025	11 January 2011	Not Approved	Low	M Main	334 Metal Rai	l Coated	Repl Paint		
Clean and spot paint ra	· · · · · · · · · · · · · · · · · · ·	Approved		TVI IVIGITI	JOY WOLAI KAI	. Coulou	rtop/ runt		

Late Reason:

Inspection Date: 12/19/2012



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### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck X 100 3 1052 sq.m. 0 % % Previous Inspection Notes: 12/19/2012 - Wider and open cracks over the un-jointed Bents. Random and mapping cracks in all of the Spans. Small surface spalls and delaminations along the edges of the joint steel. 12/27/2010 - Small surface spalls and delaminations along joint steel. Wear in the wheel paths and mapping cracks in all Spans. Wider transverse cracks over Bent that are without joints. 11/19/2008 - Placed into Condition State 2 as a couple of small delaminations were observed with chain drag near the joints/guard angles. Wear in the wheel paths. Wider transverse cracks over the unjointed Bents. Some mapping cracks also. 11/02/2006 - Open transverse cracks over the Bents without joints. Minor wear in the wheel paths. Some very minor flaking of latex concrete paste at the joint steel, but none delamianted or spalling. 10/07/2002 - 107.90 \* 9.75 = 1052.03 Deck was hydromilled and the removed material was replaced with latex concrete. The deck has some transverse cracks over the Bents that do not have expansion joints. 04/14/1998 - None 02/01/1994 - None Inspection Notes: Element 109 - P/S Conc Open Girder 519 100 1 1 m. % Previous Inspection Notes: 12/19/2012 - No problems observed. 12/27/2010 - Good condition. 11/19/2008 - Generally Good condition. 11/02/2006 - Minor tight cracks from the backside of the embedded bearing plate to the ends of the girders on several of the girders; none are a problem 10/07/2002 - (6 \* 19.8) (4 \* 40.8) (5 \* 47.3) = 518.5m Minor cracking of the concrete near the beam seat on a couple of girders; not a problem. Inspection Notes: Element 205 - R/Conc Column 2 thru 6 10 ea. 90 % % Previous Inspection Notes: 12/19/2012 - Small surface delaminations near the ground on the construction joints. Shallow surface spalls on a couple of the columns. Generally in Good condition. 12/27/2010 - Some small delaminated sack patches at construction joints near groundline on a couple of the columns. Small surface spalls along shallow tie wire. 11/19/2008 - Condition State 2 due to shallow tie wire and surface spalls. Condition State 3 for delaminations that have not popped off. Some cracks and small delaminations on the webwalls. 11/02/2006 - Tight surface shrinkage cracks. Some areas where shallow tie wire is on the surface. Wire is rusty and causing small surface spalls. 10/07/2002 - Minor, tight random cracks on several coulmns. Inspection Notes:

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Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 215 - R/Conc Abutment 1 and 7 29 m. 95 % Previous Inspection Notes: 12/19/2012 - Good condition. Small spalls along the cap to backwall area. Erosion at the corners of the wingwalls. Some missing fill under Abutment 1's cap. Tight surface shrinkage cracks. 12/27/2010 - Small spalls along a couple of the embedded bearings. Minor and tight cracks under G2 and G3 in Abutment 1's cap. 11/19/2008 - Same as last comments. 11/02/2006 - Both caps have minor and tight cracks. A couple of small spalls where girders ends are embedded in the backwall. 10/07/2002 - (11.48 1.40 1.40) \* 2 = 28.56m Minor cracking in Abutment backwalls. Minor erosion at wingwalls. Inspection Notes: Element 234 - R/Conc Cap Bents 2 thru 6 57 m. % % Previous Inspection Notes: 12/19/2012 - Bent 4's cap has a small delamination under G4 on the Span 3 side. Shallow surface spalls and delaminations on the underside of the caps from rebar chair feet. 12/27/2010 - Small delamination under G4 on the Span 3 face of Bent 4's cap. Mostly in Good condtion. Some staining. Shallow surface spalls on under of caps from rebar chair feet. 11/19/2008 - Condition State 3 for surface delaminations and Condition State 2 for cracks and small surface spalls. Staining form past joint leakage 11/02/2006 - Most all of the undersides of the Bent caps have small surface spalls with rust staining from shallow rebar chairs. 10/07/2002 - 5 \* 11.48 = 57.40m Bottom side of cap at Bent 3-Right has some minor spalling concrete around exposed rebar chairs. Inspection Notes: Element 300 - Strip Seal Exp Joint 3 23 m. 95 % Previous Inspection Notes: 12/19/2012 - Lots of sanding material is packed into the gland area. No obvious leaking. Steel portions sound solid when tapped on. Small surface spalls and paste delaminations along the joint steel. 12/27/2010 - Steel sounds solid when tapped on. Small surface spalls and delaminations along edges of the steel. Both joints are full of sanding material. No leakage observed. 11/19/2008 - Steel sounds solid when tapped on. Small spalls and delamianations along the joint edges. Gland is pushed down from debris, but no tears or leakage was observed. 11/02/2006 - Joint steel is solid when tapped on. Joints are full of debris/sanding material which is pushing on the gland. No apparent leaking 10/07/2002 - 11.48 \* 2 = 22.96m Joints are filled with sanding material/debris. Gland is in Good condition with no tears or leaking evident. Inspection Notes:

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\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*\*

Element Des	scription									
Smart Flag		Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Bea	aring								
	1	1	25	ea.		90	10	0		
						%	%	%	%	%
Previous Ins	pection Notes :									
l 12/19/2012 -	- Spot rust, scale	e, faded pa	int, and some r	oaste fro	om the hydo-	demolition. Alig	nment is ok.			UZGZ
	- Spot rust, paint	•			·	, and the second se				ZZDZ
	- Spots of rust, p			rete pas	te from past	hydomilling.				TZDT
	- Rusty spots, pa									CODN
	- Rusty spots wit		_							IZHP
Inspection I	Notes:									
moposiism										
Element 313	3 - Fixed Bearing	1								
	1	1	29	ea.		90	10	0		
	•	·		ou.		%	%	%	%	9/
D	and a Ninter					70	76	76	70	
	pection Notes :									11707
	Spot rust, paint		faded paint.							UZGZ
	Spot rust and p									ZZDZ
	- Spots of rust, p		and some conc	rete pas	te from past	hydomilling.				TZDT
	- Minor spot rust									CODN
10/07/2002 -	- Minor rusty spo	ots with pitt	ing.							IZHP
Inspection I	Notes:									
Element 331	- Conc Bridge I	Railing								
	1	3	216	m.		95	5	0	0	
						%	%	%	%	9
Previous Ins	pection Notes :					I	I	I		
12/19/2012 -	- Random shrink	age cracks	s. Minor surfac	e spalls	near the dec	ck line. Spalls o	n the backside of	the W-Beam bol	t-up.	UZGZ
12/27/2010 -	- Unchanged fro	m past insp	ections.							ZZDZ
11/19/2008 -	- Same commen	its as the p	ast inspections	and ad	d some surfo	ce spalls of the o	riginal curb near	the deck line.		TZDT
11/02/2006 -	- Minor cracks al	long the rel	bar lines in a co	ouple of	the areas. S	Some minor and	random vertical of	cracking.		CODN
							ect a barrier rail w		f the curb.	IZHP
Inspection I	Notes:									



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Element 334	Scale Factor	Env	Quantity		Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat
	- Metal Rail Co	ated Singl	le W-Beam and	Steel F	Round Handr	ail w∖ Steel Post	is			
	1	3	216	m.		85	10	5	0	
						%	%	%	%	
revious Ins	pection Notes :									
2/19/2012 -	Rusty spots, pa	aint loss, fa	iding of the pair	nt, and r	minor surface	e pitting to the po	osts near the curl	o line.		UZ
									op of the curb aga	ainst ZZ
ne rail posts		•			·			•		TZ
		noete and	l handrail are ru	istad an	d nitted So	me naint is neeli	ing also All com	nonenets are he	hind the concrete	
					•		metal rail is behir	•		iz IZ
		10.0011	asty and pitting	unougi	iout tric rail e	and posts. The i		id the concrete b	arrier now.	14
Inspection N	lotes:									
lement 358	- Deck Crackin	a SmFlaa								
X X	1	3	1	00	X	0	100	0	0	
^	ı	3	'	ea.	^					
						%	%	%	%	
revious Insp	pection Notes :									
2/19/2012 -	Unchanged fro	m past insp	pections.							UZ
2/27/2010 -	Wide and oper	cracks ov	er the Bents tha	at don't	have joints.	Some wider ma	pping cracks in a	ll Spans.		ZZ
1/19/2008 -	Open cracks or	ver the unjo	ointed Bents an	id need	to start track	ing it.				TZ
Inspection N	lotes:									
2/19/2012 -	Fair markers at	t the Abutm	nent 1 corners.							
rosion on a	II (4) corners wi	th the NE o		worse.		ckina in the deck	k surface.			UZ ZZ TZ
rosion on a 1/19/2008 - Markers on t	II (4) corners wi NBI 58, deck, r ne Right and Le	th the NE of ated a "6" oft sides of	corner being the due to small de Abutment 1 and	worse. laminat d in Fair	ions and cractions condition.	cking in the decl		air condition		ZZ TZ
Frosion on a 1/19/2008 - Markers on t 1/02/2006 -	II (4) corners wi NBI 58, deck, r ne Right and Le Minor bumps o	th the NE of rated a "6" of sides of on and off o	corner being the due to small de Abutment 1 and of the structure.	e worse. laminat d in Fair Marker	ions and crace condition. To on the app	proach end of the	k surface. e bridge and in Fa	air condition.		zz Tz CC
Frosion on a 1/19/2008 - Markers on t 1/02/2006 -	II (4) corners wi NBI 58, deck, r ne Right and Le Minor bumps o Markers on bot	th the NE of rated a "6" of sides of on and off o	corner being the due to small de Abutment 1 and of the structure.	e worse. laminat d in Fair Marker	ions and crace condition. To on the app	proach end of the		air condition.		zz Tz CC Iz
Erosion on a 1/19/2008 - Markers on t 1/02/2006 - 0/07/2002 - 04/14/1998 -	Il (4) corners wi NBI 58, deck, r ne Right and Le Minor bumps o Markers on bot None	th the NE of rated a "6" oft sides of on and off of th side of the	corner being the due to small de Abutment 1 and if the structure. the approach of	e worse. laminat d in Faii Markei the brid	ions and crace condition. To on the app	proach end of the		air condition.		zz Tz CC
Frosion on a 1/19/2008 - Markers on ti 1/02/2006 - 0/07/2002 - 4/14/1998 - 12/01/1994 -	II (4) corners wi NBI 58, deck, r ne Right and Le Minor bumps o Markers on bot	th the NE of rated a "6" oft sides of on and off of th side of the ting Calcula	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RF
Frosion on a 1/19/2008 - Markers on t 1/02/2006 - 0/07/2002 - 4/14/1998 - 12/01/1994 - Sufficiency R	Il (4) corners wi NBI 58, deck, r ne Right and Le Minor bumps o Markers on bot None Sufficiency Rat ating Calculation	th the NE of atted a "6" of sides of and off of the side of the si	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RF
Tosion on a 1/19/2008 - Markers on ti 1/02/2006 - 0/07/2002 - 14/14/1998 - 12/01/1994 - Sufficiency R	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on bot None Sufficiency Rat ating Calculation	th the NE c ated a "6" of sides of on and off o th side of the ting Calcula on Accepte	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RF RI
rosion on a 1/19/2008 - 1arkers on ti 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - sufficiency R 1/01/1992 - 3/01/1990 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on bot None Sufficiency Ratating Calculation Updated with ta	th the NE of ated a "6" ated a "6" of the sides of an and off of the side of t	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RH RI
rosion on a 1/19/2008 - 1/19/2008 - 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - Gufficiency R 1/01/1992 - 3/01/1990 - 2/01/1988 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on bot None Sufficiency Rat ating Calculation	th the NE of atted a "6" of the sides of the side of t	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RI- RI NE
rosion on a 1/19/2008 - Markers on ti 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - sufficiency R 1/01/1992 - 3/01/1990 - 2/01/1988 - 2/01/1986 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rata ating Calculation Updated with the Updated with the Updated with the	th the NE of ated a "6" of the sides of the side of th	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RH RI NE NE
Frosion on a 1/19/2008 - 1/19/2008 - 1/19/2006 - 1/19/2006 - 1/19/2006 - 1/19/2007 - 1/19/	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on bot None Sufficiency Rat ating Calculation Updated with ta Updated with ta	th the NE of atted a "6" afted a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RH RI NE NE
rosion on a 1/19/2008 - 1/19/2006 - 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - fufficiency R 1/01/1990 - 2/01/1988 - 2/01/1986 - 1/01/1984 - 8/01/1981 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rata ating Calculation Updated with the Updated with the	th the NE of ated a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RI- RI NE NE NE NE
rosion on a 1/19/2008 - 1/19/2006 - 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - 5ufficiency R 1/01/1990 - 2/01/1988 - 2/01/1986 - 1/01/1984 - 8/01/1981 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rate ating Calculation Updated with the Updated with the Updated with the Updated with the Updated with the Updated with the	th the NE of ated a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RH RI NE NE NE
rosion on a 1/19/2008 - 1/19/2006 - 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - 5ufficiency R 1/01/1990 - 2/01/1988 - 2/01/1986 - 1/01/1984 - 8/01/1981 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rata ating Calculation Updated with the Updated with the	th the NE of ated a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RI- RI NE NE NE NE
rosion on a 1/19/2008 - 1/19/2006 - 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - 5ufficiency R 1/01/1990 - 2/01/1988 - 2/01/1986 - 1/01/1984 - 8/01/1981 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rata ating Calculation Updated with the Updated with the	th the NE of ated a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RI- RI NE NE NE NE
rosion on a 1/19/2008 - larkers on t 1/02/2006 - 0/07/2002 - 4/14/1998 - 2/01/1994 - ufficiency R 1/01/1990 - 2/01/1988 - 2/01/1986 - 1/01/1984 - 8/01/1981 -	Il (4) corners wi NBI 58, deck, re ne Right and Le Minor bumps of Markers on both None Sufficiency Rata ating Calculation Updated with the Updated with the	th the NE of ated a "6" of the sides of an and off of the side of	corner being the due to small de Abutment 1 and fithe structure. The approach of ation Accepted	e worse. laminat d in Fair Marker the brid by ops\$	ions and crac condition. s on the app ge and in Go	proach end of the pod condition.		air condition.		ZZ TZ CC IZ RI- RI NE NE NE NE



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#### 100015282+05472

Location: 1M N GREAT FALLS Structure Name:

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

Percent Trucks:

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015

Str Owner Code, Description: 1 State Highway Agency **State Highway Agency** Maintained by Code, Description:1

Intersecting Feature: INT EMERSON, BNSF RR Kilometer Post, Mile Post: 454.70 km 282.54

2 %

Structure on the State Highway System: Latitude: 47°31'17" **Construction Data** 

Structure on the National Highway System: Longitude: 111°22'47"

Str Meet or Exceed NBIS Bridge Length:

Construction Project Number: IG 15-5(27)274 Construction Station Number: 724+45.00

Construction Drawing Number: 7104

Construction Year: 1967 Reconstruction Year:

#### Current ADT: 9,280 ADT Count Year: 2009

# Structure Loading, Rating and Posting Data

### Loading Data:

**Traffic Data** 

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	34.4 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	63.18		

# Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 109.42 m Deck Area: 1,067.00 m sq

8.55 m Deck Roadway Width:

11.58 m Approach Roadway Width: Median Code, Description: 0 No median Structure Vertical and Horizontal Clearance Data: Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

6.76 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 2.75 m 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 6

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 9.75 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 0.00 m Skew Angle: 30°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	South, West or Bi-directional Travel				North or East Travel		
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal		
One Route Under	N00123	Both	6.76 m	9.14 m	N/A				
VAUGHN ROAD									
Route On Structure	I00015	South	99.99 m	8.55 m	N/A				
I-15 SB / EMERSON JCT									



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**Inspection Data** 

Sufficiency Rating: 76.4

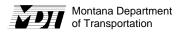
Inspection Due Date: 19 December 2014 (91) Inspection Frequency (months): 24

Structure Status: Func Obs - Elg Rehab

**NBI Inspection Data** 19 December 2012 Charles Pepos - 107 (90) Date of Last Inspection: Last Inspected By (90) Inspection Date Inspected By (62) Culvert Rating : N (58) Deck Rating: 6 (36A) Bridge Rail Rating: (68) Deck Geometry: 3 (59) Superstructure Rating: (61) Channel Rating : N (36B) Transition Rating: (67) Structure Rating: (71) Waterway Adequacy (60) Substructure Rating: 7 (36C) Approach Rail Rating (69) Under Clearance: 4 (36D) End Rail Rating (113) Scour Critical: (72) App Rdwy Align : 7 (41) Posting Status: Unrepaired Spalls: 0 m sq 0.00 in Deck Surfacing Depth: **Inspection Hours** Snooper Required : N Crew Hours for inspection: Snooper Hours for inspection Helper Hours: 0 Flagger Hours Special Crew Hours: 0 Special Equipment Hours: 0 Scope of Effected Covered **Inspection Work Candidates Status Priority** Structure Work Action Condition Candidate ID Unit States Requested D31-FY2007-000032 27 November 2006 Approved Medium M Main Bridge Spot Paint (flex) Paint the rail. Approved. DRC D31-FY2007-000031 27 November 2006 Medium M Main 300 Strip Seal Exp Joint **Approved** Min Repair Clean debris/sanding material from the joints. 11-19-2008 Full. Approved. DRC D31-FY2011-000026 11 January 2011 **Not Approved** Low M Main Bridge Spot Paint (flex) Paint the bearings.

Late Reason:

Inspection Date: 12/19/2012



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### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck X 100 3 1067 sq.m. 0 % % Previous Inspection Notes: 12/19/2012 - Open cracks over the un-jointed Bents. Minor studded tire wear in the wheel paths. Small surface spalls and delaminations along the edges of the joint's steel. Random and mapping cracks in all of the Spans. 12/27/2010 - A couple of small surface delaminations along the joint steel. Minor wear in the wheel paths. Open cracks over the Bents without a joint. Wider mapping cracks in all Spans. 11/19/2008 - A couple of small delaminations near the joints. Wear in the wheel paths. Wide transverse cracks over the unjointed Bents. Mapping cracks in most of the Spans. 11/02/2006 - Transverse cracks over the Bents without joints. Wear in the wheel paths. Minor scale/flaking of latex paste at the joint steel, but no delaminations or spalling observed. 10/07/2002 - 109.42 \* 9.76 = 1066.85 Deck was hydromilled and the removed material was replaced with latex concrete. The deck has transverse cracks over all the Bents that don't have expansion joints. 04/14/1998 - None 02/01/1994 - None Inspection Notes: Element 109 - P/S Conc Open Girder 526 100 1 1 m. % Previous Inspection Notes: 12/19/2012 - Good condition. 12/27/2010 - Good condition. 11/19/2008 - No problems observed. 11/02/2006 - Girders are in Good condition. Some minor cracks from the backside of the embedded bearing plate to the ends of the several of the girders; not a problem. 10/07/2002 - (4 \* 40.8) (6 \* 19.8) (5 \* 48.8) = 526.0m Some girders have minor cracks near beam seats. Inspection Notes: Element 205 - R/Conc Column 2 thru 6 10 ea. 90 % % Previous Inspection Notes: 12/19/2012 - Small areas of surface delaminations near the groundline at the cold joints. Right column of Bent 5 has a small spalled area. 12/27/2010 - Small delaminations to sack patches at construction joint near groundline with the Left column of Bent 4 being the worse. Some small scrapes and surface spalls on the web ties from construction. 11/19/2008 - Condition State 3 for small delamiantions observed in the Left column at Bent 4. Some small scrapes/spalls from construction acivities and the webwalls for Bents 3 and 4 show some cracks and delaminations. 11/02/2006 - Tight surface shrinkage cracks. Several small areas where tie wire is exposed and rusting. Some small surface spalling along the exposed tie wire. 10/07/2002 - Minor, tight cracks on several columns. Inspection Notes:

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\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 215 - R/Conc Abutment 1 and 7 1 29 m. 95 % Previous Inspection Notes: 12/19/2012 - Small spalls along the cap to backwall area. Tight vertical crack under G2 at Abutment 1 and under G2 and G3 at Abutment 7. Erosion at all (4) wingwalls. 12/27/2010 - Small spalls near a couple of the girders in the backwalls. Vertical crack under G2 at Abutment 1 and G2 and G3 at Abutment 7 in their caps. 11/19/2008 - Unchanged from past inspections. 11/02/2006 - Tight vertical cracks in both caps witth Abutment 1's being the worse. A couple of small spalls along the ends of the girders where they are embedded in the backwalls. 10/07/2002 - (11.48 1.40 1.40) \* 2 = 28.56m Minor, vertical cracks under girders at Abutment 1. Erosion at all (4) wingwalls. Inspection Notes: Element 234 - R/Conc Cap 2 thru 6 90 57 m. % % % % Previous Inspection Notes : 12/19/2012 - Small surface spalls on the faces of (3) caps near the outer anchors. Small delaminations on Span 4 face of Bent 4 under G5. Small surface spalls and delaminations on the underside of the caps from rebar chair feet. 12/27/2010 - Unchanged for small delamination under G5 on Span 4 side of Bent 4's cap. Several small surface spalls on the cap faces near outer most anchors. Some shallow surface spalls on underside of the caps. 11/19/2008 - Condition State 3 for small surface delaminations and Condition State 2 for cracks and minor spalling. Small spall on Bent 4's cap under G5 on the Span 4 side. 11/02/2006 - Underside of the caps show surface spalling from exposed and rusty rebar chairs. Also some staining around the chairs. 10/07/2002 - 5 \* 11.48 = 57.40m Minor stains where construction rebar chairs are exposed. Minor, tight cracks on most caps. Inspection Notes: Element 300 - Strip Seal Exp Joint 1 3 23 95 m. % Previous Inspection Notes: 12/19/2012 - Joints are packed full of sanding material today. No apparent leakage. Steel portions sound solid when tapped on and there are small spalls/delaminations along the edges of the joint's steel. 12/27/2010 - Full of sanding material today. Steel portions of the joints sound solid when tapped but do have some shallow spalls and surface delaminations along their edges. 11/19/2008 - Steel sounds solid when tapped on. A couple of small spalls and delaminations along the steel edges. Gland is pushed down from debris with no obvious tears or leakage. 11/02/2006 - Joint steel sounds solid when tapped on. Joint area is full of debris/sanding material which is pushing down on the gland. No leaking was noted 10/07/2002 - 11.48 \* 2 = 22.96m Joints are full of sanding material. Gland doesn't appear to be torn anyplace and not leaking. Inspection Notes:

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\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*\*

					-	waiii-u - (COIII	-,			
Element Des	scription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Be	aring								
	1	1	25	ea.		90	10	0		
						%	%	%	%	9
Previous Ins	pection Notes :									
			. scale. and fad	ed pain	t. Alianment	is ok.				UIGZ
12/19/2012 - Spot rust, concrete paste, scale, and faded paint. Alignment is ok. 12/27/2010 - Paint loss, spot rust, and minor scale.										ZWDZ
11/19/2008 - Spot rust, paint loss, and some concrete paste from past hydromilling operations.										TEDU
11/02/2006 - Spot rust, paint loss, and some dirt/debris.										CXDN
	Minor rust spo									IZHQ
Inspection I	Notes.									
Flomant 242	L Fixed Peerin	~								
Element 313	- Fixed Bearing						1			
	1	1	33	ea.		90	10	0		
						%	%	%	%	9
Previous Ins	pection Notes:				_					
12/19/2012 -	Paint loss, spo	t rust, and	faded paint.							UIGZ
12/27/2010 -	Paint loss and	spot rust.	Some bird debi	ris.						ZWDZ
11/19/2008 -	Spot rust, pain	t loss, and	some concrete	paste f	rom past hyd	dromilling operati	ons.			TEDU
11/02/2006 -	Spot rust, pain	t loss, and	some debris.							CXDN
10/07/2002 -	Minor rust spo	ts and mind	or pitting.							IZHQ
Inspection I	Notes:									
Element 331	- Conc Bridge	Railing								
	1	3	219	m.		95	5	0	0	
	'		210	111.				%		9/
						%	%	70	%	
	pection Notes :									
12/19/2012 - along the de		ce shrinkag	je cracks. Spal	lls on th	e backside o	of the barriers at	the rail bolt-ups.	Small surface s	palls and deteriora	ation UIGZ
	· Vertical crackii	ng through	out. A couple o	f small	scrapes.					ZWDZ
11/19/2008 - Unchanged. Small areas of surface deterioration on the original curbs near the deck line.										TEDU
11/02/2006 - Minor cracks along the rebar lines on the backside. Randonm vertical cracks.										CXDN
10/07/2002	109.42 * 2 = 2	18.84m M	inor, vertical cra	acks thr	oughout. Du	uring a rehab pro	ject a barrier was	s added on top of	of the existing curb	os, IZHQ
Inspection I						•				
mapection	10153.									

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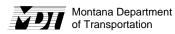
Element 334 - Metal Rail Coated Singe W-Beam with Round Steel Handrail w\ Steel Posts  1 3 219 m. 85 10 5 0  Previous Inspection Notes:  12/19/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line.  12/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the top of the curb and against the rail posts.  11/19/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  10/07/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier rail.  04/14/1998 - None  10/20/1994 - None  Inspection Notes:  Element 358 - Deck Cracking SmFlag  X 1 3 1 ea. X 0 100 0 0  % % % %  %  Previous Inspection Notes:						~ Span : i	Main-0 - (Cont	.)			
Element 334 - Metal Rail Coated Singe W-Beam with Round Steel Handrail w\ Steel Posts  1 3 219 m. 85 10 5 0  % % % % %  Previous Inspection Notes:  12/19/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line.  12/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the op of the curb and against the rail posts.  11/19/2008 - No significant change.  11/19/2008 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  10/07/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier ail.  11/19/10/1994 - None  11/19/20/20/20/20/20/20/20/20/20/20/20/20/20/	Element Des	cription									
219 m. 85 10 5 0  219/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line.  2/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the post of the curb and against the rail posts.  1/109/2008 - No significant change.  1/00/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/00/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier ail.  4/1/41/41998 - None  1/1/2004 - None  1/1/2004 - None  1/2004 - None  1/2	Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
revious Inspection Notes:  2/19/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line.  2/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the op of the curb and against the rail posts.  1/19/2008 - No significant change.  1/10/2/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/0/7/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier all.  1/1/1/1998 - None  1/1/19/1994 - Vone  1/1/1994 - Vone  1/1/19/1994 - Vone  1/1/1994 - Vone	lement 334	- Metal Rail Co	ated Sing	e W-Beam with	Round	Steel Handr	rail w\ Steel Post	6			
Previous Inspection Notes:  2/19/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line.  2/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the op of the curb and against the rail posts.  1/19/2008 - No significant change.  1/02/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/007/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier all.  1/4/14/1998 - None  1/4/14/1994 - None  1/4/1994 - None  1/4/1994 - None  2/20/2010 - Unchanged from previous inspections.  2/19/2012 - Unchanged from previous inspections.  2/217/2010 - Wide cracks over un-jointed Bents. Some wider mapping cracks in all Spans.		1	3	219	m.		85	10	5	0	
2/19/2012 - Faded paint, spot rust, and paint loss. Minor surface pitting on the rail posts near the curb line. 2/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the op of the curb and against the rail posts. 1/19/2008 - No significant change. 1/02/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout. 0/07/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier ail. 1/4/14/1998 - None 1/2/01/1994							%	%	%	%	
2/27/2010 - Paint loss, minor surface pitting, and scale on the W-Beam and posts. Sanding material starting to build up behind the barrier on the op of the curb and against the rail posts.  1/19/2008 - No significant change.  1/02/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/02/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier ail.  1/14/1998 - None  1/19/2004 - None  1/19/2014 - None  1/19/2012 - Unchanged from previous inspections.  2/19/2012 - Unchanged from previous inspections.  2/19/2012 - Unchanged from previous inspections.  2/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.	revious Ins	pection Notes :		l							
po of the curb and against the rail posts.  1/19/2008 - No significant change.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts. The metal rail and posts are now behind a concrete barrier lail.  1/102/1994 - None  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts. The metal rail and posts are now behind a concrete barrier lail.  1/102/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts. The metal rail and posts are now behind a concrete barrier lail.  1/102/2006 - Deck Cracking SmFlag  1/102/2006 - Rust, pitting, paint peel, and posts are now behind a concrete barrier lail.  1/102/2006 - Deck Cracking SmFlag  1/102/2006 - Deck Cracking SmFlag  1/102/2006 - Rust, pitting throughout paint peel, and posts are now behind a concrete barrier lail.  1/102/2006 - Deck Cracking SmFlag  1/102/2006	2/19/2012 -	Faded paint, sp	oot rust, an	nd paint loss. M	linor sui	rface pitting	on the rail posts	near the curb line	9.		UIGZ
1/19/2008 - No significant change.  1/02/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/02/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier ail.  1/14/1/1998 - None  1/19/2011 - None  1/19/2012 - Deck Cracking SmFlag    X	2/27/2010 -	Paint loss, min	or surface	pitting, and sca	le on th	e W-Beam a	and posts. Sandi	ng material starti	ng to build up be	hind the barrier on	the ZWD
1/02/2006 - Rust, pitting, paint peel, and exposed prime coat on the rail posts and top handrail pipe. W-Beam has some rusty spots throughout.  1/02/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier rail.  1/14/14/1998 - None  1/1994 - None  1/1994 - None  1/1995 - Deck Cracking SmFlag    X				ts.							TEDL
0/07/2002 - 109.42 * 2 = 218.84m Rusty spots with pitting throughout rail and posts. The metal rail and posts are now behind a concrete barrier all.  4/14/1998 - None 2/01/1994 - None Inspection Notes:    lement 358 - Deck Cracking SmFlag   X		· ·	Ŭ	and exposed pri	me coat	t on the rail r	posts and top hai	ndrail pipe. W-Be	eam has some ru	isty spots througho	
ail. 4/14/1998 - None 12/01/1994 - None Inspection Notes:  Element 358 - Deck Cracking SmFlag  X			•				•	• •		, ,	
2/01/1994 - None Inspection Notes:  Clement 358 - Deck Cracking SmFlag  X	ail.			acty opera	,g	ougoutc	an and pooter in	oo.a. ra aa p	2000 0.0 20		
Inspection Notes:  Selement 358 - Deck Cracking SmFlag  X											RHH
Element 358 - Deck Cracking SmFlag  X	2/01/1994 -	None									REFI
X 1 3 1 ea. X 0 100 0 0 0 0 % % % % % % % % % % % % %	Inspection I	Notes:									
X 1 3 1 ea. X 0 100 0 0 0 0 0 % % % % % % % % % % % %											
X 1 3 1 ea. X 0 100 0 0 0 0 % % % % % % % % % % % % %											
Previous Inspection Notes :  2/19/2012 - Unchanged from previous inspections.  2/27/2010 - Wide cracks over un-jointed Bents. Some wider mapping cracks in all Spans.  1/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.	lement 358	- Deck Crackin	g SmFlag								
Previous Inspection Notes:  2/19/2012 - Unchanged from previous inspections.  2/27/2010 - Wide cracks over un-jointed Bents. Some wider mapping cracks in all Spans.  2/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.	X	1	3	1	ea.	X	0	100	0	0	
2/19/2012 - Unchanged from previous inspections.  2/27/2010 - Wide cracks over un-jointed Bents. Some wider mapping cracks in all Spans.  2/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.							%	%	%	%	
2/27/2010 - Wide cracks over un-jointed Bents. Some wider mapping cracks in all Spans.  1/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.	revious Ins	pection Notes :									
1/19/2008 - Condition State 2 due to size of the cracks and nearing the density limit also.	2/19/2012 -	Unchanged fro	m previous	s inspections.							UIGZ
, , , , , , , , , , , , , , , , , , ,	2/27/2010 -	Wide cracks ov	er un-joint	ed Bents. Som	e wider	mapping cr	acks in all Spans				ZWD
Inspection Notes:	1/19/2008 -	Condition State	e 2 due to s	size of the crack	ks and r	nearing the c	density limit also.				TEDU
inspection reces.	Inspection N	lotes.									
	nopeodon i										



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### 100015282+05472 Continue

General Inspection Notes	
12/19/2012 - Good markers on the corners of Abutment 7.	UIGZ
12/27/2010 - Good markers on both sides of Abutment 7 for approaching traffic.	ZWDZ
Minor erosion on all (4) corners.  11/19/2008 - NBI 58, deck, rated a "6" due to small delamiantions and cracking.  Bumps on and off of the structure. Markers on both corners of Abutment 7, approach roadway, and in Fair condition.	TEDU
11/02/2006 - Minor bumps on and off of the structure. There are markers on the Right and Left approach rail into the bridge and in Fair to Good condition.	CXDN
10/07/2002 - Markers on North end of the structure, approach side, and in Good condition.	IZHQ
04/14/1998 - None	RHHJ
02/01/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:44:30 Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:07	REFI
01/01/1992 - Updated with tape 1994	NB94
03/01/1990 - Updated with tape 1991	NB91
02/01/1988 - Updated with tape 1989	NB89
02/01/1986 - Updated with tape 1988	NB88
01/01/1984 - Updated with tape 1985	NB85
08/01/1981 - Updated with tape 1984	NB84
03/01/1979 - Updated with tape 1980	NB80



**General Location Data** 

## **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

**Location: 1M N EMERSON JCT Structure Name:** 

100015284+00001

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Printing Date: Thursday, May 22 2014

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS GREAT FALLS** Division Code, Location:31

County Code, Location: 013 **CASCADE** City Code, Location: 00000 **RURAL AREA** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015

State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: DRAINAGE Kilometer Post, Mile Post: 457.10 km 284.03

Structure on the State Highway System: Latitude: 47°31'54" **Construction Data** 

Structure on the National Highway System: Longitude: 111°24'06" Construction Project Number: I 15-5(9)275 Str Meet or Exceed NBIS Bridge Length: Construction Station Number: 862+50.00

Construction Drawing Number: **Traffic Data** 

Construction Year: 1960 Current ADT: 9,280 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

## Structure Loading, Rating and Posting Data

### Loading Data:

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	32.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	48.6		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 3.86 m

Deck Area: 0.00 m sq 0.00 m Deck Roadway Width:

23.16 m Approach Roadway Width:

Median Code, Description: 0 No median

## Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

N Feature not hwy or RR Reference Feature for Vertical Clearance:

0.00 m Vertical Clearance Under the Structure:

N Feature not hwy or RR Reference Feature for Lateral Underclearance:

0.00 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span Approach Span

Number Spans: 1

Number of Spans: 0 Material Type Code, Description: 3 Steel Material Type Code, Description:

Span Design Code, Description: 19 Culvert (includes frame culverts) Span Design Code, Description:

Deck

Deck Structure Type: N Not applicable

Deck Surfacing Type: N Not Applicable (applies only to strutures with no dec

Deck Protection Type: N Not applicable (applies only to structures with no de

Deck Membrain Type: N Not applicable (applies only to structures with no de

Structure Vertical and Horizontal Clearance Data Inventory Route:

1 Design Gode, Desci	iption .	
(52) Out-to	-Out Width: 0.00 m	_
(50A) Curb Width	:	(50B) Curb Width :
0.00 m	Ckow Anglo . °	0.00 m
	Skew Angle : °	

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	lorth or East Trav	vel
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
Route On Structure	100015	Both	99.99 m	12.10 m	N/A		
I - 15	]						



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## 100015284+00001

Continue

**Inspection Data** 

Inspection Due Date : 28 April 2016

Sufficiency Rating : 8 Structure Status : Not		(91) Inspec	tion Frequenc	y (months) : <b>2</b> 4	ı		
NBI Inspection Da	ata						
(90) Date of Last Insp	pection: 28 April 201	4		La	ast Inspected By: Charles P	epos - 107	
(90) Inspection	n Date :				Inspected By :		
(58) Deck	Rating : N	(68) Deck Geo	metry : 9	(36A)	Bridge Rail Rating : N	(62) Culve	ert Rating : 6
(59) Superstructure	Rating : N	(67) Structure F	Rating: 6	(36B)	Transition Rating : N	(61) Chann	el Rating : 7
(60) Substructure	Rating : N	(69) Under Clear	rance : N	(36C) Ap	proach Rail Rating :N	(71) Waterway	Adequacy :8
(72) App Rdwy	/ Align : 8	(41) Posting S		(361	D) End Rail Rating : N	(113) Scot	ur Critical : 8
	Unrepaired S	palls: 0 m	sq		Deck Surfaci	ng Depth : 0	.00 in
Inspection Hours Crew Hours for inspec			Snor	pper Required			
Helper Ho		<u> </u>		for inspection			
Special Crew Ho		<u> </u>	'	Flagger Hours	U	<del></del>	
Special Equipment Ho		<b></b>			U		
		<u> </u>					
Inspection Worl		Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition
Candidate ID	Date Requested			Unit			States
D31-FY2006-000196	03 May 2006	Approved	High	M Main	240 Steel Culvert	Rehab Elem	
Clean debris from inlet a 5-03-2010 Lots of turn 5-07-2012 Pipe was of 4-28-2014 Inlet is full	nbleweeds at both er clean today. Ditch ne	nds today. eeds to be taken pas	st R/W to get r	rid of standing	nage ditch so as to drain the	e standing water in th	e pipe.

Late Reason:

Inspection Date: 04/28/2014



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## 100015284+00001

Continue

#### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 240 - Steel Culvert 3 65 m. 85 10 % % Previous Inspection Notes: 04/28/2014 - Area under SB lanes has rust, scale, and pin holes in the roof area in random spots. Concrete in the invert looks Good. (2) small holes in the roof about 30' in from the inlet. 05/07/2012 - Pipe was clean today with knee deep water standing in the outlet. Rust, scale, and surface pitting on the invert. Some small pin holes in the invert. Holes 30 ft. in from the inlet end are unchanged. A concrete liner was placed in this pipe during 2013 construction project. This took care of the problems on the invert of the pipe. 05/03/2010 - Same comments as the last inspections. Lots of tumbleweeds in the inlet and outlet of the pipe today. 04/24/2008 - No change on the 4" x 4" holes, 30 ft in from the inlet. 5 percent in Condition State 3 as a couple of small holes in the invert and because of loss of shape. Rusty spots, scale, and pitting on the bottom 1 ft of the pipe. Outlet is bouncy as hollow under the last 10 ft of the pipe. 04/18/2006 - 64.62 \* 1 = 64.62m Plans say it is a 13'-0" SSPP but field measurements show it to be 12'-8"(S) x 13'-9"(R). Concrete slope protection and cutoff wall added on the Right-Inlet end after initial construction. Pipe is dry at the inlet, 1' deep standing water at outlet and 2' of standing water under the SB Inae. Pipe has some rust spots and light scale on the invert. Hollow under the first 6 ft of the outlet of the pipe with no cut off wall or slope protection in place. Pipe end bounces when jumped on. About 30 ft in from the inlet is a 4" x 4" hole in the top-Left portion of the pipe. This hole does not appear to be a problem. Inspection Notes: **General Inspection Notes** 04/28/2014 - Outlet ditch needs to be worked on as still about 1-1/2' of water backed up in the inlet of the pipe for about 40'. 05/07/2012 - Outlet end of the pipe is hollow under the pipe; back 15 ft. Pipe's shape is Fair with some egg shape to it from construction activity. 05/03/2010 - Hollow area under outlet is unchanged. Mid-thigh deep at outlet today to ankle deep at inlet. 04/24/2008 - Scour hole at outlet and shallow stream bed 50 ft from the pipe has water standing 2 ft deep back into the pipe. 04/18/2006 - Cutoff wall and slope protection on Right end added in a construction project that also cleaned out the pipe. Guardrail for I-15 at the pipe due to slope steepness and is up to current standards.



100015284+02351

**Location: 6M S VAUGHN Structure Name:** 

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100015264+0255

**General Location Data** MDT Maintenance Section: 31-01 Great Falls District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** County Code, Location: 013 **CASCADE** City Code, Location: 00000 **RURAL AREA** Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00015 State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1 Intersecting Feature: JR GRADE SEP Kilometer Post, Mile Post: 457.42 km 284.23 Structure on the State Highway System: Latitude: 47°31'60" **Construction Data** Structure on the National Highway System: Longitude: 111°24'23"

**Traffic Data** 

Current ADT: 9,280 ADT Count Year: 2009 Percent Trucks: 2 %

Construction Project Number : I 15-5(9)275
Construction Station Number : 0+00.00

Construction Drawing Number: 4209

Construction Year : 1960
Reconstruction Year : 1974

## Structure Loading, Rating and Posting Data

#### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	54.4 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	120.29		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 5.49 m

Deck Area: 210.00 m sq

Deck Roadway Width: 38.30 m

Approach Roadway Width: 22.00 m

Str Meet or Exceed NBIS Bridge Length:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

Reference Feature for Vertical Clearance: N Feature not hwy or RR

Vertical Clearance Under the Structure: 3.58 m

Reference Feature for Lateral Underclearance : N Feature not hwy or RR

Minimum Lateral Under Clearance Right : 0.00 m

Minimum Lateral Under Clearance Left : 0.00 m

#### Span Data

#### Main Span

Number Spans: 1

Material Type Code, Description : 1 Concrete Span Design Code, Description : 1 Slab

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 6 Bituminous
Deck Protection Type: 0 None
Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: **0**Material Type Code, Description:
Span Design Code, Description:

(52) Out-to-Out Width: 38.30 m

(50A) Curb Width: (50B) Curb Width: 0.00 m

Skew Angle: °

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	lorth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
Route On Structure	100015	South	99.99 m	11.00 m	North	99.99 m	11.00 m
I - 15 NB AND SB							



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## 100015284+02351

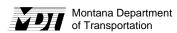
Continue

**Inspection Data** 

Sufficiency Rating: 96.6 Structure Status: Not Deficient Inspection Due Date: 06 August 2014 (91) Inspection Frequency (months): 24

<b>NBI</b> Inspection Da	ata							
(90) Date of Last Ins	pection : 06 August 2	012		La	ast Inspected By: Cha	arles Pepo	os - 107	
(90) Inspection	on Date :				Inspected By :			
(58) Deck (59) Superstructure (60) Substructure (72) App Rdw	Rating : 7	(68) Deck Geor (67) Structure R (69) Under Clear (41) Posting S	tating: 6	(36B)	Bridge Rail Rating: 1 ) Transition Rating: 0 proach Rail Rating: 1 D) End Rail Rating: 0	)	(61) Channe	et Rating : N el Rating : N dequacy : N r Critical : N
Inspection Hours Crew Hours for inspection Helper House Special Crew House	ours : 1		Snoo nooper Hours	oper Required for inspection Flagger Hours	: N : O	Surfacing [	Depth: 4.	00 in
Special Equipment He	ours :						_	
Inspection Work Candidate ID	k Candidates  Date Requested	Status	Priority	Effected Structure Unit	Scope of Work		Action	Covered Condition States
D31-FY2004-000066	28 January 2004	Approved	Low	M Main	215 R/Conc Abut	ment N	Min Repair	
Clean material away fro Approved. DRC	m the backwall drains	S.						
D31-FY2005-000030	07 October 2004	Approved	Low	M Main	39 Unp Conc Slab/	AC OvI	Min Repair	
Seal cracks between the	e deck slabs and the	median slab. Also b	petween the s	lab and aspha	It surfacing. Some dor	ne, 8-6-20	12.	
Lata Paggan:								

Inspection Date: 08/06/2012



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Continue

### **Element Inspection Data**

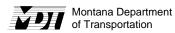
Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 39 - Unp Conc Slab/AC Ovl X 3 210 sq.m. 100 0 % % % Previous Inspection Notes: 08/06/2012 - Minor rutting in wheel paths. Roadway is smooth over structure. 08/09/2010 - No change from the previous inspections. 07/10/2008 - Chip seal in the past years. Minor ruts in the wheel paths, but surfacing is generally Good. Small section of exposed rebar on the underside of the slab at the Right edge of Abutment 1. 06/08/2006 - Crack at centerline under the NB lanes that has efflorescence. Minor rutting in the aspahlt surfacing. 09/21/2004 - Same as previous report. Joints at the median slabs to NB and SM slabs are leaking. 10/07/2002 - Mapping cracks on slab over the median with efflorescence on most cracks. 08/02/2000 - 38.30 \* 5.49 = 210.27 Seperation at the joints. 04/14/1998 - None 12/01/1995 - None 02/01/1994 - None Inspection Notes: Element 215 - R/Conc Abutment 2 90 101 m. % % % % Previous Inspection Notes: 08/06/2012 - Some small delaminated areas near cracks with effloresence. Still partially buried backwall drains. On both abutments worse cracks are from corners of spalls under traveled lanes. 08/09/2010 - No change from the previous inspections. 07/10/2008 - 5 percent in Condition State 3 for a small delmainated areas. 5 percent in Condition State 2 for cracks with efflorescence. Left wingwall at Abutment 1 has a slight seperation from the backwall. Some backwall drains are partially buried. 06/08/2006 - Same as previously reported plus some spalled patch, 4" x 10", on the Right end of Abutment 1 just under the deck. 09/21/2004 - Cracking from the corners of lane slabs with efflorescence on the cracks. Wingwalls are tight to the backwalls. 10/07/2002 - Same as previous report. Add weep drains along both backwalls are either buried or partially covered. 08/02/2000 - (38.3 \* 2) + (4 \* 6.10) = 101.00mCracks with some water marking at the joints of the median section to the sections under the roadway. Slight seperation on the left end at the wingwalls to the backwall joint. 04/14/1998 - None 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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#### 100015284+02351 Continue

\*\*\*\*\*\* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* \*

Element Des	cerintion		****	* * * *	* Span : ı	Main-0 - (cont	:. <b>)</b> * * * * * * * *	* *		
	Scale Factor	Env	Quantity	Linita	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	- Metal Rail Co		,	Units		PCI SIAI I	PCI SIAI 2	PCI SIAI 3	PCI Stat 4	PCI SIAI 5
icincii 334	1	3	11		313	95	5	0	0	
	<u>'</u>	3	11	m.						
						%	%	%	%	
Previous Ins	pection Notes :									
8/06/2012 -	Some spot rus	t and fadeo	d paint on rail p	osts. So	me sanding	material in lowe	r post webs near	bases.		HZG.
8/09/2010 -	No change from	m the previ	ous inspections	S.						JZD
7/10/2008 -	Spot rust on th	e W-Beam	rail and top ha	If of the	posts. Pain	it loss and surfac	e pitting on the lo	ower portions of t	he webs and base	es. KZC
6/08/2006 -	Unchanged.									IZDU
9/21/2004 -	Spot rust on th	e rail posts	and W-Beam	rail.						VUL
10/07/2002 -	Minor rusty spo	ots to both	posts and rail.							
08/02/2000 -	5.49 * 2 = 10.9	8m								GHJ)
Some rust a 04/14/1998 -										RHH
12/01/1995 -	None									YDN
02/01/1994 -	None									REF
Inspection I	Votes:									
Пороспол	10100.									
General	Inspection I	Notes								
08/06/2012 -	Area under brid	dge was dr	y today as was	all of th	e exposed b	backwall drains.				HZG
				ets the "	no retro-fit n	needed" policy of	the Bridge Burea	au.		JZD
	d shoe is lapped Median barrier			ndition.						KZC
					d cracks in t	he asphalt surfa	cina.			IZDI
NBI 59, supe Small deline	erstructure, rated ators on the rail	d a "7" due blocks.	to minor crack	ing on th	ne underside	e of the deck slal		alcanad out		VUL
	·								Lucata	
				tandard	s. 36A is pa	art of continuous	run and is only V	v-beam with stee	o posts.	IFHF
	New seal and	cover in 19	99.							GHJ
04/14/1998 -										RHH
	Sufficiency Rat Rating Calculation									YDN
ĺ	, and the second	on Accepte	a by opoquooo	+ at 2/10	707 14.10.0	,0				
)2/01/1994 -										REF
)1/01/1992 -	Updated with to	ape 1994								NB9
	Updated with to									NB9
02/01/1988 -	Updated with ta	ape 1989								NB8
02/01/1986 -	Updated with ta	ape 1988								NB8
01/01/1984 -	Updated with ta	ape 1985								NB8
08/01/1981 -	Updated with ta	ape 1984								NB8



**General Location Data** 

## **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

**Location: GREAT FALLS Structure Name:** 

100315000+00001

MDT Maintenance Section: 31-01 Great Falls

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Printing Date: Thursday, May 22 2014

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00315

State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: INT I-15 Kilometer Post, Mile Post: 0.02 km 0.01

Structure on the State Highway System: Latitude: 47°29'06" **Construction Data** Structure on the National Highway System:

Longitude: 111°20'42" Construction Project Number: I 15-5(26)271 Str Meet or Exceed NBIS Bridge Length: Construction Station Number: 536+44.00

Construction Drawing Number: 6792 **Traffic Data** 

Construction Year: 1967 Current ADT: 15,040 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

## Structure Loading, Rating and Posting Data

### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	36.2 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	72.91		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 89.61 m Deck Area: 1,475.00 m sq

13.72 m Deck Roadway Width: 15.00 m Approach Roadway Width:

Median Code, Description: 2 Closed median (no barrier)

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

5.48 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 3.55 m 6.70 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 5

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 5 Epoxy Overlay

Deck Protection Type: 0 None Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: 0 Material Type Code, Description: Span Design Code, Description:

> 16.46 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 0.00 m Skew Angle: 30°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	rel
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	100015	South	6.75 m	11.58 m	North	5.48 m	11.58 m
I-15 NB AND SB	]						
Route On Structure	100315	West	99.99 m	8.53 m	East	99.99 m	4.88 m
10TH AVE. SOUTH INT.	]						



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100315000+00001 Continue

**Inspection Data** 

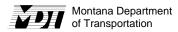
Sufficiency Rating: 88.4
Structure Status: Not Deficient

Inspection Due Date: 05 December 2014 (91) Inspection Frequency (months): 24

NBI Inspection D	ata						
(90) Date of Last Ins	pection: 05 December	er 2012		La	ast Inspected By: Charles Pe	pos - 107	
(90) Inspection	on Date :				Inspected By :		
(58) Deck (59) Superstructure (60) Substructure (72) App Rdw  Inspection Hours Crew Hours for inspection Helper Hours Special Crew Hours	Rating: 7  Rating: 6  y Align: 7  Unrepaired Space Spa	$-\overline{}$	Rating: 6 ance: 5 Status: A Socionoper Hours	(36B)	: 0	(61) Channe (71) Waterway A (113) Scou	rt Rating : N el Rating : N dequacy : N r Critical : N
Special Equipment H	lours : 0						
Inspection Wor	k Candidates	Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition
Candidate ID	Date Requested	Otatus	THORKY	Unit	WOIK	Action	States
	13 November 2002	Approved	High	All Spans	300 Strip Seal Exp Joint	Min Repair	
Clean the sanding mate	erial out of the rubber of	gland.					
D31-FY2004-000074	28 January 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
Clean and paint bearing	gs.						
<b>D31-FY2011-000022</b> Repair spalling / delami	28 December 2010 nations on the Right of	Not Approved olumn of Bent 4.	Low	M Main	205 R/Conc Column	Min Repair	

Late Reason:

Inspection Date: 12/05/2012



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#### 100315000+00001 Continue

#### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 22 - P Conc Deck/Rigid Ov 1475 X 100 3 sq.m. 0 % % Previous Inspection Notes: 12/05/2012 - Mapping cracks in all Spans. Surface delaminations along the guard angles and joint steel. Studded tire wear in the wheel paths. 12/06/2010 - Mapping cracks in most of the Spans with 4 and 5 being the worse. Wear in the wheel paths. Small delaminations along the joint 11/17/2008 - Wear in the wheel paths. Transverse cracks over the Bents w\o joints. EB lane has mapping cracks in all of the Spans. 11/02/2006 - Small delaminations along the joint over Bent 4. Wear in the wheel paths. Transverse cracking over the unjointed Bents. 10/16/2002 - 16.46 \* 89.61 = 1474.98 Same on cracks with some delamination and transverse cracking also; quick chain drag. 06/03/1998 - Numerous small, tight mapping cracks throughout the wear surface of the new overlay. A seal coat was applied in 1995 after the 1-1/2" rigid overlay. 19.19 \* 89.61 02/01/1994 - None Inspection Notes: Element 109 - P/S Conc Open Girder 781 100 m. % % % % Previous Inspection Notes : 12/05/2012 - Girders are in Good condition. 12/06/2010 - Good conditions with no hits observed. 11/17/2008 - Genreally in Good condition. 11/02/2006 - Generally in Good condition. Some minor cracks from the back of the embedded bearing plate to the ends of the girders on several of the girders. None of these are a problem. 10/16/2002 - (7 \* 28.12) (10 \* 43.5864) (8 \* 18.5166) Inspection Notes: Element 205 - R/Conc Column Bent 2, 3, 4, and 5 2 ea. 90 % Previous Inspection Notes : 12/05/2012 - Right column of Bent 4 shows spalls, delaminations, and deteriorated concrete on its' SE corners; photo. Tight surface shrinkage cracks. Columns of Bent 4 have some staining from joint leakage. 12/06/2010 - All look Good except the Right column at Bent 4 which has delaminations and spalling that is getting worse; photo. 11/17/2008 - Right column at Bent 4 has delaminations and spalling for Condition State 3 and 2 respectively; photo. Tight surface shrinkage cracks throughout. 11/02/2006 - Very minor spalling on a couple of the columns and none are a problem. A couple of the tie wires are exposed, but not a problem. 10/16/2002 - Most noticeable on the south column at Bent 4. 06/03/1998 - Some spalling of concrete on a couple of the columns. 02/01/1994 - None Inspection Notes:

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## 100315000+00001

Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 215 - R/Conc Abutment 1 and 6 45 m. 95 % Previous Inspection Notes: 12/05/2012 - Abutments are generally in Good condition. Small spalls along the cap to backwall area and (2) small spalls in Abutment 4's backwall by G3 and G6. 12/06/2010 - Generally Good condition. (1) small spall in Abutment 1's backwall at girder embedment. 11/17/2008 - (1) small spall in Abutment 1's backwall near a girder embedment. 11/02/2006 - Minor and tight shrinkage cracks on both caps. (1) small spall along the girder embedment at Abutment 1. Erosion on the Right side of Abutment 1, SW corner. 10/16/2002 - (19.19 1.65 1.45) \* 2 Inspection Notes: Element 234 - R/Conc Cap Bent 2, 3, 4, and 5 1 1 77 m. 90 % % % % Previous Inspection Notes: 12/05/2012 - Spall on the Left end of Bent 3's cap had not changed. Bent 4's cap is stained and has surface spalls and delaminations on its' bottom at rebar chair feet. 12/06/2010 - Spall on the Left end of Bent 3's cap on the Span 2 side; photo. Delamainations on the Right end of Bent 4's cap. Some small spalls on the surface of the cap bottoms from shallow rebar chair feet. 11/17/2008 - Spall on Bent 3's cap has not gotten any worse. Surface delaminations and spalls on the underside of the caps from shallow tie wire and exposed rebar chair feet. 11/02/2006 - Underside of the caps have small surface spalls where rusty rebar chairs are exposed. Also staining around the spalls. Left end of the cap at Bent 3 has a spall under the Span 2 side bearing; see photo. 10/16/2002 - 19.19 \* 4 = 76.76m Inspection Notes: Element 300 - Strip Seal Exp Joint 1 3 19 95 m. % % Previous Inspection Notes : 12/05/2012 - Joint is packed with sanding material today. Steel sounds solid when tapped on. Small delaminations in header concrete along the 12/06/2010 - Lots of dirt and ice in the joint today. Joint is leaking on its' Right end today. Steel all sounds solid when tapped on. 11/17/2008 - Full of dirt. No obvious leaking observed. Steel sounds solid when tapped on. Some small spalls/delaminations along the steel. 11/02/2006 - Joint steel sounds solid when tapped on. Packed with dirt/sanding material. No apparent areas of leakage. Some minor delaminations along the joint steel. 10/16/2002 - Full of sanding material. 06/03/1998 - Need to clean out the sanding material that is in the joint. QFBC 19.19 \* 1 02/01/1994 - None Inspection Notes:

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### I00315000+00001 Continue

	Caala Faatan	F	O + i +	I Indian	laan Faab	Dat Ctat 4	Dat Ctat 0	Dat Ctat 2	Dat Ctat 4	Dat Ctat 5
	Scale Factor - Moveable Bea	Env ering Bent	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
icinicin o i i	1	2	20	ea.	_	90	10	0		
	'		20	ca.		%	%	%	%	
						70	70	70	70	
	pection Notes :									
	Alignment is Go					3.				GZF2
	Alignment is Go									GAE:
	Rusty, paint los			ng from	prior joint.					RZD2
	Rusty, paint los		bird debris.							CXD
	Add and some									QZC.
	Some rust & pit	tting.								QFB(
2/01/1994 -	None									REF
Inspection I	Notes:									
lement 313	- Fixed Bearing									
	1	1	64	ea.		90	10	0		
						%	%	%	%	
Previous Ins	pection Notes :									
	pection Notes :	5 show fad	ed paint and sr	oot rust.	Abutment b	pearings have pai	int loss, rust, min	or surface pitting	and debris. Out	er GZFZ
2/05/2012 - earings at t	Bent 2, 3, and the Abutments a	re the wors	st.	oot rust.	Abutment b	earings have pai	int loss, rust, min	or surface pitting	, and debris. Oute	
2/05/2012 - earings at t 2/06/2010 -	Bent 2, 3, and the Abutments a Rust, dirt, paint	re the wors loss, and	t. bird debris.						, and debris. Out	GAEZ
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 -	Bent 2, 3, and 9 he Abutments a Rust, dirt, paint Spot rust on the	re the wors loss, and e Bent bea	et. bird debris. rings with paint				int loss, rust, min		, and debris. Oute	GAEZ RZDZ
12/05/2012 - pearings at t 12/06/2010 - 11/17/2008 -	Bent 2, 3, and she Abutments a Rust, dirt, paint Spot rust on the Some minor sp	re the wors loss, and e Bent bea	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ CXDC
2/05/2012 - pearings at t 2/06/2010 - 1/17/2008 - 1/02/2006 -	Bent 2, 3, and 9 he Abutments a Rust, dirt, paint Spot rust on the	re the wors loss, and e Bent bea	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ
2/05/2012 - pearings at t 2/06/2010 - 1/17/2008 - 1/02/2006 -	Bent 2, 3, and she Abutments a Rust, dirt, paint Spot rust on the Some minor spot on change.	re the wors loss, and e Bent bea	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ CXDC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 -	Bent 2, 3, and she Abutments a Rust, dirt, paint Spot rust on the Some minor spot on change.	re the wors loss, and e Bent bea	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ CXD0
2/05/2012 - pearings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 -	Bent 2, 3, and she Abutments a Rust, dirt, paint Spot rust on the Some minor spot on change.	re the wors loss, and e Bent bea	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ CXD0
2/05/2012 - pearings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 -	Bent 2, 3, and she Abutments a Rust, dirt, paint Spot rust on the Some minor spot on change.	re the wors loss, and e Bent bea ot rust and	et. bird debris. rings with paint						, and debris. Out	GAEZ RZDZ CXDC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change.	re the wors loss, and e Bent bea ot rust and	et. bird debris. rings with paint	t loss ar					, and debris. Out	GAEZ RZDZ CXDC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:	re the wors loss, and e Bent bea ot rust and	ot. bird debris. rings with paint bird debris.	t loss ar		iting on some of t	the Abutment bea	arings.		GAEZ RZDZ CXDC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - Inspection N	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:	re the wors loss, and e Bent bea ot rust and	ot. bird debris. rings with paint bird debris.	t loss ar		tting on some of t	the Abutment bea	arings.	0	GAEZ RZDZ CXD0
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  Ilement 331	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:  - Conc Bridge F 1  pection Notes:	re the wors loss, and e Bent bea ot rust and Railing	st. bird debris. rings with paint bird debris.	m.	nd surface pit	tting on some of the street of	the Abutment bea	arings.  0	0 %	GAE; RZD; CXD( QZC;
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  Ilement 331  revious Ins	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change.  Notes:  - Conc Bridge F  1  pection Notes:	re the wors loss, and le Bent bea ot rust and Railing 3	ott.  bird debris.  rings with paint bird debris.  180  palls at the bolt	m.	on the backsi	etting on some of the sound of the barriers	the Abutment bea	o % ge cracks. Gener	0 % rally in Good cond	GAE: RZD: CXD( QZC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  lement 331 revious Ins 2/05/2012 - 2/06/2010 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good	re the wors loss, and le Bent bea ot rust and Railing 3	obt.  bird debris.  rings with paint bird debris.  180  calls at the bolt.  Rubs and scr	m. holes c	on the backsi	etting on some of the sound of the barriers	the Abutment bea	o % ge cracks. Gener	0 % rally in Good cond	GAE: RZD: CXD: QZC:
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  Ilement 331  revious Ins 2/05/2012 - 2/06/2010 - 1/17/2008 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good Unchanged wit	re the wors loss, and le Bent bea ot rust and Railing 3 learriers. Sp d condition h some rub	ott.  bird debris.  rings with paint bird debris.  180  calls at the bolt Rubs and scr	m. holes or	on the backsion both. Back	etting on some of the source of the barriers aside of the barriers.	the Abutment beat 5 %  Some shrinakger has spalls near	ole cracks. Generate the ends around	0 % rally in Good cond	GAE: RZD: CXDC QZC  lition. GZF: GAE: RZD:
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  lement 331  revious Ins 2/05/2012 - 2/06/2010 - 1/17/2008 - 1/02/2006 - rilling/const	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change. Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good Unchanged wit Numerous vertiruction activity.	re the wors loss, and le Bent bea ot rust and Railing 3 learriers. Sp d condition h some rub	obt.  bird debris.  rings with paint bird debris.  180  calls at the bolt Rubs and scr	m. holes or	on the backsion both. Back	etting on some of the source of the barriers aside of the barriers.	the Abutment beat 5 %  Some shrinakger has spalls near	ole cracks. Generate the ends around	0 % rally in Good cond	GAE: RZD: CXDO QZC  GAE: RZD: CXDO
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - nspection N  Ilement 331  revious Ins 2/05/2012 - 2/06/2010 - 1/17/2008 - 1/02/2006 - rilling/const 0/16/2002 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change.  Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good Unchanged wit Numerous vertiruction activity. ok	re the wors loss, and le Bent bea ot rust and Railing 3 arriers. Sp d condition h some rubical cracks	ott. bird debris. rings with paint bird debris.  180  calls at the bolt Rubs and scr os and scrapes and some crace	m. holes of appear or noted.	on the backsion both. Back	etting on some of the source of the barriers aside of the barriers.	the Abutment beat 5 %  Some shrinakger has spalls near	ope cracks. Generate the ends around	0 % rally in Good cond	GAE: RZD: CXDC QZC  GAE: RZD: CXDC QZC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - Inspection N Element 331  Previous Ins 2/05/2012 - 2/06/2010 - 1/17/2008 - 1/02/2006 - 1/17/2008 - 1/02/2006 - 1/16/2002 - 6/03/1998 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change.  Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good Unchanged wit Numerous vertiruction activity. ok New Cast-in-Pl	re the wors loss, and le Bent bea ot rust and Railing 3 arriers. Sp d condition h some rubical cracks	ott. bird debris. rings with paint bird debris.  180  calls at the bolt Rubs and scr os and scrapes and some crace	m. holes of appear or noted.	on the backsion both. Back	etting on some of the source of the barriers aside of the barriers.	the Abutment beat 5 %  Some shrinakger has spalls near	ope cracks. Generate the ends around	0 % rally in Good cond	GAE: RZD: CXDC QZC  GAE: RZD: CXDC QZC  QZC  QZC  QZC
2/05/2012 - earings at t 2/06/2010 - 1/17/2008 - 1/02/2006 - 0/16/2002 - Inspection N Previous Ins 2/05/2012 - 2/06/2010 - 1/17/2008 - 1/02/2006 - rilling/const 0/16/2002 -	Bent 2, 3, and 3 he Abutments a Rust, dirt, paint Spot rust on the Some minor sp No change.  Notes:  - Conc Bridge F  1  pection Notes:  Rubs on both b Generally Good Unchanged wit Numerous vertiruction activity. ok New Cast-in-Pl	re the wors loss, and le Bent bea ot rust and Railing 3 arriers. Sp d condition h some rubical cracks	ott. bird debris. rings with paint bird debris.  180  calls at the bolt Rubs and scr os and scrapes and some crace	m. holes of appear or noted.	on the backsion both. Back	etting on some of the source of the barriers aside of the barriers.	the Abutment beat 5 %  Some shrinakger has spalls near	ope cracks. Generate the ends around	0 % rally in Good cond	GAE; RZD; CXD; QZC;

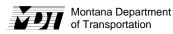


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\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*\*

Element Desc										
	cription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 358 -	<ul> <li>Deck Crackin</li> </ul>	g SmFlag								
Х	1	1	1	ea.	X	0	100	0	0	
						%	%	%	%	
revious Insp	ection Notes :						L	I	I	
12/05/2012 - 1	Due to size and	d quantity.	Spans 4 and 5	are the	worst. Little	to no sealer left.				GZFZ
12/06/2010 - 1	Lots of mappin	g cracks, e	specially in Sp	ans 4 a	nd 5.					GAEZ
11/17/2008 -	Condition State	e 2 due to d	density of crack	s in the	EB lane. Ur	nderside of the d	eck looks ok.			RZDZ
11/02/2006 -	Cracking very	visible toda	y from coating	of de-ic	er. No spalle	ed areas. In Cor	ndition State 1 as	sealed in 1995.		CXDO
10/16/2002 - I	No change.									QZCJ
06/03/1998 - 9	Small, tight ma	ping cracks	s throughout th	e new r	igid overlay.	Sealed with a se	ealer during 1995	also.		QFBC
Inspection N	otes:									
General I	nspection I	Votes								
	End shoes at A		are lanned and	ainet tra	ffic					GZFZ
Rail terminal s Slope protecti ohoto.	section at Abut ion concrete ha	ment 1-Lef as slid dow	t, NW corner, h	nas (3) b Iumns a	oroken rail po at Bent 2 and	is causing some	e cracking and sp	alling in the slope	e protection conc	rete,
	End shoes still			he NE a	and SE corne	ers.				GAEZ
NE and SE ra	Approaches ov iil end shoes ar Slope protectio	re lapped a	gainst traffic.	ows son	ne minor sett	lement and crac	kina.			RZDZ CXDO
10/16/2002 - I							3			QZCJ
06/03/1998 - I	None									QFBC
	Sufficiency Rat ating Calculation									REFI
) 01/01/1992 - <sup> </sup>	Updated with ta	ape 1994								NB94
	Updated with ta	ape 1991								NB91
03/01/1990 - 1										NDST
	Updated with ta	ape 1989								NB89



Form: bms001d

**GREAT FALLS** 

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## Printing Date: Thursday, May 22 2014

100315000+03421

**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00315

State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1

Percent Trucks:

Intersecting Feature: FAU 5225-14TH STREET SW Kilometer Post, Mile Post: 0.55 km 0.34

2 %

Approach Span

Structure on the State Highway System: Latitude: 47°29'13"

Structure on the National Highway System: Longitude: 111°20'17"

Str Meet or Exceed NBIS Bridge Length:

**Construction Data** 

Construction Project Number: IG 315-5(3)272 Construction Station Number: 21+65.00

Construction Drawing Number: 6813

Construction Year: 1967 Reconstruction Year: 1995

# Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Current ADT : 25,500

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design :	32.6 mton	A LFD Assigned
Operating Load, Design:	35.3 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

ADT Count Year: 2009

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	83.84		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 45.72 m

Deck Area: 546.00 m sq 10.96 m

Deck Roadway Width: 10.96 m Approach Roadway Width:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

5.26 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

1.70 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

Number of Spans: 0

#### Span Data

#### Main Span

Number Spans: 3

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type: 0 None Deck Membrain Type: 0 None

11.95 m (52) Out-to-Out Width:

(50A) Curb Width:

(50B) Curb Width:

0.00 m

0.00 m

Material Type Code, Description:

Span Design Code, Description:

Skew Angle: 25°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	North or East Travel			
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
One Route Under	U05225	Both	5.26 m	9.14 m	N/A			
14TH STREET SW								
Route On Structure	100315	N/A			North	99.99 m	10.96 m	
I - 315 EB								



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# I00315000+03421 Continue

**Inspection Data** 

Inspection Due Date: 05 December 2014 (91) Inspection Frequency (months): 24

Sufficiency Rating: 93

Structure Status : No	t Deficient						
NBI Inspection Da	ata						
(90) Date of Last Ins	pection : 05 December	er 2012		La	st Inspected By: Charles Pe	pos - 107	
(90) Inspection	on Date :				Inspected By :		
(58) Deck	Rating : 5	(68) Deck Geo	ometry : 4	(36A) I	Bridge Rail Rating : 1	(62) Culver	t Rating : N
(59) Superstructure	Rating : 8	(67) Structure I	Rating : 7	(36B)	Transition Rating : 1	(61) Channe	Rating : N
(60) Substructure	Rating : 7	, ,		(36C) Ap	proach Rail Rating :1	(71) Waterway A	dequacy :N
(72) App Rdwy	y Align : 8	(69) Under Clea (41) Posting	•	(360	)) End Rail Rating : 1	(113) Scour	Critical:
	Unrepaired S	palls: 0 m	sq		Deck Surfacin	g Depth : 0.0	00 in
Inspection Hours Crew Hours for inspec			Snoo	pper Required :	N		
Helper H				for inspection :		$\neg$	
Special Crew H			1	Flagger Hours :			
Special Equipment He							
Inspection Wor	k Candidates	81-1	Daile alter	Effected	Scope of	Andan	Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States
D31-FY2004-000075	28 January 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
Clean and paint bearing Approved. DRC	S.						
				<b></b>		h	
D31-FY2007-000039 Patch any spalled areas	26 December 2006	Approved	Medium	M Main	12 Bare Concrete Deck	Min Repair	
Patch any spalled areas Approved. DRC	s in the surfacing.						

Late Reason:

Inspection Date: 12/05/2012



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### I00315000+03421 Continue

### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck X 100 3 546 sq.m. 0 % % Previous Inspection Notes: 12/05/2012 - Transverse cracks with some spalls and delaminations over Bents 2 and 3. Small delaminations along the guard angles. Wear from studded tires in the wheel paths. 12/06/2010 - Spalls, delaminations, and transverse cracks over Bent 2 and 3. Wear in the wheel paths. 2 percent or less delaminations in the deck surface. 11/17/2008 - Open transverse cracks over Bent 2 and 3. Some delaminations in all (3) Spans with an estimated 2 percent or less from a quick chain drag. Wear in the wheel paths. 11/02/2006 - Wear in the wheel paths. Transverse cracks over Bent 2 and 3 with some spalls over Bent 3 also noted. 10/10/2002 - 11.95 \* 45.72 = 546.35 Add slightly open cracks over both Bents. Some minor cracking throughout. 06/03/1998 - 13.15 \* 45.72= Studded tires have left an almost exposed aggregate finish in both traffic lanes. 02/01/1994 - None Inspection Notes: Element 109 - P/S Conc Open Girder 229 1 100 m. % % % Previous Inspection Notes : 12/05/2012 - Good condition. 12/06/2010 - Good condition. 11/17/2008 - Same as prior and in Good condition. 11/02/2006 - No problems observed. Some girders have minor cracks from the backside of the embedded bearing plate to the ends of the girders. 10/10/2002 - 5 \* 45.72 = 228.60m Inspection Notes: Element 205 - R/Conc Column Bent 2 and 3 ea. % Previous Inspection Notes : 12/05/2012 - (2) small spall on the Right column of Bent 3. Tight surface shrinkage cracks in all (4) columns. Columns are in Good condition. 12/06/2010 - Tight surface shrinkage cracks in all (4) columns. (2) small spalls on the Right column of Bent 3; patch has popped off. Generally in Good condition. 11/17/2008 - Generally in Good condition. Small delamianted patch on the Right column of Bent 3 for Condition State 3 and a small spall near the sidewalk line on the same column for Condition State 2. 11/02/2006 - Tight surface shrinkge cracks. Right/South Column at Bent 3 has a small chipped area near the sidewalk and some delamianted areas of the patch at its construction joint to the cap. 10/10/2002 - Some minor wear, weathering, and shrinkage cracks. Inspection Notes:

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### I00315000+03421 Continue

Element Des	scription									
_	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 215	- R/Conc Abut	ment								
	1	2	33	m.		95	5	0	0	
						%	%	%	%	
Previous Ins	pection Notes :									
2/05/2012 -	Small spalls al	ong the car	o to backwall ar	ea and	(1) small spa	all at the G3 emb	edment in Abutn	nent 1's backwal	l.	GIFZ
		-				rface shrinkage				GZEV
	Unchanged. C				·					RCDZ
1/02/2006 -	Tight surface s	shrinakge cı	racks in both ca	aps and	some small	spalls where the	girders are emb	edded in the bad	ckwalls.	CZDO
	Add some eros									KLKZ
06/03/1998 -	(13.15 * 2) 1.	80 1.60	1.50 1.70 So	me sma	all, tight crack	ks with minor wa	ter staining.			QFKU
02/01/1994 -	None									REFI
Inspection I	Notes:									
lement 234	- R/Conc Cap	Bent 2 and	13							
	1	1	26	m.		100	0	0	0	
	•	'	20	111.			%			
						%	%	%	%	
	pection Notes :									
	Good condition		_							GIFZ
	Good condition		_							GZEV
	Good condition		_	_						RCDZ
	_		steps in the cap	s. Lots	of staining f	rom pigeon debr	is on tops of the	caps.		CZDO
10/10/2002 -	13.15 * 2 = 26	.30m								KLKZ
Inspection I	Notes:									
Element 313	- Fixed Bearing	g								
	1	1	30	ea.		85	15	0		
						%	%	%	%	· ·
Previous Ins	pection Notes :									
			n the bearings a	at Bents	s 2 and 3. Be	earings at both o	f the Abutments I	nave paint loss.	minor pitting, and	d GIFZ
neavy rust.				20		5ag5 at 25a 5		м го раши 1000,	·····g, a	
	Rusty spots, p									GZEV
	Rust, paint los									RCDZ
				n debris	on the beari	ngs at Bents 2 a	nd 3.			CZDO
10/10/2002 -	· Add some pair	nt loss and l	bird debris.							KLKZ
	Viotes.									
Inspection I	VOICO.									
Inspection I	10103.									



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### 100315000+03421 Continue

Smart Flag	ription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 331 -	Conc Bridge I	Railing		•			<u> </u>		<u>.</u>	
	1	3	91	m.		95	5	0	0	
						%	%	%	%	
Previous Insp	ection Notes :									
•		inkage crad	eks Cracks on	the had	ckside of the	harrier show effl	orescence in area	as Ends shoe a	t Ahutment 1 are	GIF.
apped agains	t traffic.									
2/06/2010 - \$ raffic flow.	Scrapes and di	ings to both	n barriers. Ver	tical shr	inkage crack	s for the length o	of the rails. End s	shoes at Abutmei	nt 1 are lapped a	gainst GZE
	Some scrapes	and dings	on both rails.	Γight ve	rtical crackin	g, random, throu	ghout.			RCD
1/02/2006 - L	Jnchanged fro	m previous	reports.							CZD
10/10/2002 - 4	15.72 * 2 = 91.	44m Mino	or dings, scrape	es, and	vertical crack	ing.				KLK
06/03/1998 - 1	New Cast-in-Pl	lace concre	ete rail in 1995.							QFK
02/01/1994 <b>- N</b>	None									REF
Inspection No	otes:									
Element 358 -	Deck Crackin	g SmFlag								
Х	1	3	1	ea.	X	0	0	100	0	
^	•			04.		%	%	%	%	
						70	70	70	70	
·	ection Notes :									
			· ·				laminations in the	e cracked areas.		GIF.
			v spaling starti	_	small delamii	nations.				GZE
11/17/2008 - N	Nide cracks wi	ith spalling	over Bents 2 a	nd 3.						RCD
Inspection No	otes:									
General I	nspection I	Notes								
			ap was not wo	rking to	day. Minor b	umps on and off	of the structure.			GIF
	_		off of the bride	_	•	·				GZE
	New approach									
Both of the rai	I end shoes at	Approach	1 are lapped a							
	·	s to the roa	idway approac	hes. St	ill minor bum	ps on and off of	the structure.			CZD
10/10/2002 - 0										KLK
06/03/1998 - N										QFK
										REF
02/01/1994 - S		on Alooopic	a by opoquooo	- ut 2/ 1	0,07 14.10.0	9				
Sufficiency Ra	ŭ									
Sufficiency Ra 01/01/1992 - U	Jpdated with ta									
Sufficiency Ra 01/01/1992 - U 01/01/1990 - U	Jpdated with ta Jpdated with ta	ape 1991								NBS
Sufficiency Ra 01/01/1992 - L 01/01/1990 - L 02/01/1988 - L	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB9 NB8
Sufficiency Ra 01/01/1992 - L 01/01/1990 - L 02/01/1988 - L	Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9
Sufficiency Ra 01/01/1992 - L 01/01/1990 - L 02/01/1988 - L	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB8
Sufficiency Ra 01/01/1992 - L 01/01/1990 - L 02/01/1988 - L	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB8
Sufficiency Ra 01/01/1992 - L 01/01/1990 - L 02/01/1988 - L	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB8
Sufficiency Ra 01/01/1992 - U 01/01/1990 - U 02/01/1988 - U	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB8
Sufficiency Ra 01/01/1992 - U 01/01/1990 - U 02/01/1988 - U	Jpdated with ta Jpdated with ta Jpdated with ta	ape 1991 ape 1989								NB9 NB8



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#### 100315000+03422

**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

Percent Trucks:

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00315

Str Owner Code, Description: 1 State Highway Agency **State Highway Agency** Maintained by Code, Description:1

Intersecting Feature: FAU 5225-14TH STREET SW Kilometer Post, Mile Post: 0.55 km 0.34

Structure on the State Highway System: Latitude: 47°29'13"

Structure on the National Highway System: Longitude: 111°20'18"

ADT Count Year: 2009

Str Meet or Exceed NBIS Bridge Length:

**Construction Data** 

Construction Project Number: IG 315-5(3)272 Construction Station Number: 21+65.00

Construction Drawing Number: 6813

Construction Year: 1967 Reconstruction Year: 1995

## Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Current ADT : 25,500

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	A LFD Assigned
Operating Load, Design:	35.3 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	83.84		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 44.20 m

Deck Area: 639.00 m sq

13.65 m Deck Roadway Width: 14.00 m Approach Roadway Width:

Median Code, Description: 0 No median

Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

5.20 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 1.70 m 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 3

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type: 0 None Deck Membrain Type: 0 None Approach Span

2 %

Number of Spans: 0 Material Type Code, Description:

Span Design Code, Description:

14.46 m (52) Out-to-Out Width:

(50A) Curb Width: 0.00 m

(50B) Curb Width:

0.00 m

Skew Angle: 25°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	North or East Travel		
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	U05225	Both	5.20 m	9.14 m	N/A		
14TH STREET SW	]						
Route On Structure	100315	West	99.99 m	13.65 m	N/A		
I - 315 WB							



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#### 100315000+03422 Continue

**Inspection Data** 

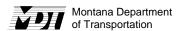
Sufficiency Rating: 96

Inspection Due Date: 06 December 2014 (91) Inspection Frequency (months): 48

Structure Status : Not	t Deficient						
NBI Inspection Da	ata						
(90) Date of Last Insp	pection : 06 December	er 2010		La	ast Inspected By: Charles Pe	pos - 107	
(90) Inspectio	on Date :				Inspected By :		
(58) Deck	Rating : 6	(68) Deck Geor	metry : 9	(36A)	Bridge Rail Rating : 1	(62) Culver	t Rating : N
(59) Superstructure	Rating : 8	(67) Structure R	ating : 7	(36B)	Transition Rating : 1	(61) Channe	l Rating : N
(60) Substructure	Rating : 7	(69) Under Clear	ance : 4	(36C) Ap	proach Rail Rating :1	(71) Waterway A	dequacy :N
(72) App Rdwy	y Align : 8	(41) Posting S		(361	D) End Rail Rating : 1	(113) Scour	Critical:
	Unrepaired Sp	palls: 0 m s	sq		Deck Surfacin	g Depth : 0.0	00 in
Inspection Hours	stion .		Snor	per Required	· 🕠		•
Crew Hours for inspect				for inspection		$\neg$	
Special Crew Ho		, s		Flagger Hours	O	_	
Special Equipment Ho			'	lagger riours	U		
Inspection Worl	k Candidates	Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition
Candidate ID	Date Requested		Triority	Unit			States
D31-FY2004-000076	28 January 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
Clean and paint bearing	S.						
Approved. DRC							
	26 December 2006	Approved	Medium	M Main	12 Bare Concrete Deck	Min Repair	
Patch any spalled areas	in the deck, very sm	all at this time.					
Approved. DRC							

Late Reason:

Inspection Date: 12/06/2010



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#### 100315000+03422 Continue

#### **Element Inspection Data**

Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 12 - Bare Concrete Deck X 3 639 sq.m. 0 100 % % Previous Inspection Notes: 12/06/2010 - Wear in the wheel paths. Tight cracks over Bents 2 and 3. Some random cracking in all (3) Spans. 11/02/2006 - Wear in the wheel paths. Cracking does not appear to be any worse or opening up. Put into Condition State 2 as there was (1) small, 1" x 2", area of delamination near Abutment 4 in the Left lane of traffic. 10/10/2002 - 14.46 \* 44.20 = 639.13 Numerous, small and tight, transverse and mapping cracks throughout; very noticeable of the repaired areas. Maybe a smart flag for deck cracking the next report. 06/03/1998 - 44.20 \* 16.35 Deck was repaired, sealed only and widened in 1995. 02/01/1994 - None Inspection Notes: Element 109 - P/S Conc Open Girder 265 100 m. % % % % Previous Inspection Notes: 12/06/2010 - Good condition. 11/02/2006 - Good condition. A couple of the girders have tight cracks from the backside of the embedded bearing plates to the ends of the airders 10/10/2002 - Some scrapes to the bottom flange, but no dings or spalled concrete. Inspection Notes: Element 205 - R/Conc Column Bent 2 and 3 95 ea. % % % Previous Inspection Notes: 12/06/2010 - Surface shrinkage cracks. Generally in Good condition. 11/02/2006 - Tight surface shrinkage cracks. Left two(2) columns on the newer portion of the bridge have some loose/spalled patches over the construction joint to the cap. 10/10/2002 - Some wear, weathering, shrinkage cracks. Inspection Notes: Element 215 - R/Conc Abutment 1 and 4 m. % % Previous Inspection Notes: 12/06/2010 - (1) small spall near girder embedment at Abutment 4. Some tight shrinkage cracks. 11/02/2006 - Minor and tight cracks in both caps with one small spalleed area in the backwall where the girders are embedded. 10/10/2002 - A little more erosion and weathering of the concrete. Inspection Notes:



Inspection Notes:

## **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

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#### I00315000+03422 Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 234 - R/Conc Cap Bent 2 and 3 100 33 m. % Previous Inspection Notes: 12/06/2010 - Some tight surface shrinkage cracks. Rebar chair feet show some rust on the underside of both caps. Minor staining from bird 11/02/2006 - Staining from pigeon debris. Some tight cracks at the steps in the caps and none are a problem. 10/10/2002 - 16.35 \* 2 = 32.70m Inspection Notes: Element 313 - Fixed Bearing ea. % Previous Inspection Notes: 12/06/2010 - Rust spots, paint loss, and bird debris. 11/02/2006 - Rusty spots and paint loss. Lots of pigeon debris on both of the Bent caps. 10/10/2002 - Add some paint loss and bird debris. Inspection Notes: Element 331 - Conc Bridge Railing 95 % % Previous Inspection Notes: 12/06/2010 - Same as past inspections. 11/02/2006 - Left/North rail has a couple of patches areas on its backside. Not a problem, only an aesthetic thing. 10/10/2002 - Some dings, scrapes, and vertical cracking. 06/03/1998 - New in 1995 and was Cast-in-Place. 44.20 \* 2. 02/01/1994 - None Inspection Notes: Element 358 - Deck Cracking SmFlag Χ Χ 100 ea. % % % % Previous Inspection Notes: 12/06/2010 - Condition State 2 due to amount of tight mapping cracks noted; especially when the surface is damp.



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### 100315000+03422 Continue

General Inspection Notes	
12/06/2010 - Minor bumps on and off of the bridge.	GZEW
11/02/2006 - Recent patches on the East approach to the structure and still a minor bump on and off of the structure.	CZDO
10/10/2002 - None	KYKZ
06/03/1998 - None	QFIX
02/01/1994 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:45:04 Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:34	REFI
01/01/1992 - Updated with tape 1994	NB94
01/01/1990 - Updated with tape 1991	NB91
02/01/1988 - Updated with tape 1989	NB89
02/01/1986 - Updated with tape 1988	NB88

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#### 100315000+03423

**Location: GREAT FALLS Structure Name:** 

**General Location Data** MDT Maintenance Section: 31-01 Great Falls District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** Kind fo Hwy Code, Description: 8 8 Other (incl toll rds) Signed Route Number: 00315 State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1 Intersecting Feature: FAU 5225-14TH STREET SW Kilometer Post, Mile Post: 0.55 km 0.34 Structure on the State Highway System: Latitude: 47°29'12" **Construction Data** Structure on the National Highway System: Longitude: 111°20'17" Construction Project Number: IR 315-5(12)1F Str Meet or Exceed NBIS Bridge Length: Construction Station Number: 5+63.00 Construction Drawing Number: 15883 **Traffic Data** Construction Year: 1997 Current ADT : 25,500 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

## Structure Loading, Rating and Posting Data

#### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design :	32.6 mton	A LFD Assigned
Operating Load, Design:	34.6 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	48.6		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 41.45 m

Deck Area: 333.00 m sq

7.11 m Deck Roadway Width: 7.32 m Approach Roadway Width:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

Reference Feature for Vertical Clearance: H Hwy beneath struct

5.71 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 1.90 m 0.50 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 3

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type: 1 Epoxy Coated Reinforcing

Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: 0

Material Type Code, Description:

Span Design Code, Description:

8.03 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 0.00 m Skew Angle: 15°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	South, West or Bi-directional Travel			North or East Travel		
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
One Route Under	U05225	Both	5.71 m	9.14 m	N/A			
14TH ST SW/BRIDGE ST								
Route On Structure	100315	N/A			East	99.99 m	7.11 m	
I-315 EB OFF RAMP								



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#### 100315000+03423 Continue

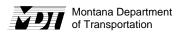
**Inspection Data** 

Inspection Due Date : 16 June 2015

(91) Inspection Frequency (months): 48 Sufficiency Rating: 96 Structure Status: Not Deficient **NBI Inspection Data** 16 June 2011 Charles Pepos - 107 Last Inspected By (90) Date of Last Inspection: (90) Inspection Date Inspected By (62) Culvert Rating : N (58) Deck Rating: 7 (36A) Bridge Rail Rating: (68) Deck Geometry: 6 (59) Superstructure Rating: (61) Channel Rating : N (36B) Transition Rating: (67) Structure Rating: (71) Waterway Adequacy (60) Substructure Rating: 7 (36C) Approach Rail Rating (69) Under Clearance: 4 (36D) End Rail Rating (113) Scour Critical: (72) App Rdwy Align : 7 (41) Posting Status: Unrepaired Spalls: 0 m sq 0.00 in Deck Surfacing Depth: **Inspection Hours** Snooper Required : N Crew Hours for inspection: Snooper Hours for inspection Helper Hours: 0 Flagger Hours Special Crew Hours: 0 Special Equipment Hours: Effected Covered **Inspection Work Candidates** Scope of **Priority Status** Structure Work Action Condition Candidate ID Unit States Requested D31-FY2007-000143 02 July 2007 Medium 313 Fixed Bearing Rehab Elem Approved M Main Clean and spot paint the bearings. Approved. DRC

Late Reason:

Inspection Date: 06/16/2011



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### I00315000+03423 Continue

### **Element Inspection Data**

\* \* \* \* \* \* \* \* \* \* \* Span : Main-0 - -1 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 26 - Conc Deck/Coatd Bars X 100 3 333 sq.m. % % Previous Inspection Notes: 06/16/2011 - Transverse and mapping cracks over both Bents. Minor wear in the wheel paths from studded tire wear 05/31/2007 - Minor wear from studded tires. Transverse cracking over Bents 2 and 3 with the worse area at Bent 2. Not enough for a smart flag 05/04/2005 - Some wear in the wheel paths. Transverse cracking over both of the Bents. (8.03 \* 40.93 (brg to brg) = 328.67m NMS) 04/30/2003 - Deck has tight mapping cracks throughout the driving surface. Studded tire wear in the wheel paths with some exposed aggregate. 08/27/2001 - 8.03 \* 41.45 = 332.8 Slightly open cracks at the two bents. Numerous small, tight tansverse &/or mapping cracks throughout the driving surface. 12/23/1998 - None Inspection Notes: Element 109 - P/S Conc Open Girder 166 100 m. % % Previous Inspection Notes : 06/16/2011 - Generally in Good condition. Small nick on bottom of G1S1 has not changed. 05/31/2007 - Small nick on the Left side of the Bottom flange of G1 in Span 1, but not a problem. 05/04/2005 - Unchanged from previous reports. (4 \* 40.93 = 163.72 NMS) 04/30/2003 - There is a small nick in the outside-left girder near Abutment 1. No problem with the nick or with any of the other girders noted. Graffti painted on girders near the Abutments. 08/27/2001 - 4 \* 41.45 = 165.8m 12/23/1998 - None Inspection Notes: Element 205 - R/Conc Column Bents 2 and 3 ea. % Previous Inspection Notes : 06/16/2011 - Generally in Good condition with some small area where small sacked patches are peeling off. Small spall on the Right column of Bent 3 from construction. 05/31/2007 - Placed 5 percent into Condition State 2 as sacked patches are loose and peeling off of the columns. None of these areas are a problem. 05/04/2005 - Same on the small popouts. 04/30/2003 - No problems noted. A couple of small popouts in areas that were sacked during construction. 08/27/2001 - None 12/23/1998 -Inspection Notes:

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### 100315000+03423 Continue

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - -1 (cont.) \* \* \* \* \* \* \* \* \*

Element Des	scription									
	•									
_	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 215	- R/Conc Abuti	ment 1 an	nd 4							
	1	1	20	m.		95	5	0	0	
						%	%	%	%	
Previous Insp	pection Notes :					I				
6/16/2011 -	Generally in G	ood conditi	ion. Small spal	on con	struction join	nt of backwall to	cap area of Abut	ment 1.		RZGE
5/31/2007 -	Minor spall at t	the cap to b	oackwall constr	uction jo	oint at Abutm	ent 1. Generally	y in Good condition	on.		EZHZ
5/04/2005 -	Minor and tight	t cracks in	both of the back	kwalls.	Erosion at t	he NW corners is	s worse. (Bent 1	= 9.62m Bent 4	1 = 10.67) = 20.29	9m EIFF
erosion probl	lems, so raised	to all in St	ate 1.		erosion on th	ne NW corner of	the structure. C	an't rate the eler	ment done due to	BPHZ
	Erosion at the	iert wingwa	all of Abutment	#1.						NHC
12/23/1998 -										KBGF
Inspection N	Notes:									
lement 234	- R/Conc Cap	Bents 2 ar	nd 3							
	1	1	16	m.		100	0	0	0	
						%	%	%	%	
revious Insi	pection Notes :	Į.				Į.			I I	
· · · · · · · · · · · · · · · · · · ·										
	Good condition	٦.								RZG
6/16/2011 -			racks. Some lo	ose sa	cked patches	at the connection	ons to the columi	ns.		
)6/16/2011 - )5/31/2007 -	Tight surface s	hrinkage c				at the connection (7.92 * 2 = 15.		ns.		EZH.
06/16/2011 - 05/31/2007 - 05/04/2005 -	Tight surface s	shrinkage cooted other	than tight surfa	ce shrir	nkage cracks			ns.		EZH. EIFF
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 -	Tight surface s	shrinkage conted other age cracking	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFR BPHZ
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 -	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0	shrinkage conted other age cracking	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFF BPHZ NHC(
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 -	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None	shrinkage conted other age cracking	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFF BPHZ NHC(
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 -	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None	shrinkage conted other age cracking	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFF BPHZ NHC(
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 -	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None	shrinkage conted other age cracking	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFF BPHZ NHC(
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None	shrinkage c oted other age crackii 16m	than tight surfa	ce shrir	nkage cracks			ns.		EZHZ EIFR BPHZ NHC0
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:	shrinkage c oted other age crackii 16m	than tight surfa	ce shrir	nkage cracks			ns. 0		EZHZ EIFF BPHZ NHC(
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:	shrinkage coted other age crackin	than tight surfa	ce shrir	nkage cracks	. (7.92 * 2 = 15. 95	84m NMS) 5	0		RZGI EZHZ EIFR BPHZ NHCC KBGI
16/16/2011 - 15/31/2007 - 15/04/2005 - 14/30/2003 - 18/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing	shrinkage cooted other age cracking 6m	than tight surfa	ce shrir	nkage cracks	. (7.92 * 2 = 15.	84m NMS)			EZH. EIFF BPH. NHC
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1 pection Notes :	shrinkage cooted other age cracking 6m	than tight surfa	ce shrirrs noted.	nkage cracks	. (7.92 * 2 = 15. 95	84m NMS) 5	0		EZH. EIFF BPH. NHC KBG
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:	chrinkage cooted other age cracking the second of the seco	than tight surfang; no problems	ea.	and 3 with so	95 %	84m NMS) 5	0 %	%	EZH. EIFF BPH. NHC KBG
06/16/2011 - 05/31/2007 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the	chrinkage cooted other age cracking 6m 1 1 ebris on be Abutment b	than tight surfaing; no problems  16  Parings of both Expearings as they	ea.	and 3 with so	95 % ome spot rust.	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru	% ust and lots of debr	EZH. EIFF BPH NHC KBG  RZG ris on EZH.
06/16/2011 - 05/31/2007 - 05/31/2003 - 04/30/2003 - 08/27/2001 - 2/23/1998 - 1. Inspection N	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the A	chrinkage cooted other age cracking from 1 1 ebris on be Abutment be eport. Bea	than tight surfaing; no problems  16  tarings of both Epearings as they arings at Bents 2	ea.  Bents 2  are not 2 and 3	and 3 with so	95 % ome spot rust. to the anchor b ered by nesting	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru 8 4 = 24 NMS)	% st and lots of debr	EZH. EIFF BPH NHC KBG  RZG ris on EZH.
06/16/2011 - 05/31/2007 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 2/23/1998 - 105/04/2001 - 05/31/2007 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 05/04/2005 - 04/30/2003 - 05/05/06/2001 - 05/04/2005 - 04/30/2003 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/20000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000 - 05/05/06/2000	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the A	chrinkage cooted other age cracking from 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	than tight surfaing; no problems  16  earings of both Expearings as they arings at Bents 2 ne bearings. Pi	ea.  Bents 2  are not 2 and 3	and 3 with so	95 % ome spot rust. to the anchor b ered by nesting	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru 8 4 = 24 NMS)	% ust and lots of debr	EZH. EIFF BPH. NHC KBG  RZG ris on EZH. EIFF rom BPH.
06/16/2011 - 05/31/2007 - 05/04/2005 - 04/30/2003 - 08/27/2001 - 12/23/1998 - 12/23	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the A Same as last r Rusty spots the Nowe of the NW wingwall. Some debris a	chrinkage cooted other age cracking from 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	than tight surfaing; no problems  16  earings of both Expearings as they arings at Bents 2 ne bearings. Pi	ea.  Bents 2  are not 2 and 3	and 3 with so	95 % ome spot rust. to the anchor b ered by nesting	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru 8 4 = 24 NMS)	% st and lots of debr	EZH. EIFF BPH. NHC KBG  RZG ris on EZH.
2/23/1998 - 2/2/23/1998 - 2/2/23/2998 - 2/23/2998 - 2/2/23/2998 - 2/2/23/2998 - 2/2/22/2001 - 2/2/23/2998 - 2/2/22/2001 - 2/2/23/2998 - 2/2/22/2001 - 2/2/23/2998 - 2/2/22	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the A Same as last r Rusty spots the Now wingwall. Some debris a	chrinkage cooted other age cracking from 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	than tight surfaing; no problems  16  earings of both Expearings as they arings at Bents 2 ne bearings. Pi	ea.  Bents 2  are not 2 and 3	and 3 with so	95 % ome spot rust. to the anchor b ered by nesting	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru 8 4 = 24 NMS)	% st and lots of debr	EZH. EIFF BPH NHC KBG  RZG ris on EZH. EIFF rom BPH NHC
16/16/2011 - 15/31/2007 - 15/04/2005 - 16/30/2003 - 18/27/2001 - 2/23/1998 - 16/16/2011 - 15/31/2007 - 16/16/2011 - 15/31/2007 - 16/16/2015 - 16/30/2003 - 16/30/2003 - 16/30/2003 - 16/30/2003 - 16/30/2001 - 16/30/	Tight surface s No problems n Surface shrink 8.03 * 2 = 16.0 None Notes:  - Fixed Bearing 1  pection Notes:  Dirt and bird de Removed the A Same as last r Rusty spots the Now wingwall. Some debris a	chrinkage cooted other age cracking from 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	than tight surfaing; no problems  16  earings of both Expearings as they arings at Bents 2 ne bearings. Pi	ea.  Bents 2  are not 2 and 3	and 3 with so	95 % ome spot rust. to the anchor b ered by nesting	84m NMS)  5 % olts . Bent beari	0 % ngs have spot ru 8 4 = 24 NMS)	% st and lots of debr	EZH EIFF BPH NHC KBG  RZG ris on EZH EIFF rom BPH NHC



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### I00315000+03423 Continue

\*\*\*\*\*\*\* Span : Main-0 - -1 (cont.) \* \* \* \* \* \* \* \*

EL D.					- СР с		,			
Element Des			Ougatitus	Lloito	Inon Foob	Dot Ctot 1	Dot Ctot 2	Dot Stat 2	Dot Stot 4	Dot Ctot F
Smart Flag	- Conc Bridge	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Licincii 331	1	_	0.2			0.5	E	0	0	
	1	3	83	m.		95	5	0		
						%	%	%	%	%
Previous Ins	pection Notes :									
06/16/2011 -	Generally in G	ood conditi	ion with some ti	ght shrii	nkage crack	s. Small chips o	n the Right barrie	er in Span 3.		RZGB
05/31/2007 -	Rest of the cor	mments fro	m prior reports	still app	ly.					EZHZ
05/04/2005 -	Same as last r	eport and a	add some small	nicks o	ut of the top	of the barrier in	Span 3 - Right si	ide. (40.93 * 2 =	81.86 NMS)	
04/30/2003 -	Vertical cracking	ng, mostly t	tight, throughou	t both b	arriers. A c	ouple of small po	pouts in concret	e surface of the	oarriers.	BPHZ
08/27/2001 -	41.45 * 2 = 82.	.90m								NHCO
12/23/1998 -	- None									KBGR
Inspection I	Notes:									
Element 358	B - Deck Crackin	g SmFlag								
X	1	3	1	ea.	X	0	100	0	0	
						%	%	%	%	%
Dravious Inc	pection Notes :					,,	,,,		, and the second	
	•								in size. Mostly to	start RZGB
Gonoral	Inspection I	Notos								
	<u> </u>		ot roted a "7" o	o dook	io oliabtly na	arrower than the	annragah raadwa	y and it is an a	NIP (O	DZCP
						arrower than the a	• •	ay and it is on a t	curve.	RZGB EZHZ
NBI 60, subs	structure, rated	a "7" due to	small delamina	ations ir		es on the columns				EZNZ
	been repaired of				se with some	e erosion to the fi	Il under the wind	wall This could	become a proble	em if EIFR
	der the concrete					e erosion to the n	in drider the wing	gwaii. Triis could	become a proble	IIIII LIFK
04/30/2003 - toe-nailes.	- Same commer	nts as 08-2	001 report. Blo	cking or	n approach	sections of the gu	uardrail are loose	e and need to be	tightened down a	and BPHZ
08/27/2001 -									Bent with W-beam nd do meet curre	
12/23/1998 -	- None									KBGR



VIEW TOKINTOK OTKO

**Location: GREAT FALLS Structure Name:** 

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Location : GREAT FALLS

**General Location Data** 

District Code, Number, Location: 03 Dist 3 GREAT FALLS

Division Code, Location :31

GREAT FALLS

County Code, Location: 013

CASCADE

City Code, Location: 32800

MDT Maintenance Section: 31-01 Great Falls

**GREAT FALLS** 

Kind fo Hwy Code, Description: 1

1 Interstate Hwy

Signed Route Number : 00315

Kilometer Post, Mile Post:

State Highway Agency

Str Owner Code, Description: 1

State Highway Agency

Maintained by Code, Description:1

1.06

Intersecting Feature: BNSF RAILROAD

Latitude : 47°29'16"

Construction Data

Structure on the State Highway System : X

Structure on the National Highway System : X

Longitude : 111°20'07"

Construction Project Number : IR 315-5(12)1F
Construction Station Number : 29+60.00

1.71 km

Str Meet or Exceed NBIS Bridge Length:

Construction Drawing Number: 1852

ADT Count Year: 2009 Percent Trucks: 2 %

Construction Year : 1946

Reconstruction Year : 1996

## Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Current ADT : 25,500

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	52.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data :	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	120.29		

#### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 54.21 m

Deck Area : **786.00 m sq** 

Deck Roadway Width: 13.59 m

Approach Roadway Width: 13.59 m

Approach Roadway Width: 13.59 m

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure : 99.99 m

Reference Feature for Vertical Clearance : R Railroad beneath struc

Vertical Clearance Under the Structure: 6.63 m

Reference Feature for Lateral Underclearance : R Railroad beneath struc

Minimum Lateral Under Clearance Right : 3.96 m

Minimum Lateral Under Clearance Left : 0.00 m

#### Span Data

#### Main Span

Number Spans: 3

Number Spans : 3

Material Type Code, Description : 4 Steel continuous

 $Span\ Design\ Code,\ Description: \textbf{2}\quad \textbf{Stringer/Multi-beam\ or\ Girder}$ 

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type : **0 None**Deck Membrain Type : **0 None** 

#### Approach Span

Number of Spans: 0

Material Type Code, Description:

Span Design Code, Description:

(52) Out-to-Out Width : 14.50 m

(50A) Curb Width : **0.00 m** 

(50B) Curb Width :

Skew Angle:

## **Structure Vertical and Horizontal Clearance Data Inventory Route:**

Over / Under Direction	Inventory	South, W	est or Bi-directio	nal Travel	N	orth or East Trav	rel
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
Route On Structure	100315	N/A			East	99.99 m	13.59 m
I-315 - EXIT 0 - EB							



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**Inspection Data** 

Inspection Due Date: 28 June 2014

Sufficiency Rating: 75.4

Structure Status : Func Obs - Elg Rehab

(91) Inspection Frequency (months): 24

NBI Inspection Da		_							
(90) Date of Last Inspection : <sup>28 June</sup> 2012					Last Inspected By : Charles Pepos - 107				
(90) Inspection	on Date :				Inspected By :				
(58) Deck Rating: 5 (59) Superstructure Rating: 7 (60) Substructure Rating: 7 (72) App Rdwy Align: 8		(68) Deck Geo (67) Structure F (69) Under Clear	Rating: 7	(36C) Ap	Bridge Rail Rating:  Transition Rating:  proach Rail Rating:  D) End Rail Rating:	(61) Chann	(62) Culvert Rating: N (61) Channel Rating: N (71) Waterway Adequacy: N (113) Scour Critical: N		
	Unrepaired S	(41) Posting Spalls : 0 m s			Deck Surfac	sing Depth : 0	.00 in		
Inspection Hours			0		. 🖼				
Crew Hours for inspec				oper Required					
Helper H	C	Sı	•	for inspection	3				
Special Crew H	C			Flagger Hours	: 0				
Special Equipment H	ours :								
Inspection Wor	k Candidates	2		Effected	Scope of		Covered		
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States		
D31-FY2004-000080	28 January 2004	Approved	Medium	All Spans	215 R/Conc Abutment	Min Repair			
repair the erosion at the 06-28-2012 Partially re Approved. DRC		icture.							
D31-FY2005-000241	13 July 2005	Approved	Low	M Main	234 R/Conc Cap	Min Repair			
Fix/repair the small dela 06-28-2012 Also (1) or Approved. DRC	aminated area on the n the Span 1 side of E	Span 2 of Bent 2's of Bent 2's and on (1) of	cap.  on the Span 3	side of Bent 3	's.				
Late Reason:									

Inspection Date: 06/28/2012



Continue

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Inspection Notes:

**Element Inspection Data** Span: Main-0 - \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck X 100 3 787 sq.m. 0 % % Previous Inspection Notes: 06/28/2012 - Spalling and delaminations in all (3) Spans. Lots of cracking in all of the Spans. Poor skid resistance on the older portion of the deck. 05/07/2010 - No change from the previous inspections. 06/16/2008 - Delamiantions/spalls in all (3) spans, but mostly in the newer portion of the deck. About 1/3 of 1 lane is mostly delamiantated as found in a quick chain drag. Old deck surface has little skid resistance remaining. 05/31/2007 - None 05/04/2005 - Wear in the wheel paths. Some cracking throughout. Newer portion appears to be cracking over the rebar, transverse, on 6" to 8" centers. Placed in Condition State 2 as there are a couple of delaminated areas. Same on the low skid resistance. 04/30/2003 - Minor areas of efflorescence on the underside of the deck. Tight transverse cracks throughout the deck; more evident over Bents 2 and 3. Wear in the wheel paths with exposed aggregate. Very low skid resistance. 08/06/2001 - 54.25 \* 14.50 = 786.63 Studded tire wear in the wheel paths. 01/14/1999 - Small tight transverse cracks in deck surface. Minor efflorescence on underside of deck. 04/01/1996 - None 02/01/1994 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 380 85 m. % % % Previous Inspection Notes : 06/28/2012 - Some fading of the paint on the newer girders and the Right side of the Left most older girder. Some rust, scale, and surface pitting of the older girders. 05/07/2010 - No change from the previous inspections. 06/16/2008 - Newer girders show minor fading of the coating system on the Outer-Right side of the Right most girder. Older portion of the structure's girders has some rusty spots, scale, and surface pitting; especially under open joints. Numerous broken welds on the attached blast plate. 05/31/2007 - None 05/04/2005 - Rusty spots, scale, minor paint loss, and smoke on the lower flange and lower portions of the web area on the older girders. New girders have no problems noted as of now. 04/30/2003 - Some spot rust on the original girders. Worse rust spots are under leaking joints. No paint on the back side of bolts used for connecting diaphragms to old girders and they are rusted. Some pack rust noted in the bottom flange area over both Bents. 08/06/2001 - 7 \* 54.25 = 379.75m01/14/1999 - Very minor rust on original painted steel beams. 04/01/1996 - None 02/01/1994 - None

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### 100315001+00691 Continue

						•				
Element Des	<u> </u>									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 205	- R/Conc Colu		2 and 3							
	1	1	8	ea.		90	5	5	0	
						%	%	%	%	Q
Previous Ins	pection Notes :		l				<u>l</u>			
06/28/2012 -	(1) small delan	nination on	Bent 3's - 2nd	from the	e Left columi	n. Spall on the L	_eft column at Bei	nt 2.		ZRGZ
	No change from									HZMS
06/16/2008 -	Left column at	Bent 2 has	a small surfac	e spall f	rom expose	d rebar chair; Co	ondition State 2.			RZDZ
05/31/2007 -										EVHZ
05/04/2005 -	Minor and tight	t shrinkage	cracks. Tight	cracks a	at the cap to	column construc	ction joint.			FZDZ
04/30/2003 -	Some surface	shrinkage (	cracks.							ZHEB
08/06/2001 -	None									NHGN
01/14/1999 -										
04/01/1996 -	None									YDNF
02/01/1994 -										REFI
										IXEIT
Inspection I	Notes:									
Element 215	- R/Conc Abuti	ment 1 an	d 4							
	1	1	35	m.		95	5	C	0	
						%	%	%	%	Q
Previous Ins	pection Notes :						L			
06/28/2012 -	Tight cracks in	both backy	walls. The wor	se area	s are on the	older portion of t	the bridge. Spall	on the Left wing	wall of Abutment	1. ZRGZ
05/07/2010 -	No change from	m the previ	ous inspections	s and in	mostly Good	d condition.				HZMS
06/16/2008 -	Same on tight	cracks. Le	ft end of Abutn	nent 1 h	as a small sp	palled area at the	e wingwall.			RZDZ
05/31/2007 -	None									EVHZ
05/04/2005 -	Both of the bad	ckwalls hav	e cracks.							FZDZ
04/30/2003 -	Minor and tight	t cracks in	areas where gi	rder end	ds are embed	dded in the Abut	ment backwalls.	Some erosion a	t the NE corner.	ZHEB
08/06/2001 -	(14.50 * 2) + (4	1 * 1.60) = 3	35.40m							NHGN
01/14/1999 -	None									
04/01/1996 -	None									YDNF
02/01/1994 -	None									REFI
Inspection I	Notes:									

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### 100315001+00691 Continue

Element Des Smart Flag	ccrintion					•	.) * * * * * * *			
Jiliait i lag	•	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 234	I - R/Conc Cap			Office	пор Едоп	1 of Old 1	1 of Glat 2	1 of Olar o	1 of Oldi 4	1 of old o
	1	1	29	m.		90	5	5	0	
					_	%	%	%		
Provious Inc	pection Notes :					70	,,		,0	
		aa a dalam	iontad area una	dor C0 a	n the Coen t	) face and Dant	O'a baa a amali d	alamination on t	ha Caan O faan al	ona 7DC
vith a small	- Bent 3's cap no spalled area. - No change fro				·		z s nas a smaii d	eiamination on t	he Span 2 face al	ong ZRG2 HZM3
	_						e caps show som	e minor surface	spalls from expos	
	bar chair feet.		·		·					EVHZ
5/04/2005 -	- Same on the o	old to new o	construction join	it. Sma	II delamiante	d area on the Sp	oan 2 side of Ben	t 2's cap.		FZDZ
4/30/2003 -	- Minor and tigh	t cracks wit	th some minor o	concrete	popouts wh	ere old portion a	and newer portion	of the caps are	joined together.	ZHEE
8/06/2001	- 2 * 14.50 = 29.	.00m								NHG
1/14/1999 -	- None									
4/01/1996	- None									YDNF
2/01/1994	- None									REF
Inspection I	Notes:									
lement 301	- Pourable Joir	nt Seal Be	nts 2 and 3							
iement oo i	1	3	20	m.		90	10	0		
	<b>'</b>	3	20	111.						
						%	%	%	%	
	pection Notes :									
6/28/2012 -	<ul> <li>Joint steel in the</li> </ul>	ne older po	rtion of the decl	k only.	Staal is salid	when tenned as		and enally alon	a the edge of the	
		m the nrevi					n. Delaminations	anu spalis alon	g the eage of the s	
5/07/2010	- No change from		ous inspections	s and in	mostly Good	condition.		and spans alon	g the edge of the s	HZMS
5/07/2010 - 6/16/2008 -	- No change from - Joints leak. Sp		ous inspections	s and in	mostly Good			anu spans alon	g the edge of the s	HZMS RZDZ
05/07/2010 - 06/16/2008 - 05/31/2007 - 05/04/2005 -	- No change from - Joints leak. Sp - None - 10.21 * 2 = 20.	palls along	ious inspections the steel guard	and in angles.	mostly Good	condition.	en tapped on.	·	added, there was	HZMS RZD2 EVH2
06/16/2008 - 05/31/2007 - 05/04/2005 -	<ul> <li>No change from</li> <li>Joints leak. Specifical</li> <li>None</li> <li>10.21 * 2 = 20.</li> <li>of the joints.</li> </ul>	palls along	ious inspections the steel guard	and in angles.	mostly Good	condition.	en tapped on.	·		HZMS RZD2 EVH2
25/07/2010 - 26/16/2008 - 25/31/2007 - 25/04/2005 - 25/04/2005 - 25/04/2005 -	<ul> <li>No change from</li> <li>Joints leak. Specifical</li> <li>None</li> <li>10.21 * 2 = 20.</li> <li>of the joints.</li> </ul>	palls along	ious inspections the steel guard	and in angles.	mostly Good	condition.	en tapped on.	·		HZMS RZD2 EVH2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation	<ul> <li>No change from</li> <li>Joints leak. Specifical</li> <li>None</li> <li>10.21 * 2 = 20.</li> <li>of the joints.</li> </ul>	palls along	ious inspections the steel guard	and in angles.	mostly Good	condition.	en tapped on.	·		HZMS RZD2 EVH2
95/07/2010 - 06/16/2008 - 05/31/2007 - 05/04/2005 - 05/04/2000 - 05/04/2000 - 05/04/2000 - 05/04/2000 - 05/04	<ul> <li>No change from</li> <li>Joints leak. Specifical</li> <li>None</li> <li>10.21 * 2 = 20.</li> <li>of the joints.</li> </ul>	palls along	ious inspections the steel guard ble guard angle	s and in angles.	mostly Good The steel s ints in the old	condition.	en tapped on.	·		HZMS RZD2 EVH2
15/07/2010 - 16/16/2008 - 15/31/2007 - 15/04/2005 - 15/04/2000 - 15/04/2000 - 15/04/2000 - 15/04/2000 - 15/04/2000 - 15/04	- No change from Joints leak. Sp None - 10.21 * 2 = 20 of the joints.	palls along	ious inspections the steel guard ble guard angle	s and in angles.  type joent 2 and	mostly Good The steel s ints in the old	condition.	en tapped on.	·	added, there was	HZMS RZD2 EVH2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection I	- No change from - Joints leak. Sp None - 10.21 * 2 = 20. of the joints.  Notes:	palls along  .42m Dou  Bearing Ne	the steel guard ble guard angle	s and in angles.  type joent 2 and	mostly Good The steel s ints in the old	condition. counds solid whe	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVH2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection I	- No change from - Joints leak. Sp None - 10.21 * 2 = 20. of the joints. Notes:	palls along  .42m Dou  Bearing Ne	the steel guard ble guard angle	s and in angles.  type joent 2 and	mostly Good The steel s ints in the old	condition.  ounds solid whe	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVH2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection I	- No change from - Joints leak. Sp None - 10.21 * 2 = 20 of the joints. Notes:	palls along .42m Dou .38earing Ne	the steel guard ble guard angle ew girders at Be	s and in angles.  e type joent 2 and ea.	mostly Good The steel s ints in the old	condition. counds solid whe	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVHZ no FZD2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection I	- No change from - Joints leak. Sp None - 10.21 * 2 = 20 of the joints. Notes:  0 - Elastomeric English - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Bearing No. 1	the steel guard ble guard angle ew girders at Be	e type jo	mostly Good The steel s ints in the old	condition.  ounds solid whe  der portions of the  100  %  bearings.	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVHZ no FZD2 ZRG2
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection Inspec	- No change from - Joints leak. Sp None - 10.21 * 2 = 20. of the joints. Notes:  0 - Elastomeric Elements of the pection Notes: - Rubber portion - No change from - No change from - Joints - Joints - No change from - No change from - No change from - Joints - Joints - Joints - Joints - No change from - No change from - Joints - Join	Bearing Ne	the steel guard ble guard angle ew girders at Be Spot rust on the	ent 2 and ea.	mostly Good The steel s ints in the old d 3 cortion of the	condition.  ounds solid whe  der portions of the  100  %  bearings.	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZDZ EVHZ no FZDZ ZRGZ HZMS
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection Inspec	- No change from - Joints leak. Sp None - 10.21 * 2 = 20 of the joints. Notes:  0 - Elastomeric E   1   - Pection Notes : - Rubber portion - No change from - Unchanged. Sp.	Bearing Ne	the steel guard ble guard angle ew girders at Be Spot rust on the	ent 2 and ea.	mostly Good The steel s ints in the old d 3 cortion of the	condition.  ounds solid whe  der portions of the  100  %  bearings.	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZDZ EVHZ no FZDZ ZRGZ HZMS RZDZ
5/07/2010 - 6/16/2008 - 5/31/2007 - 5/04/2005 - ontinuation Inspection Inspec	- No change from - Joints leak. Sp None - 10.21 * 2 = 20 of the joints. Notes:  0 - Elastomeric English of the portion of t	Bearing Ne	sous inspections the steel guard ble guard angle ew girders at Be spot rust on the sous inspections the steel portion the steel portions.	e type jo ent 2 and ea. e steel ps and in ons and	mostly Good The steel s ints in the old d 3 cortion of the	condition.  ounds solid whe  der portions of the  100  %  bearings.	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZDZ EVHZ no FZDZ  ZRGZ HZMS RZDZ EVHZ
25/07/2010 - 6/16/2008 - 6/5/31/2007 - 6/5/04/2005 - 6/5/04/2005 - 6/5/07/2010 - 6/5/31/2007 - 6/5/04/2005 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/0	- No change from - Joints leak. Sp None - 10.21 * 2 = 20. of the joints. Notes:  0 - Elastomeric Ending a spection Notes: - Rubber portion - No change from - Unchanged. Sp None - Spot rust on the	Bearing No. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	sous inspections the steel guard ble guard angle ble guard angle bew girders at Be source at the steel portions of the bear times to the steel portions of the bear times at the steel portions of the bear times to the steel guard.	ent 2 and in ea.  e steel ps and in ons and rings.	mostly Good The steel s ints in the old d 3  cortion of the Good condit bird debris s	tarting to build u	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVHZ no FZD2  ZRG2 HZMS RZD2 EVHZ
25/07/2010 - 06/16/2008 - 05/07/2010 - 05/04/2005 - 05/07/2010 - 05/07/2010 - 05/07/2010 - 05/07/2010 - 05/07/2010 - 05/07/2010 - 05/07/2005 - 05/07/2000 - 05/07/2000 - 05/07	- No change from - Joints leak. Sp None - 10.21 * 2 = 20 of the joints. Notes:  O - Elastomeric E    1    - Pection Notes : - Rubber portion - No change from - Unchanged. Sp None - Spot rust on the - Some minor sp.	Bearing No.  1 1 Spot rust or use steel pot rust for out rust for out out out out rust for out r	sous inspections the steel guard ble guard angle ble guard angle bew girders at Be was girders at Be sous inspections of the steel portions of the bear ming on the steel	ent 2 and in ea.  e steel ps and in ons and rings.	mostly Good The steel s ints in the old d 3  cortion of the Good condit bird debris s	tarting to build u	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZDZ EVHZ no FZDZ ZRGZ HZMS RZDZ EVHZ FZDZ ZHEE
25/07/2010 - 6/16/2008 - 6/5/31/2007 - 6/5/04/2005 - 6/5/04/2005 - 6/5/04/2005 - 6/5/31/2007 - 6/5/04/2005 - 6/5/04/2000 - 6/5/04/20000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/04/2000 - 6/5/	No change from Joints leak. Sp. None  - 10.21 * 2 = 20 of the joints.  Notes:  D - Elastomeric E  1  Pection Notes:  - Rubber portion - No change from Joints - None - Spot rust on the Some minor sp. Bent #2 & #3 units and specifically a specifically and specifically a specifically and specifically a speci	Bearing No.  1 1 Spot rust or use steel pot rust for out rust for out out out out rust for out r	sous inspections the steel guard ble guard angle ble guard angle bew girders at Be was girders at Be sous inspections of the steel portions of the bear ming on the steel	ent 2 and in ea.  e steel ps and in ons and rings.	mostly Good The steel s ints in the old d 3  cortion of the Good condit bird debris s	tarting to build u	en tapped on. ne deck. When n	ewer deck was	added, there was	HZMS RZD2 EVHZ no FZD2  ZRG2 HZMS RZD2 EVHZ

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\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*

Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 311 - Moveable Bearing Bent 2 and 3 under Older Girders 90 10 ea. 10 % % Previous Inspection Notes: 06/28/2012 - Alignment was Good today. Some rust, paint loss, and debris. 05/07/2010 - No change from the previous inspections and in mostly Good condition. 06/16/2008 - Spot rust from leakage. Alignment is Good. 05/31/2007 - None 05/04/2005 - Some rusty spots and scale. 04/30/2003 - Rusty spots as these joints are leaking some. Also dirt and pack rust between bottom of the rocker and bottom plate of the bearings. 08/06/2001 - Bent #2 & #3 under the original girders. Some rust and pitting. 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes: Element 331 - Conc Bridge Railing 108 m. % % Previous Inspection Notes: 06/28/2012 - Right barrier has a spalled section in Span 2. Retro-fitted barrier on the Left curb is in Good condition with some shrinkage cracks. 05/07/2010 - No change from the previous inspections and in mostly Good condition. 06/16/2008 - Minor and tight surface shrinkage cracks. Left rail sets on top of older curb. 05/31/2007 - None 05/04/2005 - Same as previously reported. 04/30/2003 - Vertical cracks throughout both rails. Some minor scrapes to rails and a few small popouts of the rail concrete. 08/06/2001 - 54.25 \* 2 = 108.50m 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes:



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\*\*\*\*\*\*\* Span : Main-0 - (cont.) \*\*\*\*\*\*\*

						main-u - (Corit	,			
Element Des										
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	- Deck Crackin	g SmFlag								
X	1	1	1	ea.	X	0	0	100	0	
						%	%	%	%	9
Previous Ins	pection Notes :	1			•		-		<u> </u>	
06/28/2012 -	The worse area	as of crack	ing are showing	g lots of	spalling and	d delaminated are	eas.			ZRGZ
05/07/2010 -	No change.									HZMS
06/16/2008 -	Many of the cra	acks are wi	der, 0.5 to 1.0r	nm, and	are open.	Some of the crac	cks have scaling a	along their edges		RZDZ
05/31/2007 -	None									EVHZ
05/04/2005 -	Add some crac	king over t	he rebar in Spa	an 2 to t	he previous	reports.				FZDZ
04/30/2003 -	Tight transvers	e and map	ping cracks thr	oughou	t. Mostly on	the older portion	of the deck.			ZHEB
08/06/2001 -	No change.									NHGN
01/14/1999 -	Small, tight tran	nverse crad	cking throughou	ut the de	eck.					
Inspection N	lotes:									
Conoral	nonaction N	Notoo								
	nspection N		dae due te ere	oion on	d fanana					ZRGZ
05/07/2010 -	Access is tough	וו מנינווס טוו	age due to ero	Sion and	i leffices.					HZMS
	Deck is getting	worso								RZDZ
Some aspha 05/31/2007 -	t placed in the	erosion at t	the NE corner of	of the br	idge.					EVHZ
05/04/2005 -	NBI 58, deck, r	ated at a "	6" due to delam	ninations	s and minor	spalling.				FZDZ
04/30/2003 -	NBI 60, substru	ucture, rate	d at a "7" due t	o some	cracking in	the substructure	concrete.			ZHEB
08/06/2001 -	None									NHGN
01/14/1999 -	None									
	Sufficiency Rat ating Calculation					11/97 10:45:05 35				YDNF
02/01/1994 -										REFI
08/01/1992 -	Updated with ta	ape 1994								NB94
01/01/1991 -	Updated with ta	ape 1992								NB92
	Updated with ta									NB91
	Updated with ta									NB89
	Updated with ta									NB86
	•									



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#### 100315001+00692

**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 Dist 3 GREAT FALLS Division Code, Location: 31 GREAT FALLS

County Code, Location: 013 CASCADE City Code, Location: 32800 GREAT FALLS

Kind fo Hwy Code, Description: 1 1 Interstate Hwy Signed Route Number: 00315

Str Owner Code, Description: 1 State Highway Agency Maintained by Code, Description: 1 State Highway Agency

Intersecting Feature: BNSF RAILROAD Kilometer Post, Mile Post: 1.71 km 1.06

Structure on the State Highway System : X Latitude : 47°29'17" Construction Data

Structure on the National Highway System: X Longitude: 111°20'07"

Str Meet or Exceed NBIS Bridge Length: X

Construction Project N

Traffic Data

Current ADT: 25,500 ADT Count Year: 2009 Percent Trucks: 2 %

Construction Project Number : IR 315-5(12)1F

Construction Project Number: IR 315-5(12)1F

Construction Station Number: 29+98.00

Construction Drawing Number : **6825** 

Construction Year : 1967
Reconstruction Year : 1996

### Structure Loading, Rating and Posting Data

#### Loading Data:

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	33.5 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	78.98		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 63.40 m

Deck Area : **767.00 m sq** 

Deck Roadway Width: 11.18 m

Approach Roadway Width: 11.18 m

Median Code, Description: 0 No median

#### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

Reference Feature for Vertical Clearance : R Railroad beneath struc

Vertical Clearance Under the Structure: 6.93 m

Reference Feature for Lateral Underclearance : R Railroad beneath struc

Minimum Lateral Under Clearance Right : 3.96 m

Minimum Lateral Under Clearance Left : 0.00 m

#### Span Data

#### Main Span

Number Spans : 1

Material Type Code, Description: 3 Steel

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type : **0 None**Deck Membrain Type : **0 None** 

### Approach Span

Number of Spans: 4

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

(52) Out-to-Out Width: 12.09 m

(50A) Curb Width:

(50B) Curb Width :

0.00 m

0.00 m

Skew Angle: 30°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	lorth or East Tra	vel
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
Route On Structure	100315	West	99.99 m	11.18 m	N/A		
I-315 AT EXIT 0 - WB	1						

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**Inspection Data** 

Inspection Due Date: 16 June 2015

Sufficiency Rating: 93.8 Structure Status : Not Deficient (91) Inspection Frequency (months): 24

NBI Inspection Da	ata						
(90) Date of Last Insp	pection: 17 June 201	3		La	ast Inspected By: Charles	Pepos - 107	
(90) Inspectio	on Date :				Inspected By :		
(58) Deck	Rating : 5	(68) Deck Geor	metry : 5	(36A)	Bridge Rail Rating : 1	(62) Culve	ert Rating : N
(59) Superstructure I	Rating : 7	(67) Structure R	Rating : 6	(36B	Transition Rating : 1	(61) Chann	el Rating : N
(60) Substructure	Rating : 6	(69) Under Clear		(36C) Ap	proach Rail Rating :1	(71) Waterway	Adequacy : N
(72) App Rdwy	y Align : 8	(41) Posting S	_	(36)	D) End Rail Rating :	(113) Scot	ur Critical : N
Incorpotion House	Unrepaired Sp	oalls: 0 m s	sq		Deck Surfa	acing Depth : 0	.00 in
Inspection Hours Crew Hours for inspec	ction :		Sno	oper Required	: <b>[</b> ]		
Helper Ho		Sr		for inspection			
Special Crew Ho	_			Flagger Hours			
Special Equipment Ho	ours: 0						
Inspection Worl	k Candidates	01-1	Duiit-	Effected	Scope of	Action	Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States
D31-FY2003-000437	27 June 2003	Approved	High	All Spans	301 Pourable Joint Se	al Min Repair	
Seal leaking joints.							
D31-FY2003-000436	27 June 2003	Approved	Low	A Approach	12 Bare Concrete Dec	k Min Repair	
Repair pot hole starting 05/31/2007 Add repairs 06/15/2011 More starti Approved. DRC	s to the spalls and de	erline over Bent 4. lamiantions also.					
D31-FY2004-000081	28 January 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
Clean pigeon debris from 05/31/2007 Some done							
Approved. DRC	•	·					
D31-FY2006-000003	18 October 2005	Approved	Low	A Approach	109 P/S Conc Open Gir	der Min Repair	
Clean dirt/debris from al 06/15/2011 Some work							
	chas been done.						
Approved. DRC							
Late Peacen:							

Inspection Date: 06/17/2013



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### **Element Inspection Data**

\* Span : Main-0 - STEEL WF - SPAN 3 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck X 100 3 190 sq.m. 0 0 % % % Previous Inspection Notes: 06/17/2013 - Cracking with delaminations and spalling in this Span. Some patching done, but the patches are starting to fail. 10-2013 deck sourvy found 7.2 percetn spalls/delaminations. 06/16/2011 - More of the delaminations are starting to spall and leaving potholes. Some patching has been done since the last inspection. 06/30/2009 - Wear in wheel paths to the aggregate. Poor skid resistance. Spalls throught span and estimate greater than 3 percent delamination. 05/31/2007 - Wear to the concrete surface. Left in Condition State 2 as estimated less than 2 percent of the surface showing spalls/distress. Some asphalt patching done on the spalls, but blowing out again. 05/04/2005 - Tight mapping cracks in the deck surface. 1 m2 delamination and spall near centerline at Bent 4. Wear in the wheel paths from studded tires. (12.09 \* 15.70 = 189.81) Nate. 04/30/2003 - Tight cracking throughout the deck. Studded tire wear in the wheel paths with exposed aggregate. There is a section of delamination and a pothole on the centerline near Bent 4, 1 sq m. 08/06/2001 - 12.09 \* 15.85 = 191.62 Some small, tight transverse cracking throughout. No brooming left for low skid resistance. Exposed aggregate surface in the wheel paths from studded tire wear. 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 79 85 m. % % % % % Previous Inspection Notes: 06/17/2013 - Rust blisters with minor surface pitting under the worst rust blisters. Girders are dirty and grimey where de-icer has sat on them. Faded paint and peeling paint in the rust blister areas where mositure can collect. 06/16/2011 - Rust, scale, and surface pitting to girders under areas that leak. Rust blisters on the lower flanges where water can collect. Paint is faded. 06/30/2009 - Same comments as past inspection and add rust blisters under areas that leak and minor surface pitting under the rust blisters. Some spot painting done during snooper inspection. 05/31/2007 - Areas on the ends of the girders under joints show the worse rusty spots and loss of paint system. Ends at Bent 3 show pitting and are rusty with paint system failure. The diaphragm vertical stiffener from the new girder, G1, to the older girder is welded solid across the top of the bottom flange; no problems observed and G2 has a hole where added diaphragm bracket was mis-drilled; photos. 05/04/2005 - Minor rust and paint loss. Mostly near the leaking joints and the original girders. (5 \* 15.70 = 78.50) Nate. 04/30/2003 - Minor spot rust with some paint loss; especially under leaking joint areas and where there is pigeon debris. 08/06/2001 - 5 \* 15.85 = 79.25 m No change from the last report. 01/14/1999 - Minor rust on the surface. 04/01/1996 - MINOR SURFACE RUST ON ORIGINAL BEAMS 02/01/1994 - None Inspection Notes:

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\*\*\*\*\*\* \* \* \* \* \* Span : Main-0 - STEEL WF - SPAN 3 (cont.) \* \* \* \* \* \* \* \* \*

Element 205 - R/Conc Column Bents 3 and 4  1 1 6 ea. 95 5 0 0  6/17/2013 - Some tight surface shrinkage cracks and a couple have small spalls on the corners from construction activity.  6/16/2011 - Generally in Good condition. Small spall on a couple of the columns.  6/30/2009 - Tight surface shrinkage cracks. Some staining of the concrete from leakage and bird debris.  5/31/2007 - Right column at Bent 3 has a small surface spall at a rebar chair foot. Tight surface shrinkage cracks noted.  5/5/4/2005 - A couple of the columns have tight cracks at the connection area with the cap.  6/4/30/2003 - Surface shrinkage cracks.  6/6/6/2001 - None  6/1/1/1994 - None  1/14/1999 - None  6/2/01/1994 - None  1/1994 - None  1/1995 - Some  1/1996 - None  1/1997 - Some  1/199	RZEV RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF REFI
Element 205 - R/Conc Column Bents 3 and 4  1 1 1 6 ea. 95 5 0 0  Revious Inspection Notes:  06/17/2013 - Some tight surface shrinkage cracks and a couple have small spalls on the corners from construction activity.  06/16/2011 - Generally in Good condition. Small spall on a couple of the columns.  06/30/2009 - Tight surface shrinkage cracks. Some staining of the concrete from leakage and bird debris.  05/31/2007 - Right column at Bent 3 has a small surface spall at a rebar chair foot. Tight surface shrinkage cracks noted.  05/04/2005 - A couple of the columns have tight cracks at the connection area with the cap.  04/30/2003 - Surface shrinkage cracks.  08/06/2001 - None  01/14/1999 - None  04/01/1996 - None  02/01/1994 - None  Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0  Revious Inspection Notes:  Element 234 - R/Conc Samulation on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	RZEV RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF
Previous Inspection Notes:  06/17/2013 - Some tight surface shrinkage cracks and a couple have small spalls on the corners from construction activity.  06/16/2011 - Generally in Good condition. Small spall on a couple of the columns.  06/30/2009 - Tight surface shrinkage cracks. Some staining of the concrete from leakage and bird debris.  05/31/2007 - Right column at Bent 3 has a small surface spall at a rebar chair foot. Tight surface shrinkage cracks noted.  05/04/2005 - A couple of the columns have tight cracks at the connection area with the cap.  04/30/2003 - Surface shrinkage cracks.  08/06/2001 - None  01/14/1999 - None  04/01/1996 - None  02/01/1994 - None  Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4   1 1 24 m. 90 5 5 0  % % % %  Previous Inspection Notes:	RZEV RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF
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06/16/2011 - Generally in Good condition. Small spall on a couple of the columns. 06/30/2009 - Tight surface shrinkage cracks. Some staining of the concrete from leakage and bird debris. 05/31/2007 - Right column at Bent 3 has a small surface spall at a rebar chair foot. Tight surface shrinkage cracks noted. 05/04/2005 - A couple of the columns have tight cracks at the connection area with the cap. 04/30/2003 - Surface shrinkage cracks. 08/06/2001 - None 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0 % % % % Previous Inspection Notes:	RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF
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05/31/2007 - Right column at Bent 3 has a small surface spall at a rebar chair foot. Tight surface shrinkage cracks noted. 05/04/2005 - A couple of the columns have tight cracks at the connection area with the cap. 04/30/2003 - Surface shrinkage cracks. 08/06/2001 - None 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0 0 % % % % % % % % % % % % % % %	FZMK ZZEB NHGC DCHF YDNF
05/04/2005 - A couple of the columns have tight cracks at the connection area with the cap. 04/30/2003 - Surface shrinkage cracks. 08/06/2001 - None 01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0  % % % % % %  Previous Inspection Notes:  06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	ZZEB NHGC DCHF YDNF
04/30/2003 - Surface shrinkage cracks.  08/06/2001 - None  01/14/1999 - None  04/01/1996 - None  02/01/1994 - None  Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0  Previous Inspection Notes:  06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	NHGC DCHF YDNF
01/14/1999 - None 04/01/1996 - None 02/01/1994 - None Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0  % % % % %  Previous Inspection Notes:  06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	DCHF YDNF
04/01/1996 - None  Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 1 24 m. 90 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	YDNF
Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 24 m. 90 5 5 0 0 % % % % % % % % % % % % % % %	
Inspection Notes:  Element 234 - R/Conc Cap Bents 3 and 4  1 1 1 24 m. 90 5 5 0 0 % % % % % % % % % % % % % % %	REFI
Element 234 - R/Conc Cap Bents 3 and 4  1 1 1 24 m. 90 5 5 0 % % % % %  Previous Inspection Notes:  06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	
Element 234 - R/Conc Cap Bents 3 and 4  1 1 1 24 m. 90 5 5 0 % % % % %  Previous Inspection Notes:  06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	
06/17/2013 - Small delamination on the Span 3 face of Bent 4's cap. Lots of staining from joint leakage. Small surface spalls in the underside of the cap from rebar chair feet.	
the cap from rebar chair feet.	
	RZEV
06/16/2011 - Photo of delaminations on Bent 4's cap. Staining from leakage. Some tight shrinkage cracks. Small spall on the surface near the	RMGH
rebar chair feet.	ZZDZ
06/30/2009 - 5 percent in stste 3 for small delaminationon bent 4 cap. Staining from bird debris and leakage on cap. Several small surface spalls near exposed reinforcing chair feet.	2202
05/31/2007 - Same as past inspections and add minor surface spalls on the underside of the older portion of the caps from rebar chair feet. Bent 4's cap has (2) spalls/delaminated areas on the Span 4 edge at the top.	EZHZ
05/04/2005 - Tight surface shrinkage cracks. Construction joint between the new to old cap has some minor cracking with minor loose areas along the crack edge; very minor.	FZMK
04/30/2003 - Tight surface shrinkage cracks. Staining of concrete due to leaking joints.	ZZEB
08/06/2001 - 12.09 * 2 = 24.19m	NHGC
01/14/1999 - None	DCHF
04/01/1996 - None	YDNF
02/01/1994 - None	REFI
Inspection Notes:	

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#### I00315001+00692 Continue

\*\*\*\*\*\* \* \* \* \* \* Span : Main-0 - STEEL WF - SPAN 3 (cont.) \* \* \* \* \* \* \* \* \*

Element Des										
Lieilielii Des	cription									
٦	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 301	- Pourable Join	t Seal Bei	nts 3 and 4							
	1	3	24	m.		60	20	20		
						%	%	%	%	
Previous Ins	pection Notes :	l	I							
up the heade	ers appears to b	e sound.	·				o. Spalling alono n. Deck spalls ju		Material that ma	ikes RZEV RMGH
		•			•	with lakage evide		·		ZZDZ
05/31/2007 -	Joint is sound	except whe	ere gland is torn	or miss	sing. Minor	spall along the e	dges of the joint	over Bent 4.		EZHZ
05/04/2005 -	Spalls along bo	oth sides of	f the joint at Bei	nt 4. So	me areas w	here the sealant	has failed and le	eaking is evident.	Most of the sand	ding FZMK
				ng out.	Concrete a	llong the joints is	mostly sound ex	cept near center	line of Bent 4 whe	ere ZZEB
	2 * 12.09 = 24.	18m								NHGC
01/14/1999 -	None									DCHF
04/01/1996 -	None									YDNF
02/01/1994 -	None									REFI
Element 310	- Elastomeric B	Bearing Ur	nder New Girde	rs						
	1	1	2	ea.		95	5	0		
						%	%	%	%	
Previous Ins	pection Notes :									
		of the bea	rings is in Good	d conditi	on with som					
	·					ne tight surface r	ust and faded pa	int on the steel p	ortions.	RZEV
	Spot fust off the	e steel por	•			•	ust and faded pa	int on the steel p	ortions.	RZEV RMGH
06/30/2009 -			tions of the bea	rings. F	Rubber area	is are Good.		·		RZEV RMGH ZZDZ
	Unchanged fro	m prior rep	tions of the bea	rings. F	Rubber area	is are Good. ons with spot pai	nting done during	g snooper inspec	tion.	RMGH
05/31/2007 -	Unchanged fro	m prior rep and faded	tions of the bea ports. Some spo I paint on the st	rings. F	Rubber area	is are Good. ons with spot pai		g snooper inspec	tion.	RMGH ZZDZ
05/31/2007 - 05/04/2005 -	Unchanged fro Minor spot rust Some spot rust	m prior rep and faded and mino	tions of the bear ports. Some spo I paint on the st r paint loss.	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	is are Good. ons with spot pai	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ
05/31/2007 - 05/04/2005 - 04/30/2003 -	Unchanged fro Minor spot rust Some spot rust	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK
05/31/2007 - 05/04/2005 - 04/30/2003 - 08/06/2001 -	Unchanged fro Minor spot rust Some spot rust One slotted and Under the new	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK ZZEB
05/31/2007 - 05/04/2005 - 04/30/2003 -	Unchanged fro Minor spot rust Some spot rust One slotted and Under the new None	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK ZZEB NHGC
05/31/2007 - 05/04/2005 - 04/30/2003 - 08/06/2001 - 01/14/1999 -	Unchanged fro Minor spot rust Some spot rust One slotted and Under the new None None	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF
05/31/2007 - 05/04/2005 - 04/30/2003 - 08/06/2001 - 01/14/1999 - 04/01/1996 -	Unchanged fro Minor spot rust Some spot rust One slotted and Under the new None None	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF
05/31/2007 - 05/04/2005 - 04/30/2003 - 08/06/2001 - 01/14/1999 - 04/01/1996 - 02/01/1994 -	Unchanged fro Minor spot rust Some spot rust One slotted and Under the new None None	m prior rep and faded and minor d one fixed	tions of the bea ports. Some spo I paint on the st r paint loss. I(Bent 4). Some	rings. F ot rust or eel porti	Rubber area n steel portion ons. A min	ns are Good.  ons with spot pai  or tear in the rub	nting done during	g snooper inspec	tion.	RMGH ZZDZ EZHZ FZMK ZZEB NHGC DCHF YDNF

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				оран .	Walli-0 - 51	EEL WF - SPA	14.5 (COIII.)			
Element Des										
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Bea	aring Bent	: 3							
	1	3	4	ea.		90	10	C		
						%	%	%	%	•
Previous Ins	pection Notes :									
06/17/2013 -	Bearing alignm	ent was G	ood as mostly	plumb: 7	0F. Staining	g from joint leak	age with rust, sca	lle, and paint los	s also.	RZEV
						at the bearings	_	, <b>p</b>		RMGH
	_		•	•		•	ring snooper insp	ection.		ZZDZ
			_	_		and spot overco				EZHZ
	Rusty spots, so				-		at painted.			FZMK
					-		ue to leaking join	t		ZZEB
		in some de	brio arouna an	boaring	go. Moved t	o Env. Olalo o a	de to leaking join			2220
Inspection I	Notes:									
Element 313	- Fixed Bearing	Bent 4								
	1	1	4	ea.		90	10	C		
						%	%	%	%	
Previous Ins	pection Notes :	-								
06/17/2013 -	Rust, scale, de	bris, peelir	ng paint, and fa	ded pair	nt.					RZEV
	Spot rust, some									RMGF
						spot painting do	ne.			ZZDZ
						spot overcoat p				EZHZ
	Spot rust, mind					.,,				FZMK
	Some rust and				<b>.</b>					ZZEB
		,								
Inspection I	votes:									
Element 331	- Conc Bridge I	Pailing								
Liement 33 i			24			0.5		C		
	1	3	31	m.		95				
						%	%	%	%	
Previous Ins	pection Notes :									
06/17/2013 -	Generally in Go	ood conditi	on. Left side h	as a sm	all spall on it	s' backside. Ra	andom shrinakge	cracks.		RZEV
06/16/2011 -	Generally in Go	ood conditi	on with some r	andom	vertical crack	king throughout.				RMGH
06/30/2009 -	Generally good	d condition.	Some crackin	g betwe	en chamfere	d areas on both	side of structure.			ZZDZ
05/31/2007 -	Minor popouts	and tight s	urface shrinkaç	ge crack	s.					EZHZ
05/04/2005 -	No change from	m previous	reports. (15.7	0 * 2 = 3	31.40) Nate.					FZMK
04/30/2003 -	Vertical cracks	throughou	t both rails. So	me min	or popouts ir	n the concrete o	f the rails.			ZZEB
08/06/2001 -	15.85 * 2 = 31.	70m								NHGC
)1/14/1999 -	None									DCHF
04/01/1996 -	None									YDNF
02/01/1994 -	None									REFI
Inspection I	NUIUS.									

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A period of the property of th			* * *	*******	Span:	Main-0 - S1	TEEL WF - SPAN	N 3 (cont.) * *	*****		
sement 358 - Deck Cracking SmFlag  X	Element Des	cription									
x 1 3 1 ea. X 0 0 0 100 0 100 0 2 2 2 2 2 2 2 2 2 2 2	Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
evious Inspection Notes:  ###################################	Element 358	- Deck Cracking	g SmFlag			<u>'</u>		1		-	
At the properties of the delaminated areas with spalling at the wider cracks.  *************  ********  ********  ****	Х	1	3	1	ea.	X	0	0	100	0	
At 17/2013 - Unchanged from previous report.  At 16/2011 - Numerous cracks in the delaminated areas with spalling at the wider cracks.  ********* Span : Appr-1 - P/S CONC SPANS - 1,2,4,and 5 *********  ***********  ***********  ****							%	%	%	%	
At 17/2013 - Unchanged from previous report.  At 16/2011 - Numerous cracks in the delaminated areas with spalling at the wider cracks.  ********* Span : Appr-1 - P/S CONC SPANS - 1,2,4,and 5 *********  ***********  ***********  ****	Previous Ins	pection Notes :									
******** Span: Appr-1 - P/S CONC SPANS - 1,2,4,and 5 ********  ********* Span: Appr-1 - P/S CONC SPANS - 1,2,4,and 5 ********  ***********  ***********  ****			m previous	s report							R <i>7</i> FV
********* Span : Appr-1 - P/S CONC SPANS - 1,2,4,and 5 *********  ***********  **********  ****		· ·		•	as with	enalling at th	he wider cracks				
**************************************			No III tilo d	ciariiriatoa aro	as with	spanning at a	ic wider ordere.				T T T T T T T T T T T T T T T T T T T
ment Description mart Flag   Scale Factor   Env   Quantity   Units   Insp Each   Pct Stat 1   Pct Stat 2   Pct Stat 3   Pct Stat 4   Pct Stat 5   ment 12 - Bare Concrete Deck    1   3   569   sq.m.   X   0   0   100   0	Inspection I	Notes:									
ment Description mart Flag   Scale Factor   Env   Quantity   Units   Insp Each   Pct Stat 1   Pct Stat 2   Pct Stat 3   Pct Stat 4   Pct Stat 5   ment 12 - Bare Concrete Deck    1   3   569   sq.m.   X   0   0   100   0											
ment Description mart Flag   Scale Factor   Env   Quantity   Units   Insp Each   Pct Stat 1   Pct Stat 2   Pct Stat 3   Pct Stat 4   Pct Stat 5   ment 12 - Bare Concrete Deck    1   3   569   sq.m.   X   0   0   100   0											
mart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Pct Stat 5 Pct Stat 5 Pct Stat 6 Pct Stat 6 Pct Stat 7 Pct Stat 8 Pct Stat 4 Pct Stat 5 Pct Stat 7 Pct Stat 8 Pct Stat 4 Pct Stat 5 Pct Stat 7 Pct Stat 8 Pct Stat 8 Pct Stat 8 Pct Stat 4 Pct Stat 5 Pct Stat 9 Pct			* * *	******	Span:	Appr-1 - P/S	CONC SPANS	5 - 1,2,4,and 5 * '	* * * * * * * *		
priment 12 - Bare Concrete Deck  1 3 569 sq.m. X 0 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		<u> </u>									
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rcent or less distressed/delaminated areas. //04/2005 - Tight mapping cracks throughout. Small delaminated area is starting to spall near Centerline of Bent 4. Very little skid resistance mains. (47.09 * 12.09 = 569.32) Nate. //30/2003 - Tight cracking throughout the deck. Studded tire wear in the wheel paths with exposed aggregate. Very little skid resistance left. mall pothole and delamination near centerline at Bent 4. //06/2001 - 47.55 * 12.09 = 574.88 nall & tight transverse cracking throughout. No broom marks left for poor skid resistance. Studded tire wear in the wheel paths. //14/1999 - Spans #1, 2, 4, & 5  //01/1996					:41	, 			O		O E2112
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/30/2003 - Tight cracking throughout the deck. Studded tire wear in the wheel paths with exposed aggregate. Very little skid resistance left. nall pothole and delamination near centerline at Bent 4. /06/2001 - 47.55 * 12.09 = 574.88 nall & tight transverse cracking throughout. No broom marks left for poor skid resistance. Studded tire wear in the wheel paths. /14/1999 - Spans #1, 2, 4, & 5  DCH /01/1996	05/04/2005 -	Tight mapping	cracks thro	oughout. Small	delamii	nated area is	s starting to spall	I near Centerline	of Bent 4. Very	ittle skid resistan	ce FZMK
nall pothole and delamination near centerline at Bent 4.  //06/2001 - 47.55 * 12.09 = 574.88  nall & tight transverse cracking throughout. No broom marks left for poor skid resistance. Studded tire wear in the wheel paths.  //14/1999 - Spans #1, 2, 4, & 5  DCH  //01/1996					dded tire	e wear in the	wheel paths wit	th exposed aggre	gate. Very little :	skid resistance le	ft. ZZEB
hall & tight transverse cracking throughout. No broom marks left for poor skid resistance. Studded tire wear in the wheel paths.  /14/1999 - Spans #1, 2, 4, & 5  DCH /01/1996	Small pothol	e and delaminat	tion near ce			, woar in the	micor paulo mi	iii oxpooda aggio	gato. Voly little		
/14/1999 - Spans #1, 2, 4, & 5 DCHI /01/1996 YDNI				ghout No broc	nm mark	e left for no	or ekid resistance	e Studded tire w	year in the wheel	nathe	NHGC
-				griodi. No broc	JIII IIIAIN	is icit for pot	or skid resistance	c. Gladaca inc w	car in the wheel	patris.	DCHF
spection Notes:	04/01/1996 -	_									YDNF
	Inspection N	lotes.									
	Порсологт										

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\*\*\*\*\*\* \* Span : Appr-1 - P/S CONC SPANS - 1 2 4 and 5 (cont ) \* \* \* \* \* \* \* \* \*

Smart Flag	scription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 109	- P/S Conc Ope	en Girder								
	1	1	235	m.		95	5	0	0	
						%	%	%	%	
revious Ins	pection Notes :									
6/17/2013 -	Generally in Go	ood conditi	on. Diagonal c	rack/sp	all on G2 and	G3 at Bent 3 ha	as not changed.			RZE
hanged.	G2 at Bent 3 has Same commen			he bear	ing and has	not changed sind	ce the last inspec	ction. Spall on G	3 has also not	RMG ZZD:
				a at Bei	nt 3 has a dia	agonal crack at 4	5 degrees in the	direction of she	ar at the Span side	of EZH
ne sole plate	e; photo to Hele	na-D. Crun	nley. G3 at Ber	nt 3 is s	palled on the	Span side behir	nd the sole Plate	; photos to Hele	na-D. Crumley.	
ight in Spa as widened	n 1 has several I. No cracks vis	small hits on the	on its' lower flar hit areas and n	nge with	small areas ed tendons.	of section loss; $(47.09 * 5 = 235)$	probably from co 5.45)		s. 2nd girder from the struct	ure
		Ŭ	the ends of the	girders.	Graffiti on g	jirders near the A	Abutments.			ZZE
	47.55 * 5 = 237	7.75m								NHG
1/14/1999 -										DCH
	INCLUDES SP	'ANS 1,2,4	,5							YDN
2/01/1994 -	None									REF
Inspection I	10103.									
	- R/Conc Colur	mn Bents 2	2 and 5							
		mn Bents 2	2 and 5	ea.		95	5	0	0	
	- R/Conc Colur			ea.		95	5 %	0		
lement 205	- R/Conc Colur			ea.						
lement 205	- R/Conc Colur 1 pection Notes : Generally in Go	1 ood conditi	6		kge cracks ar	%	%	%		a RZE
revious Ins 6/17/2013 -	- R/Conc Colur  1  pection Notes : Generally in Goon the back-Left	1 ood conditi t corner.	on. Some tight	shrinal		% and some small sp	% palls along the so	%	%	
revious Ins 6/17/2013 - " x 6" spall 6/16/2011 -	- R/Conc Colur 1 pection Notes : Generally in Go on the back-Left Generally in Go	ood conditi t corner.	on. Some tight	shrinak	all on center of	% and some small special solumn at Bent 2	% palls along the so	%	%	RMG
revious Ins 6/17/2013 - " x 6" spall 6/16/2011 - 6/30/2009 -	- R/Conc Colur  1  pection Notes : Generally in Goon the back-Left Generally in Gooden Generally good	ood conditi t corner. ood conditi	on. Some tight on. Same on sr	shrinak mall spa ll on ce	all on center on ter column	nd some small specification at Bent 2 at bent 2.	% palls along the so	%	%	RMG ZZD
revious Ins 6/17/2013 - ' x 6" spall 6/16/2011 - 6/30/2009 -	- R/Conc Colur  1  pection Notes : Generally in Goon the back-Left Generally in Good Generally good Same as past i	ood conditi t corner. ood conditi d condition.	on. Some tight on. Same on sr One small spa	shrinak mall spa ll on ce of small	all on center on ter column a surface spal	% ond some small specification at Bent 2 at bent 2.	% palls along the so	% crapes. Bent 2's	% middle column has	RMG ZZD EZH
revious Ins 6/17/2013 - 1 x 6" spall 6/16/2011 - 6/30/2009 - 5/31/2007 -	- R/Conc Colur  1  pection Notes : Generally in Goon the back-Left Generally in Good Generally good Same as past i	ood conditi t corner. ood conditi d condition. nspections	on. Some tight on. Same on sr One small spa s and a couple or	shrinak mall spa ll on ce of small	all on center on ter column a surface spal	% ond some small specification at Bent 2 at bent 2.	% palls along the so	% crapes. Bent 2's	%	RMG ZZD EZH a. FZW
revious Ins 6/17/2013 - " x 6" spall 6/16/2011 - 6/30/2009 - 5/31/2007 - 5/04/2005 - 4/30/2003 -	- R/Conc Colur 1  pection Notes : Generally in Goon the back-Left Generally in Good Generally good Same as past i	ood conditi t corner. ood conditi d condition. nspections	on. Some tight on. Same on sr One small spa s and a couple or	shrinak mall spa ll on ce of small	all on center on ter column a surface spal	% ond some small specification at Bent 2 at bent 2.	% palls along the so	% crapes. Bent 2's	% middle column has	RMG ZZD EZH
revious Ins 6/17/2013 - " x 6" spall 6/16/2011 - 6/30/2009 - 5/31/2007 - 5/04/2005 - 4/30/2003 -	- R/Conc Colur 1 pection Notes : Generally in Go on the back-Left Generally good Same as past i Tight surface s Tight surface s Bent #2 & 5.	ood conditi t corner. ood conditi d condition. nspections	on. Some tight on. Same on sr One small spa s and a couple or	shrinak mall spa ll on ce of small	all on center on ter column a surface spal	% ond some small spectations at Bent 2 at bent 2.	% palls along the so	% crapes. Bent 2's	% middle column has	RMG ZZD EZH 1. FZM ZZE NHG
revious Ins 6/17/2013 - " x 6" spall 6/16/2011 - 6/30/2009 - 5/31/2007 - 5/04/2005 - 4/30/2003 - 8/06/2001 -	- R/Conc Column 1  pection Notes: Generally in Goon the back-Left Generally good Same as past in Tight surface so Tight surface so Bent #2 & 5.  None	ood conditi t corner. ood conditi d condition. nspections	on. Some tight on. Same on sr One small spa s and a couple or	shrinak mall spa ll on ce of small	all on center on ter column a surface spal	% ond some small spectations at Bent 2 at bent 2.	% palls along the so	% crapes. Bent 2's	% middle column has	RMG ZZD EZH a. FZM ZZE

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	scription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 215	- R/Conc Abuti	ment 1 and	d 6		1	1				
	1	1	35	m.		95	5	5 0	0	
						%	%	%	%	
Pravious Ins	spection Notes :									
	•	and an alle	0		at the beat					D.7.E
	•			·	at the back	wall to cap conne	ection area.			RZE
	- Same commer		· ·			<b>-</b>				RMC
		·	•			area. Tight crack	king in both abu	tment caps.		ZZD
	- Tight surface s	_	_							EZH
		_				r the SE corner o				FZN
near the Abu				walls. v	ery minor e	rosion near the S	SE corner that is	allowing dirt/deb	ris to get on the g	jirder ZZE NHG
01/14/1999		ŕ								DCF
04/01/1996										YDN
02/01/1994										REI
Inspection	Notes.									
Iomont 22/	1 - R/Conc Cap	Ponto 2 o	ad E							
Tierrierit 232						00			0	
	1	1	24	m.		90	5			
						%	%	%	%	
Previous Ins	spection Notes :									
00/47/0040	- Rird neets and	dobric on t	ha tana of the							
						nation on Bent 5	s cap near the c	onnections to the	columns. Small	RZE
surface spal	ls on the bottom - Unchanged an	ns of the ca	ps from rebar o	hair fee		nation on Bent 5'	s cap near the c	onnections to the	e columns. Small	RZE RMG
surface spal 06/16/2011	ls on the bottom - Unchanged an	ns of the ca and more bird	ps from rebar of d debris on the	chair fee caps.	t.		·		e columns. Small small surface spal	RMG
surface spal 06/16/2011 06/30/2009 exposed rus	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe	ns of the cand more bird state 3 for set. Bird nes	ps from rebar of d debris on the small delamina sts and debris of	chair fee caps. tion on b on all ca	t. pent 5 cap a ps.	nd along constru	ction joints at co	olumns. Several s	small surface spal	RMG ls on ZZD
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe	ns of the cand more bird state 3 for set. Bird nesention on the	ps from rebar of d debris on the small delamina sts and debris of	chair fee caps. tion on b on all ca	t. pent 5 cap a ps.	nd along constru	ction joints at co	olumns. Several s		RMG ls on ZZD
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 cap from exp	ls on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamia	ns of the ca and more bird state 3 for seet. Bird nes nation on the air feet.	ps from rebar of d debris on the small delamina sts and debris of e Span 5 side of	chair fee caps. tion on b on all ca	t. pent 5 cap a ps.	nd along constru	ction joints at co	olumns. Several s	small surface spal	RMG ls on ZZD
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 cap from ex 05/04/2005 04/30/2003	ls on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at t	ns of the ca and more bird state 3 for set. Bird nes ntion on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal	RMG Is on ZZD of the EZH
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 cap from exp 05/04/2005 04/30/2003 he Span 5 s	ls on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at t	as of the ca and more bird state 3 for seet. Bird nes nation on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMG Is on ZZD of the EZH
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 cap from ex 05/04/2005 04/30/2003 he Span 5 s 08/06/2001	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamian posed rebar cha - Unchanged fro - Tight crack at side of it 12.09 * 2 = 24.	as of the ca and more bird state 3 for seet. Bird nes nation on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMC Is on ZZC of the EZH FZM 5 on ZZE
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 eap from ex 05/04/2005 04/30/2003 he Span 5 s 08/06/2001 01/14/1999	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at the ide of it 12.09 * 2 = 24.	as of the ca and more bird state 3 for seet. Bird nes nation on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMG Is on ZZD of the EZH FZM 5 on ZZE NHG
surface spal 06/16/2011 06/30/2009 exposed rus 05/31/2007 cap from ex 05/04/2005 04/30/2003 he Span 5 s 08/06/2001	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at the ide of it 12.09 * 2 = 24.	as of the ca and more bird state 3 for seet. Bird nes nation on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMG Is on ZZD of the EZH FZM 5 on ZZE NHG
surface spal 16/16/2011 16/30/2009 exposed rus 15/31/2007 eap from ex 15/04/2005 14/30/2003 the Span 5 s 18/06/2001 11/14/1999	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at the ide of it 12.09 * 2 = 24.	as of the ca and more bird state 3 for seet. Bird nes nation on the air feet. om the last	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on ton all ca on all ca of Bent 5	t. pent 5 cap a ps. 's cap. Alsc	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMG Is on ZZD of the EZH FZM 5 on ZZE NHG
surface spal 96/16/2011 96/30/2009 exposed rus 95/31/2007 eap from ex 95/04/2005 94/30/2003 the Span 5 s 98/06/2001 91/14/1999 Inspection	Is on the bottom - Unchanged an - 5 percent into sty rebar chair fe - Minor delamial posed rebar cha - Unchanged fro - Tight crack at the ide of it 12.09 * 2 = 24	ns of the ca and more bird state 3 for set. Bird nes ntion on the air feet. om the last the new to	ps from rebar of debris on the small delamina sts and debris of Span 5 side of reports.	chair fee caps. tion on k on all ca if Bent 5	t. pent 5 cap a ps. 's cap. Alsc aps. Surfac	nd along constru	ction joints at co	olumns. Several s	small surface spal the older portion	RMG Is on ZZD of the EZH FZM 5 on ZZE NHG
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Continue

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Element 313 - Fixed Bearing  1 1 38 ea. 90 10 0  Previous Inspection Notes:  06/17/2013 - Rust, scale, debris, and paint loss.  06/16/2011 - Rust, paint loss, scale, and debris.  06/30/2009 - Spot rust, paint fade, and some debris. The worst paint loss is on abutment bearings.  05/31/2007 - Spot rust, paint loss, and pigeon debris on the bearings. Left Abutment bearings in the quantity as (1) anchor bolt per bearing is visible. Blown off and spot overcoat painted if they were dry.  05/04/2005 - Minor rust, paint loss, and pigeon debris.  04/30/2003 - Spot rust on the bearings. Some debris from birds, etc.  08/06/2001 - Minor rust and pitting.	RZEV RMGH ZZDZ EZHZ FZMK
Element 313 - Fixed Bearing  1 1 38 ea. 90 10 0  Previous Inspection Notes:  06/17/2013 - Rust, scale, debris, and paint loss. 06/16/2011 - Rust, paint loss, scale, and debris. 06/30/2009 - Spot rust, paint fade, and some debris. The worst paint loss is on abutment bearings. 05/31/2007 - Spot rust, paint loss, and pigeon debris on the bearings. Left Abutment bearings in the quantity as (1) anchor bolt per bearing is visible. Blown off and spot overcoat painted if they were dry. 05/04/2005 - Minor rust, paint loss, and pigeon debris. 04/30/2003 - Spot rust on the bearings. Some debris from birds, etc. 08/06/2001 - Minor rust and pitting.	RZEV RMGH ZZDZ EZHZ
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06/17/2013 - Rust, scale, debris, and paint loss. 06/16/2011 - Rust, paint loss, scale, and debris. 06/30/2009 - Spot rust, paint fade, and some debris. The worst paint loss is on abutment bearings. 05/31/2007 - Spot rust, paint loss, and pigeon debris on the bearings. Left Abutment bearings in the quantity as (1) anchor bolt per bearing is visible. Blown off and spot overcoat painted if they were dry. 05/04/2005 - Minor rust, paint loss, and pigeon debris. 04/30/2003 - Spot rust on the bearings. Some debris from birds, etc.	RMGH ZZDZ EZHZ
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06/30/2009 - Spot rust, paint fade, and some debris. The worst paint loss is on abutment bearings. 05/31/2007 - Spot rust, paint loss, and pigeon debris on the bearings. Left Abutment bearings in the quantity as (1) anchor bolt per bearing is visible. Blown off and spot overcoat painted if they were dry. 05/04/2005 - Minor rust, paint loss, and pigeon debris. 04/30/2003 - Spot rust on the bearings. Some debris from birds, etc.	EZHZ
visible. Blown off and spot overcoat painted if they were dry. 05/04/2005 - Minor rust, paint loss, and pigeon debris. 04/30/2003 - Spot rust on the bearings. Some debris from birds, etc. 08/06/2001 - Minor rust and pitting.	
visible. Blown off and spot overcoat painted if they were dry. 05/04/2005 - Minor rust, paint loss, and pigeon debris. 04/30/2003 - Spot rust on the bearings. Some debris from birds, etc. 08/06/2001 - Minor rust and pitting.	FZMK
04/30/2003 - Spot rust on the bearings. Some debris from birds, etc. 08/06/2001 - Minor rust and pitting.	FZIVIN
08/06/2001 - Minor rust and pitting.	ZZEB
	NHGC
04/4/4000 None	DCHF
01/14/1999 - None	YDNF
04/01/1996	IDINE
Inspection Notes:	
Element 331 - Conc Bridge Railing	
1 3 94 m. 95 5 0	
% % %	
Previous Inspection Notes :	
06/17/2013 - Generally in Good condition. Small spalls on the backside of the barrier at bolt-ups to the W-Beam. Random shrinkage cracking.	RZEV
06/16/2011 - Generally in Good condition. Random vertical cracks throughout.	RMGH
06/30/2009 - Tight surface shrinkage cracks throughout. Small surface popouts and vertical cracking in all spans. Generally good condition.	ZZDZ
05/31/2007 - Minor popouts and tight shrinkage cracks.	EZHZ
	FZMK
05/04/2005 - Same as previous reports. (47.09 * 2 = 94.18) Nate.	
	ZZEB
04/30/2003 - Vertical cracks throughout both rails with some minor concrete popouts.	
04/30/2003 - Vertical cracks throughout both rails with some minor concrete popouts. 08/06/2001 - 47.55 * 2 = 95.10m	NHGC
04/30/2003 - Vertical cracks throughout both rails with some minor concrete popouts. 08/06/2001 - 47.55 * 2 = 95.10m 01/14/1999 - None	ZZEB NHGC DCHF YDNF
05/04/2005 - Same as previous reports. (47.09 * 2 = 94.18) Nate. 04/30/2003 - Vertical cracks throughout both rails with some minor concrete popouts. 08/06/2001 - 47.55 * 2 = 95.10m 01/14/1999 - None 04/01/1996 Inspection Notes:	NHGC DCHF
04/30/2003 - Vertical cracks throughout both rails with some minor concrete popouts. 08/06/2001 - 47.55 * 2 = 95.10m 01/14/1999 - None	NHGC DCHF



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General Inspection Notes	
06/17/2013 - End shoes at East Abutment, 6, are lapped against traffic flow.	RZEV
Homeless person living under Span 5. Wasn't happy about the intrusion during the inspection. 06/16/2011 - End shoes on the W-Beam at the bridge ends are lapped against traffic on the East end of the structure. Homeless household along with a fire pit near Abutment 6.	RMGH
06/30/2009 - NBI 58, deck, rated at "5" due to increasing delaminations and spalling in deck surface.	ZZDZ
W-beam end shoes at abutment 6 are lapped against traffic flow. 05/31/2007 - NBI 59, superstructure, rated a "6" due to rust, scale, and minor pitting of the steel girders in the main span.	EZHZ
Areas under the joints were very wet from overnight rain and could not be cleaned and overcoat painted very well. 05/04/2005 - NBI 58, deck, rated at a "6" due to delamination, minor potholes, and wear to the surface.	FZMK
NBI 60, substructure, rated at a "7" due to minor cracking at the construction joints and small popouts in the bottoms of the caps from exposed rebar chairs.	
04/30/2003 - None	ZZEB
08/06/2001 - None	NHGO
01/14/1999 - None	DCHF
04/01/1996 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:45:05 Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:15:35	YDNF
02/01/1994 -	REFI
08/01/1992 - Updated with tape 1994	NB94
01/01/1991 - Updated with tape 1992	NB92
03/01/1989 - Updated with tape 1991	NB91
04/01/1987 - Updated with tape 1989	NB89
09/01/1984 - Updated with tape 1986	NB86



**General Location Data** 

### **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

**Location: GREAT FALLS Structure Name:** 

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MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 00000 **RURAL AREA** 

Kind fo Hwy Code, Description: 8 8 Other (incl toll rds) Signed Route Number: 00315

State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: BNSF RAILROAD Kilometer Post, Mile Post: 1.71 km 1.06

Structure on the State Highway System: Latitude: 47°29'18"

Structure on the National Highway System: Longitude: 111°20'06"

Str Meet or Exceed NBIS Bridge Length:

**Traffic Data** 

Current ADT: 25,500 ADT Count Year: 2009 2 % Percent Trucks:

**Construction Data** 

Construction Project Number: IR 315-5(12)1F Construction Station Number: 6+55.00

Construction Year: 1996

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Construction Drawing Number: 15924

Reconstruction Year:

### Structure Loading, Rating and Posting Data

#### Loading Data:

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design :	32.6 mton	A LFD Assigned
Operating Load, Design:	32.6 mton	A LFD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	48.6		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 56.69 m

> Deck Area: 456.00 m sq

7.11 m Deck Roadway Width: 7.20 m Approach Roadway Width:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

R Railroad beneath struc Reference Feature for Vertical Clearance:

6.98 m Vertical Clearance Under the Structure:

R Railroad beneath struc Reference Feature for Lateral Underclearance:

Minimum Lateral Under Clearance Right: 1.70 m 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 5

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

Deck Protection Type: 1 Epoxy Coated Reinforcing

Deck Membrain Type: 0 None

### Approach Span

Number of Spans: 0

Material Type Code, Description:

Span Design Code, Description:

0.00 m

8.05 m (52) Out-to-Out Width:

(50A) Curb Width:

(50B) Curb Width: 0.00 m

Skew Angle: 33°

### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, We	est or Bi-direction	nal Travel	North or East Travel			
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
Route On Structure	100315	West	99.99 m	7.11 m	N/A			
-315 AT EXIT 0-WB OFF RAM								



# ${\bf INITIAL\ ASSESSMENT\ FORM\ FOR\ STRUCTURE:}$

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**Inspection Data** 

Inspection Due Date: 16 June 2015

Sufficiency Rating: 94

Structure Status : Functionally Obsolete

(91) Inspection Frequency (months): 48

NBI Inspection Da	ata								
(90) Date of Last Ins	pection: 16 June 20	11		La	st Inspected By: Charles	s Pepos - 107			
(90) Inspection	on Date :				Inspected By :				
(58) Deck	Rating : 7	(68) Deck Geo	metry : 6	(36A) I	Bridge Rail Rating :	(62) Cu	lvert Ra	ating :	N
(59) Superstructure	Rating : 8	(67) Structure F	Rating : 7	(36B)	(36B) Transition Rating : 1 (61) Channel Rating :			V	
(60) Substructure	Rating : 7	(69) Under Clear	ance · 3	(36C) App	proach Rail Rating :1	(71) Waterwa	y Adeo	uacy :	V
(72) App Rdwy	y Align : 7	(41) Posting S		(360	) End Rail Rating : 1	(113) Sc	our Cr	itical :	V
	Unrepaired S	palls: 0 m	sq	=	Deck Surfa	acing Depth :	0.00 i	n	
<b>Inspection Hours</b>									
Crew Hours for inspec	ction:	2	Sno	oper Required :					
Helper He	ours : (	Sr	nooper Hours	for inspection :	0				
Special Crew H	ours :			Flagger Hours :	0				
Special Equipment He	ours :								
Inspection World	k Candidates		<b>.</b>	Effected	Scope of			Cove	
Candidate ID	Date Requested	- Status	Priority	Structure Unit	Work	Action		Cond Stat	
D31-FY2003-000401	09 May 2003	Approved	High	M Main	300 Strip Seal Exp Jo	int Min Repair	Х	XX	XX
Clean dirt and debris ou 06/16/2011 Full of sand Approved. DRC		nent 1.							
Late Reason: Inspection Date: 06/16/2	2011								



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### **Element Inspection Data**

\* \* \* \* \* \* \* \* \* \* Span : Main-0 - Spans 1,2,3,4,&5 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 26 - Conc Deck/Coatd Bars X 100 3 456 sq.m. % % Previous Inspection Notes: 06/16/2011 - Wear in the wheel paths from studded tires. Small and shallow surface spalls in the concrete past the edge of the joint steel. 05/31/2007 - Minor stuudded tire wear. Good skid resistance. Wider cracks over the Bents; 0.5mm 05/04/2005 - Studded tire wear in the wheel paths. Small loose concrete along portions of the joint at Abutment 1. Wider cracks over all of the Bents. 04/30/2003 - Same comments as previous report and add studded tire wear in the wheel paths with exposed aggregate. 08/06/2001 - Transverse cracks at all (4) bents. Transverse cracks, mostly small & tight, in the west half with some minor efflorescence underneath. 12/23/1998 - 56.69 \* 8.05 = 456.35 Inspection Notes: Element 109 - P/S Conc Open Girder 1 227 100 m. % % Previous Inspection Notes: 06/16/2011 - Good condition. 05/31/2007 - No problems observed. 05/04/2005 - No problems noted. (55.40 \* 4 = 221.60 NMS) **EZFQ** 04/30/2003 - No problems noted. Some graffiti on girders near the Abutments. 08/06/2001 - None 12/23/1998 - 56.69 \* 4 = 226.76m Inspection Notes: Element 205 - R/Conc Column Bents 2, 3, 4, and 5 ea. 95 % Previous Inspection Notes : 06/16/2011 - One small spall on the Left column at Bent 3 for Condition State 2. Several peeling sack patches at the construction joints. 05/31/2007 - Tight surface shrinakge cracks. Placed 5 percent into Condition State 2 as sacked patches are delaminated or peeling where installed. None are a problem. 05/04/2005 - Minor surface shrinkage cracks. 04/30/2003 - Minor surface shrinkage cracks. No problems noted. 08/06/2001 - None 12/23/1998 - None Inspection Notes:

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Continue

Span: Main-0 - Spans 1,2,3,4,&5 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 215 - R/Conc Abutment 1 and 6 1 24 m. 95 % % Previous Inspection Notes: 06/16/2011 - Generally in Good condition. Some tight cracking in both Backwalls and one small spall on Abutment 1's backwall. 05/31/2007 - Same as prior inspection reports. 05/04/2005 - Tight cracks in both of the backwalls. Worse crack is on the Right end of Abutment 1. Minor erosion and mostly on the Right side of Abutment 6. 04/30/2003 - Some tight cracks in both Abutment backwalls. Still some minor erosion at the wingwalls. 08/06/2001 - No change from the last report. 12/23/1998 - 11.58 + 12.34 = 23.92mSome erosion around three(3) of the wingwalls. Inspection Notes: Element 234 - R/Conc Cap Bents 2, 3, 4, and 5 37 95 m. % Previous Inspection Notes : 06/16/2011 - Generally in Good condition. One small spall in sack patch at Bent 4. Some tight vertical cracks at steps in the caps. 05/31/2007 - Minor and tight cracks at the construction joint to the column. Placed 5 percent into Condition State 2 due to sacked patches showing minor delaminations and/or peeling. None are a problem. 05/04/2005 - Minor and tight cracks at the cap to column connections. 04/30/2003 - Minor surface shrinkage cracks. No problems noted. 08/06/2001 - Dropped caps at the abutments. 9.14 \* 4 = 36.56m12/23/1998 - (9.14 \* 4) + (2 \* 8.69) = 53.94mInspection Notes: Element 300 - Strip Seal Exp Joint 3 m. % Previous Inspection Notes : 06/16/2011 - Joint steel sounded solid when tapped on. Rubber gland is full of sanding material. Wet spot from apparent leaking near centerline. 05/31/2007 - Full of debris today. Damp near cneterline on the cap, so may have a slight leak there. Steel portions sound solid when tapped on. 05/04/2005 - Same as previously reported. Full of sanding material today. 04/30/2003 - Full of dirt/sanding material/ May be a small tear near centerline. Added cleaning as a work element. 08/06/2001 - Full of dirt and sanding material. 12/23/1998 - 8.05 \* 1 = 8.05m Inspection Notes:

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\* \* \* \* \* \* \* \* \* \* Span : Main-0 - Spans 1,2,3,4,&5 (cont.) \* \* \* \* \* \* \* \*

			•		•				
Element Description		<b>.</b> 1			5 : 0: : 1	5 : 0: : 0			
Smart Flag   Scale Factor   E Element 310 - Elastomeric Bearin	nv	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
					122				
1	1	4	ea.		100	0	0		
					%	%	%	%	o,
Previous Inspection Notes :				_					
06/16/2011 - Good condition. Sc	me fadi	ing of the pain	t on the	steel portio	ns.				RZGM
05/31/2007 - No problems observ	ved.								EZHZ
05/04/2005 - Same as last report	í <b>.</b>								EZFQ
04/30/2003 - Minor spot rust form	ning on	painted surfac	es. Sp	ots rub off w	vith some effort. I	Not a problem as	of yet.		BDHZ
08/06/2001 - At Abutment #6.									NHGO
12/23/1998 - None									AHBS
Inspection Notes:									
-1									
Element 313 - Fixed Bearing									
	1	36	ea.		95	5	0		
					%	%	%	%	(
Daniela de la constitución de la					76	76	76	76	
Previous Inspection Notes :									57014
06/16/2011 - Spot rust and some									RZGM
05/31/2007 - Minor spot rust on the		_		ebris starting	g to build up.				EZHZ
05/04/2005 - Minor spot rust and									EZFQ
04/30/2003 - Minor spot rust form	ning on I	painted surfac	es.						BDHZ
08/06/2001 - None									NHGO
12/23/1998 - None									AHBS
Inspection Notes:									
Element 331 - Conc Bridge Railir	ng								
1	3	113	m.		95	5	0	0	
					%	%	%	%	(
Previous Inspection Notes :									
06/16/2011 - Minor popouts and	scrapes	on both barrie	ers. Ra	andom vertic	al cracking through	ahout.			RZGM
05/31/2007 - Minor popouts and						5· · - · · ·			EZHZ
05/04/2005 - Same as last report	_								EZFQ
04/30/2003 - Vertical cracking thi		ıt: mostly verv	tiaht. S	Some minor	popouts on rails	concrete surface:	S.		BDHZ
08/06/2001 - None	ougou	,			popositio en railo		<b>-</b> .		NHGO
12/23/1998 - 56.69 * 2 = 113.38n	n								AHBS
									ANDO
Inspection Notes:									



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### 100315001+00693 Continue

General Inspection Notes	
06/16/2011 - Rail end shoes on the approach sections of the guardrail at the bridge ends are lapped against traffic.	RZGM
05/31/2007 - NBI 60, substructure, rated a "7" due to tight shrinkage cracks in the columns and caps.	EZHZ
05/04/2005 - Trasnsition rail at outlet doesn't have curb taper or doubled approach section, but probably doesn't warrant it either.	EZFQ
04/30/2003 - No major problems noted today.	BDHZ
08/06/2001 - None	NHGO
12/23/1998 - None	AHBS



**General Location Data** 

# **INITIAL ASSESSMENT FORM FOR STRUCTURE:**

**Location: GREAT FALLS Structure Name:** 

U05210000+01601

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 2 2 U.S. Numbered Hwy Signed Route Number: 00103

State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: CITY ST, BNSF RAILROAD Kilometer Post, Mile Post: 0.26 km 0.16

Structure on the State Highway System: Latitude: 47°30'28"

Structure on the National Highway System: Longitude: 111°20'26"

Str Meet or Exceed NBIS Bridge Length:

**Construction Data** 

Construction Project Number: IG 15-5(28)274 Construction Station Number: 21+54.00

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Form: bms001d

Printing Date: Thursday, May 22 2014

Construction Drawing Number: 7789

Construction Year: 1967

Current ADT: 11,330 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

### Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	32.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data :	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	85		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 167.94 m Deck Area: 2,684.00 m sq

8.32 m Deck Roadway Width: 8.32 m Approach Roadway Width:

Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

R Railroad beneath struc Reference Feature for Vertical Clearance:

5.16 m Vertical Clearance Under the Structure:

R Railroad beneath struc Reference Feature for Lateral Underclearance:

1.52 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 4

Material Type Code, Description: 4 Steel continuous

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: 2 Material Type Code, Description: 3 Steel

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

15.98 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 1.52 m Skew Angle: 45°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	-1	Both	5.16 m	7.32 m	N/A		
GAULT AVE.							
Route On Structure	N00103	N/A			East	99.99 m	8.32 m
CENTRAL AVE WEST - EB							

# ${\bf INITIAL\ ASSESSMENT\ FORM\ FOR\ STRUCTURE:}$

Form: bms001d Printing Date: Thursday, May 22 2014

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Continue

**Inspection Data** 

Inspection Due Date: 12 September 2014 (91) Inspection Frequency (months): 24

Sufficiency Rating: 91.4

Structure Status : Functionally Obsolete

Next Other Insp Due Date: 23 Aug 2016

Other Insp Type: Pin and Hanger

						Other map Type	. I ili alia Hangei
NBI Inspection Da	ata						
(90) Date of Last Insp	pection : 12 Septemb	er 2012		La	ast Inspected By: Charles	Pepos - 107	
(90) Inspection	on Date :				Inspected By :		
(58) Deck	Rating : 6	(68) Deck Geo	metry : 3	(36A)	Bridge Rail Rating : 1	(62) Culver	rt Rating : N
(59) Superstructure	Rating : 6	(67) Structure R	Rating : 6	(36B)	Transition Rating : 1	(61) Channe	el Rating : N
(60) Substructure	Rating : 6	(69) Under Clear		(36C) Ap	proach Rail Rating :1	(71) Waterway A	dequacy :N
(72) App Rdwy	y Align : 7	(41) Posting S	_	(361	D) End Rail Rating :	(113) Scou	r Critical :
	Unrepaired S	palls: 0 ms	sq		Deck Surfa	acing Depth : 0.0	00 in
Inspection Hours Crew Hours for inspection Helper H	ction: 7 ours: 0 ours: 16		nooper Hours	opper Required s for inspection Flagger Hours	5		
Special Equipment Ho	10						
Inspection World		Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition
Candidate ID	Date Requested			Unit			States
D31-FY2005-000060 Clean and paint bearing	15 October 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
Approved. DRC							
D31-FY2005-000061	15 October 2004	Approved	High	All Spans	301 Pourable Joint Se	eal Min Repair	
Reseal the joints. Approved. DRC							
D31-FY2011-000150	07 February 2011	Not Approved	Medium	All Spans	107 Paint Stl Opn Gird	ler Min Repair	
Clean and paint girders. 10-12-2006: Some spot		the girders.					
D31-FY2011-000151 Clean and paint rail.	07 February 2011	Not Approved	Medium	All Spans	334 Metal Rail Coate	d Repl Paint	
D31-FY2012-000086	13 September 2012	Not Approved	Medium	All Spans	234 R/Conc Cap	Rehab Elem	
Repair spalls/delaminate	ed areas on caps and	columns, especially	y those on Bo	ent 3.			
Late Reason:							

Inspection Date: 09/12/2012



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Continue

#### **Element Inspection Data**

Span: Main-0 - Steel Girder over RR - Spans 3 thru 6 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 12 - Bare Concrete Deck Latex Surface X 3 2293 sq.m. 0 100 % % Previous Inspection Notes: 09/12/2012 - Wear in wheel paths from studded tires. Cracking in all spans. Small delaminations and spalls along edges of joint steel. 09/20/2010 - Wear in the wheel paths has reduced depth of traction grooves to "0" in areas. Small surface delaminations and small spalls along joint steel. Lots of cracking in all Spans. 09/24/2008 - Wear in the wheel paths. Small spalls and delaminations along edges of the joint steel. Transverse and mapping cracks in all of the 07/25/2006 - Wear in the wheel paths. Small delamiantions along the expansion joint steel. Some mapping cracks in the latex in all of the spans. 09/29/2004 - Put deck into Condition State 2 due to small delaminations along the joints. 10/21/2002 - (79.40 \* 15.98) [(15.98 18.40)/2 \* 32.8] (18.40 \* 25.0) = 2292.6 Put deck back to a "12" as hydromilled and replace material with Latex concrete to original deck elevations. Also Class B repairs. Transverse cracking in all spans. May need to address the cracking on next inspection. 08/30/2000 - (79.40\*15.98) [(15.98 18.40) / 2 \* 32.8] )18.40 \* 25.0) = 2292.6 Repair of delaminated areas in 1999 with hydrodemolition. Replaced with latex concrete and an overlay of the entire structure with latex concrete/ 06/03/1998 - Numerous small, tight transverse cracking thoughout the deck with some small areas of delamination when it was checked several years ago. Studded tires have left a fairly smooth wear surface. 12/01/1995 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 607 85 m. % % % % Previous Inspection Notes: 09/12/2012 - Lower flange tops in areas that collect water are rusted and some surface pitting under rust blisters. Faded and chalking paint. diagonal bracing between G2 and G3 where removed in 2012 and intersecting welds drilled in reversal areas. Girders are dirty from train exhaust. 09/20/2010 - Crack on G3S4L Gusset is unchanged. Lots of debris and grime on the girders. Rust blisters with minor surface pitting. Lots of pigeon nests along the girder connections. 09/24/2008 - G3S4L near pin connection has a crack on the gusset weld for the diagonal brace. Rusty spots, scale, paint loss, and minor surface pitting in areas where water can sit on the girders. 07/25/2006 - Rust spots, pitting, some pack rust, and paint loss; especially under the joints. Left two(2) girders have some missing bolts in the bearings to girders connection. Outer girders have rust blisters on the lower flange tops and lower portion of the webs and near leaky joints. Bolts on a diagonal bracing was missing and replaced during snooper inspection. 09/29/2004 - Some rust spots, peeling paint and pitting of the girders, especially under the joints and on the lower portions of the web/lower flange. 2nd girder from the right in Span 3 is very rusty with paint peeling for 20 feet. 10/21/2002 - Minor rusty spots under leaking joints and along the bottom flange/web area. 08/30/2000 - (4 \* 137.20) + 32.8 + 25.0 = 606.6mSome rust and pitting. 06/03/1998 - Some early signs of rust & pitting. 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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Continue

lement Des										
Smart Flag	Scale Factor	Env	Quantity		Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 161				<u> </u>	mblies plus (	<u>'</u>	onnection Pins			
	1	3	3	ea.		95	5	0	0	
						%	%	%	%	
revious Ins	pection Notes :								I	
9/12/2012 -	Pins and hange	ers where I	UT tested in Au	ugust 20	12. No seriou	ıs problems obs	served (see Collir	ns Engineering re	eport).	MWH
spection w	Still Good pain ith little to no we Will be UT'd th	ear also no	ted.	•			s Engineering. N	lo "noteables" we	ere fond in the UT	WZB YQC
							ting in 2005 show	ed no significant	wear or problems.	NZD
9/29/2004 -	Ends of the pin	ns, nuts, an	d hangers sho	wing soi	me minor rus	t where they we	ere cleaned in 200	01 for UT testing.		ZZIC
0/21/2002 -	See 2001 NDT	report. So	ome minor wea	ar of sev	eral pins.					VIKO
8/30/2000 -	Some minor ru	st and pitti	ng.							
6/03/1998 -	Some minor ru	ıst & pitting	. Eight(8) sets	of the p	ins have bee	n UDT'ed and v	were ok.			XKG
2/01/1995 -	None									YDN
2/01/1994 -	None									REF
lement 205	- R/Conc Colur	mn (2) at E	Bent 3, 4, 5, an	d (3) at	6					
	1	1	9	ea.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :									
					ng corners ar	nd areas are de	laminated. Some	spall/scrapes on	columns. Shallow	tie MWF
	sed surface spa Bent 3's Right				and cracking:	photo. Some t	ight cracks and s	mall surface spa	lls from shallow tie	WZB
rire.				_						
	ŭ		•				edges. Some pai		· ·	YQC
ent 6 has s	ome spalls from	n being hot	from campfires	s.					Middle column at	
	n at Bent 3. Tig Small, tight shr					arted by homel	ess people under	the structure.	, and the second se	VIK
8/30/2000 -	No change.									
	Sama bairling	tight crack	s in the concre	te.						XKG
	Some namine,	tigrit crack								
		tigitt crack								

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Continue

mart Flag										
٠,	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
ement 215	- R/Conc Abutn									
	1	1	26	m.		95	5	0	0	
						%	%	%	%	
evious Ins	pection Notes :									
ots of soot f	from homeless of	campfires.					•	·	II near G3 embedn	
uple of the	girders in the A	butment c	ар.		·	I spalls along the		nbedded girders	. Tight cracks und	ler a YQC NZD
	Tight cracks in						Tino baokwan.			ZZIO
	Minor, tight cra					3 . 3				VIKO
8/30/2000 - o change.	14.60 + 1.55 +	9.70 = 25.8	80 East abutm	nent onl	ly.					
	Some minor er	osion @ th	e wingwalls.							XKG
2/01/1995 -										YDN 
2/01/1994 -	None									REF
•		Bents 3 th	ıru 6							
•	- R/Conc Cap	Bents 3 th	nru 6	m.		85	10	5	0	
•	- R/Conc Cap			m.						
lement 234	- R/Conc Cap			m.		85 %	10	5	0 %	
ement 234	- R/Conc Cap  1 pection Notes :	1	61		vnoced rustu	%	%	%	%	NAVA NA
revious Insport 2012/2012 - and spalls (p	- R/Conc Cap  1  pection Notes : Undersides shohoto). Those un	1 ow surface	e spalls, staining areas show sta	, and e ining.		% chair feet. Face	% of Bent 3 cap on	% span 2 side has	% s large delamination	
revious Insparation of Spalls (p. 9/20/2010 - p.	- R/Conc Cap  1  pection Notes :  Undersides shohoto). Those un Delaminated an	ow surface ider leaky a reas. Cracints.	e spalls, staining areas show sta cking and minor	, and e ining. spalls;	photo of Ber	chair feet. Face	of Bent 3 cap or	% span 2 side has aminations due	%	WZE
revious Insp 3/12/2012 - nd spalls (p 9/20/2010 - ome stainin 9/24/2008 -	- R/Conc Cap  1  pection Notes : Undersides shohoto). Those un Delaminated ar of from leaky joi Unchanged. S	ow surface der leaky a reas. Crac nts. ome of the	spalls, staining areas show stacking and minor edelaminations	g, and e ining. spalls; started	photo of Ber	chair feet. Face	of Bent 3 cap on ce spalls and del	% span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZE
revious Insp 0/12/2012 - nd spalls (p 0/20/2010 - pme stainin 0/24/2008 - 7/25/2006 - ith some st	- R/Conc Cap  1  pection Notes:  Undersides shothoto). Those un Delaminated are from leaky joi Unchanged. S  Surface spalls aining in the are	ow surface der leaky areas. Cracents. ome of the under leak.	e spalls, staining areas show stacking and minor edelaminations derside of the cal	y, and e ining. spalls; started aps fron	photo of Ber to spall on the	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3	of Bent 3 cap on ce spalls and del re and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZE YQC 2 side NZD
ement 234 evious Insport 234 evious Insport 234 evious Insport 234 evious Insport 2072010 - 100 evious 234 evious Insport 2072010 - 100 evious Insport 234 evious Ins	- R/Conc Cap  1  pection Notes:  Undersides shothoto). Those un Delaminated are ger from leaky joi Unchanged. S  Surface spalls aining in the are Minor rusty spondebris/nests.	ow surface deer leaky a reas. Craconts. ome of the under	e spalls, staining areas show stacking and minor e delaminations derside of the call spalls from e	y, and e ining. spalls; started aps fron exposed	photo of Ber to spall on the shallow reb	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3's bar chairs on the	of Bent 3 cap or ce spalls and del e and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZE YQC 2 side NZE ZZI
evious Insport 234 evious Insport 234 evious Insport 2012 - d spalls (p. 1/20/2010 - p. 1/20/2006 - th some standard 29/2004 - p. 1/20/2002 - 1/20/200	- R/Conc Cap  1  pection Notes:  Undersides sho hoto). Those un Delaminated ar ng from leaky joi Unchanged. S  Surface spalls a aining in the are Minor rusty spon debris/nests. Same as previo	ow surface der leaky areas. Cracents. ome of the on the under leak with smoots with smoots report.	spalls, staining areas show stacking and minor edelaminations derived by the capall spalls from edelaminations and some sta	y, and e ining. spalls; started aps fron exposed	photo of Ber to spall on the shallow reb	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3	of Bent 3 cap or ce spalls and del e and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZI YQ0 2 side NZI ZZI VIK
ewious Insp //12/2012 - d spalls (p //20/2010 - ome stainin //24/2008 - //25/2006 - th some stainin //29/2004 - ome pigeor //21/2002 - //30/2000 - ochange p	- R/Conc Cap  1  pection Notes:  Undersides shothoto). Those un Delaminated are ger from leaky joi Unchanged. S  Surface spalls aining in the are Minor rusty spondebris/nests.	ow surface deer leaky a reas. Crace onts. ome of the unders. ots with smous report.	e spalls, staining areas show stacking and minor edelaminations derside of the call spalls from edelamination and some stagements and some stagements are stagements.	g, and e ining. spalls; started aps from exposed ining of at a cou	photo of Ber to spall on the shallow reb d and rusty re the concrete	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3's bar chairs on the	of Bent 3 cap or ce spalls and del e and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZE YQC 2 side NZE ZZI VIK FIL
revious Insp 0/12/2012 - nd spalls (p 0/20/2010 - ome stainin 0/24/2008 - 7/25/2006 - th some stainin 0/29/2004 - ome pigeor 0/21/2002 - 0/21/2002 - 0/20/2009 - 0/20/2009 - 0/20/2009 - 0/20/2009 - 0/20/2009 - 0/20/2009 -	- R/Conc Cap  1  pection Notes:  Undersides shothoto). Those undersides shothoto. Those undersides shothoto. Those undersides shothoto. Those undersides shothoto. Surface spalls along in the are Minor rusty spondebris/nests. Same as previous (3 * 14.60) + 17 lus also noted some sanding	ow surface deer leaky a reas. Crace onts. ome of the unders. ots with smous report.	e spalls, staining areas show stacking and minor edelaminations derside of the call spalls from edelamination and some stagements and some stagements are stagements.	g, and e ining. spalls; started aps from exposed ining of at a cou	photo of Ber to spall on the shallow reb d and rusty re the concrete	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3's bar chairs on the	of Bent 3 cap or ce spalls and del e and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZI YQC 2 side NZE ZZI VIK FIL XKC
revious Insp 3/12/2012 - nd spalls (p 9/20/2010 - ome stainin 3/24/2008 - 7/25/2006 - ith some stainin 3/29/2004 - ome pigeor 0/21/2002 - 3/30/2000 - o change p	- R/Conc Cap  1  pection Notes: Undersides shohoto). Those un Delaminated ar org from leaky joi Unchanged. S Surface spalls or aining in the are Minor rusty sport in debris/nests. Same as previor (3 * 14.60)+ 17 llus also noted s Some sanding None	ow surface deer leaky a reas. Crace onts. ome of the unders. ots with smous report.	e spalls, staining areas show stacking and minor edelaminations derside of the call spalls from edelamination and some stagements and some stagements are stagements.	g, and e ining. spalls; started aps from exposed ining of at a cou	photo of Ber to spall on the shallow reb d and rusty re the concrete	chair feet. Face at 3's cap. Surface shallow tie wir ar chairs. Bent 3's bar chairs on the	of Bent 3 cap or ce spalls and del e and exposed re 3's cap has some	span 2 side has aminations due ebar chair feet.	% s large delamination to rebar chair feet.	WZE YQC

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Smart Flag	ription	Env	Quantity	Linita	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat
	Pourable Joir		Quantity	Units	insp Each	PCI SIAI I	PCI Siai 2	PCI SIAI 3	PCI SIAI 4	PCI Stat
ioment ou i	1	3	29	m.		60	25	15		
	'	J 3	23	111.						
						%	%	%	%	
·	ection Notes :									
	·					s pulled out and				MV
	ŭ				•	sounds solid wl				WZ
	·			st bond	in several a	reas and debris	is pushing sealar	nt down.		YQ
7/25/2006 - L	Jnchanged fro	m previous	reports.							NZ
3/29/2004 - S	Several areas	where the j	oint sealant ha	s lost ad	dhesion and	is pulling away fo	rom the guard an	gles. Dirt/debris	s in portions of the	e joint. ZZ
0/21/2002 - E	Dirt and debris	in joints. S	Some material I	has bee	n pushed ou	t by the dirt and	debris. Joints lea	aking in these a	reas.	
	2 * 14.60 = 29.	20 "Dow o	corning" sytle.							
ome material 6/03/1998										XK
Inspection No	atoo:									
lement 305 -	Assm Jt w/o S		32	m		an	10	0		
lement 305 -	Assm Jt w/o S	Seal 3	32	m.		90	10	0		
			32	m.						
revious Inspe 9/12/2012 - S	1 ection Notes:	3			p portions so	%	%	%		gers MW
revious Inspe 9/12/2012 - S puching slight	1 ection Notes: Some spalling tly.	3 on undersi	de of deck at jo	oints. To		% bund solid when	% tapped on. Finge	% er alignment is g	%	
Previous Inspe 9/12/2012 - S puching slight 9/20/2010 - G	1 ection Notes : Some spalling tly. Good finger ali	on undersion	de of deck at jo	oints. To	nents on und	% bund solid when derside of the de	tapped on. Finge	% alignment is go	ood with some fine	WZ
revious Inspe 9/12/2012 - S buching slight 9/20/2010 - G 9/24/2008 - F bint. Rusty ar	ection Notes : Some spalling tly. Good finger ali Finger alignme nd scale on the	on undersi	de of deck at jo d prior inspection of Good with sortions of the joir	oints. To	nents on undes s slightly tou	bund solid when derside of the deuching. Some specific control of the specific control of the deuching.	tapped on. Finge	er alignment is go Il apply. der concrete on	ood with some fine	WZ the YQ
revious Inspe 9/12/2012 - S buching slight 9/20/2010 - G 9/24/2008 - F bint. Rusty ar 7/25/2006 - F	1 Some spalling tly. Good finger alignme and scale on the Finger alignme	on undersion of undersion on un	de of deck at jo d prior inspection y Good with soit tions of the joir . Steel sounds	oints. To on comme edge nt's stee solid wi	ments on und es slightly tou l. hen tapped o	bund solid when derside of the de uching. Some spon. A couple of spon.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	WZ the YQ NZ
9/12/2012 - S puching slight 9/20/2010 - G 9/24/2008 - F pint. Rusty ar 7/25/2006 - F 9/29/2004 - J	ection Notes : Some spalling tly. Good finger ali Finger alignme nd scale on the Finger alignme	on undersion of undersion on un	de of deck at jo d prior inspection of Good with soint tions of the joint. Steel sounds and one A coup	oints. To on comme edge t's stee solid whole of ve	ments on und es slightly too l. hen tapped o ry small dela	bund solid when derside of the de uching. Some spon. A couple of siminated areas of	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fine	WZ the YQ NZ
9/12/2012 - S buching slight 9/20/2010 - G 9/24/2008 - F bint. Rusty ar 7/25/2006 - F 9/29/2004 - J 0/21/2002 - F	ection Notes : Some spalling tly. Good finger ali Finger alignme and scale on the Finger alignme Joints are solic	on undersing gnment and sent is mostly the lower portent is Good. If when tapp Both joints leading to the sent is	de of deck at jour deprior inspection of the joint of the	oints. To on comme edge it's stee solid whole of ve	ments on undes slightly tools. I. hen tapped or small dela	bund solid when derside of the de uching. Some spon. A couple of siminated areas of pes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	Wz the YQ NZ nt. ZZ
Previous Inspense 9/12/2012 - September 5/20/2010 - Complete 6/20/2010 - Complete 6/20/2008 - February 25/2006 - February 25/2004 - Jeographic 7/25/2004 - Jeographic 7/2002 - February 25/2002 - February 25/2002 - February 25/2004 - Jeographic 7/2002 - February 25/2004 - Jeographic 7/2004 - Jeographic	ection Notes : Some spalling tly. Good finger ali Finger alignme and scale on the Finger alignme Joints are solid Rusty spots. E	on undersion on un	de of deck at jo d prior inspection of Good with soint tions of the joint. Steel sounds and one A coup	oints. To on comme edge it's stee solid whole of ve the natur	ments on undes slightly tools. I. hen tapped or ry small dela e of these tyl sliding plate	bund solid when derside of the de uching. Some spon. A couple of siminated areas opes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	Wz the YQ NZ nt. ZZ
revious Inspense of the province of the provin	ection Notes: Some spalling tly. Good finger alignme nd scale on the Finger alignme Joints are solid Rusty spots. E 14.60 + 17.19	on undersion on un	de of deck at jour deprior inspection of the join. Steel sounds peed on. A coupleak as this is the One finger and	oints. To on comme me edge mt's stee solid whole of ve me natur d one(1) s and st	ments on undes slightly tool. I. hen tapped or ry small dela e of these type sliding plate eeel below the	bund solid when derside of the de uching. Some spon. A couple of siminated areas opes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	Wz the YQ NZ nt. ZZ
Previous Inspense 9/12/2012 - Septenting slight 9/20/2010 - George 9/24/2008 - Febrint. Rusty ar 7/25/2006 - Febrint. Rusty ar 7/25/2004 - Jeographic States 0/21/2002 - Febring states 8/30/2000 - 1	ection Notes: Some spalling tly. Good finger ali Finger alignme and scale on the Finger alignme Joints are solid Rusty spots. E 14.60 + 17.19: d pitting and al	on undersion on un	de of deck at jour decision of the join. Steel sounds ped on. A coupleak as this is the One finger and onto the girder.	oints. To on comme me edge mt's stee solid whole of ve me natur d one(1) s and st	ments on undes slightly tool. I. hen tapped or ry small dela e of these type sliding plate eeel below the	bund solid when derside of the de uching. Some spon. A couple of siminated areas opes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	WZ the YQ NZ nt. ZZ VII
9/12/2012 - S puching slight 9/20/2010 - G 9/24/2008 - F pint. Rusty ar 7/25/2006 - F 9/29/2004 - J 0/21/2002 - F 8/30/2000 - 1 ome rust and	ection Notes: Some spalling tly. Good finger ali Finger alignme nd scale on the Finger alignme Joints are solid Rusty spots. E 14.60 + 17.19: d pitting and al Some rust & pi	on undersion on un	de of deck at jour decision of the join. Steel sounds ped on. A coupleak as this is the One finger and onto the girder.	oints. To on comme me edge mt's stee solid whole of ve me natur d one(1) s and st	ments on undes slightly tool. I. hen tapped or ry small dela e of these type sliding plate eeel below the	bund solid when derside of the de uching. Some spon. A couple of siminated areas opes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	WZ the YQ NZ nt. ZZ VII FII
revious Inspense of the provious Inspense of the Inspen	ection Notes: Some spalling tly. Good finger ali Finger alignme and scale on the Finger alignme Joints are solid Rusty spots. E 14.60 + 17.19: d pitting and al Some rust & pi None	on undersion on un	de of deck at jour decision of the join. Steel sounds ped on. A coupleak as this is the One finger and onto the girder.	oints. To on comme me edge mt's stee solid whole of ve me natur d one(1) s and st	ments on undes slightly tool. I. hen tapped or ry small dela e of these type sliding plate eeel below the	bund solid when derside of the de uching. Some spon. A couple of siminated areas opes of joints.	tapped on. Fingerick in this area stipalling of the hea	er alignment is go Il apply. der concrete on ns/spalls along	ood with some fing the underside of the joint's edge.	Wz the YQ NZ nt. ZZ VII FII XK YD

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\* \* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \*

Element Des	cription		- 1				ans 3 thru 6 (CO	,		
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Bea	aring			1		<u>"</u>		<b>,</b>	
	1	3	14	ea.		85	15	0		
						%	%	%	%	9
Previous Ins	pection Notes :									
09/12/2012 -	Bearings are to	wards exp	ansion at 75 de	grees F	and tolerab	ole. Lots of debri	s and spot rust or	n bearings.		MWHP
09/20/2010 -	Bearings are to	wards exp	ansion today; 5	5F. De	bris, rust, ar	nd paint loss.				WZBZ
09/24/2008 -	Some slight alig	gnment tov	wards expansion	n today	; 40F. Some	e dirt and debris.	Some overcoat	painting done.		YQCZ
	Rusty spots, de	ebris, scale	and paint loss.	Alignr	nent is tolera	able today. Blew	off and spot ove	rcoat painted du	ring snooper	NZDN
inspection. 09/29/2004 -	Rusty spots, so	ale, paint	peel, and pitting	on tho	se under the	e leaking joints.	Some pigeon deb	oris/nests near so	ome of the bearing	s. ZZIO
	Rusty and pittir		_			0,	, 0		J	VIKC
08/30/2000 -										FILQ
06/03/1998 -	Some rust & pit	tting.								XKGJ
12/01/1995 -	None									YDNF
02/01/1994 -	None									REFI
Inspection N	Notes:									
	- Fixed Bearing 1	2	14	ea.		90	10	0	%	C
	pection Notes :									
	Dirt, debris, and		_							MWHP
	Debris, dirt, spo		·		a af dalawa	and dist. Desertions				WZBZ
	•		, ,				oots and paint los	iS.		YQCZ
						ed during snoope near some of the				NZDN ZZIO
	Minor rust and		minor pitting.	orne pi	geon debits	near some or the	e bearings.			VIKC
08/30/2000 -		pitting.								FILQ
	Some rust & pit	ttina.								XKGJ
	·									
12/01/1995 - 02/01/1994 -										YDNF REFI
										- KEFI
Inspection N	NOTES:									

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\* Span: Main-0 - Steel Girder over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 331 - Conc Bridge Railing 3 270 m. 95 % Previous Inspection Notes: 09/12/2012 - Vertical cracks and some mapping cracks on backs of barriers. Spalls where top hand rail was removed. 09/20/2010 - Unchanged from prior inspections comments. 09/24/2008 - Vertical cracks in the relief cuts. Small spalls in some areas on the Right rail where the handrail on top was removed. 07/25/2006 - Same as past inspections. 09/29/2004 - Vertical cracking between the relief cuts. Surface shrinkage cracks. A couple of small areas of fracture concrete along the tops of the barrier where the handrail was removed. 10/21/2002 - Pedestrian hand rail removed my Maintenance. Minor, vertical cracks and shrinkage cracks throughout. 08/30/2000 - Replaced steel rail with concrete barrier rail in 1999. 06/03/1998 - Some rust & pitting of the rail and posts. 12/01/1995 - None 02/01/1994 - None Inspection Notes: Element 334 - Metal Rail Coated W-Beam, Pipe Handrail, and Guard Fence w\ Steel Posts 1 3 137 m. 80 20 0 % % % Previous Inspection Notes: 09/12/2012 - Rust, scale, and paint loss on rail posts and pipes. Gaurd fence and fabric has a bend where a luminare pole fell into it. 09/20/2010 - Rust, scale, and paint loss to the posts and pipe. Guard fence posts and fabric are in Good condition. 09/24/2008 - Some rust, scale, and paint loss on the rail posts and pipes. The guard fence is in Good condition. 07/25/2006 - Same as past inspections. 09/29/2004 - Rusty spots on the rail posts and pipes. Guard fence is in Good condition. 10/21/2002 - Rusty spots and pitting throughout. Guard fence is in Good condition. 08/30/2000 - 137.2x1=137.2 Sidewalk has existing metal rail and guard fence was added during 1999 construction. Minor rust on existing rail and posts. Inspection Notes: Element 357 - Sup Pack Rust SmFlag Χ 2 Χ 100 ea. % % Previous Inspection Notes : . 09/12/2012 - Swelling and cracking of welds on diaphragms lower members where water can get to them. 09/20/2010 - Unchanged from prior inspections comments. 09/24/2008 - Diaphragms under leaky joints show pack rust with swelling and cracking of welds. Inspection Notes:

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	cription				T					
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	- Deck Cracking			4			400	0	0	
Х	1	3		l ea.	Х	0	100	0	0	
						%	%	%	%	
revious Insp	pection Notes :									
	Both size and o	, , , ,	•							MWH
	Unchanged from									WZB
9/24/2008 -	Lots of wider ci	racks, near	1.0mm, in all	Spans a	ind some are	as were density	comes into play.			YQC
nspection N	Notes:									
		* * *	* * * * * * *	Span	: Appr-1 - St	eel Girder - Spa	ans 1 and 2 * * *	*****		
lement Des	•			T		5 . 6	5 . 6 6	5.0		
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
iement 12 -	Bare Concrete		40.	1	V		400	0	d	
	1	3	49	sq.m.	Х	0	100	0	0	
						%	%	%	%	
	pection Notes :									
		ear in whee	el paths. Spalls	s/delamii	nations along	edges of joint s	teel. Random cra	cking in both sp	ans.	MWF
9/12/2012 - 9/20/2010 -	Studded tire we Transverse and	d mapping	cracks. Wear	in the w	heel paths.	Small surface sp	alls and delamina	ations along the	joint steel.	WZE
9/12/2012 - 9/20/2010 - 9/24/2008 -	Studded tire we Transverse and Some transverse	d mapping se and map	cracks. Wear	in the w	heel paths.	Small surface sp		ations along the	joint steel.	WZB YQC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 -	Studded tire we Transverse and Some transvers Same as past i	d mapping se and map	cracks. Wear oping cracks.	in the w Small sp	heel paths. Spalls and dela	Small surface sp aminations along	alls and delamina the joint steel ed	ations along the Iges. Wear in th	joint steel.	WZB YQC NZD
9/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 -	Studded tire we Transverse and Some transvers Same as past i Put into Condit	d mapping see and map nspections ion State 2	cracks. Wear oping cracks due to small of	in the w Small sp	heel paths. Spalls and dela	Small surface sp aminations along the joints. Some	alls and delamina the joint steel ed mapping cracks	ations along the lges. Wear in the	joint steel. e wheel paths.	WZB YQC NZD ZZIC
9/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 - 0/21/2002 -	Studded tire we Transverse and Some transvers Same as past i Put into Condit 15.98 * 30.74 =	d mapping see and map nspections ion State 2 = 491.23	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	WZB YQC NZD ZZIC
9/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 - 0/21/2002 -	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B rep	d mapping see and map nspections ion State 2 = 491.23	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed mapping cracks was placed to the	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	WZB YQC NZD ZZIC
9/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 - 0/21/2002 - 19/19/19/19/19/19/19/19/19/19/19/19/19/1	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B rep	d mapping see and map nspections ion State 2 = 491.23	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed mapping cracks was placed to the	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	MWH WZB YQC NZDI ZZIC VIKC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B rep	d mapping see and map nspections ion State 2 = 491.23	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed mapping cracks was placed to the	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	WZB YQC NZD ZZIC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B rep	d mapping ase and map nspections ion State 2 = 491.23 C air. Numer	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed mapping cracks was placed to the	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	WZB YQC NZDI ZZIC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B repolotes:	d mapping ase and map nspections ion State 2 = 491.23 C air. Numer	cracks. Wear oping cracks.  due to small containing the containing	in the w Small sp delamina ent back se crack	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete	alls and delamina the joint steel ed mapping cracks was placed to the	ations along the lges. Wear in the in both spans.	joint steel. e wheel paths. n it was prior to	WZB YQC NZD ZZIC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B replotes:	d mapping se and map nspections ion State 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the control of the con	in the w Small sp delamina ent back se crack	heel paths. Spalls and dela	Small surface sp aminations along he joints. Some Latex concrete eed to be re-eval	alls and delamina the joint steel ed mapping cracks was placed to the uated at the next	ations along the lges. Wear in th in both spans. e same elevation inspection; sma	joint steel. e wheel paths. n it was prior to urt flag.	WZB YQC NZD ZZIC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N	Studded tire we Transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B replotes:	d mapping se and map nspections ion State 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the control of the con	in the w Small sp delamina ent back se crack	heel paths. Spalls and dela	Small surface sp aminations along the joints. Some as Latex concrete teed to be re-eval	alls and delamina the joint steel ed mapping cracks was placed to the uated at the next	ations along the lges. Wear in the in both spans. e same elevation inspection; sma	joint steel. e wheel paths. n it was prior to art flag.	WZB YQC NZD ZZIC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N	Studded tire we Transverse and Some transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn 1	d mapping se and map nspections ion State 2 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the country of the cou	in the w Small sp delamina ent back se crack	heel paths. Spalls and delations along to a "12", as that may no	Small surface spaminations along the joints. Some Latex concrete ed to be re-eval	alls and delamina the joint steel ed mapping cracks was placed to the uated at the next	ations along the lges. Wear in the in both spans. e same elevation inspection; small 5	joint steel. e wheel paths. n it was prior to urt flag.	WZB YQC NZD ZZIC VIKC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N	Studded tire we Transverse and Some transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn 1  Decction Notes:	d mapping se and map nspections state 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the countries	in the w Small sp delamina ent backs se cracks m.	heel paths. Spalls and delations along to to a "12", as that may not be the minor surfate.	Small surface spaminations along the joints. Some Latex concrete the ded to be re-eval when the second seco	alls and delamina the joint steel economic mapping cracks was placed to the uated at the next  5 % s of bottom flang	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small spection; small specific sp	joint steel. e wheel paths. n it was prior to art flag.  0 % nalky paint. Smoke	WZE YQC NZD ZZIC VIKO
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N  lement 107  revious Insp 9/12/2012 - lose near A 9/20/2010 -	Studded tire we Transverse and Some transverse and Some transverse Same as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Decition Notes:  Steel is in good butment 1 from Some rust blist	d mapping se and map nspections state 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the countries of the bottom.	in the w Small sp delamina ent backs se cracks m.  sters wit flanges	heel paths. Spalls and delations along to to a "12", as that may not be the minor surfate.	Small surface spaminations along the joints. Some Latex concrete the ded to be re-eval when the second seco	alls and delamina the joint steel economic mapping cracks was placed to the uated at the next  5 % s of bottom flang	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small spection; small specific sp	joint steel. e wheel paths. n it was prior to urt flag.	WZE YQC NZD ZZIC VIKO
9/12/2012 - 9/20/2010 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N  Idement 107  Idement 107  Idement 107  Idement 107  Idement 107  Idement 107  Identify 12/2012 - Ose near A 9/20/2010 - Inalky paint v	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and Some as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Dection Notes:  Steel is in good butment 1 from Some rust blist with some spot	d mapping se and map nspections state 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the countries of the bottom majority of are	in the w Small sp delamina ent backs se cracks m. sters wit flanges ea.	heel paths. Spalls and delations along to to a "12", as that may not be the minor surfations where moist	Small surface spaminations along the joints. Some Latex concrete the ded to be re-eval when the second seco	alls and delamina the joint steel ec mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small spection; small specific sp	joint steel. e wheel paths. n it was prior to art flag.  0 % nalky paint. Smoke	WZE YQC NZD ZZIG VIKG
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N  lement 107  revious Insp 9/12/2012 - tose near A 9/20/2010 - nalky paint t 9/24/2008 - 7/25/2006 -	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and Some as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Dection Notes:  Steel is in good butment 1 from Some rust blist with some spot Paint loss, rust Rusty spots, pa	d mapping se and map nspections state 2 = 491.23 Cair. Numer	cracks. Wear oping cracks.  due to small of the countries of the bottom majority of are frace pitting, and pitting in are	in the w Small sp  delamina ent backs se cracks  m.  sters wit flanges ea. nd very as unde	heel paths. Spalls and delations along to to a "12", as that may not be the minor surfative where moist dirty girders.	Small surface spaminations along the joints. Some Latex concrete and to be re-eval when the property of the pr	alls and delamina the joint steel ec mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small small spectron; spectron; small s	joint steel. e wheel paths. n it was prior to rt flag.  0 % nalky paint. Smoke	WZE YQC NZD ZZIC VIKO WZE YQC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N  Dement 107  revious Inspection S  1/2/2012 - 0/20/2010 - 0/20/2010 - 0/20/2010 - 0/24/2008 - 0/24/2008 - 0/25/2006 - 0/25/2006 - 0/25/2006 -	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and some as past in Put into Condit 15.98 * 30.74 = and class B reproduces:  - Paint Stl Opn  1  Decetion Notes:  Steel is in good butment 1 from Some rust blist with some spot Paint loss, rust	d mapping se and map nspections state 2 = 491.23 Cair. Numer disconsisted and service and fires ers on tops rust on the y spots, su aint loss and the girder.	cracks. Wear oping cracks.  due to small of the countries of the bottom majority of are face pitting, and pitting in are s. Lower flanges.	in the w Small sp  delamina ent backs se cracks  m.  sters wit flanges ea. nd very as unde ges are s	heel paths. Soalls and delations along to to a "12", as is that may not the minor surfative where moist dirty girders. It leaky joints sticky from delations and the sticky from delations	Small surface spaminations along the joints. Some Latex concrete and to be re-eval to	alls and delamina the joint steel ed mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit many areas.	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small small spectron; spectron; small s	joint steel. e wheel paths. n it was prior to rt flag.  0 % nalky paint. Smoke	WZE YQC NZD ZZIC VIKC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N  Idement 107  Idement 107  Idement 107  Idement 207  Idement 207  Idement 307  Idement 407  Idement 407  Idement 407  Idement 507  Idement 607  Idement 707  Idement 707  Idement 707  Idement 807  Idement 9/24/2008 - 7/25/2006 - Idement 807  Idement 9/24/2008 - Idement	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and Some as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Dection Notes:  Steel is in good butment 1 from Some rust blist with some spot Paint loss, rust Rusty spots, past of dirt/grime or Lower flange/w	d mapping se and map nspections sion State 2 = 491.23 Cair. Numer discondition. Camp fires ers on tops rust on the y spots, su aint loss an the girder reb portions	cracks. Wear oping cracks.  due to small of the country of are face pitting, and pitting in ares. Lower flangs show rusty s	in the w Small sp delamina ent backse cracks  m.  sters wit flanges ea. nd very as unde ges are s pots, per	heel paths. Soalls and delations along to a "12", as that may not so that may	Small surface spaminations along the joints. Some Latex concrete and to be re-eval to	alls and delamina the joint steel eco mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit many areas. ck towards Abutn	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small small spectron; spectron; small s	joint steel. e wheel paths. n it was prior to rt flag.  0 % nalky paint. Smoke	on MWH WZE YQC NZD ZZIC VIKC
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling nspection N  lement 107  revious Insp 9/12/2012 - 10se near A 10/20/2010 - 10/20/2010 - 10/20/2010 - 10/20/2010 - 10/20/2000 - 10/20/2000 - 10/21/2000 - 10/21/2000 - 10/21/2000 -	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and Some as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Dection Notes:  Steel is in good butment 1 from Some rust blist with some spot Paint loss, rust Rusty spots, past of dirt/grime or Lower flange/w	d mapping se and map nspections sion State 2 = 491.23 Cair. Numer directions of the series on tops rust on the y spots, su aint loss and the girder seb portions on under less than the girder seb portions of the girder	cracks. Wear oping cracks.  due to small of the country of are face pitting, and pitting in ares. Lower flangs show rusty s	in the w Small sp delamina ent backse cracks  m.  sters wit flanges ea. nd very as unde ges are s pots, per	heel paths. Soalls and delations along to a "12", as that may not so that may	Small surface spaminations along the joints. Some states concrete the ded to be re-evaluated to be re-evalua	alls and delamina the joint steel eco mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit many areas. ck towards Abutn	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small small spectron; spectron; small s	joint steel. e wheel paths. n it was prior to rt flag.  0 % nalky paint. Smoke	on MWH WZE YQC VIKO VIKO VIKO VIKO VIKO VIKO VIKO VIKO
9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 - 9/29/2004 - 0/21/2002 - ydromilling Inspection N  Ilement 107  Irevious Inspection N  Ilement 107	Studded tire we Transverse and Some transverse and Some transverse and Some transverse and Some as past i Put into Condit 15.98 * 30.74 = and class B replotes:  - Paint Stl Opn  1  Decident Notes:  Steel is in good butment 1 from Some rust blist with some spot Paint loss, rust and cidr/grime or Lower flange/we Rusty and pittir	d mapping se and map nspections sion State 2 = 491.23 Cair. Numer discondition. Camp fires ers on tops rust on the y spots, su aint loss an the girden reb portions in gunder less.	cracks. Wear oping cracks.  due to small of the cours, transverse	in the w Small sp delamina ent backse cracks  m.  sters wit flanges ea. nd very as unde ges are s pots, per	heel paths. Soalls and delations along to a "12", as that may not so that may	Small surface spaminations along the joints. Some states concrete the ded to be re-evaluated to be re-evalua	alls and delamina the joint steel eco mapping cracks was placed to the uated at the next  5 % s of bottom flang Minor surface pit many areas. ck towards Abutn	ations along the liges. Wear in the liges. Wear in the in both spans. It is same elevation inspection; small small spectron; spectron; small s	joint steel. e wheel paths. n it was prior to rt flag.  0 % nalky paint. Smoke	WZB YQC NZD ZZIC VIKC

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Continue

Span: Appr-1 - Steel Girder - Spans 1 and 2 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 161 - Paint Stl Pin/Hanger Bent 3 - End Girder Connection Pins ea. 95 % % Previous Inspection Notes: 09/12/2012 - Pins were UT tested in August 2012 and no significant problems were observed (see Collins Engineering report). 09/20/2010 - Still Good paint where re-painted by UT inspectors. Refer to report by Collins Engineering. No "noteables" were fond in the UT inspection with little to no wear also noted. 09/24/2008 - Ut'd recently. See report. Some minor rust showing. 07/25/2006 - No problems found in 2005 UT inspection. Spot rust on the ends of the pins. Wired brushed and re-painted. 09/29/2004 - Paint is worn off the areas that were cleaned for UT inspections in 2001 with some surface rust. 10/21/2002 - See NDT report from 2001. No problems noted. Inspection Notes: Element 205 - R/Conc Column Bent 2 95 ea. % Previous Inspection Notes: 09/12/2012 - Tight surface shrinkage cracks and small surface spall from tie wire. 09/20/2010 - Tight surface shrinakge cracks. Some shallow surface staining and spalls from tie wire. 09/24/2008 - Tight shrinake cracks in areas. Columns have been painted to cover graffiti. 07/25/2006 - Same on tight cracks. Graffiti has been painted over. 09/29/2004 - Tight shrinkage surface cracks. Tight cracking on the construction joints. 10/21/2002 - Some tight, shrinkage cracks throughout. 08/30/2000 - None 06/03/1998 - \_ Inspection Notes: Element 215 - R/Conc Abutment 1 - West 1 20 m. 95 % Previous Inspection Notes: 09/12/2012 - Smokey and sooted from homeless campfires. Some tight cracks in backwall and a small spall near G2 embedded bearing. 09/20/2010 - Some tight vertical cracks near centerline of roadway and a small spalled area near G2's bearing. One tent and campfire going today. 09/24/2008 - Same as past comments. Generally in Good condition. 07/25/2006 - Same with one small area spalled where G2 is embedded. 09/29/2004 - Tight vertical cracks on the backwall concrete. Some cracks have minor efflorescence. 10/21/2002 - Tight, vertical cracks in the backwall concrete. 08/30/2000 - 15.98 + 1.30 + 2.80 = 20.08m06/03/1998 - None Inspection Notes:

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Smart Flag	cription									
		Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 234	- R/Conc Cap	Bent 2								
	1	1	16	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :						L			
9/12/2012 -	Spalled areas	with expose	ed rusty rabar a	and chai	r feet. Shallo	w surface delam	ination.			MWH
9/20/2010 -	Same as previ	ous inspec	tion comments.							WZB
9/24/2008 -	Condition State	e 3 due to d	delaminations.	Cracks	at the steps	and lots of dirt/de	ebris.			YQC
7/25/2006 -	Surface spalls	where reba	ar chairs are ex	posed o	n the bottom	of the caps.				NZDI
9/29/2004 -	Minor rust stai	ns with sma	all spalled secti	ons on t	ne areas who	ere the rebar cha	irs are exposed;	mainly on the be	ottom of the caps.	ZZIC
10/21/2002 -	ok									VIKC
08/30/2000 -	15.98 * 1 = 15	.98m								FILC
06/03/1998 -	None									XKG
Inspection I	Notes:									
lement 30F	- Assm Jt w/o	Seal								
Tomoni ooo	1	3	16	m		90	10	0		
	'	3	10	m.					0.4	
						%	%	%	%	
Previous Ins	pection Notes :									
)9/12/2012 -	Steel portions	sound solic	when tapped	on. Mino	r spalling on	underside of dec	ck at joint. Small	spalls/delaminate	ions along joint ste	eel. MWH
					spalls and o	delaminations in t	he concrete alor	ng the joint's edg	e. Minor spalling a	and WZB2
	e header concr Steel sounds s				and delami	nations along the	ioint edaes. So	me spalling and	staining of the hea	ader YQC
concrete on	the underside o	of the deck i	n the header a	rea.					ŭ	
						led area along th	e joint.			NZDI
	Joint leaks. Si			_						ZZIC
	Minor rust spo		•	s the nat	ure of these	joints.				VIKC
	15.98 * 1 = 15	.98m Slic	ding plate.							FILG
08/30/2000 -										
	_									XKG
08/30/2000 - eaking. 06/03/1998 -										XKG
08/30/2000 - eaking. 06/03/1998 -										XKG
08/30/2000 - .eaking. 06/03/1998 -										XKG
08/30/2000 - Leaking. 06/03/1998 - Inspection I	Notes:	aring Ben	t 2 and 3							XKG
08/30/2000 - Leaking. 06/03/1998 - Inspection I	Notes: - Moveable Be			ea		90	10	0		XKG
08/30/2000 - Leaking. 06/03/1998 - Inspection I	Notes:	aring Ben	t 2 and 3	ea.		90	10	0	0/	XKG
08/30/2000 - Leaking. 06/03/1998 - Inspection I	Notes:  - Moveable Be	3		ea.		90 %	10	0 %	%	XKG
8/30/2000 - eaking. 6/03/1998 - Inspection I	- Moveable Be	3	8			%	%		%	
08/30/2000 - eaking. 16/03/1998 - Inspection I	- Moveable Be  1  pection Notes : Bearings are to	3 owards epa	nsion but tolera	able 75 d	-	% pot rust, stained,	% and debris.		%	MWH
98/30/2000 - eaking. 16/03/1998 - Inspection	- Moveable Be  1  pection Notes:  Bearings are to	3 owards epa	nsion but tolera	able 75 o	spot rust, di	% pot rust, stained, rt, and debris on	% and debris.	%	%	MWH
18/30/2000 - eaking. 16/03/1998 - Inspection I Element 311 Previous Ins 19/12/2012 - 19/20/2010 - 19/24/2008 -	- Moveable Be  1  pection Notes: Bearings are to Bearings in slight rotation	owards epa	insion but tolera erate expansion pansion; 55F w	able 75 one Some	spot rust, di	% pot rust, stained,	% and debris.	%	%	MWH WZB YQC
8/30/2000 - eaking. 6/03/1998 - Inspection I Element 311 Previous Ins 9/12/2012 - 9/20/2010 - 9/24/2008 -	- Moveable Be  1  pection Notes:  Bearings are to	owards epa	insion but tolera erate expansion pansion; 55F w	able 75 one Some	spot rust, di	% pot rust, stained, rt, and debris on	% and debris.	%	%	MWH WZB YQC
18/30/2000 - eaking. 16/03/1998 - 16/03/1998 - 15/03/1998 - 15/03/1998 - 15/03/1998 - 15/03/1998 - 15/03/2008 - 15/03/2006 - 15/03/200000 - 15/03/2000 - 15/03/2000 - 15/03/2000 - 15/03/2000 - 15/03/20	- Moveable Be  1  pection Notes:  Bearings are to Bearings in slight rotation Same as past	owards epa ght to mode towards ex inspections	nsion but tolera erate expansior pansion; 55F w and alignment	able 75 one hen und	spot rust, di ler the area.	% pot rust, stained, rt, and debris on	and debris. the bearings. painting and clea	%	%	MWH WZB YQC NZDI
8/30/2000 - eaking. 6/03/1998 - Inspection I Element 311 Previous Ins 9/12/2012 - 9/20/2010 - 9/24/2008 - 7/25/2006 -	- Moveable Be  1  pection Notes:  Bearings are to Bearings in slight rotation Same as past	owards epa ght to mode towards ex inspections pitting from	nsion but tolerate expansior pansion; 55F was and alignment leaking joint.	able 75 one hen und	spot rust, di ler the area.	pot rust, stained, rt, and debris on Some overcoat	and debris. the bearings. painting and clea	%	%	MWH WZB YQC NZDI ZZIC VIKC
18/30/2000 - eaking. 16/03/1998 - Inspection I Element 311 Previous Ins 19/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 - 19/29/2004 - 10/21/2002 -	- Moveable Be  1  pection Notes:  Bearings are to Bearings in slight rotation Same as past Spot rust and	owards epa ght to mode towards ex inspections pitting from ng under le	nsion but tolerate expansior pansion; 55F was and alignment leaking joint.	able 75 one hen und	spot rust, di ler the area.	pot rust, stained, rt, and debris on Some overcoat	and debris. the bearings. painting and clea	%	%	MWH WZB YQC. NZDI ZZIC
8/30/2000 - eaking. 6/03/1998 - Inspection I Element 311 Previous Ins 9/12/2012 - 19/20/2010 - 19/24/2008 - 17/25/2006 - 19/29/2004 - 0/21/2002 - 18/30/2000 -	- Moveable Be  1  pection Notes: Bearings are to Bearings in slight rotation Same as past Spot rust and processing and pittings are posts.	owards epa ght to mode towards ex inspections pitting from ng under le	nsion but tolerate expansior pansion; 55F was and alignment leaking joint.	able 75 one hen und	spot rust, di ler the area.	pot rust, stained, rt, and debris on Some overcoat	and debris. the bearings. painting and clea	%	%	MWH WZB YQC NZD ZZIG VIKG



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Continue

\* \* \* \* \* \* \* \* \* Span : Appr-1 - Steel Girder - Spans 1 and 2 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Quantity Element 313 - Fixed Bearing Abutment 1 2 ea 90 10 % % Previous Inspection Notes: 09/12/2012 - Spot rust, staining, faded paint, and some debris. 09/20/2010 - Spot rust, debris, and faded paint. 09/24/2008 - No change. 07/25/2006 - Same as past inspections. 09/29/2004 - Spot rust and pitting on the bearings. Some pigeon debris/nests on and around the bearings. 10/21/2002 - Some rust and scale on Abutment bearings. 08/30/2000 - Some rust and pitting. 06/03/1998 - Some rust & pitting. Inspection Notes: Element 321 - R/Conc Approach Slab 1 3 ea. 100 % Previous Inspection Notes : 09/12/2012 - Bump onto bridge from settlement in approach slab and roadway. 09/20/2010 - Same as previous inspection comments. 09/24/2008 - Settlement of the slab is allowing a big bump onto the structure. Sealant in the joint between the slab and bridge end is leaking and loose in areas 07/25/2006 - Put into condition State 2 due to settlement of the slab. 09/29/2004 - Minor settlement. Joint between the slab and the structure is leaking as adhesion of the sealant is broken. 10/21/2002 - Minor settlement. 08/30/2000 - None 06/03/1998 - \_ Inspection Notes: Element 331 - Conc Bridge Railing 3 61 m. 95 % % % Previous Inspection Notes: 09/12/2012 - Vertical and mapping cracks. Spalls on tops of barrier where hand rail was removed. 09/20/2010 - Same as previous inspection comments. 09/24/2008 - Vertical cracks at the relief cuts. Some spalls on the top where the Right handrail was removed. 07/25/2006 - Same as last inspection. 09/29/2004 - Vertical cracking between the relief cuts. Some minor pieces of concrete were fracutured from when the metal handrail was removed from the top of the barrier. 10/21/2002 - Vertical cracking and shrinkage cracks throughout. 08/30/2000 - 30.74 \* 2 = 61.48m New concrete rail in 1999. 06/03/1998 - 30.74 \* 2 = 61.48Some rust & pitting of the rail posts and bridge rail. Inspection Notes:



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\*\*\*\*\*\* Cnon : Annu 4 Steel Circles Chang 4 and 2 (cont ) \*\*\* \*\*\*

Smart Flag Element 334	cription								
element 334	Scale Factor	Env	Quantity	Units Insp Eac		Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	1	3	31	m.	80	20	C		
					%	%	%	%	
revious Ins	pection Notes :								
9/12/2012 -	Rust, scale, pa	int loss, ar	nd scrapes on p	ipe and posts. Ga	aurd fence is in goo	d condition.			MWHI
	Rust, scale, pa	int loss, ar	nd minor surface	e pitting to the pos	sts, W-Beam rail, a	nd handrail. Gua	ard fence posts	and fabric are in Goo	od WZBZ
ondition.	Rust naint loss	s scale ar	nd fading of the	coating system of	n the rail posts and	nines quard fer	nce is in Good c	rondition	YQCZ
	Same as last in		id idding of the	oodiing system of	Trail pools and	pipeo. gadia ici	100 10 111 0000 0	orianion.	NZDN
		•	some snot rust	throughout The	guard fence is in pl	ace and in Good	condition		ZZIO
	·		•	ce is in Good con	•		condition.		VIKC
		ŭ				during 1999 cons	struction Minor	rus on existing rail a	
osts.	01.7481-00.74	Ciacwaii	That existing m	ctai raii aria gaare	renee was added	during 1000 con	Struction: Willion	ras on existing ran e	and HEQ
Inspection N	Notes:								
Conoral	Inanastian N	Vlotos							
	Inspection I						,	<i>r</i>	B 4) A // L
9/12/2012 -	Area under eas	st abutmen	it nas a smail vi	liage of nomeless	people. Lots of so	ot on underside i	n area from carr	np fires.	MWH
					Collins Engineers	. CRH			
	Lots of camper		•	•					WZBZ
				installed in the be	arings at Bent 6.				YQCZ
				d delamiantions.	ons of the girders.				NZDN
				olumns and caps.					
	Deck cracking								ZZIO
						as placed on the	strucure. Unsu	re if extra dead load	has VIKC
				some crack proble	ems to worsen ard fence that was p	placed in 1999.			
06/03/1998 -				, and 12 gas					FILQ
									FILQ XKG.
12/01/1995 -		ina Calcul	ation Accepted	hv ons\$u5963 at	3/11/97 10:45:45				XKG
				by ops\$u5963 at 4 at 2/19/97 14:25					
Sufficiency R	Rating Calculation								XKG. YDNF
Sufficiency R 02/01/1994 -	ating Calculation	on Accepte							XKG. YDNF REFI
Sufficiency R 02/01/1994 - 08/01/1992 -	tating Calculation	on Accepte ape 1994							XKG. YDNF REFI NB94
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 -	Cating Calculation Updated with ta	on Accepte ape 1994 ape 1992							XKG YDNF REFI NB94 NB92
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 - 04/01/1989 -	Updated with to Updated with the Updated	ape 1994 ape 1992 ape 1991							XKG YDNF REFI NB94 NB92 NB91
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 - 04/01/1989 -	Updated with to Updated with Updated w	ape 1994 ape 1992 ape 1991 ape 1989							XKG. YDNF REFI NB94 NB91 NB91
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 - 04/01/1989 - 04/01/1987 - 09/01/1984 -	Updated with ta Updated with ta Updated with ta Updated with ta Updated with ta	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986							XKG YDNF REFI NB94 NB92 NB91 NB89
Gufficiency R 12/01/1994 - 18/01/1992 - 11/01/1991 - 14/01/1989 - 14/01/1987 - 19/01/1984 - 17/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
2/01/1994 - 8/01/1992 - 1/01/1991 - 4/01/1989 - 4/01/1987 - 9/01/1984 - 7/01/1981 -	Updated with ta Updated with ta Updated with ta Updated with ta Updated with ta	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB92 NB91 NB89
2/01/1994 - 8/01/1992 - 1/01/1991 - 4/01/1989 - 4/01/1987 - 9/01/1984 - 7/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
Gufficiency R 12/01/1994 - 18/01/1992 - 11/01/1991 - 14/01/1989 - 14/01/1987 - 19/01/1984 - 17/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
Gufficiency R 12/01/1994 - 18/01/1992 - 11/01/1991 - 14/01/1989 - 14/01/1987 - 19/01/1984 - 17/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 - 04/01/1989 - 04/01/1987 - 09/01/1984 - 07/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
Sufficiency R 02/01/1994 - 08/01/1992 - 01/01/1991 - 04/01/1989 - 04/01/1987 - 09/01/1984 - 07/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
2/01/1994 - 8/01/1992 - 1/01/1991 - 4/01/1989 - 4/01/1987 - 9/01/1984 - 7/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86
ufficiency R 2/01/1994 - 8/01/1992 - 1/01/1991 - 4/01/1989 - 4/01/1987 - 9/01/1984 - 7/01/1981 -	Updated with to Updated with Updat	ape 1994 ape 1992 ape 1991 ape 1989 ape 1986 ape 1984							XKG YDNF REFI NB94 NB91 NB89 NB86 NB86



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**Location: GREAT FALLS Structure Name:** 

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 3 3 State Hwy Signed Route Number: 00103

State Highway Agency **State Highway Agency** Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: CITY ST, BNSF RAILROAD Kilometer Post, Mile Post: 0.26 km 0.16

Structure on the State Highway System: Latitude: 47°30'29"

Structure on the National Highway System: Longitude: 111°20'27"

Str Meet or Exceed NBIS Bridge Length:

**Construction Data** 

Construction Project Number: IG 15-5(28)274 Construction Station Number: 21+54.00

Construction Drawing Number: 7789

Construction Year: 1967

Current ADT: 11,330 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

### Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Design Loading :		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	32.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3 :	85		

### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 167.94 m

Deck Area: 1,781.00 m sq 8.32 m Deck Roadway Width: 9.14 m

Approach Roadway Width: Median Code, Description: 0 No median

### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

R Railroad beneath struc Reference Feature for Vertical Clearance:

5.11 m Vertical Clearance Under the Structure:

R Railroad beneath struc Reference Feature for Lateral Underclearance:

1.50 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 4

Material Type Code, Description: 4 Steel continuous

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: 2 Material Type Code, Description: 3 Steel

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

10.61 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 1.52 m 0.00 m Skew Angle: 45°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction			est or Bi-direction	nal Travel	North or East Travel			
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal	
One Route Under	-1	N/A	5.11 m	7.32 m	N/A			
GUALT AVE								
Route On Structure	N00103	Both	99.99 m	8.32 m	N/A			
CENTRAL AVE. WEST - WB								

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**Inspection Data** 

Inspection Due Date: 13 September 2014
(91) Inspection Frequency (months): 24

Sufficiency Rating: 76.3

Structure Status : Func Obs - Elg Rehab

Next Other Insp Due Date : 22 Aug 2016

Other Insp Type : Pin and Hanger

							•
NBI Inspection Da	ata						
(90) Date of Last Ins	pection : 13 Septemb	er 2012		La	st Inspected By: Charle	s Pepos - 107	
(90) Inspection	on Date :				Inspected By :		
(58) Deck	Rating : 6	(68) Deck Ge	ometry : 3	(36A)	Bridge Rail Rating : 1	(62) Culve	rt Rating : N
(59) Superstructure	Rating : 6	(67) Structure	Rating : 6	(36B)	Transition Rating : 1	(61) Channe	el Rating : N
(60) Substructure Rating : 6		, ,		(36C) Ap	proach Rail Rating :1	(71) Waterway A	dequacy :
(72) App Rdw		(69) Under Clea (41) Posting		(360	D) End Rail Rating :	(113) Scou	r Critical :
	Unrepaired S	palls: 0 m	n sq	一	Deck Surf	acing Depth: 0.	00 in
Inspection Hours				<del></del>			
Crew Hours for inspec				oper Required			
Helper H	ours :	)	•	for inspection	3		
Special Crew H	ours : 13.5	5		Flagger Hours	0		
Special Equipment H	ours : 13.5	5					
Inspection Wor	k Candidates	Ctatura	Dui a nite e	Effected	Scope of	Action	Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States
D31-FY2005-000058	15 October 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
2006 - Some overcoat p	painting and cleaning	done.					
D31-FY2005-000059	15 October 2004	Approved	High	All Spans	301 Pourable Joint S	eal Min Repair	
Reaseal these joints.							
Approved. DRC							
D31-FY2011-000152	07 February 2011	Not Approved	Medium	All Spans	Bridge	Spot Paint (flex)	
Clean and paint Bearing 2006 - Some overcoat p		done.					
D31-FY2011-000153	07 February 2011	Not Approved	Low	All Spans	334 Metal Rail Coate	ed Repl Paint	
Clean and paint Rail Po	<u> </u>	.tot/tpp/oreu		opano	oo i motar itan ooat	Topi Tunt	
Late Reason:							

Inspection Date: 09/13/2012



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#### **Element Inspection Data**

Span: Main-0 - Steel Girders over RR - Spans 3 thru 6 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 12 - Bare Concrete Deck X 3 2003 sq.m. 0 100 % % Previous Inspection Notes: 09/13/2012 - Studded tire wear in wheel paths. Spalls/Delaminations along edges of joint steel. Mapping cracks in all spans. 09/21/2010 - Lots of tight mapping cracks. Wear in the wheel paths. Small spalls and delaminations along joint steel. 09/23/2008 - Wear in the wheel paths. Transverse and mapping cracks in areas. Small spalls and surface delaminations along the joint edges. 10/13/2006 - Wear in the wheel paths. Right lane has more mapping cracks in it. Spalls/Delaminations along the joint achorage's steel. 09/29/2004 - Put the deck into Condition State 2 as there are some small areas of delamination along the joint edges. 10/21/2002 - 14.60 \* 137.20 = 2003.12 Deck element changed to a "12" as the Latex concrete was placed back to the original depths after the 1999 hydromill and Class B repair operations. Cracks in latex where sealed in 1999 with HMWM. Many tight transverse deck cracks. MDT Maintenance is spraying the deck with freeze guard. Cracks are soaking ip the freeze guard. 08/30/2000 - New Latex concrete overlay in 1999 with some transverse cracking(small and tight). Cracks sealed with HMWM before construction was completed. Delaminated areas were removed by hydrodemolition and replaced with latex concrete. 06/03/1998 - 14.60 \* 137.20 = 2003.12. Numerous small, tight transverse cracking throughout with small areas of delamination when it was checked several years ago. Studded tires have left a fairly smooth wear surface. 12/01/1995 - None 02/01/1994 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 549 80 15 m. % % % % % Previous Inspection Notes: 09/13/2012 - Rust blisters, minor surface pitting, and paint loss on tops of lower girder flanges where water and debris has collected. Diagonals between G2 and G3 were removed and intersecting welds in tension reversal zones were drilled early in 2012 under statewide steel rehab job. 09/21/2010 - Dirty, grime, bird debris, and rust blisters on top of the bottom flanges. Some surface pitting under rust blisters. Faded and chalky 09/23/2008 - Rust, scale, paint loss, and some surface pitting under rust blisters. Outer girders and areas under leaky joints are the worse. Very dirty from diesel smoke, bird debris, and de-icer. 10/13/2006 - Rust, scale, pitting and paint loss. Most notiable under joints, outside girders, and where piegon nest/debris are built-up. Pulled most of this stuff off. 09/29/2004 - Rusty, scale, peeling paint, and minor pitting; mostly under the joints and on the lower flange/web areas. 10/21/2002 - Rusty spots throughout and some pitting. Mostly under leaking joints and on the bottom flange/lower web area. 08/30/2000 - No Change; mainly under the joints. 06/03/1998 - 4 \* 137.20 = 548.80. Show some signs of early rust & pitting. 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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\* Span: Main-0 - Steel Girders over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Quantity Element 161 - Paint Stl Pin/Hanger (4) Pin and Hanger Assemblies plus (4) End Girder Connection Pins 3 12 ea. 95 0 % % % % Previous Inspection Notes: 09/13/2012 - Pins and hangers were UT tested in August 2012 and no excessive wear was noted (see Collins Engineering reports). 09/21/2010 - Still Good paint where re-painted by UT inspectors. Refer to report by Collins Engineering. No "noteables" were fond in the UT inspection with little to no wear also noted. 09/23/2008 - 2005 UT showed no problems. Some minor rust on the pins and hangers. 10/13/2006 - Showed ok in 2005 UT testing. 09/29/2004 - Ends of the pins, nuts, and hangers are showing some minor rust where the paint was removed for UT testing. No major wear or problems noted in UT inspection in 2001. 10/21/2002 - See Bills report from 2001. 08/30/2000 - No Change; mainly under the joints. 06/03/1998 - Some minor rusting and pitting. Eight(8) pins have been UDT'ed and are ok. 12/01/1995 - None 02/01/1994 - None Inspection Notes: Element 205 - R/Conc Column Bent 3, 4, 5, 6, and 7 ea. 90 % Previous Inspection Notes: 09/13/2012 - Shallow surface delaminations near tiewire or reinforcing chair feet. Some columns have tight vertical cracks near their corners. Scrapes and shallow spalls on some. 09/21/2010 - Tight surface shrinkage cracks with some cracking on the edges. Some surface spalls from shallow tie wire. 09/23/2008 - Tight cracking in most of the columns. Some surface spalls and small delaminations from shallow tie wire or exposed feet of the rebar chairs. Right column at Bent 3 has not gotten any worse. 10/13/2006 - Same as past inspections with surface spalling where rebar chairs are exposed. Bent 3's Right column has a small spall on the edge with some staining. 5 percent in Condition State 3 is probably pushing it for the staining and spalls. 09/29/2004 - Tight cracks and shrinkage cracks on most of the columns. Tight cracks near construction joints to the caps. Some rust stains from exposed rebar chairs and/or wire. 10/21/2002 - Some tight cracks throughout. Graffti and smoked areas from homeless people under the structure. 08/30/2000 - No Change. 06/03/1998 - Some hairline, tight cracking in the concrete. 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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\* Span: Main-0 - Steel Girders over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 215 - R/Conc Abutment East Abutment (7) 2 26 m. 95 % Previous Inspection Notes: 09/13/2012 - Some tight cracking in backwall and cap. Small spall near embedded bearings and along cap/backwall connection. Lots of belongings of homeless people stacked on backwalls. 09/21/2010 - Tight cracks in the backwall and under G3. A couple of small spalls near bearing embedments. One camper between G2 and G3 09/23/2008 - Some tight cracks in the backwall and cap. Small spalls along the edges of the girders where they are embedded into the backwalls. 10/13/2006 - Unchanged from previous inspections. 09/29/2004 - Minor spalling and deteriorated concrete where the girders meet the backwalls. Minor erosion at the Left wingwall. 10/21/2002 - (14.060 1.55 9.70 = 25.80m Minor erosion at wingwall. Some minor concrete deterioration where girders meet the backwalls. Inspection Notes: Element 234 - R/Conc Cap Bent 3, 4, 5, 6, and 7 2 58 85 10 m. % Previous Inspection Notes: 09/13/2012 - Bent 3 cap has a delamination on Span 2 face along with some spalling (photo). Surface spalls/delaminations on underside of caps from reinforcing chair feet. 09/21/2010 - Staining from mositure and rebar chair feet. Delaminated and cracked areas on most of the caps. Some surface spalls and delaminations from shallow tie wire. 09/23/2008 - Spalls, cracking, and delaminations in most of the caps. Underside of the caps show surface spalls/delaminations from exposed rebar chair feet. Some staining on the Right end of Bent 3's cap at delamination under G4S2 side. 10/13/2006 - Caps show surface spalls from shallow rebar chairs. Some minor staining in delaminated areas. 5 percent in Condition State 3 is maybe alittle strong. 09/29/2004 - Some minor spalled areas on bottoms of the caps where rebar chairs are exposed and rusting. Some minor cracking under the beam seats. 10/21/2002 - Same as previous report. Some staining in areas where joints leak. 08/30/2000 - 4 \* 14.60 = 58.40m Env. #2 as some under leaking joints. 06/03/1998 - 5 \* 14.60. Some sanding material on some of the caps. 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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Continue

\* Span: Main-0 - Steel Girders over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 301 - Pourable Joint Seal 25 3 29 m. 60 15 % % % Previous Inspection Notes: 09/13/2012 - Steel portions sound solid when tapped on. Minor spalling and deterioration on underside of deck and joints. Sealant is loose, torn, and missing in joints. Small delaminations/spalls along edge of joint steel. 09/21/2010 - Several areas of loose and pushed down sealant. Some small areas of torn sealant. 09/23/2008 - Leaky, sanding material pushed in, and loose sealant along the joints edges. Some small surface mortar spalls/delaminations along the steel edges. 10/13/2006 - Unchanged from previous rpeorts. 09/29/2004 - Several areas where the sealant has lost contact and is pulling away. Joints are leaking. Some debris/dirt in the joints and this is putting prressure on the sealant. 10/21/2002 - Sanding material and debris in joints. Some areas where Dow Corning has pulled away or been forced open from debris in the 08/30/2000 - 14.60 \* 2 = 29.20m "Dow corning" Some missing material and sanding material in the joint. Inspection Notes: Element 305 - Assm Jt w/o Seal 10 1 3 29 m. 90 % % Previous Inspection Notes: 09/13/2012 - Steel sounds solid when tapped on and finger alignment is good. Small spalls/delaminations along edge of joint steel. Minor spalling and deterioration on underside of deck at joint area. 09/21/2010 - Good alignment on the fingers. Small spalls and surface delaminations along the joint edges. Steel sounds solid when tapped on. Minor deterioration and spalling of the deck concrete on the bottom side under the steel. 09/23/2008 - Steel sounds solid when tapped on. Finger alignment is Good. Some cracking and small spalls along the underside of the deck edges at the joints. 10/13/2006 - Steel portions of the joints sound solid when tapped on. Some delaminations/spalls along the steel. Finger alignment is Good this 09/29/2004 - West most sliding plate has a small section of delamination on its' edge, 8 to 12". Finger joint alignment is Good. 10/21/2002 - Minor rusty spots. Joints are in good alignment. 08/30/2000 - No Change. 06/03/1998 - 14.60 \* 2. Some rust and pitting. (1) Finger & (1) Sliding Plate Joints. 12/01/1995 - None 02/01/1994 - None Inspection Notes:

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Element Dec			Span . IV	1a111-0 -	Steel Girde	is over KK - Sp	ans 3 thru 6 <b>(C</b> 0	Jiii.)		
Element Des	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	- Moveable Be				mop _uen				. 5. 5.4.	
	1	3	12	ea.		85	10	Ę	5	
						%	%	%	%	
Previous Ins	pection Notes :									
		anchor bo	Its at Bent 3. Be	earings	near maximu	ın expansion (70	) dearees F). Ru	stv spots, scale.	paint loss, and de	ebris NLGQ
at bearings.				_			,			
09/21/2010 - bearings.	inear maximun	n movemer	nt in expansion	at Bent	3; 50F. Rus	ty spots, dirt, an	a some peeling p	paint. Lots of pig	geons nesting nea	ar the WZBZ
	Rusty spots, dovement; 48F for			ne over	coat painting	done. Alignmer	nt of the bearings	at Bent 2 are in	expansion and no	ear YZCZ
				cent in (	Condition Sta	ate 3 for the aligi	nment of rockers	at Bent 3; still to	olerable. Clean ar	nd NADO
overcoat pair 09/29/2004 -		Some scale	e, peeling paint.	and pit	tina. Piaeon	nest and debris	near the bearing	IS.		ZAIP
	Minor rusting s			aa p	ggee			,		VZKC
08/30/2000 -		•								FIKL
06/03/1998 -	Some rust & pi	itting.								MHIL
12/01/1995 -	None									YDNF
02/01/1994 -										REFI
Inspection N										
mapection										
Element 313	- Fixed Bearing	g								
	1	3	12	ea.		95	5	(		
						%	%	%	%	
Previous Ins	pection Notes :									
09/13/2012 -	Spot rust and f	ading pain	t.							NLGQ
09/21/2010 -	Some dirt and	grime. Pai	int still looks Go	od with	only some s	pot rust.				WZBZ
09/23/2008 -	Some spot rus	t. Cleaned	and overcoat	spot pai	nted.					YZCZ
10/13/2006 -	Same as previ	ous reports	s. Clean and ov	/ercoat	painted.					NADO
09/29/2004 -	Rust spots and	d pitting. P	igeon nest arou	ınd som	e of the bear	rings.				ZAIP
10/21/2002 -	Minor rusting s	pots and p	its.							VZKC
08/30/2000 -	No change.									FIKL
06/03/1998 -	Some rust & pi	itting.								MHIL
12/01/1995 -	None									YDNF
02/01/1994 -	None									REFI
Inspection N	lotes:									

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Continue

\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girders over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 331 - Conc Bridge Railing 274 95 3 m. % Previous Inspection Notes: 09/13/2012 - Random shrinkage cracks. Top of barrier has some spalls where hand rail was removed. 09/21/2010 - Unchanged from past inspection comments. 09/23/2008 - Vertical cracks at relief cuts. Small surface spalls where hand rail was removed from the top of the Left rail. 10/13/2006 - Same as past inspection reports. 09/29/2004 - Minor vertical cracking between relief cuts. Some areas of fractured concrete where the hand rail was removed from the top of the barrier rail. 10/21/2002 - Some vertical cracks and mapping/shrinkage cracks. 08/30/2000 - Changed from metal rail to concrete rail in 1999. 06/03/1998 - 137.20 \* 2 = 274.4. Some rust & ptting of the rail & rail posts. 12/01/1995 - None 02/01/1994 - None Inspection Notes: Element 334 - Metal Rail Coated W-Beam and Round Steel Pipe w\ Guard Fence and Steel Posts 1 3 137 80 20 m. % % % % Previous Inspection Notes: 09/13/2012 - Rust, scale, paint loss, and peeling paint on posts and pipe rail. Gaurd fence and fabric in good condition. 09/21/2010 - Spot rust, scale, peeling paint, and faded paint on the posts and pipe rail. Guard fence posts and fabric are in Good condition. 09/23/2008 - Same comments as past inspections. 10/13/2006 - Paint system is pitted, flaking, and rusty throughout. W-Beam has some spot rust. Guard fence is in Good condition. 09/29/2004 - Rust spots on the rail posts and pipe. Some spot rust on the W-Beam rail. Guard fence is in Good condition. 10/21/2002 - Rusty spots with some pitting. Guard fence is in Good condition. /ZKC 08/30/2000 - Rail along sidewalk is metal rail and new guard fence added during 1999 construction. Some minor rust on posts and existing w-Inspection Notes: Element 357 - Sup Pack Rust SmFlag Χ 1 Χ 100 ea. % % % Previous Inspection Notes: 09/13/2012 - Lower angles on diaphragms show spreading and cracked welds from pack rust. 09/21/2010 - Unchanged from past inspection comments. 09/23/2008 - Added due to pack rust at the diaphragms under leaky joints. Some swelling has cracked welds; photo. Inspection Notes:

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\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girders over RR - Spans 3 thru 6 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 358 - Deck Cracking SmFlag X 100 3 ea. 0 % Previous Inspection Notes: 09/13/2012 - Due to size and density. 09/21/2010 - Unchanged from past inspection comments and not yet in Condition State 3. 09/23/2008 - Added due to the size of some of the cracks, 1.00mm, and density of the cracks in some areas. Inspection Notes: \* \* \* \* \* \* \* \* \* Span : Appr-1 - Steel Girders - Span 1 and 2 \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck 449 100 sq.m. Χ % % % % % Previous Inspection Notes: 09/13/2012 - Studded tire wear in wheel paths. Mapping cracks in both spans. Shallow spalls/delaminations along joint steel. 09/21/2010 - Tight mapping cracks. Minor spalls and delaminations along joint edges. Wear in the wheel paths. 09/23/2008 - Wear in the wheel paths. Transverse and mapping cracks in areas. Small spalls/delaminations along the joint edges. 10/13/2006 - Same comments as past inspections. 09/29/2004 - Had to move to Condition State 2 due to small delaminations along the joints. Some mapping cracks in the spans. 10/21/2002 - 14.60 \* 30.74 = 448.8 Changed Element to "12" as the Latexx concrete was only placed to the existing levels after hydromiliing and Class B repairs. Inspection Notes: Element 107 - Paint Stl Opn Girder 2 123 m. % % % % Previous Inspection Notes : 09/13/2012 - Rust blisters with some surface pitting on tops of bottom flange where moisture collects. Girders are dirty and have faded paint. 09/21/2010 - Dirty, grimey, and faded paint. Minor rust blisters with surface pitting. 09/23/2008 - Rust, scale, minor surface pitting, and paint loss; worse in areas that the deicer and water collects. Girders are dirty. 10/13/2006 - Rust, scale, peeling paint, paint loss, and pitting; mainly in areas under/near leaky joints. 09/29/2004 - Unchanged from previous reports. 10/21/2002 - Rusty spots with some minor pitting under joints and on the bottom flange/lower web area. 08/30/2000 - No Change. 06/03/1998 - 4 \* 30.74 = 122.96. Some areas of rust & pitting. Inspection Notes:

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Continue

Span : Appr-1 - Steel Girders - Span 1 and 2 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Quantity Element 161 - Paint Stl Pin/Hanger Bent 3 - Pins Only 3 ea. 100 % % Previous Inspection Notes: NLGQ 09/13/2012 - Pins were UT tested in August 2012 and no significant wear was observed. 09/21/2010 - Still Good paint where re-painted by UT inspectors. Refer to report by Collins Engineering. No "noteables" were fond in the UT inspection with little to no wear also noted. 09/23/2008 - Cleaned and re-painted after UT testing this summer. See report for findings. 10/13/2006 - UT testing in 2005 showed no problems. 09/29/2004 - Minor rust where paint has weathered off of the pins from whre they were cleaned for UT inspection. 10/21/2002 - Girder to Girder connection. No problems noted when inspected/NDT'd in 2001. Inspection Notes: Element 205 - R/Conc Column Bent 2 95 ea. % Previous Inspection Notes: 09/13/2012 - Tight surface shrinkage cracks and a small shallow spall from tie wire. 09/21/2010 - Some tight surface shrinkage cracks. Left column has tight cracks on the Left-Back corners of the column. 09/23/2008 - Both columns show tight shrinkage cracks. Generally in Good condition. 10/13/2006 - No change exept that the graffiti has been painted over. 09/29/2004 - Tight shrinkage cracks. Tight cracks at the construction joint near the caps. Graffiti on both columns. 10/21/2002 - Minor shrinkage cracks throughout. Some graffti from homeless village/camp under the structure. 08/30/2000 - None 06/03/1998 - \_ Inspection Notes: Element 215 - R/Conc Abutment Abutnment 1 - West 1 1 19 m. 95 % Previous Inspection Notes: 09/13/2012 - Generally good condition. Some tight cracks and few small spalls near cap/backwall connection and near embedded bearings. 09/21/2010 - Unchanged from past inspection comments. Good condition. Fence on the Left end of the Abutment is broken over by homeless traffic. 09/23/2008 - Tight cracks in the backwall and under a couple of the girders in the cap. Small spalls at a couple of the girders edges where embedded in the backwall. 10/13/2006 - Minor delaminations where the girdrs are embedded in the backwalls. Some tight cracks between the girders. Still minor erosion at the corners. 09/29/2004 - Same as previous report. 10/21/2002 - Minor concrete popouts and deterioration where girders are embedded in backwall. Minor erosion at wingwall. 08/30/2000 - No change. 06/03/1998 - 14.60 + 1.30 + 2.80 = 18.7. Some erosion @ the wingwalls. Inspection Notes:

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### U05210000+01602

Continue

Span : Appr-1 - Steel Girders - Span 1 and 2 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Quantity Element 234 - R/Conc Cap Bent 2 15 m. 90 % Previous Inspection Notes: 09/13/2012 - Spall with exposed rebar and some shallow surface delaminations. 09/21/2010 - Small delaminations and spalls on the cap. Surface spall from tie wire and rebar chair feet. 09/23/2008 - Shallow surface delaminations; Condition State 3. Some small surface spalls from shallow tie wire and rebar chair feet; Condition State 2. 10/13/2006 - Surface spalls on the underside of the cap from shallow rebar chairs. Cap is stained from leaky joint above. 09/29/2004 - Minor rust stains and spalling where chairs are exposed on the bottom side of the cap. Staining from leaking joint. 10/21/2002 - ok 08/30/2000 - 14.60 \* 1 = 14.60m 06/03/1998 - 14.60 \* 2 = 29.2 Inspection Notes: Element 305 - Assm Jt w/o Seal 3 15 m. 90 10 % Previous Inspection Notes: 09/13/2012 - Steel sounds solid when tapped on. Some delaminations/spalls along edges of joint steel. 09/21/2010 - Small spalls along the joint steel edge. Steel sounds solid when tapped on. 09/23/2008 - Steel sounds solid when tapped on. Some small surface spalls and delaminations along the joint edges. 10/13/2006 - Steel all sounds solid when tapped on. Small spots of delaminated concrete and small spalls in a couple of areas along the joint's 09/29/2004 - Small spot of delamination on the joint edge, 4". Leaky also. 10/21/2002 - Minor rusty spots. Leaking as normal for a sliding plate joint. 08/30/2000 - Leaking. 06/03/1998 - Sliding Plate. Inspection Notes: Element 311 - Moveable Bearing 3 95 ea. % Previous Inspection Notes: 09/13/2012 - Bearings are towards slight expansion (65 degeers F). Paint is faded, dirty, and has spot rust. 09/21/2010 - Slight expansion; 50F. Some spot rust and debris. 09/23/2008 - Good to Fair alignment today as slightly in expansion; 48F. Some cleaning and overcoat painting done. 10/13/2006 - Rust, scale, and some paint loss. Alignment is Good. 09/29/2004 - Spot rust and pitting from leaking joint. 10/21/2002 - Minor rusty spots with some pitting under leaking joints. 08/30/2000 - No change. 06/03/1998 - Some rust & pitting. Inspection Notes:

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### U05210000+01602

Continue

Span : Appr-1 - Steel Girders - Span 1 and 2 (cont.) \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 313 - Fixed Bearing Abutment 1 2 ea 95 % Previous Inspection Notes: 09/13/2012 - Spot rust and faded paint. 09/21/2010 - Spot rust and some soot from campfires on G1 and G2 bearing areas. 09/23/2008 - Some overcoat painting has been done. 10/13/2006 - Some rust, paint loss, amd flaking paint where visible. 09/29/2004 - Same as previous report. 10/21/2002 - Rusty spots where visible. 08/30/2000 - No change. 06/03/1998 - Some rust & ptting. Inspection Notes: Element 321 - R/Conc Approach Slab West - Abutment 1 1 3 100 ea. Previous Inspection Notes: 09/13/2012 - Slab shows settlement and a bump. Sealant between slab and bridge end is torn most of length. 09/21/2010 - Torn and loose sealant in the joint between the slab and bridge end. Settlement in the slab and approach roadway. 09/23/2008 - Same as past inspections. 10/13/2006 - Put into Condition State 2 due to settlement. Joint between the slab and bridge is leaking into the approach fill. 09/29/2004 - Big bump for the off going traffic. Joint between the slab and bridge is leaking. Some of the sealant has lost its' bond to the guard angles 10/21/2002 - Bump going off of the structure due to settlement of approach slab. 08/30/2000 - None 06/03/1998 -Inspection Notes: Element 331 - Conc Bridge Railing 1 3 61 m. 95 % Previous Inspection Notes: 09/13/2012 - Tight shrinkage cracking. Small spalls where hand rail was removed. 09/21/2010 - Unchanged from past inspection comments. 09/23/2008 - Vertical cracking along the relief cuts. Small spalls where handrail was removed on the Left rail. 10/13/2006 - Same as past reports. 09/29/2004 - Vertical cracking between the relief cuts. Some fractured concrete where the hand rail was removed. 10/21/2002 - Minor vertical cracks and some shrinkage cracks throughout. 08/30/2000 - Replaced matel rail with concrete barrier in 1999. 06/03/1998 - 30.74 \* 2 = 61.48. Some rust & pitting of the rail posts & bridge rail. Inspection Notes:



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# U05210000+01602 Continue

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REF NB9 NB9 NB9



**General Location Data** 

### INITIAL ASSESSMENT FORM FOR STRUCTURE:

Location: GREAT FALLS Structure Name: GF Warden Br-WB

P00060094+08281

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 2 2 U.S. Numbered Hwy Signed Route Number: 00089

State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: MISSOURI RV, U5205, BNSF Kilometer Post, Mile Post: 152.60 km 94.82

Structure on the State Highway System: Latitude: 47°29'37"

Structure on the National Highway System: Longitude: 111°18'41"

Str Meet or Exceed NBIS Bridge Length:

**Traffic Data** 

Current ADT: 37,380 ADT Count Year: 2009 2 % Percent Trucks:

**Construction Data** 

Construction Project Number: F 60-2(5)92 1 2 Construction Station Number: 46+06.00

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Form: bms001d

Printing Date: Thursday, May 22 2014

Construction Drawing Number: 12646

Construction Year: 1983

Reconstruction Year:

#### Structure Loading, Rating and Posting Data

#### Loading Data:

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	32.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data :	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	48.6		

#### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 646.79 m

Deck Area: 10,192.00 m sq

12.10 m Deck Roadway Width: 12.19 m Approach Roadway Width:

Median Code, Description: 0 No median

#### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

6.46 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

7.40 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

Number of Spans: 14

Material Type Code, Description: 5 Prestressed concrete

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

#### Span Data

#### Main Span

Number Spans: 6

Material Type Code, Description: 4 Steel continuous

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 1 Monolithic concrete (concurrently placed with struct

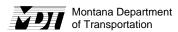
Deck Protection Type: 0 None Deck Membrain Type: 0 None

15.76 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 0.00 m 2.74 m Skew Angle: 45°

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	U05205	Both	6.46 m	7.32 m	N/A		
RIVER ROAD							
Route On Structure	P00060	West	99.99 m	12.10 m	N/A		
10TH AVE SOUTH WB							

Approach Span



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Continue

**Inspection Data** 

Sufficiency Rating: 96.3

Inspection Due Date: 19 September 2014 (91) Inspection Frequency (months): 24

Next Under Water Insp : 15 Nov 2016

Under Water Insp Type: Type II

Structure Status : No	ot Deficient						
NBI Inspection D							
(90) Date of Last Ins	spection : 19 Septemb	er 2012		L	ast Inspected By: Charles Pe	pos - 107	
(90) Inspecti	on Date :				Inspected By :		
(58) Deck	Rating : 6	(68) Deck Geo			Bridge Rail Rating : 1	(62) Culver	t Rating : N
(60) Substructure		(67) Structure F	Rating : 6		pproach Rail Rating :1	(71) Waterway A	
(72) App Rdw		(69) Under Clear	ance : 7		D) End Rail Rating : 1	1	r Critical : 5
(12) App Num	y Aligii . O	(41) Posting S			D) End rail railing .		
Inspection Hours	Unrepaired S <sub>l</sub>	palls: 0 m	sq		Deck Surfacing	Depth: 0.0	00 in
Crew Hours for inspe		<b>.</b>	Sno	ooper Required	: <b>Y</b>		
Helper H			nooper Hours	s for inspection	12		
Special Crew H	lours : C			Flagger Hours	0		
Special Equipment F	lours :						
Inspection Wor	k Candidates	Status	Priority	Effected Structure	Scope of Work	Action	Covered Condition
Candidate ID	Date Requested	Status	Filonity	Unit	Work	Action	States
D31-FY2004-000264	02 February 2004	Approved	Low	All Spans	Bridge	Spot Paint (flex)	
D31-FY2004-000263	02 February 2004	Annroyed	Low	All Spans	12 Bare Concrete Deck	Min Repair	I
Clean Drains throughou		Approved	Low	All Spans	12 Bare Concrete Deck	імін керап	
2003-08-05: Cleaned of Approved. DRC	drains on the left road	way side. W.A.Lay					
D31-FY2005-000076	18 October 2004	Approved	Low	All Spans	334 Metal Rail Coated	Rehab Elem	
Clean and spot paint th				-			
Approved. DRC							
D31-FY2008-000120	14 July 2008	Approved	Low	All Spans	12 Bare Concrete Deck	Min Bonoir	I
Patch spalled areas.	14 July 2006	Approved	Low	All Spans	12 Bare Concrete Deck	Min Repair	
Approved. DRC							
Approved. Divo							
D31-FY2011-000131	07 February 2011	Not Approved	Low	All Spans	12 Bare Concrete Deck	Min Repair	
Repair damaged downs	-		-				
D31-FY2011-000132	07 February 2011	Not Approved	High	All Spans	305 Assm Jt w/o Seal	Rehab Elem	
Clean the finger joint tro 2003-08-05: Cleaned I		ughs today. W.A.La	ıy				



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### P00060094+08281

Continue

Inspection Wor	k Candidates	Ct-t	Dui a uitu	Effected	Scope of	A -4:	Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States
D31-FY2013-000004	02 October 2012	Not Approved	High	A Approach	305 Assm Jt w/o Seal	Rehab Elem	
epair the loose finger	oint at Bent 8 on the	Left side of the bridg	je.				
D31-FY2013-000005	02 October 2012	Not Approved	High	All Spans	Bridge	Rehab (flex)	
Repair the spalls along	all of the joints.						

Late Reason:

Inspection Date: 09/19/2012

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#### **Element Inspection Data**

Span: Main-0 - Steel Girder Spans 14 - 19 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 12 - Bare Concrete Deck X 3 4618 sq.m. 0 100 0 % % % Previous Inspection Notes: 09/19/2012 - Random spalled areas in most of the Spans and delaminations along the joint edges. Some cracked areas with delaminations in Spans 15 thru 17. Some spalls have been patched with the velocity patcher. 09/27/2010 - Small spalls and delaminations along the joint edges. Steel sounds solid when tapped on. 06/20/2008 - Same as past inspections and add some spalling and delamiantions along the joint edges. 08/17/2006 - None 10/06/2004 - Transverse cracking throughout with some cracks that are wider and open. Spalling along joint edges. Some areas of mapping cracks, mostly in the Left lane. Some wear in the wheel paths. 10/21/2002 - Same as last report and add some minor delamination noted with a small spalled area at one joint. 08/23/2000 - 293 \* 15.76 = 4617.68 No change from previous report plus some delaminations noted on spot checks near the joints. 12/11/1997 - Deck has mapping cracks throughout. 10/01/1995 - None 09/01/1992 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 2 1465 90 10 m. % % Previous Inspection Notes: 09/19/2012 - Minor peeling paint in areas. Rust blisters with minor surface pitting near joints that leak. Faded and dirty paint throughout the 09/27/2010 - Rust blisters, scale, and minor paint loss on tops of the lower flanges of the outer girders. Wose areas are where water can leak onto the girders from joints or drains. 06/20/2008 - Rust, scale, and paint loss on the lower web and bottom flanges; especially near leaky joints and downspouts. 08/17/2006 - None 10/06/2004 - Spot rust and some paint fade on the lower portions of the web and bottom flanges; especially near leaking joints. 10/21/2002 - Some paint loss along the under side of the girders near drains, more so on G5. Some speckled rust starting on the left side of the web and bottom flange of G1. A 4" x 1"(h) 1' back of Pier 19 for G1S18R. 08/23/2000 - 293 \* 5 = 1465.0m Some rust and pitting. 12/11/1997 - None 10/01/1995 - None 09/01/1992 - None Inspection Notes:

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#### P00060094+08281 Continue

		* * * *	* * * * * * Sp	an : <b>M</b>	ain-0 - Steel	Girder Spans 1	14 - 19 (cont.) *	* * * * * * * *	*	
Element De	<u>'</u>			1		· · · · · · · · · · · · · · · · ·	5 : 0: : 0			
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 205	5 - R/Conc Colu									
	1	3	2	7 ea.		90	5	5	0	
						%	%	%	%	
Previous Ins	spection Notes :									
09/19/2012 -	- Right column a	at Pier 16 h	nas a small dela	aminated	d area.					ZZJO
	· ·					xposed rebar fe	et. Rust on lower	portions of the i	ce breakers.	EZJZ
	- Same as past	•			•	•	on reaction on	portions or the r	oo broakere.	OZKZ
08/17/2006	·	mopodiom	o, but onderwa		ay be ameren					TZCZ
		vor portion	of the ice bree	koro T	iaht ahrinkaa	o orooko on mor	ot columna Mina	r anat rust stains	fron ovnoced robe	
chair legs. S	Some scale belo	ow the norr	mal waterline.			lce breakers nee		r spot rust stains	fron exposed reba	ır GIDZ IZHX
	- Env. #3 as alw	-	J		J		·			FIAS
	- (4) columns ea		s 14 - 19 and <i>(</i> 3	3) colum	ns at Bent 20	)				FKAR
10/01/1995		2011 2011 1018	o i i io ana (c	, Joiui I	at Don't 20					YDNF
09/01/1993 ·										REFI
J9/U1/1992 ·	- None									KEFI
Inspection	Notes:									
Element 220	o - R/C Sub Pile	Cap/Ftg	Pier 15 thru 19	)						
	1	3	4	4 ea.		100	0	0	0	
					_	%	%	%	%	
Duarria ya Ina						,0	76	,,,	,,,	
	spection Notes :									
09/19/2012	- None									ZZJC
09/27/2010	- Per the 2011 ι	ınderwater	inspection by I	nfrastru	cture Engine	ers there is no c	hange to the con	dition of this eler	nent. CRH	EZJZ
06/20/2008	- See latest Und	derwater II	report.							OZK2
The pier 3 s	ubfooting is now	v covered b	by sand and riv	er rock.	The pier 4 s	ubfooting is exp	osed 10 inches hi		at the upstream no am nose and is in g	
	imber formwork - Unchanged, b					ce of the pier 5	footing.			GIDZ
		ut check th	e iasiesi uriuei	water re	port.					
10/21/2002			7/45/20 (0							IZHX
08/23/2000	- LW underwa	ater Inspec	tion 7/15/98 (G	uthrie D	iving Co) A	III exposed footii	ngs in good condi	tion.		FIAS
Inspection	Notes:									
Element 227	7 - R/C Submer	ged Pile I	Pier 15 thru 19							
	1	3	20	ea.		90	10	0	0	
						%	%	%	%	
						/0	70	/0	70	
	spection Notes :									
09/19/2012	- None									ZZJC
09/27/2010	- Per the 2011 ι	ınderwater	inspection by I	nfrastru	cture Engine	ers there is no c	hange in the cond	dition of this elen	nent. CRH	EZJZ
06/20/2008	- See latest Und	derwwater l	II report.							OZK2
							s vertical cracking	present on piers	s 4 thru 7. The vert	tical TZCZ
cracking is g	generally 1/32" t	o 1/16" wic	de and extends	from the	e waterline to					
	- Unchanged, b	ut check th	e iastest under	water re	роп.					GIDZ
10/21/2002										IZHX
	<ul> <li>LW Underw significant deter</li> </ul>			Guthrie [	Diving Co)	All have light sc	aling below water	line. Piers have	1/32" vertical crack	s. FIAS
Inspection		noration or	uistress.							
เมอุคธิดิเกิด	NOLES.									

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#### P00060094+08281 Continue

\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder Spans 14 - 19 (cont.) \* \* \* \* \* \* \* \*

	scription									
-	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 234	- R/Conc Cap									
	1	1	156	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :				<u>-</u>			1	1	
et on the u 9/27/2010 - ight cracks	nderside of the Staining on ca at steps in the	caps. Cap ps under le caps. Dirt a	s at Pier 15 an aky joints. Sor and debris in a	d 16 ha ne sma reas.	ve small surf Il surface spa	ace delamination	ns on their Right side of the caps f	ends. rom exposed/rus	pouts from rebar of ty rebar chair feet le of the caps show	EZJ
	hair feet with m			J			·		·	TZC
racks under	the bearings.								nts. Some tight ve	rtical GID2
		Ŭ	nkage cracks t	hrougho	out. Dirt and o	debris on top of the	he cap at Pier 17	under the finger	joint.	IZH.
	7 * 22.29 = 150	63.03m								FIA
2/11/1997 -										FKA
0/01/1995 -	None									YDN
9/01/1992 -	None									REF
nspection N	Notes:									
	- Assm Jt w/o				Sliding Plate	at Bent 14 and P				
		Seal Finge	r Joint at Pier 1		Sliding Plate	90	10	0		
lement 305	- Assm Jt w/o				Sliding Plate			0 %	%	
lement 305	- Assm Jt w/o	3			Sliding Plate a	90	10		%	
lement 305	- Assm Jt w/o :  1 pection Notes : Spalling along	the edges	60 of the steel. St	m.		90 %	10	%	% dirt and debris wit	h ZZJ
lement 305 revious Ins 9/19/2012 - ome areas 9/27/2010 -	- Assm Jt w/o s  1  pection Notes : Spalling along of the troughs s	the edges of showing dark	of the steel. St	m. reel sou	nds solid who	90 % en tapped on. Ti	10 % roughs under the	% joints are full of		
revious Insp 9/19/2012 - ome areas 9/27/2010 - oint edges. 6/20/2008 - one downspo	pection Notes: Spalling along of the troughs are further than the spalling along of the troughs are further than the spalling and the spalling are plugged to the spalling	the edges chowing dar	of the steel. St nage. oris. Good alig	m. reel sou nment o	nds solid who	90 % en tapped on. Ti teel sounds solid when tapped on	10 % roughs under the	% joints are full of n. Some small sp	dirt and debris wit	the EZJ
revious Ins 9/19/2012 - ome areas 9/27/2010 - int edges. 6/20/2008 - e downspo 8/17/2006 -	- Assm Jt w/o sign of the troughs are further plugged None	the edges of showing dar all of dirt/det gnment at Fd. Small sp	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination	m. reel sou nment c	nds solid who on fingers. S sounds solid ng the joint ed	90 % en tapped on. To teel sounds solid when tapped on dges.	roughs under the I when tapped or I. Trough under	% joints are full of n. Some small sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZk
revious Ins 9/19/2012 - ome areas 9/27/2010 - int edges. 6/20/2008 - e downspo 8/17/2006 - 0/06/2004 - dges.	pection Notes: Spalling along of the troughs are further point aliquits are plugged. None	the edges of showing dar all of dirt/det gnment at Fd. Small sp	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination	m.  reel sou  nment c  . Steel ons alor	nds solid who on fingers. S sounds solid ng the joint ed	90 % en tapped on. To teel sounds solid when tapped on dges.	roughs under the when tapped or . Trough under Trough under	% joints are full of n. Some small sp	dirt and debris wit	the EZJ and OZK TZC GID
ement 305 revious Insport 19/2012 - 19/2010 - 19/2010 - 19/2010 - 19/2006 -	pection Notes: Spalling along of the troughs are further plugged None Troughs uinde	the edges of showing dar all of dirt/det gnment at Fd. Small sport the joints at the finger j	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination	m.  reel sou  nment c  . Steel ons alor	nds solid who on fingers. S sounds solid ng the joint ed	en tapped on. To teel sounds solid when tapped on dges.	roughs under the when tapped or . Trough under Trough under	% joints are full of n. Some small sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZk TZC GID IZH
revious Insp 0/19/2012 - ome areas (6)/27/2010 - int edges. 6/20/2008 - 6/20/2006 - 0/06/2004 - 0/06/2002 - 0/21/2002 - 8/23/2000 -	pection Notes: Spalling along of the troughs are further plugged by the troughs are plugged. Troughs uinde to the troughs uinde	the edges of showing darnill of dirt/det gnment at F d. Small sp r the joints at the finger j	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination are full of dirt a ioint is full of sa 2m	m. reel sou nment o . Steel ons alor and sand	nds solid who on fingers. S sounds solid ng the joint ed ding material.	en tapped on. To teel sounds solid when tapped on dges.	roughs under the when tapped or . Trough under unment is Good. parrier rail.	% joints are full of n. Some small spotthe joint is full of Minor spalled sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZK TZC GID IZH FIA
revious Ins 3/19/2012 - ome areas 9/27/2010 - int edges. 6/20/2008 - e downspo 3/17/2006 - 0/06/2004 - dges. 0/21/2002 - 3/23/2000 - 2/11/1997 -	pection Notes: Spalling along of the troughs are further foughs are further form. Finger joint aliquits are plugged None Troughs uinde No change but 15.76 + (2 * 22 Sliding plate jo	the edges of showing darnill of dirt/det gnment at F d. Small sp r the joints at the finger j	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination are full of dirt a ioint is full of sa 2m	m. reel sou nment o . Steel ons alor and sand	nds solid who on fingers. S sounds solid ng the joint ed ding material.	90 % en tapped on. To teel sounds solid when tapped on dges. Finger joint align the both ends by the both series where the solid part of t	roughs under the when tapped or . Trough under unment is Good. parrier rail.	% joints are full of n. Some small spotthe joint is full of Minor spalled sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZF TZC GID IZH FIA
revious Insp 9/19/2012 - ome areas 6/27/2010 - int edges. 6/20/2008 - ee downspo 0/06/2004 - dges. 0/21/2002 - 8/23/2000 -	pection Notes: Spalling along of the troughs are further foughs are further formal for	the edges of showing darnill of dirt/det gnment at F d. Small sp r the joints at the finger j	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination are full of dirt a ioint is full of sa 2m	m. reel sou nment o . Steel ons alor and sand	nds solid who on fingers. S sounds solid ng the joint ed ding material.	90 % en tapped on. To teel sounds solid when tapped on dges. Finger joint align the both ends by the both series where the solid part of t	roughs under the when tapped or . Trough under unment is Good. parrier rail.	% joints are full of n. Some small spotthe joint is full of Minor spalled sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZF TZC GID IZH FIA FKA YDN
revious Ins 30/19/2012 - ome areas 9/27/2010 - int edges. 6/20/2008 - e downspo 8/17/2006 - 0/06/2004 - dges. 0/21/2002 - 8/23/2000 - 2/11/1997 - 0/01/1995 -	pection Notes: Spalling along of the troughs are further from the plugged None Troughs uinde No change but 15.76 + (2 * 22 Sliding plate jo None None	the edges of showing darnill of dirt/det gnment at F d. Small sp r the joints at the finger j	of the steel. St mage. oris. Good alig Pier 17 is Good alls/delamination are full of dirt a ioint is full of sa 2m	m. reel sou nment o . Steel ons alor and sand	nds solid who on fingers. S sounds solid ng the joint ed ding material.	90 % en tapped on. To teel sounds solid when tapped on dges. Finger joint align the both ends by the both series where the solid part of t	roughs under the when tapped or . Trough under unment is Good. parrier rail.	% joints are full of n. Some small spotthe joint is full of Minor spalled sp	dirt and debris wit palled areas along sanding material a	the EZJ and OZK TZC

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\* \* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder Spans 14 - 19 (cont.) \* \* \* \* \* \* \* \*

			96.			i Girder Spans	(551111)				
Element Des	cription										
	Scale Factor	Env	Quantity		Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Sta	at 5
Element 311	- Moveable Be	aring Pier	14, 15, 17(doub	oles), 18	, and 20						
	1	2	30	ea.		85	10	5	D. C.		
						%	%	%	%		(
Previous Insp	pection Notes :										
also broken. 09/27/2010 -	Spot rust, stair Spot rust and o	ning, and d debris on s	ebris at the leal ome of the bear	ky joints rings. A	lignment is	ok today. Same	on previously re	ported broken a	r bolts for G5S17 nchor bolts. se anchor bolts,, b		ZZJO EZJZ OZKZ
	pearings as pre								paint loss on other	s.	TZCZ
10/06/2004 -	Rust spots, pitt	ting and so	me paint loss o	n the be	arings. Un	changed from pr	evious reports wi	hen viewed by b	inoculars.		GIDZ
	Loose anchor b	bolts but tig	ght in their holes	at Pier	18 for G4L	, G3L and R, and	d G2R. Some rus	st, pitting, minor	paint loss and de	bris at	IZHX
all bearings. 08/23/2000 -	Env. #2 as und	der joints.	Some rust and p	oitting.							FIAS
	5 shoes each a			_	es), Pier 15	and Bent 14					FKAR
10/01/1995 -	None										YDNF
09/01/1992 -	None										REFI
Element 313	- Fixed Bearing										
	1	1	10	ea.		95	5	(			
						%	%	%	%		
Previous Insp	pection Notes :	•	1								
09/19/2012 -	Spot rust, pain	t loss, and	some debris.							Z	ZZJO
09/27/2010 -	Spot rust with s	some dirt/d	ebris.								EZJZ
06/20/2008 -	Overcoat paint	ed some, b	out still some ru	st and p	aint loss to	others.					OZKZ
08/17/2006 -											TZCZ
	•		· ·		•	•	en viewed by bind	oculars.			GIDZ
	Some rust, pitti		paint loss and c	lebris at	all bearing	S.					IZHX
	Some rust and										FIAS
	Fixed shoes at	Piers 16 a	na 19.								FKAR
10/01/1995 - 09/01/1992 -											YDNF REFI
										'	KLII
Inspection N	NOIG9.										

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\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder Spans 14 - 19 (cont.) \* \* \* \* \* \* \* \* \*

	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 331	- Conc Bridge I									
	1	3	586	m.		90	5	5	0	
						%	%	%	%	
ovious las	naction Notes					70	70	70	70	
	pection Notes :									
				_			ace shrinkage cra			ZZJ(
inor delam	inations on barr	ier in spots					and scaling alon and some spalled		ondition State 3 de	ue to EZJ. OZK
B/17/2006 ·						an dolan matod	aa 000 0pa00	. 4. 545.		TZC
	- Tight vertical c	racks even	/ 3 to 4 feet							GID
	- Minor shrinkag		, 0 10 1 10011							IZH)
	- 293 * 2 = 586m									FIAS
			MENT WAS AD	DED 6/	16/2000 NF	EED TO VERIEY	CONDITION ST	ATE(S)		FKA
		IG II. EEEI	WEITT WAS AD	DLD 0/	10/2000. 141	LED TO VEIGHT	CONDITION OF	A12(0).		TIVA
nspection	Notes:									
lement 334	I - Metal Rail Co	ated								
	1	3	293	m.		90	10	0	0	
						%	%	%	%	
revious Ins	pection Notes :	l				l.				
9/19/2012	- Spot rust, expo	sed base	coat, and faded	paint th	roughout. C	Chainlink fabric is	s in Good condition	on.		ZZJ(
	- Spot rust, expo			•	Ŭ					EZJ.
	- Rsuty spots, pa				_					OZK
8/17/2006		,								TZC
	- Rusty spots on	the rail po	sts and tubes.							GID
	- Add some scra			nout.						IZH
	- Some rust and									FIAS
	- Pedestrian rail		ide of bridge							FKA
0/01/1995		On North o	ide of bridge.							YDN
9/01/1992										REF
										INLI
Inspection	Notes:									
Пороспол										
Поросион										
	3 - Deck Crackin	g SmFlag								
	3 - Deck Crackin 1	g SmFlag	1	ea.	X	0	100	0	0	
lement 358			1	ea.	Х	0 %	100	0	0	
Element 358			1	ea.	X					
lement 358  X revious Ins	1 pection Notes :	3	1 ne into plav	ea.	Х					
X Previous Ins	pection Notes :	3 density con				%				ZZJ( EZJ
revious Ins 9/19/2012	pection Notes : - Both size and o	3 density con				%				
X Previous Ins 9/19/2012 9/27/2010 6/20/2008	pection Notes : - Both size and of the cracking - Unchanged.	3 density con				%				EZJ. OZK
Previous Ins 9/19/2012 9/27/2010 6/20/2008 8/17/2006	pection Notes : - Both size and c - Lots of cracking - Unchanged None	3 density con	e small delamin	ations i	n the worse	% areas.	%	%	%	EZJ OZK TZC
Previous Ins 9/19/2012 9/27/2010 6/20/2008 8/17/2006 0/06/2004	pection Notes : - Both size and c - Lots of cracking - Unchanged None	3 density cong with some	e small delamin	ations i	n the worse	% areas.	%	%		EZJ OZK TZC

\* \* \* \* \* \* \* \* \* Span : Appr-1 - P/S Concrete Spans 1 thru 13 and 20 \* \* \* \* \* \* \* \*

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\* \* \* \* \* \* \* \* \* Span : Appr-1 - P/S Concrete Spans 1 thru 13 and 20 (cont.) \* \* \* \* \* \* \* \*

	scription				I					
٥	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 12 -	Bare Concrete	Deck								
	1	3	5576	sq.m.	X	0	100	0	0	
						%	%	%	%	
Previous Ins	pection Notes :									
9/19/2012 -	Spalls and dela	aminations	along joint stee	el. Som	e random de	laminations in m	ost of the Spans	with some potho	oles/spalls starting.	ZZJ
							he worse cracke			
6/20/2008 -	Wear is probab	oly a little w	orse and the re	est of the	e comments	still apply.				OZK
8/17/2006 -	None									TZC
0/06/2004 -	Transverse cra	cking throp	oughout with so	me of th	ne cracks wid	der and open; se	e photos. Spallir	ng along joint ed	ges. Some areas o	of GID
	cks; mainly in th					e: roet ie uneban	ged from previou	is roports		IZH:
	No change.	alions and v	very small spail	eu area	is at the joint	s, rest is unicrian	ged from previou	is reports.		
	· No change. · Deck has mino	r cracking t	throughout							FKA
0/01/1997 -		i cracking i	illioughout.							YDN
	· 353.79 * 15.76	EE7E 70								REF
nspection N										
lamont 100	D/C Cone One	an Cirdar								
Element 109	- P/S Conc Ope	en Girder	2209	m.		95	5	O	0	
Element 109			2209	m.		95	5	0	0 %	
			2209	m.				Ĭ		
revious Ins	1 pection Notes :	1			ral of the gir	%		%		ZZJ
revious Ins 9/19/2012 -	pection Notes :	1 nd surface	spalls on ends	of seve	•	% ders. Mostly on	%	% bisture on them.	%	ZZJ EZJ
Previous Ins 19/19/2012 - 19/27/2010 -	pection Notes :	1 nd surface	spalls on ends	of seve	•	% ders. Mostly on	% those that get mo	% bisture on them.	%	EZJ
Previous Ins 9/19/2012 - 9/27/2010 - 6/20/2008 -	pection Notes : Minor cracks at Generally Good No change.	1 nd surface	spalls on ends	of seve	•	% ders. Mostly on	% those that get mo	% bisture on them.	%	EZJ OZk
Previous Ins 199/19/2012 - 199/27/2010 - 196/20/2008 - 198/17/2006 -	pection Notes : Minor cracks at Generally Good No change.	1 nd surface d condition	spalls on ends	of seve	nd cracking o	ders. Mostly on on ends of sever	those that get mo	oisture on them.	%	EZJ OZŁ TZC
Previous Ins 19/19/2012 - 19/27/2010 - 16/20/2008 - 18/17/2006 - 0/06/2004 -	pection Notes : Minor cracks and Generally Good No change. None Same on the gi	nd surface d condition	spalls on ends . Some minor s	of seve spalls an	nd cracking of	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% rposed strands.	EZ. OZŁ TZC rs. GID
Previous Ins 19/19/2012 - 19/27/2010 - 16/20/2008 - 18/17/2006 - 0/06/2004 - 0/21/2002 - howing.	pection Notes : Minor cracks and Generally Good No change. None Same on the gits	nd surface d condition	spalls on ends . Some minor s	of seve spalls an	nd cracking of	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% posed strands.	EZJ OZK TZC rs. GID d IZH
Previous Ins 19/19/2012 - 19/27/2010 - 16/20/2008 - 18/17/2006 - 0/06/2004 - 0/21/2002 - howing. 18/23/2000 -	pection Notes: Minor cracks at Generally Good No change. None Same on the gi	nd surface d condition	spalls on ends . Some minor s	of seve spalls an	nd cracking of	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% posed strands.	EZJ OZk TZC rs. GID
Previous Ins 19/19/2012 - 19/27/2010 - 16/20/2008 - 18/17/2006 - 0/06/2004 - 0/21/2002 - howing. 18/23/2000 - 2/11/1997 -	pection Notes: Minor cracks at Generally Good No change. None Same on the gi End of G2S12L None None	nd surface d condition	spalls on ends . Some minor s	of seve spalls an	nd cracking of	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% posed strands.	EZJ OZH TZC rs. GID d IZH
Previous Ins 9/19/2012 - 9/27/2010 - 6/20/2008 - 8/17/2006 - 0/06/2004 - 0/21/2002 - howing. 8/23/2000 - 2/11/1997 - 0/01/1995 -	pection Notes: Minor cracks at Generally Good No change. None Same on the gi End of G2S12L None None	nd surface d condition irder ends a _ at Bent 12	spalls on ends . Some minor s at Bent 11 and 2 and several g	of seve spalls and left end irder en	of the left gu	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% posed strands.	EZJ OZŁ TZC rs. GID d IZH FIA
Previous Ins 19/19/2012 - 19/27/2010 - 19/20/2008 - 19/6/20/2006 - 0/06/2004 - 0/21/2002 - 19/20/2000 - 19/20/2000 - 2/11/1997 - 0/01/1995 -	pection Notes: Minor cracks at Generally Good No change. None Same on the gite End of G2S12L None None None None (6 * 321) (7 * 3	nd surface d condition irder ends a _ at Bent 12	spalls on ends . Some minor s at Bent 11 and 2 and several g	of seve spalls and left end irder en	of the left gu	ders. Mostly on on ends of sever urder at Bent 12.	those that get mo al of the girders t	oisture on them. hat have now ex	% posed strands.	EZ. OZF TZC rs. GIC d IZH FIA

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	scription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 205	5 - R/Conc Colur	mn Bents 2	2 thru 13							
	1	2	28	ea.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :							I		
9/19/2012 · racks.	- Staining from jo	oint leakag	e on some. Cr	acks on	the columns	of Bent 2 and 3	3 with a small dela	aminated area.	Tight surface shrir	nkage ZZJ
ost everyth	<ul> <li>Staining on tho ning is superficia</li> <li>Same as previous</li> </ul>	al and prob	ably caused by				n noted in the wor	se areas of crac	king. Observed to	hat EZJ OZK
3/17/2006	- None	·								TZC
0/06/2004	- Sides of severa	al columns	have small spa	alling se	ction with eit	ner rebar chair f	eet or shallow reb	par; causing som	ne rust stains. Sm	nall GID
	several columns - Minor scrapes									IZH.
8/23/2000	- None									
2/11/1997	- None									FKA
0/01/1995	- None									YDN
9/01/1992	- (4) locations wi	ith 3 colum	ns and (8) loca	tions wi	th 2 columns					REF
		ment Abut	ment 1 and 22							
nspection	Notes:  5 - R/Conc Abutr	ment Abuti	ment 1 and 22	m.		95	5	0	0	
	5 - R/Conc Abutr			m.		95	5 %	0	0	
lement 215	5 - R/Conc Abutr 1			m.						
lement 215	5 - R/Conc Abutr 1 spection Notes :	1	52		(2) girders	%	%	%	%	rings 77
revious Ins	5 - R/Conc Abutr 1 spection Notes : - Abutment 1 hand of the bearings	s a crack b	52 between the Rig	ht most	`, "	% Small spalls at	%	%		, and the second
revious Ins 3/19/2012 teel portion	5 - R/Conc Abutr 1 spection Notes : - Abutment 1 had not the bearings - Generally Good	s a crack be are rusty.	etween the Rig	tht most	previous insp	% Small spalls at opections.	% the cap/backwall	% area and near th	% ne embedded bea	EZJ
revious Ins 9/19/2012 teel portior 9/27/2010 6/20/2008 oted on the	5 - R/Conc Abutr 1 spection Notes : - Abutment 1 had of the bearings - Generally Good - Same as past is a visible portion of	s a crack b are rusty. d condition	etween the Rig	tht most	previous insp	% Small spalls at opections.	% the cap/backwall	% area and near th	%	EZJ oss OZk
revious Ins 3/19/2012 teel portion 9/27/2010 6/20/2008 oted on the 3/17/2006	5 - R/Conc Abutr 1 spection Notes : - Abutment 1 had of the bearings - Generally Good - Same as past is a visible portion of	s a crack b s are rusty. d condition inspections of the beari	etween the Rig . Same common. Crack at Abuings.	tht most ents as atment 1	previous insp	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ oss OZK TZC
revious Ins 0/19/2012 eel portior 0/27/2010 6/20/2008 oted on the 0/06/2004 nbedded in	5 - R/Conc Abutr  1  spection Notes: - Abutment 1 had of the bearings - Generally Good - Same as past is visible portion of None - None - Both Abutment hackwall concil	s a crack be are rusty. d condition inspections of the bearing taps have	etween the Rig . Same common. Crack at Abuings.	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	% ne embedded bea	EZJ oss OZK TZC
ement 215 evious Ins 9/19/2012 eel portion 9/27/2010 6/20/2008 oted on the 8/17/2006 0/06/2004 nbedded in	5 - R/Conc Abutr 1 spection Notes : - Abutment 1 had of the bearings - Generally Good - Same as past is a visible portion of the concerning of the conc	s a crack be are rusty. d condition inspections of the bear to the caps have	etween the Rig . Same common. Crack at Abuings.	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ oss OZK TZC e GID
revious Ins 20/19/2012 deel portion 20/27/2010 6/20/2008 oted on the 8/17/2006 0/06/2004 mbedded in 0/21/2002	5 - R/Conc Abutr  1 spection Notes: - Abutment 1 han of the bearings - Generally Good - Same as past is exisible portion of None - None - Both Abutment of backwall conciling to the backwall conciling the None - None	s a crack be are rusty. d condition inspections of the bear to the caps have	etween the Rig . Same common. Crack at Abuings.	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ oss OZK TZC e GID IZH FIA
revious Ins 9/19/2012 teel portion 9/27/2010 6/20/2008 bited on the 8/17/2006 0/06/2004 mbedded in 0/21/2002 8/23/2000 2/11/1997	5 - R/Conc Abutr  1  spection Notes: - Abutment 1 had of the bearings - Generally Good - Same as past is visible portion of None - Both Abutment backwall concrete ok - None - None	s a crack be are rusty. d condition inspections of the bear to the caps have	etween the Rig . Same common. Crack at Abuings.	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ oss OZK TZC e GID IZH FIA FKA
revious Ins 9/19/2012 teel portion 9/27/2010 6/20/2008 oted on the 8/17/2006 0/06/2004 mbedded in 0/21/2002 8/23/2000 2/11/1997	5 - R/Conc Abutr  1  spection Notes: - Abutment 1 had of the bearings - Generally Good - Same as past is visible portion of None - Both Abutment backwall concrete ok - None - None	s a crack be are rusty. d condition inspections of the bear t caps have rete. Minor	etween the Rig . Same common. c. Crack at Aburings. e tight vertical correrosion on the	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ OSS OZK TZC GID IZH FIA FKA YDN
revious Ins 9/19/2012 teel portion 9/27/2010 6/20/2008 oted on the 8/17/2006 0/06/2004 mbedded in 0/21/2002 8/23/2000 2/11/1997	pection Notes: - Abutment 1 had of the bearings - Generally Good - Same as past is visible portion of None - Both Abutment backwall concrete None - None - None - None - None - None - None	s a crack be are rusty. d condition inspections of the bear t caps have rete. Minor	etween the Rig . Same common. c. Crack at Aburings. e tight vertical correrosion on the	ght most ents as utment 1 racks w	previous inspondent between three ith effloresce	% Small spalls at to pections. Right (2) girder	the cap/backwall	% area and near th ter in 2006. Som	ne embedded bea	EZJ oss OZK TZC e GID

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Smart Flag	scription									
_	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
ement 234	- R/Conc Cap	Bents 2 th	ıru 13							
	1	1	215	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :									
Small delan 9/27/2010 - igeon nests 6/20/2008 - hair feet. V 8/17/2006 - 0/06/2004 -	ninations on Ber Tight cracks ne and debris on to Tight vertical so Vorse rusty stair None Tight vertical co	nts 2, 3, and ear steps of tops of the tress riser of his and spal racks unde	d 8's caps. In the caps. Lor caps. Cracks at the st I are under the r several of the	ts of sur eps in t leaky jo	face spalls che caps. Un bint caps.	on the underside dersides of the c and swallows are	of the caps from aps show surface e residing on the	exposed rebar of expansion	joints. Dirt and deb hair feet. Lots of posed and rusty reba nining under leaking	EZ. ar OZŀ TZC
						exposed rebar chat Bent 11 from G			S.	IZH
8/23/2000 -		o o	ŭ		·					
2/11/1997 -	- None									FKA
0/01/1995 -	- None									YDY
0/04/4000										RE
Inspection I										NL.
nspection I	Notes: 5 - Assm Jt w/o S	Seal Finge	r Joints - 5, 8, a			0.0				IVE.
Inspection I	Notes:					80	10	10		IVE
Inspection I	Notes: 5 - Assm Jt w/o \$	Seal Finge	r Joints - 5, 8, a			80 %	10	10	%	NL
Inspection I	Notes: 5 - Assm Jt w/o S	Seal Finge	r Joints - 5, 8, a						%	NE.
element 305 Previous Ins	Notes:  5 - Assm Jt w/o S  1  pection Notes : - Joint at Bent 8	Seal Finge 3	r Joints - 5, 8, a 67 e section in the	m.			%	%		ZZ
lement 305 revious Ins 9/19/2012 - 9-26-2012. 9/27/2010 -	Notes:  5 - Assm Jt w/o S  1  pection Notes : - Joint at Bent 8 Fixed loose se - Full and some	Seal Finge  3  has a loosection of the damage to	r Joints - 5, 8, 67 67 e section in the joint at Bent 8 the troughs. 6	m. Left lai	eft lane.	%	% niantions along th	% ne edges of the j	oints.	ZZ、
lement 305 revious Ins 9/19/2012 - 9-26-2012. 9/27/2010 - palls/delam	Notes:  5 - Assm Jt w/o S  1  Depection Notes:  - Joint at Bent 8  Fixed loose se  - Full and some sinations along the second se	Seal Finge  3  has a loose ction of the damage to he joint ste	r Joints - 5, 8, 8 67 e section in the joint at Bent 8 the troughs. Cel.	m. Left lai	eft lane.	% palling and delan	% niantions along th	% ne edges of the j	oints.	ZZ、
Previous Ins 9/19/2012 - 9-26-2012. 9/27/2010 - palls/delam 6/20/2008 -	Notes:  1  Spection Notes:  Joint at Bent 8 Fixed loose se Full and some inations along the	Seal Finge  3  has a loose ction of the damage to he joint ste	r Joints - 5, 8, 8 67 e section in the joint at Bent 8 the troughs. Cel.	m. Left lai	eft lane.	% palling and delan	% niantions along th	% ne edges of the j	oints.	ZZ. EZ: OZI
Previous Ins 9/19/2012 - 9-26-2012 - 9/27/2010 - palls/delam 6/20/2008 - 8/17/2006 -	Notes:  5 - Assm Jt w/o S  1  pection Notes:  - Joint at Bent 8  Fixed loose se - Full and some hinations along the - Same as past if - None	Seal Finge  3  has a loose ction of the damage to he joint sterminspection of the damage to he joint sterminspecti	e section in the joint at Bent 8 the troughs. Cel. comments.	m. Left lar in the L Good ali	Left lane. gnment on fi	palling and delar	niantions along the	% ne edges of the j apped on and so	oints. ome small	ZZ. EZ. OZ! TZ(
Previous Ins 9/19/2012 - 9-26-2012. 9/27/2010 - palls/delam 6/20/2008 - 8/17/2006 - 0/06/2004 -	Notes:  5 - Assm Jt w/o S  1  Pection Notes:  - Joint at Bent 8  Fixed loose se  - Full and some inations along the Same as past in the None  - Minor spalling in the Same in	has a loose ction of the damage to he joint sterinspection of along the joint sterinspectic sterinspection of along the joint sterinspection of along the joint sterinspection o	e section in the joint at Bent 8 the troughs. Cel. comments.	m.  Left lar in the L Good ali	Left lane. gnment on fi	% palling and delan	niantions along the	% ne edges of the j apped on and so	oints. ome small	ZZ. EZ. OZI TZ( GIE
Previous Ins 9/19/2012 - 99-26-2012. 9/27/2010 - palls/delam 6/20/2008 - 8/17/2006 - 0/06/2004 - 0/21/2002 -	Notes:  1  Spection Notes:  Joint at Bent 8 Fixed loose se Full and some inations along the Same as past in None Minor spalling in Also add that be	has a loose ction of the damage to he joint sterinspection of along the joint sterinspectic sterinspection of along the joint sterinspection of along the joint sterinspection o	e section in the joint at Bent 8 the troughs. Cel. comments.	m.  Left lar in the L Good ali	Left lane. gnment on fi	palling and delar	niantions along the	% ne edges of the j apped on and so	oints. ome small	ZZ. EZ. OZI TZ( GIE IZI-
Previous Ins 9/19/2012 - 9-26-2012 - 9/27/2010 - 9/27/2010 - 9/27/2010 - 0/20/2008 - 8/17/2006 - 0/06/2004 - 0/21/2002 - 8/23/2000 -	Notes:  5 - Assm Jt w/o S  1  1  1  1  1  1  1  1  1  1  1  1  1	has a loosection of the damage to damage to inspection of along the jooth ends a	e section in the joint at Bent 8 the troughs. Comments.	m.  Left lar in the L Good ali ger alig	eft lane. gnment on fi nment is Goo rial.	palling and delar ngers. Steel sou od. Troughs are	niantions along the nds solid when to either plugged of	% ne edges of the j apped on and so r missing on all o	oints.  ome small  of the joints.	ZZ. EZ. OZI TZ. GIE IZ. FIA
Previous Ins 9/19/2012 - 9-26-2012 - 9/27/2010 - 9/27/2010 - 9/27/2008 - 8/17/2006 - 0/06/2004 - 0/21/2002 - 8/23/2000 - 2/11/1997 -	Notes:  5 - Assm Jt w/o S  1  Spection Notes:  - Joint at Bent 8 Fixed loose se - Full and some interventions along the same as past in the same a	has a loosection of the damage to damage to inspection of along the jooth ends a	e section in the joint at Bent 8 the troughs. Comments.	m.  Left lar in the L Good ali ger alig	eft lane. gnment on fi nment is Goo rial.	palling and delar ngers. Steel sou od. Troughs are	niantions along the nds solid when to either plugged of	% ne edges of the j apped on and so r missing on all o	oints. ome small	ZZ. EZ. OZI TZ( GII IZH FIA S FK/
Previous Ins 9/19/2012 - 9-26-2012 - 9/27/2010 - palls/delam 6/20/2008 - 8/17/2006 - 0/06/2004 - 0/21/2002 - 8/23/2000 - 2/11/1997 - nto the cap 0/01/1995 -	Notes:  5 - Assm Jt w/o S  1  Spection Notes:  - Joint at Bent 8 Fixed loose se - Full and some interventions along the same as past in the same a	has a loosection of the damage to he joint sterinspection of along the jooth ends at Bents 5, 8	e section in the joint at Bent 8 the troughs. Cel. comments.	m.  Left lar in the L Good ali ger alig	eft lane. gnment on fi nment is Goo rial.	palling and delar ngers. Steel sou od. Troughs are	niantions along the nds solid when to either plugged of	% ne edges of the j apped on and so r missing on all o	oints.  ome small  of the joints.	ZZ. EZ. OZ. TZ. GIC IZ. FIA

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#### P00060094+08281 Continue

\* \* \* \* \* \* \* \* \* Span : Appr-1 - P/S Concrete Spans 1 thru 13 and 20 (cont.) \* \* \* \* \* \* \* \*

Element Des	scription		<u> </u>		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10 13 and 20 (CC	····,		
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	I - Moveable Be	aring Bent	ts 5, 8, 11, 14, a	nd Pier	20		L			
	1	2	49	ea.		80	20	0		
						%	%	%	%	9/
Previous Ins	spection Notes :									
 09/19/2012 -	- Alignment was	ok. Dirt, c	lebris, and bird	nest on	the bearing	s. Rust, scale, p	paint loss, and sta	aining.		ZZJO
09/27/2010 -	- Fair to Good a	lignment. I	Lots of debris or	n the be	arings. Sta	ining from leaky	joints above. Ru	st, scale, and pa	int loss.	EZJZ
06/20/2008 -	- Rusty spots, pa	aint loss, a	nd debris. Aligr	nment a	ppeared to	be Good.				OZKZ
08/17/2006 -	- None									TZCZ
10/06/2004 -	- Bent anchor bo	olts. Rusty	spots, scale, a	nd pittin	g on most o	f the bearings. I	Rest is from previ	ous reports whe	n viewed by binoc	culars. GIDZ
	- All have bent a	anchor bolts	s except at Pier	20. All	show some	rust and minor p	paint loss with the	ose at Bent 11 bu	uried in sanding	IZHX
material. 08/23/2000 -	- Env. State 2 as	s under lea	kv ioints. Rust	and nitt	ina: rest is u	ınchanged				FIAS
			•		•	· ·	bent over due to	excessive move	ement - see photo	
10/01/1995 -			g							YDNF
	- (12) each at Be	ents 5, 8, a	nd 11 plus (6) a	it Bent 1	14 plus (7) a	nt Pier 20.				REFI
Inspection I	` '	, ,	1 ( )		1 ( )					
Пореспол	140103.									
Element 313	3 - Fixed Bearing	Bent 2. 3	3. 4. 6. 7. 9. 10.	12. and	13					
	1	1	120			90	10	0		
						%		%	%	9,
Drovious Inc	spection Notes :					70	,0	70	70	
	•		a and dahria							ZZJO
	<ul> <li>Spot rust, pain</li> <li>Rust, paint lost</li> </ul>			hrio						EZJZ
	- Rusty spots, pa				utmont hoo	ringe				OZKZ
08/17/2006 ·		airit 1033, a	na debns. Diop	peu Ab	ulinent bea	riilgs.				TZCZ
		Initting S	ome dehris nea	r the he	aringes fron	n hird dehris whe	en viewed by bind	oculare		GIDZ
	- Rust spots and - Some rust, pitt				•	ii biid debiis wiid	en viewed by binc	oculais.		IZHX
	- Some rust and	•	mor pame 1000 ti	nougne	,at.					FIAS
12/11/1997 -		Pitting								FKAR
10/01/1995 ·										YDNF
		nt 1, (7)at A	butment 21, plu	ıs (15) a	at Bent 2, (1	8) at Bent 3, (15	) at Bent 4, (12) a	at Bent 6, 7, 9, 10	), 12, and 13	REFI
Inspection I	, ,		, ,	, ,			,,			
Порссион	140103.									

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#### P00060094+08281 Continue

\* \* \* \* \* \* \* \* \* Span : Appr-1 - P/S Concrete Spans 1 thru 13 and 20 (cont.) \* \* \* \* \* \* \* \*

Element Des	scription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 331	- Conc Bridge I	Railing Let	ft and Right veh	icle rail						
	1	3	708	m.		90	5	5	0	
						%	%	%	%	9
Previous Ins	pection Notes :									
09/19/2012 -	Small spalls, de	elaminatior	ns, and popouts	through	hout. Barrie	r has a lot of sui	rface shrinkage c	racks.		ZZJO
delamination	s on barrier in s	pots.					scaling along crac or delaminated a		tate 3 due to small	EZJZ OZKZ
08/17/2006 -			o i it with many	, 01 1110		ring ornali opalio				TZCZ
	Minor and tight	vertical cra	acks every 3 to	4 feet.						GIDZ
	Minor dings, so									IZHX
08/23/2000 -	_		•							FIAS
12/11/1997 -	None									FKAR
10/01/1995 -	None									YDNF
09/01/1992 -	353.79 * 707.5	8m								REFI
Element 334	- Metal Rail Co									
	1	3	354	m.		90	10	0		
						%	%	%	%	9
	pection Notes :									77.10
						Chainlink fabric i	s in Good condition	on.		ZZJO
	Spot rust, expo				_					EZJZ OZKZ
08/17/2006 -	Rusty spots, pa	airit 1055, ai	nu prime coat v	isible III	rougriout.					TZCZ
		hox heams	s show rust spo	ts Han	d rail on ton	of the barrier ra	il has rust spots.			GIDZ
	Add some scra		· ·		a ran on top		iii riao raot opoto.			IZHX
	Some rust and	•	,							FIAS
12/11/1997 -										FKAR
10/01/1995 -	None									YDNF
09/01/1992 -	Pedestrian rail	on the righ	t outside of the	bridge.	353.79 * 1	= 353.79m				REFI
Inspection I	Notes:									



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Continue

General Inspection Notes	
•	77 10
09/19/2012 - David Crumley was notified about the finger joint failing at Bent 8 on 09-18-2012. He set up a check for 09-21-2012 in the am with 31-01 and Bill Lay. He and 31-01's crew with Charlie and Henry repaired the joint on 09-26-2012.	ZZJO EZJZ
From the 2011 underwater inspection by Infrastructure Engineers there is no change to the channel or scour conditions at this bridge. There is ight timber debris at the upstream nose of Piers 3 and 4. CRH	
06/20/2008 - NBI 59, superstructure, rated a "6" due to broken or loose anchor bolts in the Main span.	OZKZ
08/17/2006 - Per Infrastructure Engineers August 24, 2006 underwater inspection, There are no significant defects present below the high vaterline. There is no significant local or general scour present at the bridge site. There are no significant restrictions in the channel that will adversely impact flow. There is a local scour cone 5 feet in diameter by 3 feet deep at the upstream nose of pier 6. Construction debris at the upstream nose of pier 5 and the downstream nose of pier 4. Debris consists of rebar protruding from the mudline 3 feet high with a 55 gallon parrel along side of it. ITEM 61 CHANGED PER INFRASTRUCTURE ENGINEERS UNDERWATER INSPECTION.	TZCZ
0/06/2004 - NBI 58, deck, rates at a "6" due to cracking in all spans and spalls along the joint edges.	GIDZ
NBI 60, substructure, rated at a "6" due to minor spalls on the underside of some caps and minor/tight cracks in the columns.	IZHX
08/23/2000 - None	FIAS
2/11/1997 - None	FKAR
0/01/1995 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 3/11/97 10:45:22 Sufficiency Rating Calculation Accepted by ops\$u5963 at 2/26/97 10:59:10 Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:23:33	YDNF
09/01/1992 -	REFI
01/01/1991 - Updated with tape 1993	NB93
05/01/1989 - Updated with tape 1991	NB91
04/01/1987 - Updated with tape 1989	NB89
0/01/1984 - Updated with tape 1986	NB86



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### INITIAL ASSESSMENT FORM FOR STRUCTURE:

P00060094+08282

Location: GREAT FALLS Structure Name: GF Warden-EB

**General Location Data** 

MDT Maintenance Section: 31-01 Great Falls

District Code, Number, Location: 03 **GREAT FALLS** Division Code, Location:31 **GREAT FALLS** 

County Code, Location: 013 **CASCADE** City Code, Location: 32800 **GREAT FALLS** 

Kind fo Hwy Code, Description: 2 2 U.S. Numbered Hwy Signed Route Number: 00089

State Highway Agency State Highway Agency Str Owner Code, Description: 1 Maintained by Code, Description:1

Intersecting Feature: MISSOURI RV, U5205, BNSF Kilometer Post, Mile Post: 152.60 km 94.82

Structure on the State Highway System: Latitude: 47°29'37"

Structure on the National Highway System: Longitude: 111°18'39"

Str Meet or Exceed NBIS Bridge Length:

Construction Data

Construction Project Number: FGU 388 1 2 Construction Station Number: 45+89.00

Construction Drawing Number: 2926

Construction Year: 1951

Current ADT: 37,380 ADT Count Year: 2009 2 % Percent Trucks: Reconstruction Year:

#### Structure Loading, Rating and Posting Data

#### Loading Data:

**Traffic Data** 

Design Loading:		5 MS 18 (HS 20)
Inventory Load, Design:	32.6 mton	B ASD Assigned
Operating Load, Design:	32.6 mton	B ASD Assigned
Posting :		5 At/Above Legal Loads

Rating Data:	Operating	Inventory	Posting
Truck 1 Type 3:			
Truck 2 Type 3-S3:			
Truck 3 Type 3-3:	86		

#### Structure, Roadway and Clearance Data

#### Structure Deck, Roadway and Span Data:

Structure Length: 637.90 m Deck Area: 6,960.00 m sq

8.53 m Deck Roadway Width: 10.90 m Approach Roadway Width:

Median Code, Description: 0 No median

#### Structure Vertical and Horizontal Clearance Data:

Vertical Clearance Over the Structure: 99.99 m

H Hwy beneath struct Reference Feature for Vertical Clearance:

5.49 m Vertical Clearance Under the Structure:

H Hwy beneath struct Reference Feature for Lateral Underclearance:

3.50 m Minimum Lateral Under Clearance Right: 0.00 m Minimum Lateral Under Clearance Left:

#### Span Data

#### Main Span

Number Spans: 6

Material Type Code, Description: 4 Steel continuous

Span Design Code, Description: 3 Girder and Floorbeam System

Deck

Deck Structure Type: 1 Concrete Cast-in-Place

Deck Surfacing Type: 3 Latex Concrete or similar additive

Deck Protection Type: 0 None Deck Membrain Type: 0 None

#### Approach Span

Number of Spans: 21

Material Type Code, Description: 4 Steel continuous

Span Design Code, Description: 2 Stringer/Multi-beam or Girder

10.91 m (52) Out-to-Out Width: (50A) Curb Width: (50B) Curb Width: 1.19 m 1.19 m Skew Angle: '

#### Structure Vertical and Horizontal Clearance Data Inventory Route:

Over / Under Direction	Inventory	South, W	est or Bi-direction	nal Travel	N	orth or East Trav	/el
Name	Route	Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
One Route Under	U05205	Both	5.49 m	7.92 m	N/A		
RIVER ROAD / U05205							
Route On Structure	P00060	N/A	99.99 m	8.53 m	East		
10TH AVE. SOUTH - EB							

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**Inspection Data** 

Sufficiency Rating: 75.7

Structure Status : Func Obs - Elg Rehab

Inspection Due Date: 05 September 2015 (91) Inspection Frequency (months): 24

Next Fracture Critical Due Date : 05 Sep 2015 Fracture Critical Detail : 1 or 2 Stl-girder systms Next Under Water Insp : 15 Nov 2016

Under Water Insp Type : **Type II** 

		i lacture of	iticai Detaii . I	or z ou-girac	a ayanna		
NBI Inspection Da	ata						
(90) Date of Last Ins	pection : 05 Septemb	er 2013		La	ast Inspected By: Charles	Pepos - 107	
(90) Inspection	on Date :				Inspected By :		
(58) Deck	Rating : 7	(68) Deck Geo	metry : 3	(36A)	Bridge Rail Rating : 0	(62) Culver	t Rating : N
(59) Superstructure	Rating : 6			(36B	) Transition Rating : 0	(61) Channe	el Rating : 7
(60) Substructure	Rating: 6	(67) Structure F			pproach Rail Rating :1	(71) Waterway A	dequacy :8
(72) App Rdwy		(69) Under Clear (41) Posting S			D) End Rail Rating : 1	(113) Scoul	r Critical : 5
	Unrepaired S			_	Deck Surfac	ring Depth : 0.0	00 in
nspection Hours						ang Deptir.	
Crew Hours for inspec	ction: 35		Snoo	oper Required	: <b>Y</b>		
Helper H	ours :	s	nooper Hours	for inspection	17		
Special Crew H	ours: 12		I	Flagger Hours	: 0		
Special Equipment Ho	ours:						
Inspection World	k Candidates	Ctatus	Duianitus	Effected	Scope of	Action	Covered
Candidate ID	Date Requested	Status	Priority	Structure Unit	Work	Action	Condition States
D31-FY2006-000012	19 October 2005	Approved	Medium	All Spans	Bridge	Spot Paint (flex)	
pproved. DRC							
D31-FY2006-000014	19 October 2005	Approved	High	M Main	305 Assm Jt w/o Seal	Rehab Elem	
Repair the drain trough			Tilgii	IVI IVICIII	Joo Assiii et wo dear	IXCHAD EICH	
pproved. Bite							
D31-FY2006-000011		Approved		A Approach	205 R/Conc Column	Min Repair	
Repair spalling/delamina	ated concrete on Colu	umns at Bents 3 and	d 4.				
pproved. DRC							
D31-FY2011-000135	07 February 2011	Not Approved	Medium	All Spans	107 Paint Stl Opn Girde	r Min Repair	
lean and paint the gird	ers as needed.						
D31-FY2011-000134	07 February 2011	Not Approved	Medium	All Spans	334 Metal Rail Coated	Repl Paint	
Clean and paint the brid	ge rail.						

Late Reason:

Inspection Date: 09/05/2013



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#### **Element Inspection Data**

Span : Main-0 - Steel Girder - Spans 21 thru 26 \* \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Element 12 - Bare Concrete Deck 2011 Mill and Overlay w\ Silica Fume 3 3226 sq.m. 100 % % % Previous Inspection Notes: 09/05/2013 - Mapping cracks reflecting up through the 2011 overlay. No delaminations found during chaining in the closed Right lane. 09/06/2011 - Removed and replaced 2" of the existing surface with Silica Fume Concrete in June 2011. 08/25/2009 - Mapping cracks in all spans. Delaminated and spalled concrete along the joints. Poor skid resistance remains. Deck was evaluated by Helena earlier this summer and their report is on file in Helena. 08/27/2007 - Quick chain drag showed delaminations or spalls every 20 to 30 ft or less than 10 percent for Condition State 3; may be more with a more through evaluation. Delaimantions/spalls concrete at the joint anchorages. Rest of the previous comments still apply. 06/28/2005 - Tight mapping cracks in all spans with some areas that are delaminated. Some areas of spalling along the edges of the joints. May be nearing the 2 percent limit for Condition State 2. Very little ski resistance remaining. (295.66 \* 10.91 = 3225.65) Nate 07/24/2003 - Same as previous report. Some delamination at the drain scuppers with exposed and rusty reinforcing on the undeside od the deck soffits. Also covered with deck soffit smart flag. 09/27/2001 - 306.75 \* 10.91 = 3346.64 Tight mapping cracks throughout the deck area. Minor spalling at all the joints. Some cracks are wide with efflorescence on the under side of the deck. Wear in the wheel paths. 09/02/1998 - Small, tight cracks throughout the deck. 09/01/1992 - None Inspection Notes: Element 107 - Paint Stl Opn Girder 1 2 591 m. 15 % Previous Inspection Notes: 09/05/2013 - Faded and dirty paint. Rust blisters w\ surface pitting under the blisters. Worst areas are under leaking joints. Not much leakage since the 2011 deck/joint rehab. 09/06/2011 - No change from previous inspections except alittle more paint loss and rust noted. 08/25/2009 - Paint is faded, dirty, peeling, and scaling in areas that moisture can get to the girders. Lots of heavy rust blisters in areas with surface piting under the blisters. Bottom flange top side is stickey from the deicer placed on the deck. 08/27/2007 - G2 at Pier 26 has some deep surface corrosion, 1/8 ", at the lower web longitudinal stiffner. Outside of the girders and under leaky joints show the worse paint loss and rust. Paint is very dirty in areas that mag. chloride/sanding material has accumulated. 06/28/2005 - Rust, pack rust, pitting, paint loss, and paint peel; especially under or near leaky joints. Some area on the lower portions of the web have pack rust blisters, mostly still tight, on them. Mag chloride/dirt laying on the outside of the girders on the top of the bottom flange. (295.66 \* 2 = 591.32) Nate. 07/24/2003 - Rusty spots with pack rust and minor section loss on girder webs; especially under leaking joints. See photos from past FC inspections. 09/27/2001 - 306.75 \* 2 = 613.50m Rusty spots under all the joints and near the drains. 09/02/1998 - None 09/01/1992 - None Inspection Notes:

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#### P00060094+08282 Continue

\*\*\*\*\* \* Span : Main-0 - Steel Girder - Spans 21 thru 26 (cont.) \* \* \* \* \* \* \* \*

Element Desc	cription									
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 113	- Paint Stl Strin	ger								
	1	1	887	m.		90	10	C	0	
						%	%	%	%	
revious Insp	ection Notes :									
9/05/2013 -	Some paint los	s and peel	ing paint in area	as. Ger	nerally in Go	od paint system	. Stringers are di	irty.		FPD
	·	·	•		·	nt loss and rust i	•	•		GCC
8/25/2009 -	Paint is genera	lly in good	condition. Som	e rust a	nd scale in a	area near joints.				ZQD
8/27/2007 -	Same as past of	comments	on rust at the d	eck to s	tringer flang	e area.				ZZB
						meet the concre	te deck. Some r	usty spots and s	staining where the	SZM
ringers are i	in the area of le	eaking joint	s. (295.66 * 3 :	= 886.98 • flanges	8 s: mainly nea	ar concrete conr	nections under an	ıd near leaking i	nints	YAD
172 172000				nango	o, manny mod			ia rioar ioaning j	J. 1.0.	NIBI
9/27/2001 -		7U 25M								
linor rust spe	ots; mostly at the		ge to concrete o	connecti	on and unde	er the joints.				
linor rust spi 9/02/1998 - Inspection N	ots; mostly at th	ne top flanç	ge to concrete d	connecti	on and unde	er the joints.				GKL
linor rust spi 9/02/1998 - Inspection N	ots; mostly at th	ne top flanç	ge to concrete d	connecti	on and unde	er the joints.				
Minor rust spi 9/02/1998 - Inspection N	ots; mostly at th	ne top flanç	ge to concrete o		on and unde	er the joints.	10		5	
linor rust spi 9/02/1998 - Inspection N	ots; mostly at the lotes: - Paint Stl Floo	r Beam			on and unde	,	10	£ 5%		
linor rust spo 9/02/1998 - nspection N lement 152	ots; mostly at the lotes: - Paint Stl Floo	r Beam			on and unde	80				
linor rust spi 9/02/1998 - nspection N lement 152	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes :	r Beam	458	m.		80		%	%	
Ainor rust spending rust rust spending rust	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes:	r Beam  2 y paint, rus	458 t blisters, and s	m. surface į	Ditting in thos	80	% leakage and whe	%	%	GKL
finor rust spending rust rust spending rust	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes: Faded and dirty No change fror Floorbeams sh	r Beam 2 y paint, rus	458 t blisters, and s inspections exc	m. surface p	pitting in those	80 % se areas of past nt loss and rust i	% leakage and whe	% ere water can ga	%	GKL FPD GCC
Previous Inspection No. 100 (100 (100 (100 (100 (100 (100 (100	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes: Faded and dirty No change from Floorbeams shose rivot.	r Beam  2 y paint, rus n previous ow dirty pa	458 t blisters, and s inspections exi	m. surface p cept aliti	pitting in those the more pair rust blisters	80 % se areas of past nt loss and rust i on those under	leakage and whenoted. the leaky joints.	ere water can ga	wither.	FPD GCC from ZQD
Pinor rust spending rust rust spending rust	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes: Faded and dirty No change fror Floorbeams shose rivot. Floorbeams unspan 24 has (1)	r Beam  2 y paint, rus n previous ow dirty pa der leaky j loose rive	t blisters, and s inspections exi int, some peeli oints show rust t; not a problem	m. surface p cept alitt ng, and blisters	pitting in those the more pair rust blisters	80 % se areas of past nt loss and rust i on those under nt loss, and mind	leakage and whenoted. the leaky joints. It or section loss in the leaky in the leaky joints.	ere water can ga  No change on 3i  open rust blister	wither.  In the floor beam back for the floor back for the floor back floor beam back for the floor back floor back floor back floor beam back floor back floo	FPD GCC from ZQD pack ZZB
linor rust spe 9/02/1998 - nspection N lement 152 revious Insp 9/05/2013 - 9/06/2011 - 8/25/2009 - ier 25 on loc 8/27/2007 - f Pier 25 in s 6/28/2005 -	ots; mostly at the lotes:  - Paint Stl Flootection Notes: Faded and dirty No change from Floorbeams shose rivot. Floorbeams unspan 24 has (1) Same commen	r Beam  2 y paint, rus n previous ow dirty pa der leaky j loose rive ats with pair	t blisters, and s inspections exi int, some peeli oints show rust t; not a problem nt loss, pitting a	m. surface p cept alitt ng, and blisters h. und som	pitting in those the more pair rust blisters , pitting, pair se tight pack	se areas of past nt loss and rust on those under nt loss, and minor rust also noted	leakage and whenoted. the leaky joints. It or section loss in and mostly near the section loss in the sect	ere water can ga  No change on 3i  open rust blister  the leaking joints	wither.  In the state of the st	FPD GCC from ZQD pack ZZB SZM
linor rust spe 9/02/1998 - nspection N lement 152 revious Insp 9/05/2013 - 9/06/2011 - 8/25/2009 - ier 25 on loc 8/27/2007 - f Pier 25 in s 6/28/2005 - 7/24/2003 - ome minor r	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes: Faded and dirty No change fror Floorbeams shose rivot. Floorbeams un span 24 has (1) Same commen Rusty spots thrust blisters and	r Beam  2 y paint, rus n previous ow dirty pa der leaky j loose rive its with pain	t blisters, and s inspections exi int, some peeli oints show rust t; not a problem t loss, pitting a e floorbeams. at connections.	m. surface p cept alitt ng, and blisters n. and som Worse i	pitting in those the more pair rust blisters, pitting, pair te tight pack rust is in area	se areas of past nt loss and rust on those under rust also noted as under leaking	leakage and whenoted. the leaky joints. It or section loss in and mostly near the section loss in the sect	ere water can ga  No change on 3i  open rust blister  the leaking joints	wither.  In the floor beam back for the floor back for the floor back floor beam back for the floor back floor back floor back floor beam back floor back floo	FPD GCC from ZQD pack ZZB SZM
Previous Insp 9/02/1998 - Inspection N Element 152 Previous Insp 9/05/2013 - 9/06/2011 - 8/25/2009 - ier 25 on loc 8/27/2007 - f Pier 25 in s 6/28/2005 - 7/24/2003 - ome minor r 9/27/2001 -	ots; mostly at the lotes:  - Paint Stl Floo  1  Dection Notes: Faded and dirty No change fror Floorbeams shose rivot. Floorbeams un span 24 has (1) Same commen Rusty spots thr rust blisters and 10.91 * 42 = 45	r Beam  2 y paint, rus n previous ow dirty pa der leaky j loose rive its with pail roughout th	t blisters, and s inspections exi int, some peeli oints show rust t; not a problem t loss, pitting a e floorbeams. at connections. I are in contact	m. surface p cept alitt ng, and blisters n. nd som Worse n with the	poitting in those the more pair rust blisters, pitting, pair te tight pack rust is in arease steel string	se areas of past nt loss and rust on those under rust also noted as under leaking ers.	leakage and whenoted. the leaky joints. It or section loss in and mostly near the section loss in the sect	ere water can ga  No change on 3i  open rust blister  the leaking joints	wither.  In the state of the st	FPD GCC from ZQD pack ZZB SZM
Previous Insp 9/02/1998 - Inspection N Element 152 Previous Insp 9/05/2013 - 9/06/2011 - 9/06/2011 - 9/06/2011 - 9/06/2007 - 9/06/2007 - 9/06/2007 - 9/06/2007 - 9/06/2007 - 9/06/2007 - 9/06/2007 -	ots; mostly at the lotes:  - Paint Stl Flootheams Structure Floorbeams Structure Floorbeams University Same comment Rusty spots thrust blisters and 10.91 * 42 = 45 especially under lotes:	r Beam  2 y paint, rus n previous ow dirty pa der leaky j loose rive its with pail roughout th	t blisters, and s inspections exi int, some peeli oints show rust t; not a problem t loss, pitting a e floorbeams. at connections. I are in contact	m. surface p cept alitt ng, and blisters n. nd som Worse n with the	poitting in those the more pair rust blisters, pitting, pair te tight pack rust is in arease steel string	se areas of past nt loss and rust on those under rust also noted as under leaking ers.	leakage and whenoted. the leaky joints. It or section loss in and mostly near the section loss in the sect	ere water can ga  No change on 3i  open rust blister  the leaking joints	wither.  In the state of the st	FPD GCC from ZQD pack ZZB SZM V YAD



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= 500	cription	* * * * * *								
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
٠,	- R/Conc Colur	nn Pier 21	thru 26		'					
	1	3	8	ea.		90	5	5	0	
	•			04.						
						%	%	%	%	
Previous Insp	ection Notes :									
9/05/2013 - 9	Spalls and dela	imination a	along edges of	the ice I	breaker's ste	el. Tight cracks	from corners of ic	e breakers steel	on Pier 22 and 23.	FPD
9/06/2011 - !	No change from	n previous	inspections.							GCC
	0	cking behir	nd the ice breat	cers with	h small spalls	and a couple of	small delaminati	ons. Some rust a	and scale on ice	ZQD
oreaker steel. 08/27/2007 - 1		n has a sr	mall enall with s	tainina	at the ton-We	est corner of the	ica hraakar Rus	ty enote through	out the ice breakers	zzbz
			•	Ŭ				, ,	eel ice breakers are	
	on the concrete			ııııasııu	icture Engine	ers August 24, 2	.000 underwater i	rispection, the st	eerice breakers are	3ZIVI
				ru 26.	Rusty steel o	n the upstream i	ce breaker.			YAD
9/27/2001 - [	Minor shrinkag	e cracks.	Need to look at	the col	umns closer	when snoopered	or with a boat to	get closer to the	m.	NIBL
9/02/1998 - 1	Two columns a	t Bent 27(	Tower Span).	One col	umn at Piers	21 - 26.				GKL
Inspection N	lotes:									
mopeodion 14										
	2/2 2 1 2									
lement 220 -	- R/C Sub Pile		Pier 24 and 25							
	1	3	2	ea.		100	0	0	0	
						%	%	%	%	
revious Insp	ection Notes :		1							
9/05/2013 - 1	Refer to UW IN	Ispection								FPD
		•	inspection ren	ort by In	ifrastructura F	Engineers there i	s no change to th	nis alamant sinca	the 2006 inspection	
CRH	i ci ilic zo i i u	idei watei	пореспол терс	nt by in		ingineers there i	3 no change to th	iis cicificiti sirioc	the 2000 mapeedion	000
8/25/2009 - I	Information is in	n latest un	derwater inspe	ction.						ZQD.
8/27/2007 - (	Check on the la	atest Unde	rwater II report							ZZB
							s August 24, 200	6 underwater ins	pection, there is	SZM
			ndary rebar at Diving Co.'s un			on the west side	e of pier 5.			YAD
)9/27/2001 - I		ii Guuiile i	Diving Co. s un	ueiwaid	ы тероп.					NIBL
		C. I. Iva al a mass	-t lti	7/4/5/00	) (O. 4h mi - Di.	: C-\				
19/02/1998 - 1	LVV - Piers 4 &	5 Underwa	ater inspection	7/15/98	(Guthrie Div	ing Co) Expos	ed footings in goo	oa condition		GKL
Inspection N	otes:									
lement 227	- R/C Submerg	ed Pile F	Pier 22 thru 26							
	1	3	5	ea.		90	10	0	0	
						%	%	%	%	
revieue Inen	action Notes :		<u> </u>						/ 1	
	ection Notes :									
·	Refer to UW IN	•								FPD.
19/05/2013 - I		a alament						rete and steel ice	breaker interfaces	of GCC
9/05/2013 - I 9/06/2011 - I	Per the 2011 u		are are concret		n me concret	- 41 - 1-15 3 400	7. UKH			
9/05/2013 - I 9/06/2011 - I ne substructu	Per the 2011 uures. The steel	I Ice break	ers are separat t underwater ins							ZQD
9/05/2013 - I 9/06/2011 - I ne substructu 8/25/2009 - I	Per the 2011 uures. The steel Information is c	I Ice breake on the past	t underwater ins	spection		o at 1 ioio o ana				
9/05/2013 - I 9/06/2011 - I ne substructu 8/25/2009 - I 8/27/2007 - (	Per the 2011 uures. The steel Information is c Check on the la	I Ice breake on the past atest Unde	t underwater ins erwater II report	spection	٦.		Per Infractructure	Engineers Augus	et 24, 2006 undonus	ZZB
9/05/2013 - I 9/06/2011 - I ne substructu 8/25/2009 - I 8/27/2007 - G 6/28/2005 - I nspection. S	Per the 2011 ulures. The steel Information is contact the latest t	I Ice breake on the past atest Unde til the next ent at the ce	t underwater ins rwater II report underwater ins concrete/steel in	spection pection	n.  Condition s s of the subs	states changed F	Per Infrastructure	Engineers Augus	st 24, 2006 underwa	ZZB
9/05/2013 - 1 9/06/2011 - 1 the substructu 08/25/2009 - 1 08/27/2007 - 0 06/28/2005 - 1 the spection. S	Per the 2011 ulures. The steel Information is contact the latest t	I Ice breake on the past atest Unde til the next ent at the ce	t underwater ins rwater II report underwater ins	spection pection	n.  Condition s s of the subs	states changed F	Per Infrastructure	Engineers Augus	st 24, 2006 underwa	ZQD ZZB: ater SZW YAD
9/05/2013 - I 9/06/2011 - I ne substructu 8/25/2009 - I 8/27/2007 - 0 6/28/2005 - I nspection. S	Per the 2011 ures. The steel Information is continuous Check on the launchanged unitipalling is presented.	I Ice breake on the past atest Unde til the next ent at the ce	t underwater ins rwater II report underwater ins concrete/steel in	spection pection	n.  Condition s s of the subs	states changed F	Per Infrastructure	Engineers Augus	st 24, 2006 underwa	ZZB. ater SZM
9/05/2013 - I 9/06/2011 - I ne substructu 8/25/2009 - I 8/27/2005 - I nspection. S 7/24/2003 - I 9/27/2001 - I	Per the 2011 ures. The steel Information is of Check on the last Unchanged unitipalling is present Information from None  LW Piers 3,4	I Ice breake on the past atest Unde til the next ent at the co m Guthrie I	t underwater ins erwater II report underwater ins concrete/steel in Diving Co.'s un	spection  pection  terface derwate	n. Condition s s of the subster report.	states changed F tructures.	Per Infrastructure			ZZB ater SZM YAD

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\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder - Spans 21 thru 26 (cont.) \* \* \* \* \* \* \* \*

	cription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
lement 234	- R/Conc Cap	Pier 21 thr	ru 26				<u>.</u>			
	1	2	65	m.		90	5	5	0	
						%	%	%	%	
revious Ins	pection Notes :									
9/05/2013 -	Spall with expo	sed rebar	on centerline of	f Pier 23	3's cap. Son	ne delaminations	s noted on all of th	ne caps; mostly s	small surface type.	FPDZ
9/06/2011 -	No change from	m previous	inspections. B	lown of	f during the s	snooper inspecti	ons.			GCC'
				with a c	ouple more o	of the caps show	ving some diagona	al cracks. Caps a	also have some	ZQDZ
	leaking deck o Cap at Pier 24			rebar o	n the Top-Le	ft side on the un	derside of the car	o. Cap at Pier 2	3 has a diagonal cr	ack ZZBZ
om G1 to th	e column conn	ectiona are	a; digital photo	2115.	·		·	'	J	
	Tight and mind			•	ag of concret	e under leaking	iointo			SZM YADZ
	6 * 10.91 = 65.	•	Topons. Some	o otali ili	ig or concret	o under leaking	jonits.			NIBL
linor crackir	ng on hammer h	neads. Nee		at with	snooper.					
9/02/1998 -	Some cracking	, but minor	at this time.							GKLI
										REF
99/01/1992 - Inspection N		nt Seal Pie	er 22, 23, 25, ar	nd 26						REF
Inspection N	Notes:	nt Seal Pie	er 22, 23, 25, aı 44			95	5	0		REF
Inspection N	lotes: - Pourable Joir					95	5 %	0 %	%	REF
Inspection N	lotes: - Pourable Joir								%	REF
lement 301 Irevious Insp	- Pourable Joir 1 Dection Notes :	3	44	m.	nall area of P	%	%	%	% s sound solid when	REF
lement 301  Irevious Insp 9/05/2013 -	- Pourable Joir 1 Dection Notes :	3 erally in Go	44 od condition w	m.	nall area of P	%	%	%		
Previous Inspection No. 19/05/2013 - apped on. 19/06/2011 -	- Pourable Joir 1 Dection Notes: Sealant is generally sealant in	erally in Go	44 od condition w	m. ith a sm		% ier 23's where th	%	% s. Steel portions		FPD:
revious Inspection N 9/05/2013 - apped on. 9/06/2011 - 8/25/2009 - 8/27/2007 -	- Pourable Joir  1 Dection Notes: Sealant is generated the sealant in Torn and missing All have torn or the sealant in the sea	erally in Go June 2011 ing sealant r missing se	od condition wi . in all joints. So	m. ith a sm me spa	lling and dela	% ier 23's where th	% ne sealant is loose	%. Steel portions	s sound solid when	FPD. GCC ZQD
Previous Inspection No. 19/05/2013 - apped on. 19/06/2011 - 18/25/2009 - 18/27/2007 - anchorages. 16/28/2005 -	Pourable Joir  1 Dection Notes: Sealant is generated with the sealant in Torn and missing All have torn on Some nicks to Loose and torn.	erally in Go June 2011 ing sealant r missing se the guard a sealant in	od condition wind all joints. So ealant with leak angles.	m. ith a sm me spa age no	lling and delated undernea	% ier 23's where th amination along ath. All have sor	ne sealant is loose the edges of the me delamiantions	%. Steel portions ioint steel. /spalls in the cor	s sound solid when	FPD GCC ZQD ZZB;
Previous Inspection No. 19/05/2013 - apped on. 19/06/2011 - 19/25/2009 - 19/25/2007 - 19/25/2005	Pourable Joir  1  Dection Notes:  Sealant is generated with the sealant in Torn and missing All have torn on Some nicks to	erally in Go June 2011 ing sealant r missing se the guard a sealant in ider the joir	od condition wind all joints. So ealant with leak angles.	m. ith a sm me spa age no	lling and delated undernea	% ier 23's where th amination along ath. All have sor	ne sealant is loose the edges of the me delamiantions	%. Steel portions ioint steel. /spalls in the cor	s sound solid when	FPD: GCC ZQD: ZZB: pint SZM
Previous Inspection No. 2011 - 2012 -	Pourable Joir  1  Dection Notes: Sealant is generated to seal and the seal and the seal and torreages. Caps units and the seal and torreages. Caps units and the seal and torreages.	erally in Go June 2011 ing sealant r missing se the guard a n sealant in ider the join eport. 64m	od condition wince and in all joints. So ealant with leak angles. all (4) joints. So tts are wet from	m.  me spa  sage no  some di  n an ove	lling and delated underneart/debris in sernight rain.	% ier 23's where th amination along ath. All have sor	ne sealant is loose the edges of the me delamiantions	%. Steel portions ioint steel. /spalls in the cor	s sound solid when	FPD: GCC ZQD: ZZB:

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Continue

	scription		2			5 / 6/ / 4	5 / 0/ / 0	5 , 0, , 0	5 (0) (4	D + O+ + E
١	Scale Factor  3 - Assembly Join	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Herneni 303					J Bent∠ <i>i</i>	0.5				
	1	3	22	m.		95	5	0		
						%	%	%	%	
revious Ins	pection Notes :									
9/05/2013	<ul> <li>Small portion o</li> </ul>	n the Left s	side of the joint	at Pier	24's has bro	ken off. Gland a	ppears to be in G	lood condition.		FPDZ
9/06/2011	- New joints in Ju	une 2011.								GCCY
8/25/2009	- Tears in the gla	and in area	s, leakage, and	d some r	minor damag	ge to the joint sys	tem. Small delan	ninations and spa	alls along the edg	es. ZQDZ
08/27/2007 oted.	- Tears and dam	age to the	joints themselv	ves. And	chorage con	crete has delami	antions or spalls.	Nicks to the me	etal anchorages al	lso ZZBZ
6/28/2005 nights rain.			spalling along t	the joint	anchorages.	. Some areas wh	nere gland is pus	ned down. Leak	age evident after	
7/24/2003	- Same as last re	eport.								YADZ
	- 2 * 10.91 =21.8 se anchorage pl			long tho	anaharagaa					NIBL
11645 01 100	• .	ales. Con	hele spailing a	liong the	anchorages	).				
Inspection		Seal Finge	r Joint at Pior 3	21						
•	5 - Assm Jt w/o S					ad	10	0		
•		Seal Finge	r Joint at Pier 2			90	10	0	Q/	
Element 305	5 - Assm Jt w/o S					90	10	0	%	
Element 305 Previous Ins	5 - Assm Jt w/o S 1 spection Notes :	3	11	m.		%	%	%		
Previous Ins	5 - Assm Jt w/o S  1  pection Notes : - Some spalling	3 on the und	11 erside of the de	m.	e joint. Stee		%	%		FPDZ
Previous Ins 9/05/2013	5 - Assm Jt w/o S  1  pection Notes: - Some spalling of the company of the compan	on the und	erside of the de inspections.	m. eck at th	·	% el sounds solid w	% hen tapped on. F	% Finger alignment	looks Good.	FPDZ GCCY
Previous Ins 9/05/2013 9/06/2011 18/25/2009 Frough under	5 - Assm Jt w/o S  1  pection Notes: - Some spalling of the company of the compan	on the under the previous at on the fin and needs	erside of the de inspections.	m. eck at th	d when tapp	%	% hen tapped on. F	% Finger alignment	looks Good.	FPDZ GCCY
Previous Ins 9/05/2013 99/06/2011 98/25/2009 Frough unde 18/27/2007	5 - Assm Jt w/o S  1  pection Notes: - Some spalling - No change from - Good alignment or joint is torn up - No change from	on the und in previous at on the fin and needs in the previous	erside of the de inspections. agers, steel sous some repair/nous reports.	m. eck at th unds soli nodificat	d when tapp ions.	% el sounds solid w	% hen tapped on. F	% Finger alignment aminations along	looks Good.	FPDZ GCCY ZQDZ
revious Ins 9/05/2013 9/06/2011 8/25/2009 rough unde 8/27/2007	5 - Assm Jt w/o S  1  pection Notes: - Some spalling - No change from - Good alignment or joint is torn up - No change from	on the under previous and needs an the previous and delami	erside of the de inspections. Ingers, steel sous some repair/nous reports. Ination along the	m. eck at th unds soli	d when tapp ions. dges. Finge	% sounds solid wheel on, and some	% hen tapped on. F	% Finger alignment aminations along	looks Good.	FPDZ GCCY ZQDZ ZZBZ SZMI
Previous Ins 9/05/2013 9/06/2011 8/25/2009 rough unde 8/27/2007 6/28/2005	5 - Assm Jt w/o S  1  spection Notes: - Some spalling - No change from - Good alignment er joint is torn up - No change from - No change from - Minor spalling a	on the under previous and needs in the previous and delaminain system	erside of the de inspections. Ingers, steel sous some repair/nous reports. Ination along the	m. eck at th unds soli	d when tapp ions. dges. Finge	% sounds solid wheel on, and some	% hen tapped on. F	% Finger alignment aminations along	looks Good.	FPDZ GCCY ZQDZ ZZBZ SZMI
Previous Ins 19/05/2013 19/06/2011 18/25/2009 17/04/2005 17/24/2003 19/27/2001	pection Notes: Some spalling No change from Good alignment or joint is torn up No change from Minor spalling a Trough and dra 10.91 * 1 = 10.	on the und in previous at on the fin and needs in the previous and delamitation system 91m	erside of the de inspections.  Ingers, steel sous some repair/nous reports.  Ination along the is in need of clean	m. eck at th unds soli	d when tapp ions. dges. Finge	% sounds solid wheel on, and some	% hen tapped on. F	% Finger alignment aminations along	looks Good.	FPDZ GCCY ZQDZ ZZBZ SZMI YADZ
lement 305 revious Ins 9/05/2013 9/06/2011 8/25/2009 rough unde 8/27/2007 6/28/2005 7/24/2003 9/27/2001 tusty areas	appection Notes: Some spalling No change from Good alignment or joint is torn up No change from Minor spalling a Trough and dra 10.91 * 1 = 10.1 Some spalling	on the und in previous at on the fin and needs in the previous and delamitation system 91m	erside of the de inspections.  Ingers, steel sous some repair/nous reports.  Ination along the is in need of clean	m. eck at th unds soli	d when tapp ions. dges. Finge	% sounds solid wheel on, and some	% hen tapped on. F	% Finger alignment aminations along	looks Good.	FPDZ GCCY ZQDZ ZZBZ SZMI YADZ NIBL

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		•			•	•	•		
Element Description									
Smart Flag Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311 - Moveable Be	earing								
1	3	12	ea.		90	10	0		
					%	%	%	%	
Previous Inspection Notes	:								
09/05/2013 - Spot rust and	paint loss.	Bearing alignm	nent was	to expansion	on slightly today;	85F.			FPDZ
09/06/2011 - No change fro	m previous	inspections. E	Blown off	f and overco	oat painted during	g the snooper ins	pection.		GCCY
08/25/2009 - Bearings were	e cleaned s	ome and spot p	ainted. I	Bearings at	Bent 27 tower sp	oan, are rocked to	owards expansio	n. Remaining bea	ring ZQDZ
allignments are good. 08/27/2007 - Bearings were	e blown off :	and overcoat pa	ainted di	uring the sno	ooper inspection	Alignment was	tolerable except	for those at Bent	ZZBZ
27/Tower Span. These are	at maximu	m expansion/al	head on						
06/28/2005 - Rusty, pitting,	•	•							SZMI
07/24/2003 - Rusty with soi			and sand	ding materia	il. Some cleanin	g done when sno	oper inspection	was done.	YADZ
09/27/2001 - Env. State #3 Debris from bird nests and		0,	ere visib	ole. Need to	verify numbers	and condition wh	en snoopered.		NIBL
09/02/1998 - None		ŭ					·		GKLH
09/01/1992 - None									REFI
Element 313 - Fixed Bearin					0.5	F	0		
1	1	4	ea.		95		0		
					%	%	%	%	
Previous Inspection Notes									
09/05/2013 - Steel portion i			_						FPDZ
09/06/2011 - No change fro					•	g the snooper ins	pection.		GCCY
08/25/2009 - Spot rost and				where able	to get at.				ZQDZ
08/27/2007 - Blown off and	•		ed.						ZZBZ
06/28/2005 - Some rust, pit			a naar b	ooringo Co	omo olooning wo	a dana whan ana	oner innecation	waa dana	SZMI YADZ
07/24/2003 - Some minor r 09/27/2001 - Rusty spots.	· ·			Ŭ	· ·	s done when sho	oper impsection (	was done.	NIBL
09/02/1998 - None	NCEU IO VEI	my numbers an	a condit	ions whell s	поорегеи.				GKLH
09/01/1992 - None									REFI
Inspection Notes:									

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Continue

\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder - Spans 21 thru 26 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Fnv Quantity Element 334 - Metal Rail Coated 3 591 m. 60 25 10 % % Previous Inspection Notes: 09/05/2013 - Rusty spots, thin paint, exposed base paint, rusted post webs at the curb line with section loss to the webs. On-going repairs to the rails. Delaminated and spalling on the curbs. 09/06/2011 - No change from previous inspections. Reapired some rail on the Left side in June 2011. Noted seveal posts and panels damaged over the Labor Day Weekend on the Rigth side near the West Abutment. 08/25/2009 - Same comments as past inspections. Several post have been repaired where webs have been rotted away. 08/27/2007 - 5th post from Pier 26 on the Right/Median side is broken loose from the concrete. One bent post in Span 23 on the Right side. Lots of rust in the lower rail post webs causing section loss. Posts have been hit and bent over as web crumples. Most of the top coat of paint is faded to the primer coat. 2007/09/10. Bent posts straightened and fixed today. 06/28/2005 - Faded paint and rust spots where paint is chipped off. Red primer coat is coming through in most of the rail. A couple of areas rattle under traffic. (295.66 \* 2 = 591.32) Nate 07/24/2003 - Same as last report. 09/27/2001 - 306.75 \* 2 = 613.50m Paint is chaulky and pitted from sanding material. Rusty spots throughout. Rattling with some loose areas noted when traffic is crossing. 09/02/1998 - Minor areas of rust throughout. 09/01/1992 - None Inspection Notes: Element 357 - Sup Pack Rust SmFlag none Χ 3 Χ 100 ea. % % % % Previous Inspection Notes: 09/05/2013 - Swelling between connection plates. No distress visible to the rivets. 09/06/2011 - No change from previous inspections. 08/25/2009 - Minor swelling between some of the conection plates exists. Inspection Notes: Element 358 - Deck Cracking SmFlag none X 3 Χ 100 ea. % % % Previous Inspection Notes: 09/05/2013 - Mapping cracks in all Spans. Condition State 2 due to quantity. 09/06/2011 - Removed and replaced 2" of the existing surface with Silica Fume Concrete in June 2011. 08/25/2009 - Added due to the quantity and size of cracking in this deck. Inspection Notes:

Inspection Notes:

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\* \* \* \* \* \* \* \* \* Span : Main-0 - Steel Girder - Spans 21 thru 26 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 359 - Soffit Smart Flag X 100 1 ea. 0 0 % % % Previous Inspection Notes: 09/05/2013 - Spalling and deteriorated concrete throughout. Exposed and rusty rebar under post areas with delaminated concrete. 09/06/2011 - No change from previous inspections, but continueing to get worse. 08/25/2009 - Outlets on the drains show deteriorated and crumbling concrete with exposed and rusty reiforcing steel. Spalling and delaminated areas throughout underside of the curbs. 08/27/2007 - Same and lots of it throughout the bridge; see photos. 06/28/2005 - Unchanged from last report or maybe slightly more deterioration/spalling. 07/24/2003 - The outlets of the drain scuppers are deteriorating with some exposed and rusting reinforcing steel. Some deteriorating concrete is falling off and/or is loose. Inspection Notes: \* \* \* \* \* \* \* \* \* Span : Appr-1 - Steel Girders - Spans 1 thru 20 \* \* \* \* \* \* \* \* Element Description Smart Flag | Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 12 - Bare Concrete Deck 3 3609 Χ 100 sq.m. 0 % % % % % Previous Inspection Notes: 09/05/2013 - (1) small delamination found along Bent 5 and Bent 9's joints. Deck looks Good with minor wear in the wheel paths. Lots of mapping cracks. 09/06/2011 - Removed and replaced 2" of the existing surface with Silica Fume Concrete in June 2011. 08/25/2009 - Poor skid resistance, and wear from studded tires. Helena did an indepth scan of delamination and spalling in the deck this past summer and their report is in Helena. 08/27/2007 - Quick chain drag showed delaminations or spalls every 30 to 40 ft or less than 10 percent for Condition State 3; may be more with a more through evaluation. Delaimantions/spalls concrete at the joint anchorages. Rest of the previous comments still apply. 06/28/2005 - Mapping cracks throughout all spans with some small areas of delamination and spalling; probably less than 2 percent. Very little skid resistance with wear in the wheel paths. (330.83 \* 10.91 = 3609.36) Nate. 07/24/2003 - Same on deck comments and on scuppers. Wear on deck with some exposed aggregate. Tight mapping cracks throughout the deck. Soffitt smart flag for popouts around scuppers. 09/27/2001 - 331.12 \* 10.91 = 3613.39 Cracking throughout. Some concrete is poping out under all drain scuppers with some exposed reinforcing steel. Some concrete popouts along the top flange of the main girders. 09/02/1998 - minor cracking throughout.

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\* \* \* \* \* \* \* \* \* Span : Appr-1 - Steel Girders - Spans 1 thru 20 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 107 - Paint Stl Opn Girder 2 1323 m. 80 10 0 % % % Previous Inspection Notes: 09/05/2013 - Bottom flanges have rust blisters and minor pitting on their tops. Areas near the joints have heavy rust and paint loss from past leakage. Faded and dirty paint. 09/06/2011 - No change from previous inspections with a little more paint loss and rust noted. 08/25/2009 - Rust blisters with some minor surface pitting on the tops of the bottom flanges in areas that moisture is collecting. Rust and some cracking of the welds on the bottom cover plates in areas that water has gotten between the cover and bottom flange. 08/27/2007 - Spots of rust on the bottom flanges of the outside girders; especially where the drains are dumping water onto them. Rust blisters show surface pitting when cleaned off. Also the same as previous comments. 06/28/2005 - Rust and scale along the underside of the deck where the top flange is against the concrete. Areas under leaky joints are the worse. (4 \* 330.83 = 1323.32) Nate. 07/24/2003 - Rusty spots along the upper flanges to concrete area. Ends of girders under leaking joints show some minor blistering rust. 09/27/2001 - 4 \* 331.2m = 1324.8m Rusty spots under the joints with some rust spots at the top flange to concrete connection. 09/02/1998 -Inspection Notes: Element 178 - Painted Trans Girder Bent 21 3 11 80 15 m. % % Previous Inspection Notes : 09/05/2013 - Heavy rust, scale, rust blisters, and surface pitting where water can sit. 09/06/2011 - No change from previous inspections with a little more paint loss and rust noted. 08/25/2009 - Dirty. rust, scale and some acctive corrsion in areas that moisture is collecting. 08/27/2007 - Dirty, stained, and some rusty spots. 06/28/2005 - Same as last report. 07/24/2003 - Step up girder to make up difference in girder heights. (4) girders on top and supported by (2) bearings. Some areas of rust 09/27/2001 - 10.91 \* 1 = 10.91m Env. State #3 as under an open joint. Rusty spots at the connections. Inspection Notes:

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\* \* Span : Appr-1 - Steel Girders - Spans 1 thru 20 (cont.) \* \* \* \* \* \* \* \* Element Description Smart Flag Scale Factor Env Quantity Units Insp Each Pct Stat 1 Pct Stat 2 Pct Stat 3 Pct Stat 4 Pct Stat 5 Element 205 - R/Conc Column Bent 2 thru 20 2 23 ea 85 10 % % % Previous Inspection Notes: 09/05/2013 - Spalling and delaminations on Bent 5's. Vertical cracking along edges on some. Surface spalls from shallow tie wire. Staining on those under leaky areas. 09/06/2011 - No change from previous inspections. 08/25/2009 - Delams and spalls on bent 5 about 6 feet up. Several with small spalls and staining on those that have some leakage from above. 08/27/2007 - 5 percent in Condition State 3 for exposed rebar chair feet. Also exposed rebar and rust at Bent 3 thru 5. Several have small delamianted areas. Bent 9's column has a spall on the Left corner. 06/28/2005 - Columns at Bents 3 thru 5 have some spalls on them. Rebar is rusted in these areas. Same on the shrinkage cracks. 07/24/2003 - Minor and tight shrinkage cracks on surface of concrete of most columns. Some scrapes on a couple of the columns from vehicle activity under the structure. 09/27/2001 - Minor cracking throughout. Minor shrinkage cracks. 09/02/1998 - 4 bents with 2 columns per (+) 15 bents with 1 column per = 23 Inspection Notes: Element 215 - R/Conc Abutment Abutment 1-East 2 % % % % Previous Inspection Notes: .09/05/2013 - Generally Good condition. Some tight cracks in the backwall concrete. Water leaking through the backwall to cap areas. Small spall on the Left wignwall edge at the groundline. 09/06/2011 - No change from previous inspections. 08/25/2009 - Tight cracks in abutment backwalls and wingwalls. Area is damp from leakage. All prior remarks still apply. 08/27/2007 - leaking at Abutment has area is damp. Lots of sanding material on the cap. Tight cracks in the Abutment's backwall and wingwalls. Some moderate erosion from under the Abutment towards Bent 2. 06/28/2005 - Same as last report and add some small spalls where the girders are embedded. 07/24/2003 - Minor and tight cracking in Abutment backwall. Some graffti painted on the backwall and girder ends. 09/27/2001 - 14.81 \* 1 = 14.81m Minor cracking in the Abutment backwalls. 09/02/1998 -Inspection Notes:



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Element Des	orintion		· · · · · Span	: Appı	r-1 - Steel G	irders - Spans	1 thru 20 (CONt.	) ^ ^ ^ ^ ^ ^ ^ ^ ^		
	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	- R/Conc Cap		,	Onno	mop Edon	r or orar r	r or orar 2	. or orar o	1 or orac 1	
	1	2	219	m.		85	10	5	0	
						%	%	%	%	%
Previous Inst	pection Notes :									
			d leaking deck i	ninte (	Snalling from	shallow rehar o	hairs and tie wire	Cracks with eff	lorescence on end	ds of FPDZ
some of the o		ations on B	ent 6, 9, and 15		Spannig Iron	i sitaliow repair o	nans and tie wire	. Oracks with on	oresective of ene	GCCY
08/25/2009 -	Same commer	nts as prior	inspections.							ZQDZ
side's Left co delamianted	rner. Bent 6 ha area near cent	as a 2'(w) x erline on th	1'(h) delamina	tion und	der G1Ś6. B	ent 15's cap has	s a 1' x 1' spall on	the underside of	a spall on the Spa the Right end and Lots of staining un	da
06/28/2005 -	Same as previ	ous reports			d of the caps	under the beari	ngs at Bents 3 an	d 4 show some o	cracking and spalli	ing SZMI
	ning from leaki Same as previ		ld that the south	n end of	f the cap at E	Bent 2 is cracked	d with delaminated	d concrete. Som	e minor delaminat	ions YADZ
also noted at		n the colum	nn to cap conne							NIBL
Minor cracks	at ends of seve	eral caps.	Need to look at	with sn	ooper for co	ndition state.				
09/02/1998 -	Some cracking	g, but minoi	Ī							GKLH
Element 301	- Pourable Joir	nt Seal Be	ents 3(skewed),	5(Skev	ved), 6, 9, 12	2, 15, and 18				
	1	3	82	m.		95	5	0		
						%	%	%	%	%
Previous Insp	ection Notes :	1	I.				<u> </u>		1	
	Generally in G	ood conditi	on. A couple o	f small	tears in the s	sealant at Bents	3, 6, and 12. Sea	alant looks adher	ed in most of the a	areas FPDZ
of the joints. 09/06/2011 -	New Silicone s	sealant and	joints in June 2	2011.						GCCY
08/25/2009 -	Torn and miss	ing joint ma	aterial. Spalling	and de	laminations a	along edges of jo	oint steel. Most of	the steel sounde	ed solid when it wa	s ZQDZ
	Some loose or	missing jo	int material. So	me del	aminated co	ncrete along the	joint anchorages	, but the steel so	unds solid when	ZZBZ
tapped on. 06/28/2005 - edges.	These joints co	ould be con	npression joint	glands.	Same as pr	revious reports w	vith loose materia	l and dealaminat	ions along the join	t SZMI
	Leaking. Area	s of loose j	oint material. N	/linor sp	alling and d	elaminations alo	ng the joint ancho	orages.		YADZ
						are perpendicu is spalled along	lar. both sides of the	anchorages.		NIBL
09/02/1998 -	Sliding Plate J	oints at Be	nts 11, 14, 17, 2	20, 23, 2	24 & 26.					GKLH
Inspection N	lotes:									

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Element Des	cription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311	- Moveable Be	aring								
	1	3	56	ea.		80	15		5	
						%	%	9,	%	
Previous Insp	pection Notes :									
)9/05/2013 -	Some of the be	earings are	at maximum m	ovemer	nt with bendi	ng of the ancho	bolts: 90F. Deb	ris, faded paint	, rust, and scale on	the FPD
earings.	No change from					<b>J</b>		.,	,,	GCC
	_	·	·	no durir	na tha snaan	or inspection L	eft 5 percent in st	ato 2 for alligan	nont	ZQE
	·	•	· ·		•	•	•	· ·		
			Additional con				ted. Several of the	ne bearings are	at maximum move	ement ZZE
	Areas of rust, p									SZN
7/24/2003 -	Still need to ve	rify numbe	rs with next sno	oper in	enection					
0/07/0004				•	эрссион.					
19/27/2001 -	Rusty with som	ne debris. '	Verify numbers			snooper.				NIB
	-	ne debris. '	Verify numbers			snooper.				NIB GKL
09/02/1998 - Inspection N	-		Verify numbers			snooper.				
09/02/1998 - Inspection N	- lotes:		Verify numbers	and cor		snooper.	10		0	
09/02/1998 - Inspection N	- lotes: - Fixed Bearing	9		and cor			10		0 %	
Inspection N	- lotes: - Fixed Bearing	9		and cor		90				
Inspection N Element 313	- lotes: - Fixed Bearing 1	2	56	and cor		90				
Inspection Number of the Inspection Number of	- Fixed Bearing 1 Dection Notes :	2 2 ant loss, and	56 scale.	and cor		90				GKL
Previous Insp 09/05/2013 -	- Fixed Bearing 1 Dection Notes: Dirty, rust, pair	2 2 ant loss, and m previous	scale.	ea.	ndition with s	90		9	%	GKL FPC
Previous Insp 09/02/1998 - Inspection N Element 313 Previous Insp 09/05/2013 - 09/06/2011 - 08/25/2009 - 08/27/2007 -	- Fixed Bearing 1 Dection Notes: Dirty, rust, pair No change from Dirty, some rus 5 percent in Co	2  It loss, and m previous st, debris, a	scale. inspections. and scale. Some	ea.	ndition with s	90 % painting was do	% ne during the sno	oper inspection	%	GKL FPE GCC ZQE
Previous Insp 09/02/1998 - Inspection N Element 313 Previous Insp 09/05/2013 - 09/06/2011 - 08/25/2009 - 08/27/2007 - come of the b	- Fixed Bearing 1 Dection Notes: Dirty, rust, pair No change from Dirty, some rus 5 percent in Co	2  nt loss, and m previous st, debris, a	scale. inspections. and scale. Some	ea.	ndition with s	90 % painting was do	% ne during the sno	oper inspection	6 % n.	GKL FPE GCC ZQE
Previous Insp 19/02/1998 - Inspection N Element 313 Previous Insp 19/05/2013 - 19/06/2011 - 18/25/2009 - 18/27/2007 - 18/27/2007 - 18/28/2005 -	- Fixed Bearing 1 Dection Notes: Dirty, rust, pair No change fror Dirty, some rus 5 percent in Copearings. Areas of rust, p	2  It loss, and m previous st, debris, a condition State condition State coaint loss, a	scale. inspections. and scale. Some	ea.	ndition with s	90 % painting was do	% ne during the sno	oper inspection	6 % n.	FPC GCC ZQC of ZZE
Previous Insp 09/05/2013 - 09/05/2013 - 09/06/2011 - 08/25/2009 - 08/25/2007 - come of the b 06/28/2005 - 07/24/2003 -	- Fixed Bearing 1 Dection Notes: Dirty, rust, pair No change fror Dirty, some rus 5 percent in Copearings. Areas of rust, p	2  at loss, and m previous st, debris, a condition State condi	scale. inspections. and scale. Some ate 3 due to rus and debris. rs with next sno	ea.	ng and spot tting. Some	90 % painting was do	% ne during the sno	oper inspection	6 % n.	FPC GCC ZQC of ZZB SZM
Previous Insp 09/02/1998 - Inspection N Element 313 Previous Insp 09/05/2013 - 09/06/2011 - 08/25/2009 - 08/27/2007 - 06/28/2005 - 07/24/2003 -	- Fixed Bearing 1  Dection Notes:  Dirty, rust, pair No change from Dirty, some rust 5 percent in Content of the content of th	2  at loss, and m previous st, debris, a condition State condi	scale. inspections. and scale. Some ate 3 due to rus and debris. rs with next sno	ea.	ng and spot tting. Some	90 % painting was do dirt and debris a	% ne during the sno	oper inspection	6 % n.	FPE GCC ZQE of ZZE SZN YAE

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	scription									
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 334	I - Metal Rail Co	ated		1		· ·		1	<u> </u>	
	1	3	662	m.		60	25	10	5	
						%	%	%	%	9
revious Ins	spection Notes :									
rails. Delam 09/06/2011 08/25/2009 still has rust the web in tl 08/27/2007	ninated and spall No change from Sanding materi minor paint loss ne rotted areas.	ing on the man previous ial packed s, and top on the lower ra	curbs. inspections. R in the posts we coat worn dowr	Replaced ebs near to n to a fade	rail posts a the curbs ha led primer c	nd panels in (2) a as rusted and we oat. Some posts	areas in June 20° akened the posts that were bent o	11. s. This span is in ver have been re	n-going repairs to the best condition epaired by reinforce les. Most of the to	GCCY n, but ZQDZ cing
06/28/2005 330.83 * 2 : 07/24/2003 09/27/2001 Rusty spots	- Faded paint an = 661.66) Nate. - Same as previo - 331.2 * 2 = 662 . Chaulky paint v	d rust whe ous report. 2.4m with some	re paint is chip	on the N	lorth side of	•			e Right rail near Be	YADZ NIBL
06/28/2005 (330.83 * 2 : 07/24/2003 09/27/2001 Rusty spots	- Faded paint an = 661.66) Nate. - Same as previo - 331.2 * 2 = 662 Chaulky paint to - Some rusing th	d rust whe ous report. 2.4m with some	re paint is chip	on the N	lorth side of	•			•	YADZ
06/28/2005 (330.83 * 2 : 07/24/2003 09/27/2001 Rusty spots 09/02/1998	- Faded paint an = 661.66) Nate. - Same as previo - 331.2 * 2 = 662 Chaulky paint to - Some rusing th	d rust whe ous report. 2.4m with some iroughout.	re paint is chip	on the N	orth side of	the structure bea	ar Bent 2 under h	neavy loads in th	•	YADZ NIBL
06/28/2005 (330.83 * 2 07/24/2003 09/27/2001 Rusty spots 09/02/1998	- Faded paint an = 661.66) Nate. - Same as previd - 331.2 * 2 = 662 . Chaulky paint v - Some rusing th Notes:	d rust whe ous report. 2.4m with some iroughout.	re paint is chip	on the N	orth side of	•	ar Bent 2 under h	neavy loads in th	•	YADZ NIBL
06/28/2005 (330.83 * 2 07/24/2003 09/27/2001 Rusty spots 09/02/1998 Inspection	- Faded paint an e 661.66) Nate Same as previor - 331.2 * 2 = 662. Chaulky paint - Some rusing the Notes:	d rust whe ous report. 2.4m with some troughout.	re paint is chip	on the Noint system  Span:	lorth side of n. Appr-2 - T	the structure beautiful to the structure beautif	ar Bent 2 under h	neavy loads in th	e left traffic lane.	YADZ NIBL GKLH
06/28/2005 330.83 * 2 07/24/2003 09/27/2001 Rusty spots 09/02/1998 Inspection	- Faded paint an e 661.66) Nate Same as previor 331.2 * 2 = 662. Chaulky paint to Some rusing the Notes:	d rust whe ous report. 2.4m with some roughout.  * *	re paint is chip	on the Noint system  Span:	orth side of	the structure bea	ar Bent 2 under h	neavy loads in th	•	YADZ NIBL
06/28/2005 330.83 * 2 07/24/2003 09/27/2001 Rusty spots 09/02/1998 Inspection	- Faded paint an e 661.66) Nate Same as previorable as a specific control of the control of t	d rust whe bus report. 2.4m with some iroughout.  * *	re paint is chipped Rail is rattling chips in the paint	on the Notint system  Span:	n.  Appr-2 - T	Tower Abutment  Pct Stat 1	ar Bent 2 under h	*****  Pct Stat 3	e left traffic lane.  Pct Stat 4	YADZ NIBL GKLH
06/28/2005 330.83 * 2 07/24/2003 09/27/2001 Rusty spots 09/02/1998 Inspection	- Faded paint an e 661.66) Nate Same as previor 331.2 * 2 = 662. Chaulky paint to Some rusing the Notes:	d rust whe ous report. 2.4m with some roughout.  * *	re paint is chipped Rail is rattling chips in the paint	on the Noint system  Span:	lorth side of n. Appr-2 - T	the structure beautiful to the structure beautif	ar Bent 2 under h	neavy loads in th	e left traffic lane.	YADZ NIBL GKLH

08/27/2007 - 11.30 \* 10.91 = 123.28 Some wear in the wheel paths with reduced skid resistance. Some delamianted concrete along the joint.

09/06/2011 - Removed and then replaced top 2" with Silica Fume Concrete in June 2011. 08/25/2009 - Wear from studded tires. Small delaminated area near the guard angle.

Some tight mapping cracks throughout.

Inspection Notes:

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\* \* \* \* \* \* \* \* \* Span : Appr-2 - Tower Abutment - Span 27 (cont.) \* \* \* \* \* \* \* \*

				•		r Abutment - S	( ( ) ( ) ( )			
Element Descri	otion									
Smart Flag S	cale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 215 - F	R/Conc Abutr	nent Abuti	ment 27							
	1	2	33	m.		95	5	0	0	
						%	%	%	%	
Previous Inspec	tion Notes :									
l 09/05/2013 - Sc	me tight cra	cking in are	eas near the en	d posts	. Face of the	e backwall has s	ome tight cracks.			FPDZ
09/06/2011 - No	change fror	n previous	inspections.	·			ŭ			GCCY
08/25/2009 - Mi area of the bear 08/27/2007 - No	ings.						ackwall and girde	r ends. Some di	rt and debris sitting	ZQDZ ZZBZ
06/28/2005 - Sa	· ·		· ·		ŭ					SZMI
						vingwalls. Tight	shrinkage cracks	on the Abutme	nt backwall face.	YADZ
09/27/2001 - 11					u u o.,.o .		oago o.aoo		n bachman nacci	NIBL
09/02/1998 - No										GKLH
09/01/1992 - No										REFI
Element 334 - N	Metal Rail Co	ated 3	22	m.		70	25	5	O	
						%	%	%	%	
	e N					70	70	70	70	
Previous Inspec										
09/05/2013 - Ru past traffic hits.	isty spots, th	in paint, ex	cposed base pa	ınt, rusi	ted post web	s at the curb line	e with section loss	to the webs. S	crapes and dings fro	m FPDZ
09/06/2011 - No	change fror	m previous	inspections.							GCCY
08/25/2009 - Sa	inding mater	ial packed	in the posts we	bs near	the curbs. C	Concrete end pos	sts are in good co	ndition.		ZQDZ
							eakened the post	s. This span is i	n the best condition,	ZZBZ
but still has rust	ncrete end p	oosts have	tight shrinkage				eel. Some chips i	n the paint and	primer coat is visible	
the steel in area										YADZ
the steel in area 07/24/2003 - Sa	ime as previ	ous report.								
the steel in area 07/24/2003 - Sa 09/27/2001 - 11 Rusty spots. Cl	me as previ .3 * 2 = 22.6	ous report. m		Paint i	s chaulky.					NIBL GKLH
00/22/2003 - Ct the steel in area 07/24/2003 - Sa 09/27/2001 - 11 Rusty spots. Cl 09/02/1998 Inspection Not	ame as previo .3 * 2 = 22.6 nips from sar	ous report. m		Paint i	s chaulky.					NIBL
he steel in area 07/24/2003 - Sa 09/27/2001 - 11 Rusty spots. Cl 09/02/1998	ame as previo .3 * 2 = 22.6 nips from sar	ous report. m		Paint i	s chaulky.					NIBL

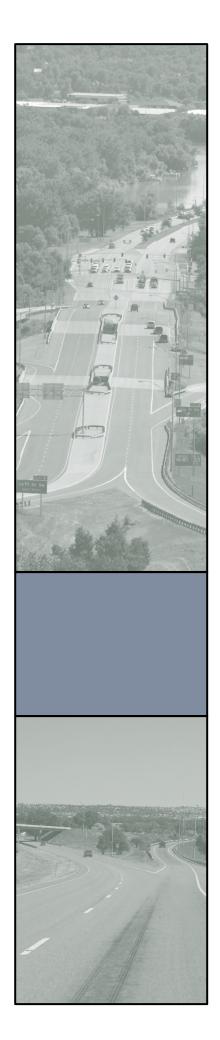


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General Inspection Notes	
09/05/2013 - Snooper truck used on the River Spans and Havre bucket truck on the ground Spans.	FPDZ
09/06/2011 - None	GCCY
08/25/2009 - Paul from Helena Bridge and Crew checked this deck for delaminatin with groung penetrating radar and chain dragging this past summer.	ZQDZ
Watch the alignmnet or any more movement of the bearings on the West end as nearly touching the Tower Abutment wall. 08/27/2007 - None	ZZBZ
06/28/2005 - NBI 58, deck, rated at a "5" due to delaminations and spalling of the deck surface; especially at the joints.  NBI 60, substructure, rated at a "6" due to spalling and deteriorating concrete at columns for Bents 3 and 4. Also some spalling under bearings at Left-Outside of Bents 3 and 4. Per Infrastructure Engineers August 24, 2006 underwater inspection, the inspected substructure units are in satisfactory condition. There is no significant local or general scour present at the bridge site. There are no significant restrictions in the channel that will adversely impact flow. ITEM 61 CHANGED PER INFRASTRUCTURE ENGINEEERS UNDERWATER INSPECTION.  07/24/2003 - Some photos of rust blisters and section loss on the main span girder webs taken during FC inspection.	SZMI YADZ
09/27/2001 - Studded tire wear in the wheel paths.	NIBL
09/02/1998 - None	GKLH
09/01/1992 - Sufficiency Rating Calculation Accepted by ops\$u5963 at 2/26/97 11:10:39 Sufficiency Rating Calculation Accepted by ops\$u9004 at 2/19/97 14:23:34	REFI
01/01/1991 - Updated with tape 1994	NB94
05/01/1989 - Updated with tape 1991	NB91
04/01/1987 - Updated with tape 1989	NB89
10/01/1984 - Updated with tape 1986	NB86
02/01/1981 - Updated with tape 1984	NB84





# **APPENDIX B**

**Traffic Data Collection** 



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 1

#### **Turning Movement Data**

						j iviovcinc	in Data						
		Airpo	rt Rd			Tri Hill I	Frontage						
0		South	bound			North	bound			East	bound		
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	15	13	0	28	4	41	0	45	11	2	0	13	86
7:15 AM	16	15	0	31	1	34	0	35	16	4	0	20	86
7:30 AM	22	29	0	51	2	54	0	56	20	10	0	30	137
7:45 AM	24	26	0	50	4	53	0	57	16	2	0	18	125
Hourly Total	77	83	0	160	11	182	0	193	63	18	0	81	434
8:00 AM	26	19	0	45	2	36	0	38	19	2	0	21	104
8:15 AM	25	14	0	39	1	46	0	47	28	5	0	33	119
8:30 AM	31	13	0	44	0	34	0	34	15	5	0	20	98
8:45 AM	26	6	0	32	0	50	0	50	8	2	0	10	92
Hourly Total	108	52	0	160	3	166	0	169	70	14	0	84	413
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	50	26	0	76	3	48	0	51	21	2	0	23	150
4:15 PM	37	16	0	53	1	43	0	44	11	5	0	16	113
4:30 PM	61	18	0	79	1	50	0	51	14	1	0	15	145
4:45 PM	45	12	0	57	2	41	0	43	16	1	0	17	117
Hourly Total	193	72	0	265	7	182	0	189	62	9	0	71	525
5:00 PM	46	21	0	67	3	31	0	34	33	1	0	34	135
5:15 PM	55	19	0	74	3	38	0	41	12	4	0	16	131
5:30 PM	57	16	0	73	4	38	0	42	12	2	0	14	129
5:45 PM	51	19	0	70	2	35	0	37	14	5	0	19	126
Hourly Total	209	75	0	284	12	142	0	154	71	12	0	83	521
Grand Total	587	282	0	869	33	672	0	705	266	53	0	319	1893
Approach %	67.5	32.5	-	-	4.7	95.3	-	-	83.4	16.6	-	-	-
Total %	31.0	14.9	-	45.9	1.7	35.5	-	37.2	14.1	2.8	-	16.9	-
Motorcycles	17	2	-	19	0	14	-	14	1	1	-	2	35
% Motorcycles	2.9	0.7	-	2.2	0.0	2.1	-	2.0	0.4	1.9	-	0.6	1.8
Cars	325	168	-	493	13	343	-	356	154	15	-	169	1018
% Cars	55.4	59.6	-	56.7	39.4	51.0	-	50.5	57.9	28.3	-	53.0	53.8
Light Goods Vehicles	102	87	-	189	11	112	-	123	80	25	-	105	417
% Light Goods Vehicles	17.4	30.9	-	21.7	33.3	16.7	-	17.4	30.1	47.2	-	32.9	22.0
Buses	4	1	-	5	0	5	-	5	0	2	-	2	12
% Buses	0.7	0.4	-	0.6	0.0	0.7	-	0.7	0.0	3.8	-	0.6	0.6
Single-Unit Trucks	33	19	-	52	6	45	-	51	29	7	-	36	139
% Single-Unit Trucks	5.6	6.7	-	6.0	18.2	6.7	-	7.2	10.9	13.2	-	11.3	7.3
Articulated Trucks	105	5	-	110	0	153	-	153	2	3	-	5	268
% Articulated Trucks	17.9	1.8	-	12.7	0.0	22.8	-	21.7	0.8	5.7	-	1.6	14.2
Bicycles on Road	1	0	-	1	3	0	-	3	0	0	-	0	4
% Bicycles on Road	0.2	0.0	-	0.1	9.1	0.0	-	0.4	0.0	0.0	-	0.0	0.2

Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	_	-	-	-	-	_	-	-	-	-	-	-	-



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 3

		T
	Airport Rd [N]  Out	
Alport Rd [W]  Out In Total  2 2 2 4  181 182 380  98 105 380  98 105 319 624  74 74  315 319 624  0 25 0  0 53 266  P R L L	07/16/2014 7:00 AM Ending AI 07/16/2014 6:00 PM Motorcycles Cass Light Goods Vehicles Buses Other	Fake Approach (E)  Out In Total  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0
	L T P 0 14 0 13 343 0 11 112 0 0 5 0 9 198 0 33 672 0 18 14 32 340 356 696 127 123 250 6 5 11 149 207 356 640 705 1345 Out In Total Tri Hill Frontage [S]	

Turning Movement Data Plot



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

				i airiii ig i	VIOVCITICI	it i can i ic	on Data (	(1.30.7)					
		Airpo	ort Rd			Tri Hill F	Frontage			Airpo	ort Rd		
Start Time		South	bound			North	bound			Easth	bound		
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:30 AM	22	29	0	51	2	54	0	56	20	10	0	30	137
7:45 AM	24	26	0	50	4	53	0	57	16	2	0	18	125
8:00 AM	26	19	0	45	2	36	0	38	19	2	0	21	104
8:15 AM	25	14	0	39	1	46	0	47	28	5	0	33	119
Total	97	88	0	185	9	189	0	198	83	19	0	102	485
Approach %	52.4	47.6	-	-	4.5	95.5	-	-	81.4	18.6	-	-	-
Total %	20.0	18.1	-	38.1	1.9	39.0	_	40.8	17.1	3.9	-	21.0	-
PHF	0.933	0.759	-	0.907	0.563	0.875	-	0.868	0.741	0.475	-	0.773	0.885
Motorcycles	1	0	-	1	0	0	-	0	0	0	-	0	1
% Motorcycles	1.0	0.0	-	0.5	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.2
Cars	56	56	-	112	3	91	-	94	34	5	-	39	245
% Cars	57.7	63.6	-	60.5	33.3	48.1	-	47.5	41.0	26.3	-	38.2	50.5
Light Goods Vehicles	15	26	-	41	4	44	-	48	31	9	-	40	129
% Light Goods Vehicles	15.5	29.5	-	22.2	44.4	23.3	-	24.2	37.3	47.4	-	39.2	26.6
Buses	0	1	-	1	0	0	-	0	0	1	-	1	2
% Buses	0.0	1.1	-	0.5	0.0	0.0	_	0.0	0.0	5.3	-	1.0	0.4
Single-Unit Trucks	8	3	-	11	2	14	-	16	17	3	-	20	47
% Single-Unit Trucks	8.2	3.4	-	5.9	22.2	7.4	-	8.1	20.5	15.8	-	19.6	9.7
Articulated Trucks	17	2	-	19	0	40	_	40	1	1	_	2	61
% Articulated Trucks	17.5	2.3	-	10.3	0.0	21.2	-	20.2	1.2	5.3	-	2.0	12.6
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	<u>-</u>	0	-	-	-	0	-	-	<u>-</u>	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 5

	Airport Rd [N]  Out In Total  0 1 1  125 112 237  75 41 116  0 1 1  72 30 102  272 185 457  0 1 0 0  56 56 0  26 15 0  1 0 0  5 25 0  88 97 0  R T P	
Author Rd (WI   N   Cross   Color Rd (WI   Color Rd	Peak Hour Data  O7/16/2014 7:30 AM Ending At O7/16/2014 8:30 AM Motorcycles Cars Cars Ligo Goods Vehicles Buses Other	Fake Approach [E]  Out In Total  O
	L T P 0 0 0 0 3 91 0 4 44 0 0 0 0 0 2 54 0 9 188 0 1 0 1 61 94 155 24 48 72 1 0 1 29 56 85 116 198 314 Out In Total Tri Hill Frontage [S]	

Turning Movement Peak Hour Data Plot (7:30 AM)



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (4:30 PM)

				*10 * 011101	it i bait i ic	on Data (	(1.00 1 101)					
	Airpo	rt Rd			Tri Hill F	rontage						
	South	bound			North	bound			Easth	oound		
Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
61	18	0	79	1	50	0	51	14	1	0	15	145
45	12	0	57	2	41	0	43	16	1	0	17	117
46	21	0	67	3	31	0	34	33	1	0	34	135
55	19	0	74	3	38	0	41	12	4	0	16	131
207	70	0	277	9	160	0	169	75	7	0	82	528
74.7	25.3	-	-	5.3	94.7	-	-	91.5	8.5	-	-	-
39.2	13.3	-	52.5	1.7	30.3	_	32.0	14.2	1.3	-	15.5	-
0.848	0.833	-	0.877	0.750	0.800	-	0.828	0.568	0.438	-	0.603	0.910
10	0	-	10	0	3	-	3	0	0	-	0	13
4.8	0.0	-	3.6	0.0	1.9	-	1.8	0.0	0.0	-	0.0	2.5
115	42	-	157	5	88	-	93	53	3	-	56	306
55.6	60.0	-	56.7	55.6	55.0	-	55.0	70.7	42.9	-	68.3	58.0
42	17	-	59	2	14	_	16	20	4	-	24	99
20.3	24.3	-	21.3	22.2	8.8	-	9.5	26.7	57.1	-	29.3	18.8
1	0	-	1	0	1	-	1	0	0	-	0	2
0.5	0.0	-	0.4	0.0	0.6	-	0.6	0.0	0.0	-	0.0	0.4
8	9	-	17	2	14	-	16	2	0	-	2	35
3.9	12.9	-	6.1	22.2	8.8	-	9.5	2.7	0.0	-	2.4	6.6
31	2	-	33	0	40	_	40	0	0	_	0	73
15.0	2.9	-	11.9	0.0	25.0	-	23.7	0.0	0.0	-	0.0	13.8
0	0	-	0	0	0	-	0	0	0	-	0	0
0.0	0.0	-	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
-	<u>-</u>	0	-	-	-	0	-	-	-	0	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
	61 45 46 55 207 74.7 39.2 0.848 10 4.8 115 55.6 42 20.3 1 0.5 8 3.9 31 15.0 0 0.0	South Thru Right 61 18 45 12 46 21 55 19 207 70 74.7 25.3 39.2 13.3 0.848 0.833 10 0 4.8 0.0 115 42 55.6 60.0 42 17 20.3 24.3 1 0 0.5 0.0 8 9 3.9 12.9 31 2 15.0 2.9 0 0 0.0 0.0	61 18 0 45 12 0 46 21 0 55 19 0 207 70 0 74.7 25.3 - 39.2 13.3 - 0.848 0.833 - 10 0 - 4.8 0.0 - 115 42 - 55.6 60.0 - 42 17 - 20.3 24.3 - 1 0 0 - 0.5 0.0 - 8 9 - 3.9 12.9 - 31 2 - 15.0 2.9 - 0 0 0 - 0.0 0.0 -	Airport Rd Southbound  Thru Right Peds App. Total  61 18 0 79  45 12 0 57  46 21 0 67  55 19 0 74  207 70 0 277  74.7 25.3  39.2 13.3 - 52.5  0.848 0.833 - 0.877  10 0 - 10  4.8 0.0 - 3.6  115 42 - 157  55.6 60.0 - 56.7  42 17 - 59  20.3 24.3 - 21.3  1 0 - 1  0.5 0.0 - 0.4  8 9 - 17  3.9 12.9 - 6.1  31 2 - 33  15.0 2.9 - 11.9  0 0 0 - 0.0  - 0.0	Airport Rd Southbound  Thru Right Peds App. Total Left  61 18 0 79 1 45 12 0 57 2 46 21 0 67 3 55 19 0 74 3 207 70 0 277 9 74.7 25.3	Airport Rd Southbound Thru Right Peds App. Total Left Thru  61 18 0 79 1 50  45 12 0 57 2 41  46 21 0 67 3 311  55 19 0 74 3 38  207 70 0 277 9 160  74.7 25.3 - 5.3 94.7  39.2 13.3 - 52.5 1.7 30.3  0.848 0.833 - 0.877 0.750 0.800  10 0 - 10 0 3  4.8 0.0 - 3.6 0.0 1.9  115 42 - 157 5 88  55.6 60.0 - 56.7 55.6 55.0  42 17 - 59 2 14  20.3 24.3 - 21.3 22.2 8.8  1 0 - 1 0 0 1  0.5 0.0 - 0.4 0.0 0.6  8 9 - 17 2 14  3.9 12.9 - 6.1 22.2 8.8  31 2 - 33 0 40  15.0 2.9 - 11.9 0.0 25.0  0 0 0 0 0 0 0 0 0	Airport Rd Southbound         Tri Hill Frontage Northbound           Thru         Right         Peds         App. Total         Left         Thru         Peds           61         18         0         79         1         50         0           45         12         0         57         2         41         0           46         21         0         67         3         31         0           55         19         0         74         3         38         0           207         70         0         277         9         160         0           74.7         25.3         -         -         5.3         94.7         -           39.2         13.3         -         52.5         1.7         30.3         -           0.848         0.833         -         0.877         0.750         0.800         -           10         0         -         10         0         3         -           4.8         0.0         -         3.6         0.0         1.9         -           115         42         -         157         5         88	Northbound	Airport Rd   Southbound   Southbound   Southbound   Thru   Right   Peds   App. Total   Left   Thru   Peds   App. Total   Thru   Thru	Airport Rd Southbound Thru Right Peds App. Total 18 0 79 1 50 0 51 14 15 14 1 14 1 14 1 14 1 15 14 15 15 15 15 15 15 15 15 15 15 15 15 15	Airport Rd   Southbound   Sou	Airport Rd   Southbound   Rept



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 7

		Airport Rd [N]  Out   In   Total 3   10   13  141   157   298  34   59   93  1   1   2  56   50   106  235   277   512	
Arrort Rd [W] Out In Total 0 0 0 0 47 56 103 19 24 43 0 0 0 0 13 2 15 79 82 161	3 - 0 m 4 0 0 r m	Peak Hour Data  O7/16/2014 4:30 PM Ending At O7/16/2014 5:30 PM Motorcycles Cars Light Goods Vehicles Buses Other	Fake Approach [E]  Out In Total  0
		L T P 0 3 0 0 5 88 0 0 2 14 0 0 0 1 0 0 2 54 0 9 9 160 0 10 3 13 118 93 211 46 16 62 1 1 2 2 39 56 95 214 169 383 Out In Total Tri Hill Frontage [S]	

Turning Movement Peak Hour Data Plot (4:30 PM)



Count Name: 01-TriHillFrontage\_AirportRd TMC Site Code: TMC-01 Start Date: 07/16/2014 Page No: 8



Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014

Page No: 1

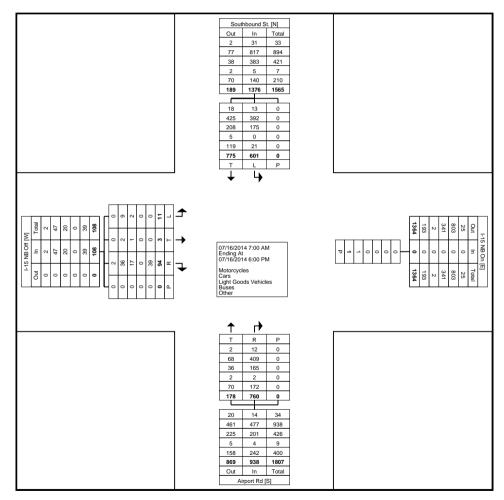
#### **Turning Movement Data**

					ı	i uii	mig wio	VOITION L	Julu		i					
		Southbo	ound St.			Airpo	ort Rd		I-15	NB On			I-15 NB Off			
O:T		South	bound			North	bound		Wes	stbound			Eastbound			
Start Time	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	23	16	0	39	44	8	0	52	1	0	6	0	2	0	8	99
7:15 AM	28	16	0	44	42	8	0	50	0	0	2	1	1	0	4	98
7:30 AM	48	16	0	64	64	9	0	73	0	0	4	0	1	0	5	142
7:45 AM	47	12	0	59	54	15	0	69	0	0	3	0	2	0	5	133
Hourly Total	146	60	0	206	204	40	0	244	1	0	15	1	6	0	22	472
8:00 AM	43	28	0	71	47	8	0	55	0	0	2	0	0	0	2	128
8:15 AM	35	23	0	58	57	17	0	74	0	0	4	0	1	0	5	137
8:30 AM	33	17	0	50	40	10	0	50	0	0	8	0	1	0	9	109
8:45 AM	29	19	0	48	44	13	0	57	0	0	3	0	0	0	3	108
Hourly Total	140	87	0	227	188	48	0	236	0	0	17	0	2	0	19	482
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	68	107	0	175	60	8	0	68	0	0	8	0	0	0	8	251
4:15 PM	46	50	0	96	47	9	0	56	0	0	9	1	0	0	10	162
4:30 PM	68	111	0	179	47	17	0	64	0	0	10	1	1	0	12	255
4:45 PM	54	39	0	93	43	13	0	56	0	0	4	0	1	0	5	154
Hourly Total	236	307	0	543	197	47	0	244	0	0	31	2	2	0	35	822
5:00 PM	63	53	0	116	55	8	0	63	0	0	5	0	0	0	5	184
5:15 PM	66	44	0	110	39	12	0	51	0	0	7	0	1	0	8	169
5:30 PM	65	29	0	94	39	11	0	50	0	0	7	0	0	0	7	151
5:45 PM	59	21	0	80	38	12	0	50	0	0	12	0	0	0	12	142
Hourly Total	253	147	0	400	171	43	0	214	0	0	31	0	1	0	32	646
Grand Total	775	601	0	1376	760	178	0	938	1	0	94	3	11	0	108	2422
Approach %	56.3	43.7	-	-	81.0	19.0	-	-	-	-	87.0	2.8	10.2	-	-	-
Total %	32.0	24.8	-	56.8	31.4	7.3	-	38.7	-	0.0	3.9	0.1	0.5	-	4.5	-
Motorcycles	18	13	-	31	12	2	-	14	-	0	2	0	0	-	2	47
% Motorcycles	2.3	2.2	-	2.3	1.6	1.1	-	1.5	-	-	2.1	0.0	0.0	-	1.9	1.9
Cars	425	392	-	817	409	68	-	477	-	0	36	2	9	-	47	1341
% Cars	54.8	65.2	-	59.4	53.8	38.2	-	50.9	-	-	38.3	66.7	81.8	-	43.5	55.4
Light Goods Vehicles	208	175	-	383	165	36	-	201	-	0	17	1	2	-	20	604
% Light Goods Vehicles	26.8	29.1	-	27.8	21.7	20.2	-	21.4	-	-	18.1	33.3	18.2	-	18.5	24.9
Buses	5	0	-	5	2	2	-	4	-	0	0	0	0	-	0	9
% Buses	0.6	0.0	-	0.4	0.3	1.1	-	0.4	-	-	0.0	0.0	0.0	-	0.0	0.4
Single-Unit Trucks	45	13	-	58	78	17	-	95	-	0	8	0	0	-	8	161
% Single-Unit Trucks	5.8	2.2	-	4.2	10.3	9.6	-	10.1	-	-	8.5	0.0	0.0	-	7.4	6.6
Articulated Trucks	72	8	-	80	94	53	-	147	-	0	31	0	0	-	31	258
% Articulated Trucks	9.3	1.3	-	5.8	12.4	29.8	-	15.7	-	-	33.0	0.0	0.0	-	28.7	10.7
Bicycles on Road	2	0	-	2	0	0	-	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.3	0.0	-	0.1	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	-	0.0	0.1

Pedestrians	-	-	0	-	-	-	0	-	1	-	-	-	-	0	-	-
% Pedestrians	_	_	-	_	_	_	_	_	100.0	_	_	_	_	_		_



Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



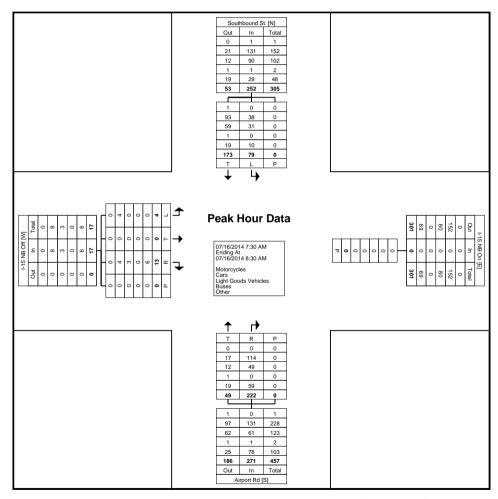
Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

i					ı anınış	g iviovoi	iloilt i o	ak i loui i	Julia (1.	.00 / ((1))						ı
		Southbo	ound St.			Airpo	ort Rd		I-15	NB On			I-15 NB Off			
Start Times		South	bound			North	bound		Wes	stbound			Eastbound			
Start Time	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:30 AM	48	16	0	64	64	9	0	73	0	0	4	0	1	0	5	142
7:45 AM	47	12	0	59	54	15	0	69	0	0	3	0	2	0	5	133
8:00 AM	43	28	0	71	47	8	0	55	0	0	2	0	0	0	2	128
8:15 AM	35	23	0	58	57	17	0	74	0	0	4	0	1	0	5	137
Total	173	79	0	252	222	49	0	271	0	0	13	0	4	0	17	540
Approach %	68.7	31.3	-	-	81.9	18.1	-	-	-	-	76.5	0.0	23.5	-	-	-
Total %	32.0	14.6	-	46.7	41.1	9.1	-	50.2	-	0.0	2.4	0.0	0.7	-	3.1	-
PHF	0.901	0.705	-	0.887	0.867	0.721	-	0.916	-	0.000	0.813	0.000	0.500	-	0.850	0.951
Motorcycles	1	0	-	1	0	0	-	0	-	0	0	0	0	-	0	1
% Motorcycles	0.6	0.0	-	0.4	0.0	0.0	-	0.0	-	-	0.0	_	0.0	-	0.0	0.2
Cars	93	38	-	131	114	17	-	131	-	0	4	0	4	-	8	270
% Cars	53.8	48.1	-	52.0	51.4	34.7	-	48.3	-	-	30.8	-	100.0	-	47.1	50.0
Light Goods Vehicles	59	31	-	90	49	12	-	61	-	0	3	0	0	-	3	154
% Light Goods Vehicles	34.1	39.2	-	35.7	22.1	24.5	-	22.5	-	-	23.1	-	0.0	-	17.6	28.5
Buses	1	0	-	1	0	1	-	1	-	0	0	0	0	-	0	2
% Buses	0.6	0.0	-	0.4	0.0	2.0	-	0.4	-	-	0.0	_	0.0	-	0.0	0.4
Single-Unit Trucks	12	4	-	16	33	5	-	38	-	0	1	0	0	-	1	55
% Single-Unit Trucks	6.9	5.1	-	6.3	14.9	10.2	-	14.0	-	-	7.7	-	0.0	-	5.9	10.2
Articulated Trucks	7	6	-	13	26	14	-	40	-	0	5	0	0	-	5	58
% Articulated Trucks	4.0	7.6	-	5.2	11.7	28.6	-	14.8	-	-	38.5	-	0.0	-	29.4	10.7
Bicycles on Road	0	0	-	0	0	0	-	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	-	0.0	_	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	0	-	0	-	1	-	-	0	-	-
% Pedestrians	-	-	-	-	-	_		-	-	-	-	-	-	-	_	-



Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



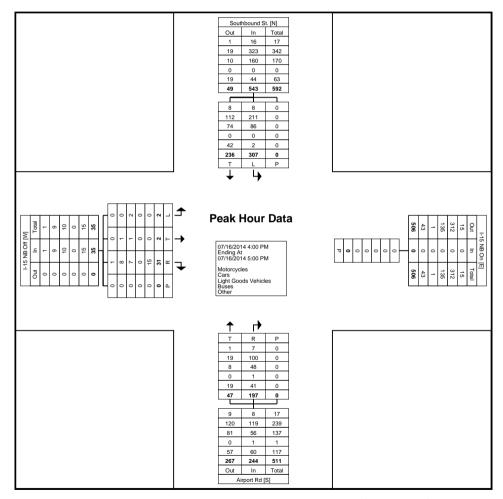
Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (4:00 PM)

i					ı anınış	g iviovoi	iloilt i o	ak i loui i	Julu (+.	.00 1 111)						1
		Southbo	ound St.			Airpo	ort Rd		I-15	NB On			I-15 NB Off			1
Otant Time		South	bound			North	bound		Wes	tbound			Eastbound			
Start Time	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:00 PM	68	107	0	175	60	8	0	68	0	0	8	0	0	0	8	251
4:15 PM	46	50	0	96	47	9	0	56	0	0	9	1	0	0	10	162
4:30 PM	68	111	0	179	47	17	0	64	0	0	10	1	1	0	12	255
4:45 PM	54	39	0	93	43	13	0	56	0	0	4	0	1	0	5	154
Total	236	307	0	543	197	47	0	244	0	0	31	2	2	0	35	822
Approach %	43.5	56.5	-	-	80.7	19.3	-	-	-	-	88.6	5.7	5.7	-	-	-
Total %	28.7	37.3	-	66.1	24.0	5.7	-	29.7	-	0.0	3.8	0.2	0.2	-	4.3	-
PHF	0.868	0.691	-	0.758	0.821	0.691	-	0.897	-	0.000	0.775	0.500	0.500	-	0.729	0.806
Motorcycles	8	8	-	16	7	1	-	8	-	0	1	0	0	-	1	25
% Motorcycles	3.4	2.6	-	2.9	3.6	2.1	-	3.3	-	-	3.2	0.0	0.0	-	2.9	3.0
Cars	112	211	-	323	100	19	-	119	-	0	8	1	0	-	9	451
% Cars	47.5	68.7	-	59.5	50.8	40.4	-	48.8	-	-	25.8	50.0	0.0	-	25.7	54.9
Light Goods Vehicles	74	86	-	160	48	8	-	56	-	0	7	1	2	-	10	226
% Light Goods Vehicles	31.4	28.0	-	29.5	24.4	17.0	-	23.0	-	-	22.6	50.0	100.0	-	28.6	27.5
Buses	0	0	-	0	1	0	-	1	-	0	0	0	0	-	0	1
% Buses	0.0	0.0	_	0.0	0.5	0.0	-	0.4	-	-	0.0	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	12	2	-	14	13	5	-	18	-	0	2	0	0	-	2	34
% Single-Unit Trucks	5.1	0.7	-	2.6	6.6	10.6	-	7.4	-	-	6.5	0.0	0.0	-	5.7	4.1
Articulated Trucks	29	0	-	29	28	14	-	42	-	0	13	0	0	-	13	84
% Articulated Trucks	12.3	0.0	-	5.3	14.2	29.8	-	17.2	-	-	41.9	0.0	0.0	-	37.1	10.2
Bicycles on Road	1	0	-	1	0	0	-	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.4	0.0	-	0.2	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	<u>-</u>	0	-	-	-	0	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-



Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (4:00 PM)



Count Name: 02-I15NB\_AirportRd TMC Site Code: TMC-02 Start Date: 07/16/2014 Page No: 8



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 1

# Turning Movement Data

Start Time			Airport Rd Southbound		3		Airpo Northi				SB On tbound	
Start Time	Right	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Peds	App. Total	Int. Total
7:00 AM	0	41	0	0	41	5	5	0	10	0	0	51
7:15 AM	1	44	0	0	45	4	5	0	9	0	0	54
7:30 AM	1	63	0	0	64	5	5	0	10	0	0	74
7:45 AM	1	61	0	0	62	9	9	0	18	0	0	80
Hourly Total	3	209	0	0	212	23	24	0	47	0	0	259
8:00 AM	0	72	0	0	72	2	6	0	8	0	0	80
8:15 AM	4	55	0	0	59	7	12	0	19	0	. 0	78
8:30 AM	1	55	1	0	57	6	5	0	11	0	0	68
8:45 AM	2	48	0	0	50	8	5	0	13	0	0	63
Hourly Total	7	230	1	0	238	23	28	0	51	0	. 0	289
*** BREAK ***	-		<u>-</u>	-	-	-	<del>-</del>	-	-	-	<u>-</u>	-
4:00 PM	5	175	0	0	180	4	3	0	7	0	0	187
4:15 PM	3	94	0	0	97	4	5	0	9	0	0	106
4:30 PM	2	182	0	0	184	6	10	0	16	0	0	200
4:45 PM	4	91	0	0	95	7	7	0	14	0	0	109
Hourly Total	14	542	0	0	556	21	25	0	46	0	0	602
5:00 PM	0	117	0	0	117	2	6	0	8	0	0	125
5:15 PM	2	108	0	0	110	4	9	0	13	0	0	123
5:30 PM	4	96	0	0	100	3	6	0	9	0	0	109
5:45 PM	1	78	0	0	79	2	9	0	11	0	0	90
Hourly Total	7	399	0	0	406	11	30	0	41	0	0	447
Grand Total	31	1380	1	0	1412	78	107	0	185	0	0	1597
Approach %	2.2	97.7	0.1	-	-	42.2	57.8	-	-	-	-	-
Total %	1.9	86.4	0.1	-	88.4	4.9	6.7	-	11.6	-	0.0	-
Motorcycles	0	32	0	-	32	1	1	-	2	-	0	34
% Motorcycles	0.0	2.3	0.0	-	2.3	1.3	0.9	-	1.1	-	-	2.1
Cars	20	765	1	-	786	43	25	-	68	-	0	854
% Cars	64.5	55.4	100.0	-	55.7	55.1	23.4	-	36.8	-		53.5
Light Goods Vehicles	9	432	0	-	441	22	21	-	43	-	0	484
% Light Goods Vehicles	29.0	31.3	0.0	-	31.2	28.2	19.6	-	23.2	-	-	30.3
Buses	0	2	0	-	2	0	0	-	0	-	0	2
% Buses	0.0	0.1	0.0	-	0.1	0.0	0.0	-	0.0	-		0.1
Single-Unit Trucks	1	61	0	-	62	5	10	-	15	-	0	77
% Single-Unit Trucks	3.2	4.4	0.0	-	4.4	6.4	9.3	-	8.1	-	-	4.8
Articulated Trucks	1	85	0	-	86	7	49	-	56	-	0	142
% Articulated Trucks	3.2	6.2	0.0	-	6.1	9.0	45.8	-	30.3	-		8.9
Bicycles on Road	0	3	0	-	3	0	1	-	1	-	0	4
% Bicycles on Road	0.0	0.2	0.0	-	0.2	0.0	0.9	-	0.5	-		0.3

Pedestrians	-	-	-	0	-	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 3

	Airport Rd [N]  Out   In   Total  1   32   33  43   786   829  22   441   463  0   2   2  12   151   163  78   1412   1490  0   32   0   0  20   765   1   0  9   432   0   0  0   2   0   0  2   149   0   0  31   1380   1   0  R   T   L   P	
1-15 589 On WI Out In Cotal Oct	07/16/2014 7:00 AM Ending At 07/16/2014 6:00 PM Motorcycles Cars Light Goods Vehicles Buses Other	Fake Approach (E)  Out In Total  0 0 0 1  0 0 0 0  0 0 0 0  1 0 0 0  0 0 0 0  1 0 0 0  1 0 0 0 0
	L T P 1 1 0 25 43 0 21 22 0 0 0 0 0 60 12 0 107 78 0 L J J 32 2 34 765 68 833 432 43 475 2 0 2 149 72 221 1380 185 1865 Out In Total Airport Rd [S]	

Turning Movement Data Plot



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 4

#### Turning Movement Peak Hour Data (7:30 AM)

			Airport Rd				•	ort Rd		I-15	SB On	
Start Time			Southbound				North	bound		Eas	tbound	
Start Time	Right	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Peds	App. Total	Int. Total
7:30 AM	1	63	0	0	64	5	5	0	10	0	0	74
7:45 AM	1	61	0	0	62	9	9	0	18	0	0	80
8:00 AM	0	72	0	0	72	2	6	0	8	0	0	80
8:15 AM	4	55	0	0	59	7	12	0	19	0	0	78
Total	6	251	0	0	257	23	32	0	55	0	0	312
Approach %	2.3	97.7	0.0	-	-	41.8	58.2	-	-	-	-	-
Total %	1.9	80.4	0.0	-	82.4	7.4	10.3	-	17.6	-	0.0	-
PHF	0.375	0.872	0.000	-	0.892	0.639	0.667	-	0.724	-	0.000	0.975
Motorcycles	0	1	0	-	1	0	0	-	0	-	0	1
% Motorcycles	0.0	0.4	-	-	0.4	0.0	0.0	-	0.0	-	-	0.3
Cars	4	102	0	-	106	13	7	-	20	-	0	126
% Cars	66.7	40.6	-	-	41.2	56.5	21.9	-	36.4	-	-	40.4
Light Goods Vehicles	1	113	0	-	114	5	10	-	15	-	0	129
% Light Goods Vehicles	16.7	45.0	-	-	44.4	21.7	31.3	-	27.3	-	-	41.3
Buses	0	0	0	-	0	0	0	-	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	-	-	0.0
Single-Unit Trucks	1	17	0	-	18	2	3	-	5	-	0	23
% Single-Unit Trucks	16.7	6.8	-	-	7.0	8.7	9.4	-	9.1	-	-	7.4
Articulated Trucks	0	18	0	-	18	3	11	-	14	-	0	32
% Articulated Trucks	0.0	7.2	-	-	7.0	13.0	34.4	-	25.5	-	-	10.3
Bicycles on Road	0	0	0	-	0	0	1	-	1	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	3.1	-	1.8	-	-	0.3
Pedestrians	-	-	-	0	-	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 5

	Airport Rd [N]  Out In Total  0 1 1  13 106 119  5 114 119  0 0 0 0  5 36 41  23 257 280  0 1 0 0 0  4 102 0 0  1 113 0 0  0 1 1 35 0 0  6 251 0 0  R T L P	
145 SB On [W]  Out In Total  11 0 0 0  11 0 0 11  11 0 0 11  16 0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0 0  0 0 0 0 0 0 0	Peak Hour Data  O7/16/2014 7:30 AM Ending At O7/16/2014 8:30 AM Motorcycles Cars Light Goods Vehicles Buses Other	Fake Approach [E]  Out In Total   0
	L T P 0 0 0 0 7 13 0 10 5 0 0 0 0 15 5 0 32 23 0 1 1 0 1 102 20 122 113 15 128 0 0 0 0 35 20 55 251 55 306 Out In Total Airport Rd [S]	

Turning Movement Peak Hour Data Plot (7:30 AM)



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 6

#### Turning Movement Peak Hour Data (4:00 PM)

			Airport Rd Southbound	Ü			Airpo	ort Rd bound			SB On	
Start Time	Right	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Peds	App. Total	Int. Total
4:00 PM	5	175	0	0	180	4	3	0	7	0	0	187
4:15 PM	3	94	0	0	97	4	5	0	9	0	0	106
4:30 PM	2	182	0	0	184	6	10	0	16	0	0	200
4:45 PM	4	91	0	0	95	7	7	0	14	0	0	109
Total	14	542	0	0	556	21	25	0	46	0	0	602
Approach %	2.5	97.5	0.0	-	-	45.7	54.3	-	-	-	-	-
Total %	2.3	90.0	0.0	-	92.4	3.5	4.2	-	7.6	-	0.0	-
PHF	0.700	0.745	0.000	-	0.755	0.750	0.625	-	0.719	-	0.000	0.753
Motorcycles	0	16	0	-	16	0	1	-	1	-	0	17
% Motorcycles	0.0	3.0	-	-	2.9	0.0	4.0	-	2.2	-	-	2.8
Cars	9	331	0	-	340	10	6	-	16	-	0	356
% Cars	64.3	61.1	-	-	61.2	47.6	24.0	-	34.8	-	-	59.1
Light Goods Vehicles	5	154	0	-	159	7	2	-	9	-	0	168
% Light Goods Vehicles	35.7	28.4	<u>-</u>	-	28.6	33.3	8.0	-	19.6	-	-	27.9
Buses	0	0	0	-	0	0	0	-	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	-	-	0.0
Single-Unit Trucks	0	17	0	-	17	1	5	-	6	-	0	23
% Single-Unit Trucks	0.0	3.1	-	-	3.1	4.8	20.0	-	13.0	-	-	3.8
Articulated Trucks	0	23	0	-	23	3	11	_	14	-	0	37
% Articulated Trucks	0.0	4.2	-	-	4.1	14.3	44.0	-	30.4	-	-	6.1
Bicycles on Road	0	1	0	-	1	0	0	-	0	-	0	1
% Bicycles on Road	0.0	0.2		_	0.2	0.0	0.0	_	0.0	-	-	0.2
Pedestrians	-	<u>-</u>	<u>-</u>	0	-	-	<u>-</u>	0	-	0	<u>-</u>	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 7

	Airport Rd [N] Out In Total 0 16 16 10 340 350 7 159 166 0 0 0 0 4 41 45 21 556 577  0 16 0 0 0 9 331 0 0 5 154 0 0 0 0 0 0 0 41 0 0 14 542 0 0 R T L P	
1-15 SSB On MVI Out in Total 1 0 15 7 0 7 7 0 0 16 99 0 39	Peak Hour Data  O7/16/2014 4:00 PM Ending At O7/16/2014 5:00 PM Motorcycles Cars Light Goods Vehicles Buses Other	Fake Approach [E] Out In Total O 0 0 0 O 0 0 O 0 0 O 0 0 O 0 0 O 0 0 O 0 0 O 0 0
	L T P 1 0 0 6 10 0 2 7 0 0 0 0 16 4 0 25 21 0 16 1 17 331 16 347 154 9 163 0 0 0 41 20 61 542 46 588 Out In Total Airport Rd [S]	

Turning Movement Peak Hour Data Plot (4:00 PM)



Count Name: 03-I15SBOn\_AirportRd TMC Site Code: TMC-03 Start Date: 07/16/2014 Page No: 8



Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 1

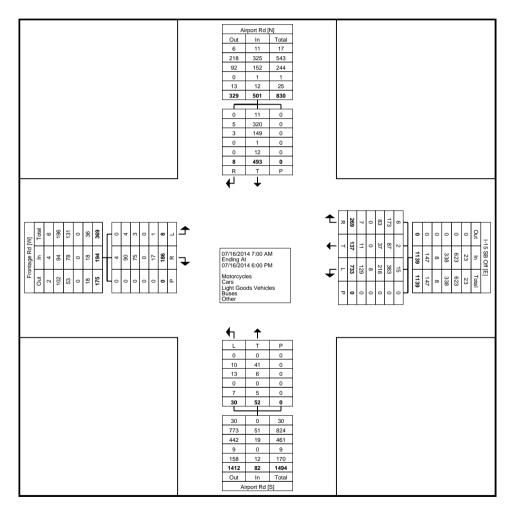
## Turning Movement Data

Chart Time			ort Rd bound				ort Rd abound	5			I-15 SB Off Westbound					age Rd bound		
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7:00 AM	0	13	0	13	5	0	0	5	47	4	. 22	0	73	5	0	0	5	96
7:15 AM	1	9	0	10	4	0	0	4	34	13	31	0	78	5	1	0	6	98
7:30 AM	0	9	0	9	3	2	0	5	18	13	43	0	74	12	0	0	12	100
7:45 AM	1	9	0	10	4	5	0	9	28	15	49	0	92	6	3	0	9	120
Hourly Total	2	40	0	42	16	7	0	23	127	45	145	0	317	28	4	0	32	414
8:00 AM	2	13	0	15	1	1	0	2	16	13	36	0	65	21	1	0	22	104
8:15 AM	0	12	0	12	3	4	0	7	8	13	33	0	54	15	1	0	16	89
8:30 AM	1	13	0	14	2	5	0	7	13	2	36	0	51	7	0	0	7	79
8:45 AM	1	11	0	12	6	2	0	8	17	10	23	0	50	16	2	0	18	88
Hourly Total	4	49	0	53	12	12	0	24	54	38	128	0	220	59	4	0	63	360
*** BREAK ***	-	-	_	-	-		-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	101	0	101	2	3	0	5	13	4	61	0	78	19	0	0	19	203
4:15 PM	0	44	0	44	3	1	0	4	10	7	37	0	54	14	0	0	14	116
4:30 PM	1	105	0	106	5	3	0	8	7	6	65	0	78	14	0	0	14	206
4:45 PM	0	36	0	36	5	1	0	6	17	9	54	0	80	8	0	0	8	130
Hourly Total	1	286	0	287	15	8	0	23	47	26	217	0	290	55	0	0	55	655
5:00 PM	0	40	0	40	2	0	0	2	8	13	57	0	78	21	0	0	21	141
5:15 PM	1	37	0	38	3	1	0	4	10	5	65	0	80	7	0	0	7	129
5:30 PM	0	25	0	25	3	1	0	4	7	4	65	0	76	11	0	0	11	116
5:45 PM	0	16	0	16	1	1	0	2	16	6	56	0	78	5	0	0	5	101
Hourly Total	1	118	0	119	9	3	0	12	41	28	243	0	312	44	0	0	44	487
Grand Total	8	493	0	501	52	30	0	82	269	137	733	0	1139	186	8	0	194	1916
Approach %	1.6	98.4	-	-	63.4	36.6	-	-	23.6	12.0	64.4	-	-	95.9	4.1	-	-	-
Total %	0.4	25.7	-	26.1	2.7	1.6	-	4.3	14.0	7.2	38.3	-	59.4	9.7	0.4	-	10.1	-
Motorcycles	0	11	-	11	0	0	-	0	6	2	15	-	23	4	0	-	4	38
% Motorcycles	0.0	2.2	-	2.2	0.0	0.0	-	0.0	2.2	1.5	2.0	-	2.0	2.2	0.0	-	2.1	2.0
Cars	5	320	-	325	41	10	-	51	173	87	363	-	623	90	4	-	94	1093
% Cars	62.5	64.9	-	64.9	78.8	33.3	-	62.2	64.3	63.5	49.5	-	54.7	48.4	50.0	-	48.5	57.0
Light Goods Vehicles	3	149	-	152	6	13	-	19	83	37	218	-	338	75	3	-	78	587
% Light Goods Vehicles	37.5	30.2	-	30.3	11.5	43.3	-	23.2	30.9	27.0	29.7	-	29.7	40.3	37.5	-	40.2	30.6
Buses	0	1	-	1	0	0	-	0	0	0	8	-	8	0	0	-	0	9
% Buses	0.0	0.2	-	0.2	0.0	0.0	-	0.0	0.0	0.0	1.1	-	0.7	0.0	0.0	-	0.0	0.5
Single-Unit Trucks	0	6	-	6	3	2	-	5	4	2	46	-	52	7	0	-	7	70
% Single-Unit Trucks	0.0	1.2	-	1.2	5.8	6.7	-	6.1	1.5	1.5	6.3	-	4.6	3.8	0.0	-	3.6	3.7
Articulated Trucks	0	3	-	3	2	5	-	7	3	7	83	-	93	10	1	-	11	114
% Articulated Trucks	0.0	0.6	-	0.6	3.8	16.7	-	8.5	1.1	5.1	11.3	-	8.2	5.4	12.5	-	5.7	5.9
Bicycles on Road	0	3	-	3	0	0	-	0	0	2	0	-	2	0	0	-	0	5
% Bicycles on Road	0.0	0.6		0.6	0.0	0.0	-	0.0	0.0	1.5	0.0	-	0.2	0.0	0.0	-	0.0	0.3

Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	_	_	-	-	-	-	-	_	-



Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



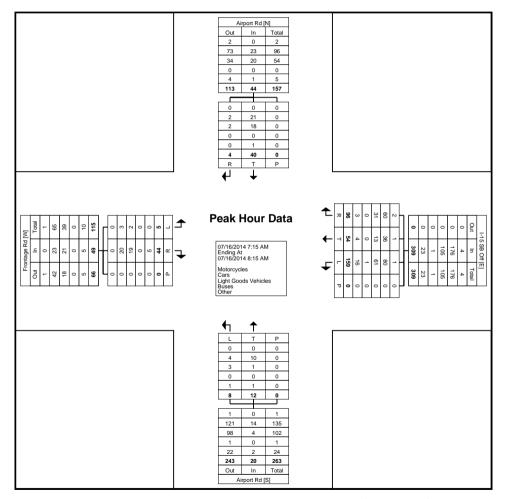
Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 4

#### Turning Movement Peak Hour Data (7:15 AM)

		Airpo Southl				Airpo				•	I-15 SB Off Westbound	,			Fronta	age Rd oound		
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7.45.454	Right			- ''	Iniu			App. Total	Ü		-		- ''		Leit			
7:15 AM	1	9	0	10	4	0	0	4	34	13	31	0	78	5		. 0	6	98
7:30 AM	0	9	0	9	3	2	0	5	18	13	43	0	74	12	0	0	12	100
7:45 AM	1	9	0	10	4	5	0	9	28	15	49	0	92	6	3	0	9	120
8:00 AM	2	13	0	15	1	1	0	2	16	13	36	0	65	21	1	0	22	104
Total	4	40	0	44	12	8	0	20	96	54	159	0	309	44	5	0	49	422
Approach %	9.1	90.9	-	-	60.0	40.0	-	-	31.1	17.5	51.5	-	-	89.8	10.2	-	-	-
Total %	0.9	9.5	-	10.4	2.8	1.9	-	4.7	22.7	12.8	37.7	-	73.2	10.4	1.2	-	11.6	-
PHF	0.500	0.769	-	0.733	0.750	0.400	-	0.556	0.706	0.900	0.811	-	0.840	0.524	0.417	-	0.557	0.879
Motorcycles	0	0	-	0	0	0	-	0	2	1	1	-	4	0	0	-	0	4
% Motorcycles	0.0	0.0	-	0.0	0.0	0.0	-	0.0	2.1	1.9	0.6	-	1.3	0.0	0.0	-	0.0	0.9
Cars	2	21	-	23	10	4	-	14	60	36	80	-	176	20	3	-	23	236
% Cars	50.0	52.5	-	52.3	83.3	50.0	-	70.0	62.5	66.7	50.3	-	57.0	45.5	60.0	-	46.9	55.9
Light Goods Vehicles	2	18	-	20	1	3	-	4	31	13	61	-	105	19	2	-	21	150
% Light Goods Vehicles	50.0	45.0	-	45.5	8.3	37.5	-	20.0	32.3	24.1	38.4	-	34.0	43.2	40.0	-	42.9	35.5
Buses	0	0	-	0	0	0	-	0	0	0	1	-	1	0	0	-	0	1
% Buses	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.6	-	0.3	0.0	0.0	-	0.0	0.2
Single-Unit Trucks	0	0	-	0	0	0	-	0	1	0	6	-	7	3	0	-	3	10
% Single-Unit Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	1.0	0.0	3.8	-	2.3	6.8	0.0	-	6.1	2.4
Articulated Trucks	0	1	-	1	1	1	-	2	2	4	10	-	16	2	0	-	2	21
% Articulated Trucks	0.0	2.5	-	2.3	8.3	12.5	-	10.0	2.1	7.4	6.3	-	5.2	4.5	0.0	-	4.1	5.0
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-



Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)



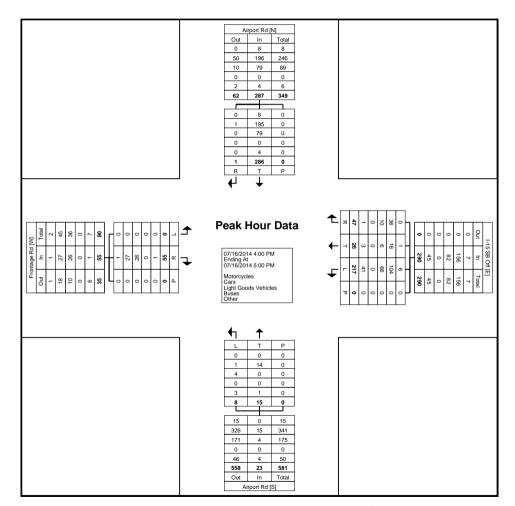
Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 6

## Turning Movement Peak Hour Data (4:00 PM)

		Airpo Southl			Airport Rd Northbound				I-15 SB Off Westbound					Frontage Rd Eastbound				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
4:00 PM	0	101	0	101	2	3	0	5	13	4	61	0	78	19	0	0	19	203
4:15 PM	0	44	0	44	3	1	0	4	10	7	37	0	54	14	0	0	14	116
4:30 PM	1	105	0	106	5	3	0	8	7	6	65	0	78	14	0	0	14	206
4:45 PM	0	36	0	36	5	1	0	6	17	9	54	0	80	8	0	0	8	130
Total	1	286	0	287	15	8	0	23	47	26	217	0	290	55	0	0	55	655
Approach %	0.3	99.7	-	-	65.2	34.8	-	-	16.2	9.0	74.8	-	-	100.0	0.0	-	-	-
Total %	0.2	43.7	-	43.8	2.3	1.2	-	3.5	7.2	4.0	33.1	-	44.3	8.4	0.0	-	8.4	-
PHF	0.250	0.681	-	0.677	0.750	0.667	-	0.719	0.691	0.722	0.835	-	0.906	0.724	0.000	-	0.724	0.795
Motorcycles	0	8	-	8	0	0	-	0	0	1	6	-	7	1	0	-	1	16
% Motorcycles	0.0	2.8	-	2.8	0.0	0.0	-	0.0	0.0	3.8	2.8	-	2.4	1.8	-	-	1.8	2.4
Cars	1	195	-	196	14	1	-	15	36	16	104	-	156	27	0	-	27	394
% Cars	100.0	68.2	-	68.3	93.3	12.5	-	65.2	76.6	61.5	47.9	-	53.8	49.1	-	-	49.1	60.2
Light Goods Vehicles	0	79	-	79	0	4	-	4	10	6	66	-	82	26	0	-	26	191
% Light Goods Vehicles	0.0	27.6	-	27.5	0.0	50.0	-	17.4	21.3	23.1	30.4	-	28.3	47.3	-	-	47.3	29.2
Buses	0	0	-	0	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Buses	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	2	-	2	1	0	-	1	0	1	15	-	16	0	0	-	0	19
% Single-Unit Trucks	0.0	0.7	-	0.7	6.7	0.0	-	4.3	0.0	3.8	6.9	-	5.5	0.0	-	-	0.0	2.9
Articulated Trucks	0	1	-	1	0	3	-	3	1	2	26	-	29	1	0	-	1	34
% Articulated Trucks	0.0	0.3	-	0.3	0.0	37.5	-	13.0	2.1	7.7	12.0	-	10.0	1.8	-	-	1.8	5.2
Bicycles on Road	0	1	-	1	0	0	-	0	0	0	0	-	0	0	0	-	0	1
% Bicycles on Road	0.0	0.3	-	0.3	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	<u>-</u>	0	-	-	_	0	-	-	-	<u>-</u>	0		-	-	0	-	-
% Pedestrians	-		-	-	-		-	-	-	-		-	-	-	-	-	-	-



Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (4:00 PM)



Count Name: 04-I15SBOff\_AirportRd\_Frontage TMC Site Code: TMC-04 Start Date: 07/16/2014 Page No: 8



Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 1

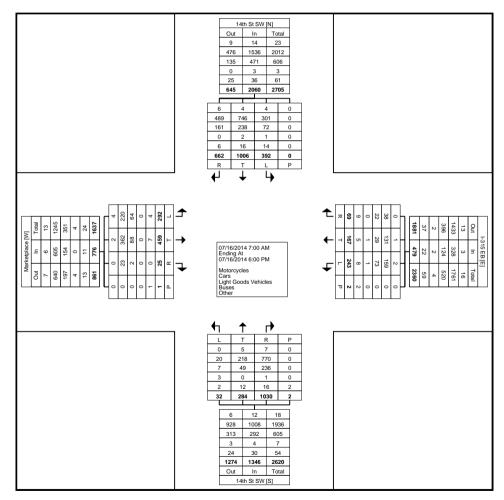
# **Turning Movement Data**

Start Time			14th St SW Southbound					14th St SW Northbound	9				I-315 EB Westbound					Marketplace Eastbound			
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	15	18	26	0	59	52	15	2	0	69	1	4	3	0	8	0	6	4	0	10	146
7:15 AM	15	15	31	0	61	66	15	1	0	82	2	5	9	1	16	0	15	6	0	21	180
7:30 AM	21	25	41	0	87	75	21	4	0	100	0	4	2	1	6	1	22	12	0	35	228
7:45 AM	14	27	46	0	87	90	21	0	0	111	2	9	. 5	0	16	1	17	16	0	34	248
Hourly Total	65	85	144	0	294	283	72	7	0	362	5	22	19	2	46	2	60	38	0	100	802
8:00 AM	10	24	24	0	58	55	9	2	0	66	1	12	4	0	17	1	15	10	0	26	167
8:15 AM	19	38	16	0	73	47	16	1	0	64	4	3	9	0	16	0	15	12	0	27	180
8:30 AM	25	36	19	0	80	59	19	1	0	79	6	9	10	0	25	0	13	8	0	21	205
8:45 AM	37	48	22	0	107	55	16	0	0	71	4	6	17	0	27	0	20	8	0	28	233
Hourly Total	91	146	81	0	318	216	60	4	0	280	15	30	40	0	85	1	63	38	0	102	785
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
4:00 PM	51	80	11	0	142	79	17	2	1	98	3	22	23	0	48	3	46	26	0	75	363
4:15 PM	67	97	16	0	180	48	16	0	0	64	4	11	23	0	38	4	48	29	1	81	363
4:30 PM	69	92	26	0	187	75	24	5	1	104	7	17	27	0	51	2	37	22	0	61	403
4:45 PM	77	97	24	0	198	70	28	2	0	100	6	10	21	0	37	4	51	30	0	85	420
Hourly Total	264	366	77	0	707	272	85	9	2	366	20	60	94	0	174	13	182	107	1	302	1549
5:00 PM	58	90	26	0	174	46	11	3	0	60	12	7	36	0	55	2	47	26	0	75	364
5:15 PM	58	117	19	0	194	69	19	3	0	91	6	16	18	0	40	2	33	29	0	64	389
5:30 PM	56	104	26	0	186	72	15	1	0	88	3	18	21	0	42	2	42	32	0	76	392
5:45 PM	70	98	19	0	187	72	22	5	0	99	8	14	15	0	37	3	32	22	0	57	380
Hourly Total	242	409	90	0	741	259	67	12	0	338	29	55	90	0	174	9	154	109	0	272	1525
Grand Total	662	1006	392	0	2060	1030	284	32	2	1346	69	167	243	2	479	25	459	292	1	776	4661
Approach %	32.1	48.8	19.0	-	-	76.5	21.1	2.4	-	-	14.4	34.9	50.7	-	-	3.2	59.1	37.6	-	-	-
Total %	14.2	21.6	8.4	-	44.2	22.1	6.1	0.7	-	28.9	1.5	3.6	5.2	-	10.3	0.5	9.8	6.3	-	16.6	-
Motorcycles	6	4	4	-	14	7	5	0	-	12	0	1	2	-	3	0	2	4	-	6	35
% Motorcycles	0.9	0.4	1.0	-	0.7	0.7	1.8	0.0	-	0.9	0.0	0.6	0.8	-	0.6	0.0	0.4	1.4	-	0.8	0.8
Cars	489	746	301	-	1536	770	218	20	-	1008	38	131	159	-	328	23	362	220	-	605	3477
% Cars	73.9	74.2	76.8	-	74.6	74.8	76.8	62.5	-	74.9	55.1	78.4	65.4	-	68.5	92.0	78.9	75.3	-	78.0	74.6
Light Goods Vehicles	161	238	72	-	471	236	49	7	-	292	22	29	73	-	124	2	88	64	-	154	1041
% Light Goods Vehicles	24.3	23.7	18.4	-	22.9	22.9	17.3	21.9	-	21.7	31.9	17.4	30.0	-	25.9	8.0	19.2	21.9	-	19.8	22.3
Buses	0	2	1	-	3	1	0	3	-	4	0	1	1	-	2	0	0	0	-	0	9
% Buses	0.0	0.2	0.3	-	0.1	0.1	0.0	9.4	-	0.3	0.0	0.6	0.4	-	0.4	0.0	0.0	0.0	-	0.0	0.2
Single-Unit Trucks	6	14	10	-	30	9	8	2	-	19	8	4	5	-	17	0	7	3	-	10	76
% Single-Unit Trucks	0.9	1.4	2.6	-	1.5	0.9	2.8	6.3	-	1.4	11.6	2.4	2.1	-	3.5	0.0	1.5	1.0	-	1.3	1.6
Articulated Trucks	0	1	4	-	5	7	3	0	-	10	1	1	3	-	5	0	0	1	-	1	21
% Articulated Trucks	0.0	0.1	1.0	-	0.2	0.7	1.1	0.0	-	0.7	1.4	0.6	1.2	_	1.0	0.0	0.0	0.3	-	0.1	0.5
Bicycles on Road	0	1	0	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
	<u> </u>		· · · · · · · · · · · · · · · · · · ·				· ·	· · · · · · · · · · · · · · · · · · ·			-					-		· · ·			

% Bicycles on Road	0.0	0.1	0.0	-	0.0	0.0	0.4	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



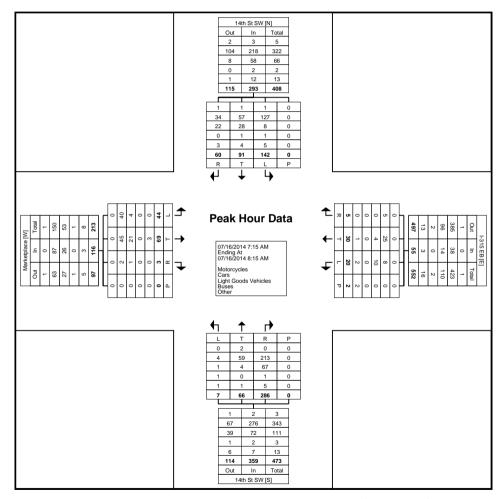
Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 4

#### Turning Movement Peak Hour Data (7:15 AM)

							41111119	, ,,,,,,,,,	1110110	ı cakı	ioai D	ala (1.	10 / (10)	')							i
			14th St SW					14th St SW					I-315 EB					Marketplace			
Start Time			Southbound					Northbound					Westbound					Eastbound			
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:15 AM	15	15	31	0	61	66	15	1	0	82	2	5	9	1	16	0	15	6	0	21	180
7:30 AM	21	25	41	0	87	75	21	4	0	100	0	4	2	1	6	1	22	12	0	35	228
7:45 AM	14	27	46	0	87	90	21	0	0	111	2	9	5	0	16	1	17	16	0	34	248
8:00 AM	10	24	24	0	58	55	9	2	0	66	1	12	4	0	17	1	15	10	0	26	167
Total	60	91	142	0	293	286	66	7	0	359	5	30	20	2	55	3	69	44	0	116	823
Approach %	20.5	31.1	48.5	-	-	79.7	18.4	1.9	-	-	9.1	54.5	36.4	-	-	2.6	59.5	37.9	-	-	-
Total %	7.3	11.1	17.3	-	35.6	34.8	8.0	0.9	-	43.6	0.6	3.6	2.4	-	6.7	0.4	8.4	5.3	-	14.1	-
PHF	0.714	0.843	0.772	-	0.842	0.794	0.786	0.438	-	0.809	0.625	0.625	0.556	-	0.809	0.750	0.784	0.688	-	0.829	0.830
Motorcycles	1	1	1	-	3	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	5
% Motorcycles	1.7	1.1	0.7	-	1.0	0.0	3.0	0.0	-	0.6	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.6
Cars	34	57	127	-	218	213	59	4	-	276	5	25	8	-	38	2	45	40	-	87	619
% Cars	56.7	62.6	89.4	-	74.4	74.5	89.4	57.1	-	76.9	100.0	83.3	40.0	-	69.1	66.7	65.2	90.9	-	75.0	75.2
Light Goods Vehicles	22	28	8	-	58	67	4	1	-	72	0	4	10	-	14	1	21	4	-	26	170
% Light Goods Vehicles	36.7	30.8	5.6	-	19.8	23.4	6.1	14.3	-	20.1	0.0	13.3	50.0	-	25.5	33.3	30.4	9.1	-	22.4	20.7
Buses	0	1	1	-	2	1	0	1	-	2	0	0	0	-	0	0	0	0	-	0	4
% Buses	0.0	1.1	0.7	-	0.7	0.3	0.0	14.3	-	0.6	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.5
Single-Unit Trucks	3	4	3	-	10	5	1	1	-	7	0	0	2	-	2	0	3	0	-	3	22
% Single-Unit Trucks	5.0	4.4	2.1	-	3.4	1.7	1.5	14.3	-	1.9	0.0	0.0	10.0	-	3.6	0.0	4.3	0.0	-	2.6	2.7
Articulated Trucks	0	0	2	-	2	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	3
% Articulated Trucks	0.0	0.0	1.4	-	0.7	0.0	0.0	0.0	-	0.0	0.0	3.3	0.0	-	1.8	0.0	0.0	0.0	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-	_	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)



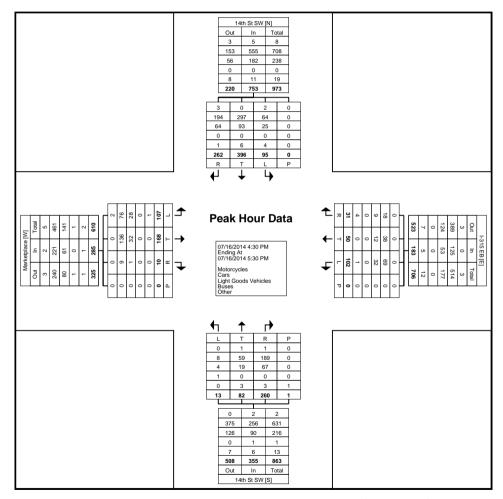
Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 6

# Turning Movement Peak Hour Data (4:30 PM)

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			14th St SW					14th St SW					I-315 EB					Marketplace			
Ot and Time			Southbound					Northbound					Westbound					Eastbound			
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:30 PM	69	92	26	0	187	75	24	5	1	104	7	17	27	0	51	2	37	22	0	61	403
4:45 PM	77	97	24	0	198	70	28	2	0	100	6	10	21	0	37	4	51	30	0	85	420
5:00 PM	58	90	26	0	174	46	11	3	0	60	12	7	36	0	55	2	47	26	0	75	364
5:15 PM	58	117	19	0	194	69	19	3	0	91	6	16	18	0	40	2	33	29	0	64	389
Total	262	396	95	0	753	260	82	13	1	355	31	50	102	0	183	10	168	107	0	285	1576
Approach %	34.8	52.6	12.6	-	-	73.2	23.1	3.7	-	-	16.9	27.3	55.7	-	-	3.5	58.9	37.5	-	-	-
Total %	16.6	25.1	6.0	-	47.8	16.5	5.2	0.8	-	22.5	2.0	3.2	6.5	-	11.6	0.6	10.7	6.8	-	18.1	-
PHF	0.851	0.846	0.913	-	0.951	0.867	0.732	0.650	-	0.853	0.646	0.735	0.708	-	0.832	0.625	0.824	0.892	-	0.838	0.938
Motorcycles	3	0	2	-	5	1	1	0	-	2	0	0	0	-	0	0	0	2	-	2	9
% Motorcycles	1.1	0.0	2.1	-	0.7	0.4	1.2	0.0	-	0.6	0.0	0.0	0.0	-	0.0	0.0	0.0	1.9	-	0.7	0.6
Cars	194	297	64	-	555	189	59	8	-	256	18	38	69	-	125	9	136	76	-	221	1157
% Cars	74.0	75.0	67.4	-	73.7	72.7	72.0	61.5	-	72.1	58.1	76.0	67.6	-	68.3	90.0	81.0	71.0	-	77.5	73.4
Light Goods Vehicles	64	93	25	-	182	67	19	4	-	90	9	12	32	-	53	1	32	28	-	61	386
% Light Goods Vehicles	24.4	23.5	26.3	-	24.2	25.8	23.2	30.8	-	25.4	29.0	24.0	31.4	-	29.0	10.0	19.0	26.2	-	21.4	24.5
Buses	0	0	0	-	0	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	7.7	-	0.3	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	1	4	3	-	8	1	2	0	-	3	4	0	1	-	5	0	0	1	-	1	17
% Single-Unit Trucks	0.4	1.0	3.2	-	1.1	0.4	2.4	0.0	-	0.8	12.9	0.0	1.0	-	2.7	0.0	0.0	0.9	-	0.4	1.1
Articulated Trucks	0	1	1	-	2	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.3	1.1	-	0.3	0.8	0.0	0.0	-	0.6	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	1	0	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.3	0.0	-	0.1	0.0	1.2	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (4:30 PM)



Count Name: 05-14thStSW\_I315EB TMC Site Code: TMC-05 Start Date: 07/16/2014 Page No: 8



Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 1

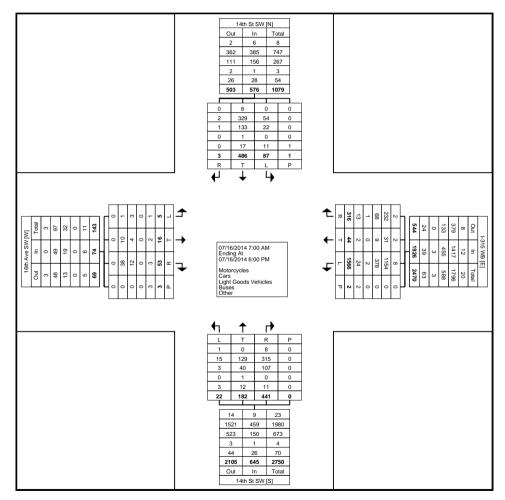
# Turning Movement Data

			14th St SW					14th St SW	Ū				I-315 WB					16th Ave SW			İ
			Southbound					Northbound		İ			Westbound					Eastbound			İ
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	29	6	0	35	15	4	1	0	20	9	0	25	0	34	2	0	0	0	2	91
7:15 AM	0	31	7	0	38	19	5	1	0	25	12	1	28	1	41	3	0	0	0	3	107
7:30 AM	0	49	5	0	54	24	5	0	0	29	9	2	37	1	48	3	2	0	0	5	136
7:45 AM	0	45	13	0	58	28	5	7	0	40	13	5	38	0	56	5	2	0	0	7	161
Hourly Total	0	154	31	0	185	86	19	9	0	114	43	8	128	2	179	13	4	0	0	17	495
8:00 AM	0	24	7	0	31	14	6	1	0	21	10	5	31	0	46	2	1	0	0	3	101
8:15 AM	0	18	1	0	19	24	1	3	0	28	6	4	56	0	66	5	2	0	1	7	120
8:30 AM	0	23	6	0	29	24	11	0	0	35	6	0	53	0	59	4	1	1	0	6	129
8:45 AM	0	23	4	0	27	18	8	0	0	26	11	0	80	0	91	3	1	0	0	4	148
Hourly Total	0	88	18	0	106	80	26	4	0	110	33	9	220	0	262	14	5	1	1	20	498
*** BREAK ***	-			-	-	•	-	-	-	-	-	-	-	-	-	-		-	-	-	-
4:00 PM	0	18	4	0	22	33	10	2	0	45	20	3	121	0	144	1	1	0	0	2	213
4:15 PM	0	30	2	0	32	33	14	0	0	47	25	6	145	0	176	2	1	0	0	3	258
4:30 PM	0	37	5	0	42	29	21	2	0	52	24	3	156	0	183	2	0	1	0	3	280
4:45 PM	1	41	5	0	47	38	22	2	0	62	32	9	148	0	189	2	3	1	1	6	304
Hourly Total	1	126	16	0	143	133	67	6	0	206	101	21	570	0	692	7	5	2	1	14	1055
5:00 PM	0	28	3	0	31	37	20	2	0	59	41	1	161	0	203	6	1	0	0	7	300
5:15 PM	1	27	8	0	36	32	21	1	0	54	40	0	159	0	199	4	0	2	0	6	295
5:30 PM	0	35	6	0	41	39	13	0	0	52	29	2	170	0	201	7	1	0	0	8	302
5:45 PM	1	28	5	1	34	34	16	0	0	50	29	3	158	0	190	2	0	0	1	2	276
Hourly Total	2	118	22	1	142	142	70	3	0	215	139	6	648	0	793	19	2	2	1	23	1173
Grand Total	3	486	87	1	576	441	182	22	0	645	316	44	1566	2	1926	53	16	5	3	74	3221
Approach %	0.5	84.4	15.1	-	_	68.4	28.2	3.4	-	-	16.4	2.3	81.3	-	-	71.6	21.6	6.8	-	-	-
Total %	0.1	15.1	2.7	-	17.9	13.7	5.7	0.7	-	20.0	9.8	1.4	48.6	-	59.8	1.6	0.5	0.2	-	2.3	-
Motorcycles	0	6	0	-	6	8	0	1	-	9	2	2	8	-	12	0	0	0	-	0	27
% Motorcycles	0.0	1.2	0.0	-	1.0	1.8	0.0	4.5	-	1.4	0.6	4.5	0.5	-	0.6	0.0	0.0	0.0	-	0.0	0.8
Cars	2	329	54	-	385	315	129	15	-	459	232	31	1154	-	1417	38	10	1	-	49	2310
% Cars	66.7	67.7	62.1	-	66.8	71.4	70.9	68.2	-	71.2	73.4	70.5	73.7	-	73.6	71.7	62.5	20.0	-	66.2	71.7
Light Goods Vehicles	1	133	22	-	156	107	40	3	-	150	68	9	378	-	455	12	4	3	-	19	780
% Light Goods Vehicles	33.3	27.4	25.3	-	27.1	24.3	22.0	13.6	-	23.3	21.5	20.5	24.1	-	23.6	22.6	25.0	60.0	-	25.7	24.2
Buses	0	1	0	-	1	0	1	0	-	1	1	0	2	-	3	0	0	0	-	0	5
% Buses	0.0	0.2	0.0	-	0.2	0.0	0.5	0.0	-	0.2	0.3	0.0	0.1	-	0.2	0.0	0.0	0.0	-	0.0	0.2
Single-Unit Trucks	0	10	8	-	18	8	9	3	-	20	11	2	22	-	35	2	2	1	-	5	78
% Single-Unit Trucks	0.0	2.1	9.2	-	3.1	1.8	4.9	13.6	-	3.1	3.5	4.5	1.4	-	1.8	3.8	12.5	20.0	-	6.8	2.4
Articulated Trucks	0	5	1	-	6	3	2	0	-	5	2	0	2	-	4	1	0	0	-	1	16
% Articulated Trucks	0.0	1.0	1.1	-	1.0	0.7	1.1	0.0	-	0.8	0.6	0.0	0.1	-	0.2	1.9	0.0	0.0	-	1.4	0.5
Bicycles on Road	0	2	2	-	4	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	5

% Bicycles on Road	0.0	0.4	2.3	-	0.7	0.0	0.5	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.2
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	2	-	-	-	-	3	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



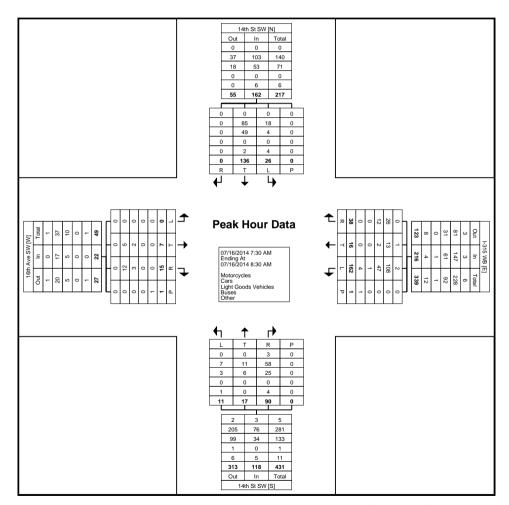
Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 4

#### Turning Movement Peak Hour Data (7:30 AM)

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			14th St SW					14th St SW					I-315 WB					16th Ave SW			
Start Time			Southbound					Northbound					Westbound					Eastbound			
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:30 AM	0	49	5	0	54	24	5	0	0	29	9	2	37	1	48	3	2	0	0	5	136
7:45 AM	0	45	13	0	58	28	5	7	0	40	13	5	38	0	56	5	2	0	0	7	161
8:00 AM	0	24	7	0	31	14	6	1	0	21	10	5	31	0	46	2	1	0	0	3	101
8:15 AM	0	18	1	0	19	24	1	3	0	28	6	4	56	0	66	5	2	0	1	7	120
Total	0	136	26	0	162	90	17	11	0	118	38	16	162	1	216	15	7	0	1	22	518
Approach %	0.0	84.0	16.0	-	-	76.3	14.4	9.3	-	-	17.6	7.4	75.0	-	-	68.2	31.8	0.0	-	-	-
Total %	0.0	26.3	5.0	_	31.3	17.4	3.3	2.1	-	22.8	7.3	3.1	31.3	-	41.7	2.9	1.4	0.0	-	4.2	-
PHF	0.000	0.694	0.500	-	0.698	0.804	0.708	0.393	-	0.738	0.731	0.800	0.723	-	0.818	0.750	0.875	0.000	-	0.786	0.804
Motorcycles	0	0	0	-	0	3	0	0	-	3	0	1	2	-	3	0	0	0	-	0	6
% Motorcycles	-	0.0	0.0	-	0.0	3.3	0.0	0.0	-	2.5	0.0	6.3	1.2	-	1.4	0.0	0.0	-	-	0.0	1.2
Cars	0	85	18	-	103	58	11	7	-	76	26	13	108	-	147	12	5	0	-	17	343
% Cars	-	62.5	69.2	-	63.6	64.4	64.7	63.6	-	64.4	68.4	81.3	66.7	-	68.1	80.0	71.4	-	-	77.3	66.2
Light Goods Vehicles	0	49	4	-	53	25	6	3	-	34	12	2	47	-	61	3	2	0	-	5	153
% Light Goods Vehicles	-	36.0	15.4	-	32.7	27.8	35.3	27.3	-	28.8	31.6	12.5	29.0	-	28.2	20.0	28.6	-	-	22.7	29.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	0	0	0	-	0	1
% Buses	-	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.6	-	0.5	0.0	0.0		-	0.0	0.2
Single-Unit Trucks	0	2	2	-	4	3	0	1	-	4	0	0	4	-	4	0	0	0	-	0	12
% Single-Unit Trucks	-	1.5	7.7	-	2.5	3.3	0.0	9.1	-	3.4	0.0	0.0	2.5	-	1.9	0.0	0.0		-	0.0	2.3
Articulated Trucks	0	0	0	-	0	1	0	0	-	. 1	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	-	0.0	0.0	-	0.0	1.1	0.0	0.0	-	0.8	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	2	-	2	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	-	0.0	7.7	-	1.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.4
Pedestrians	-	_	_	0		-	_	_	0	-	-	_	_	1	-	-	_		1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-		100.0	-	-	-	-	100.0	-	-



Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



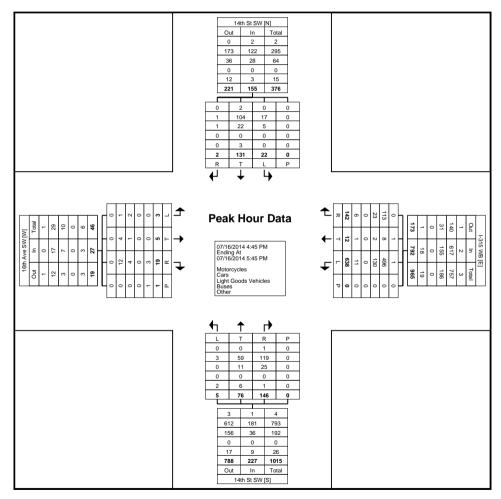
Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 6

# Turning Movement Peak Hour Data (4:45 PM)

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			14th St SW					14th St SW					I-315 WB					16th Ave SW	'		
Start Time			Southbound					Northbound					Westbound					Eastbound			
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:45 PM	1	41	5	0	47	38	22	2	0	62	32	9	148	0	189	2	3	1	1	6	304
5:00 PM	0	28	3	0	31	37	20	2	0	59	41	1	161	0	203	6	1	0	0	7	300
5:15 PM	1	27	8	0	36	32	21	1	0	54	40	0	159	0	199	4	0	2	0	6	295
5:30 PM	0	35	6	0	41	39	13	0	0	52	29	2	170	0	201	7	1	0	0	8	302
Total	2	131	22	0	155	146	76	5	0	227	142	12	638	0	792	19	5	3	1	27	1201
Approach %	1.3	84.5	14.2	-	-	64.3	33.5	2.2	-	-	17.9	1.5	80.6	-	-	70.4	18.5	11.1	-	-	-
Total %	0.2	10.9	1.8	-	12.9	12.2	6.3	0.4	-	18.9	11.8	1.0	53.1	-	65.9	1.6	0.4	0.2	-	2.2	-
PHF	0.500	0.799	0.688	-	0.824	0.936	0.864	0.625	-	0.915	0.866	0.333	0.938	-	0.975	0.679	0.417	0.375	-	0.844	0.988
Motorcycles	0	2	0	-	2	1	0	0	-	1	0	1	1	-	2	0	0	0	-	0	5
% Motorcycles	0.0	1.5	0.0	-	1.3	0.7	0.0	0.0	-	0.4	0.0	8.3	0.2	-	0.3	0.0	0.0	0.0	-	0.0	0.4
Cars	1	104	17	-	122	119	59	3	-	181	113	8	496	-	617	12	4	1	-	17	937
% Cars	50.0	79.4	77.3	-	78.7	81.5	77.6	60.0	-	79.7	79.6	66.7	77.7	-	77.9	63.2	80.0	33.3	-	63.0	78.0
Light Goods Vehicles	1	22	5	-	28	25	11	0	-	36	23	2	130	-	155	4	1	2	-	7	226
% Light Goods Vehicles	50.0	16.8	22.7	-	18.1	17.1	14.5	0.0	-	15.9	16.2	16.7	20.4	-	19.6	21.1	20.0	66.7	-	25.9	18.8
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	2	0	-	2	1	5	2	-	8	4	1	10	-	15	2	0	0	-	2	27
% Single-Unit Trucks	0.0	1.5	0.0	-	1.3	0.7	6.6	40.0	-	3.5	2.8	8.3	1.6	-	1.9	10.5	0.0	0.0	-	7.4	2.2
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	2	0	1	-	3	1	0	0	-	1	5
% Articulated Trucks	0.0	0.8	0.0	-	0.6	0.0	0.0	0.0	-	0.0	1.4	0.0	0.2	-	0.4	5.3	0.0	0.0	-	3.7	0.4
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	1.3	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	_	-	0	-	-	-	-	0	-	-	_		1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-
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Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (4:45 PM)



Count Name: 06-14thStSW\_I315WB TMC Site Code: TMC-06 Start Date: 07/16/2014 Page No: 8



Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 1

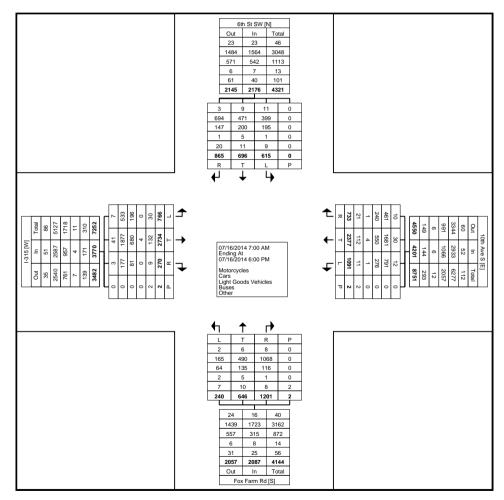
**Turning Movement Data** 

			6th St SW					Fox Farm Rd	3				10th Ave S					I-315			
Ctart Time			Southbound					Northbound					Westbound					Eastbound			[
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	17	15	21	0	53	79	33	12	0	124	20	78	14	0	112	8	140	32	0	180	469
7:15 AM	24	14	45	0	83	77	33	7	0	117	41	79	22	0	142	15	155	47	0	217	559
7:30 AM	22	15	36	0	73	103	58	16	0	177	28	99	21	0	148	15	211	45	0	271	669
7:45 AM	32	19	63	0	114	145	81	16	0	242	49	81	24	0	154	10	244	50	0	304	814
Hourly Total	95	63	165	0	323	404	205	51	0	660	138	337	81	0	556	48	750	174	0	972	2511
8:00 AM	26	33	37	0	96	93	38	5	0	136	26	70	24	0	120	9	128	43	0	180	532
8:15 AM	41	23	36	0	100	96	42	13	0	151	33	85	32	0	150	11	149	23	0	183	584
8:30 AM	36	22	37	0	95	82	45	15	0	142	26	97	25	0	148	15	147	30	0	192	577
8:45 AM	45	27	38	0	110	99	39	9	0	147	34	129	36	0	199	8	156	44	0	208	664
Hourly Total	148	105	148	0	401	370	164	42	0	576	119	381	117	0	617	43	580	140	0	763	2357
*** BREAK ***	-		-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-
4:00 PM	54	52	39	0	145	31	26	16	0	73	54	188	95	0	337	17	223	53	1	293	848
4:15 PM	77	68	43	0	188	63	24	26	1	113	64	164	85	0	313	21	160	52	0	233	847
4:30 PM	79	46	33	0	158	50	37	18	0	105	52	244	121	0	417	34	216	61	1	311	991
4:45 PM	101	64	38	0	203	49	36	15	1	100	55	166	95	0	316	23	163	69	0	255	874
Hourly Total	311	230	153	0	694	193	123	75	2	391	225	762	396	0	1383	95	762	235	2	1092	3560
5:00 PM	69	79	44	0	192	54	43	18	0	115	63	217	105	1	385	22	184	53	0	259	951
5:15 PM	76	85	38	0	199	74	39	20	0	133	80	247	165	0	492	24	143	59	0	226	1050
5:30 PM	84	74	40	0	198	58	34	18	0	110	60	217	94	1	371	13	166	53	0	232	911
5:45 PM	82	60	27	0	169	48	38	16	0	102	48	216	133	0	397	25	149	52	0	226	894
Hourly Total	311	298	149	0	758	234	154	72	0	460	251	897	497	2	1645	84	642	217	0	943	3806
Grand Total	865	696	615	0	2176	1201	646	240	2	2087	733	2377	1091	2	4201	270	2734	766	2	3770	12234
Approach %	39.8	32.0	28.3	-	-	57.5	31.0	11.5	-	-	17.4	56.6	26.0	-	-	7.2	72.5	20.3	-	-	-
Total %	7.1	5.7	5.0	-	17.8	9.8	5.3	2.0	-	17.1	6.0	19.4	8.9	-	34.3	2.2	22.3	6.3	-	30.8	-
Motorcycles	3	9	11	-	23	8	6	2	-	16	10	30	12	-	52	3	41	7	-	51	142
% Motorcycles	0.3	1.3	1.8	-	1.1	0.7	0.9	0.8	-	0.8	1.4	1.3	1.1	-	1.2	1.1	1.5	0.9	-	1.4	1.2
Cars	694	471	399	-	1564	1068	490	165	-	1723	461	1681	791	-	2933	177	1877	533	-	2587	8807
% Cars	80.2	67.7	64.9	-	71.9	88.9	75.9	68.8	-	82.6	62.9	70.7	72.5	-	69.8	65.6	68.7	69.6	-	68.6	72.0
Light Goods Vehicles	147	200	195	-	542	116	135	64	-	315	240	550	276	-	1066	81	680	196	-	957	2880
% Light Goods Vehicles	17.0	28.7	31.7	-	24.9	9.7	20.9	26.7	-	15.1	32.7	23.1	25.3	-	25.4	30.0	24.9	25.6	-	25.4	23.5
Buses	1	5	1	-	7	1	5	2	-	8	1	4	. 1	-	6	0	4	0	-	4	25
% Buses	0.1	0.7	0.2	-	0.3	0.1	0.8	0.8	-	0.4	0.1	0.2	0.1	-	0.1	0.0	0.1	0.0	-	0.1	0.2
Single-Unit Trucks	16	10	5	-	31	8	9	6	-	23	17	59	11	-	87	8	65	19	-	92	233
% Single-Unit Trucks	1.8	1.4	0.8	-	1.4	0.7	1.4	2.5	-	1.1	2.3	2.5	1.0	-	2.1	3.0	2.4	2.5	-	2.4	1.9
Articulated Trucks	4	1	4	-	9	0	0	1	-	1	4	53	0	-	57	0	67	11	-	78	145
% Articulated Trucks	0.5	0.1	0.7	-	0.4	0.0	0.0	0.4	-	0.0	0.5	2.2	0.0	-	1.4	0.0	2.5	1.4	-	2.1	1.2
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1	0	0	-	1	2

% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	_	100.0	-	-	-	-	100.0	-	-



Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



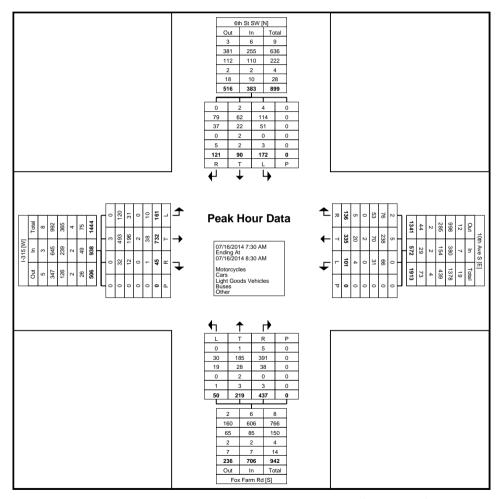
Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 4

# Turning Movement Peak Hour Data (7:30 AM)

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			6th St SW					Fox Farm Ro	I				10th Ave S					I-315			[
Start Time			Southbound					Northbound					Westbound					Eastbound			[
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:30 AM	22	15	36	0	73	103	58	16	0	177	28	99	21	0	148	15	211	45	0	271	669
7:45 AM	32	19	63	0	114	145	81	16	0	242	49	81	24	0	154	10	244	50	0	304	814
8:00 AM	26	33	37	0	96	93	38	5	0	136	26	70	24	0	120	9	128	43	0	180	532
8:15 AM	41	23	36	0	100	96	42	13	0	151	33	85	32	0	150	11	149	23	0	183	584
Total	121	90	172	0	383	437	219	50	0	706	136	335	101	0	572	45	732	161	0	938	2599
Approach %	31.6	23.5	44.9	-	-	61.9	31.0	7.1	-	-	23.8	58.6	17.7	-	-	4.8	78.0	17.2	-	-	-
Total %	4.7	3.5	6.6	-	14.7	16.8	8.4	1.9	-	27.2	5.2	12.9	3.9	-	22.0	1.7	28.2	6.2	-	36.1	-
PHF	0.738	0.682	0.683	-	0.840	0.753	0.676	0.781	-	0.729	0.694	0.846	0.789	-	0.929	0.750	0.750	0.805	-	0.771	0.798
Motorcycles	0	2	4	-	6	5	1	0	-	6	2	5	0	-	7	0	3	0	-	3	22
% Motorcycles	0.0	2.2	2.3	-	1.6	1.1	0.5	0.0	-	0.8	1.5	1.5	0.0	-	1.2	0.0	0.4	0.0	-	0.3	0.8
Cars	79	62	114	-	255	391	185	30	-	606	76	238	66	-	380	32	493	120	-	645	1886
% Cars	65.3	68.9	66.3	-	66.6	89.5	84.5	60.0	-	85.8	55.9	71.0	65.3	-	66.4	71.1	67.3	74.5	-	68.8	72.6
Light Goods Vehicles	37	22	51	-	110	38	28	19	-	85	53	70	31	-	154	12	196	31	-	239	588
% Light Goods Vehicles	30.6	24.4	29.7	-	28.7	8.7	12.8	38.0	-	12.0	39.0	20.9	30.7	-	26.9	26.7	26.8	19.3	-	25.5	22.6
Buses	0	2	0	-	2	0	2	0	-	2	0	2	0	-	2	0	2	0	-	2	8
% Buses	0.0	2.2	0.0	-	0.5	0.0	0.9	0.0	-	0.3	0.0	0.6	0.0	-	0.3	0.0	0.3	0.0	-	0.2	0.3
Single-Unit Trucks	5	1	2	-	8	3	2	0	-	5	5	12	4	-	21	1	24	8	-	33	67
% Single-Unit Trucks	4.1	1.1	1.2	-	2.1	0.7	0.9	0.0	-	0.7	3.7	3.6	4.0	-	3.7	2.2	3.3	5.0	-	3.5	2.6
Articulated Trucks	0	1	1	-	2	0	0	1	-	1	0	8	0	-	8	0	14	2	-	16	27
% Articulated Trucks	0.0	1.1	0.6	-	0.5	0.0	0.0	2.0	-	0.1	0.0	2.4	0.0	-	1.4	0.0	1.9	1.2	-	1.7	1.0
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
		•	•				•	•				•	•							•	



Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



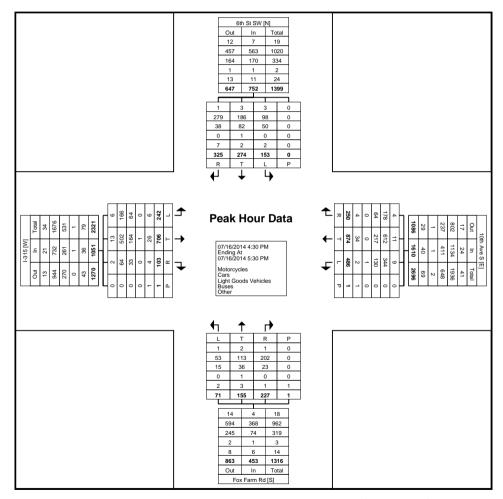
Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 6

# Turning Movement Peak Hour Data (4:30 PM)

	i						٠	_				( .		,	1						i
			6th St SW					Fox Farm Ro					10th Ave S					I-315			
Start Time			Southbound					Northbound					Westbound					Eastbound			
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:30 PM	79	46	33	0	158	50	37	18	0	105	52	244	121	0	417	34	216	61	1	311	991
4:45 PM	101	64	38	0	203	49	36	15	1	100	55	166	95	0	316	23	163	69	0	255	874
5:00 PM	69	79	44	0	192	54	43	18	0	115	63	217	105	1	385	22	184	53	0	259	951
5:15 PM	76	85	38	0	199	74	39	20	0	133	80	247	165	0	492	24	143	59	0	226	1050
Total	325	274	153	0	752	227	155	71	1	453	250	874	486	1	1610	103	706	242	1	1051	3866
Approach %	43.2	36.4	20.3	-	-	50.1	34.2	15.7	-	-	15.5	54.3	30.2	-	-	9.8	67.2	23.0	-	-	-
Total %	8.4	7.1	4.0	-	19.5	5.9	4.0	1.8	-	11.7	6.5	22.6	12.6	-	41.6	2.7	18.3	6.3	-	27.2	-
PHF	0.804	0.806	0.869	-	0.926	0.767	0.901	0.888	-	0.852	0.781	0.885	0.736	-	0.818	0.757	0.817	0.877	-	0.845	0.920
Motorcycles	1	3	3	-	7	1	2	1	-	4	4	11	9	-	24	2	13	6	-	21	56
% Motorcycles	0.3	1.1	2.0	-	0.9	0.4	1.3	1.4	-	0.9	1.6	1.3	1.9	-	1.5	1.9	1.8	2.5	-	2.0	1.4
Cars	279	186	98	-	563	202	113	53	-	368	178	612	344	-	1134	64	502	166	-	732	2797
% Cars	85.8	67.9	64.1	-	74.9	89.0	72.9	74.6	-	81.2	71.2	70.0	70.8	-	70.4	62.1	71.1	68.6	-	69.6	72.3
Light Goods Vehicles	38	82	50	-	170	23	36	15	-	74	64	217	130	-	411	33	164	64	-	261	916
% Light Goods Vehicles	11.7	29.9	32.7	-	22.6	10.1	23.2	21.1	-	16.3	25.6	24.8	26.7	-	25.5	32.0	23.2	26.4	-	24.8	23.7
Buses	0	1	0	-	1	0	1	0	-	1	0	0	1	-	1	0	1	0	-	1	4
% Buses	0.0	0.4	0.0	-	0.1	0.0	0.6	0.0	-	0.2	0.0	0.0	0.2	-	0.1	0.0	0.1	0.0	-	0.1	0.1
Single-Unit Trucks	4	2	0	-	6	1	3	2	-	6	3	19	2	-	24	3	13	4	-	20	56
% Single-Unit Trucks	1.2	0.7	0.0	-	8.0	0.4	1.9	2.8	-	1.3	1.2	2.2	0.4	-	1.5	2.9	1.8	1.7	-	1.9	1.4
Articulated Trucks	3	0	2	-	5	0	0	0	-	0	1	15	0	-	16	0	13	2	-	15	36
% Articulated Trucks	0.9	0.0	1.3	-	0.7	0.0	0.0	0.0	-	0.0	0.4	1.7	0.0	-	1.0	0.0	1.8	0.8	-	1.4	0.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.0	0.0	0.0	-	0.1	0.0
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	_	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-
									•	- '											



Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (4:30 PM)



Count Name: 07-FoxFarm\_I315 TMC Site Code: TMC-07 Start Date: 07/16/2014 Page No: 8



Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 1

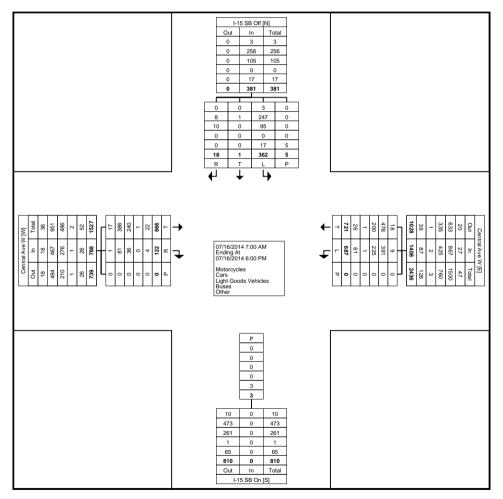
# **Turning Movement Data**

			I-15 SB Off Southbound			I-15 SB On Central Ave W  Northbound Westbound							Central Ave W Eastbound				
Start Time	Right	Thru	Left	Peds	App. Total	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total	
7:00 AM	3	0	31	0	34	0	0	9	30	0	39	9	35	0	44	117	
7:15 AM	1	0	37	0	38	0	0	19	28	0	47	13	33	0	46	131	
7:30 AM	2	0	38	0	40	0	0	27	24	0	51	8	69	0	77	168	
7:45 AM	1	0	35	0	36	0	0	22	40	0	62	12	47	0	59	157	
Hourly Total	7	0	141	0	148	0	0	77	122	0	199	42	184	0	226	573	
8:00 AM	2	0	20	0	22	0	0	20	31	0	51	6	42	0	48	121	
8:15 AM	0	0	19	0	19	0	0	20	33	0	53	7	42	0	49	121	
8:30 AM	0	0	20	0	20	0	0	23	28	0	51	6	29	0	35	106	
8:45 AM	0	0	20	0	20	2	0	21	35	0	56	7	33	0	40	116	
Hourly Total	2	0	79	0	81	2	0	84	127	0	211	26	146	0	172	464	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4:00 PM	1	1	26	0	28	0	0	59	46	0	105	10	44	0	54	187	
4:15 PM	2	0	13	0	15	0	0	73	44	0	117	5	37	0	42	174	
4:30 PM	0	0	23	0	23	0	0	68	53	0	121	7	49	0	56	200	
4:45 PM	0	0	14	3	14	0	0	61	65	0	126	2	40	0	42	182	
Hourly Total	3	1	76	3	80	0	0	261	208	0	469	24	170	0	194	743	
5:00 PM	2	0	16	0	18	0	0	75	52	0	127	7	40	0	47	192	
5:15 PM	1	0	17	1	18	1	0	86	64	0	150	5	49	0	54	222	
5:30 PM	1	0	15	0	16	0	0	66	64	0	130	9	43	0	52	198	
5:45 PM	2	0	18	1	20	0	0	72	50	0	122	9	34	0	43	185	
Hourly Total	6	0	66	2	72	1	0	299	230	0	529	30	166	0	196	797	
Grand Total	18	1	362	5	381	3	0	721	687	0	1408	122	666	0	788	2577	
Approach %	4.7	0.3	95.0	-	-	-	-	51.2	48.8	-	-	15.5	84.5	-	-	-	
Total %	0.7	0.0	14.0	-	14.8	-	0.0	28.0	26.7	-	54.6	4.7	25.8	-	30.6	-	
Motorcycles	0	0	3	-	3	-	0	18	9	-	27	1	17	-	18	48	
% Motorcycles	0.0	0.0	0.8	-	0.8	-	_	2.5	1.3	-	1.9	0.8	2.6	-	2.3	1.9	
Cars	8	1	247	-	256	-	0	476	391	-	867	81	386	-	467	1590	
% Cars	44.4	100.0	68.2	-	67.2	-	_	66.0	56.9	-	61.6	66.4	58.0	-	59.3	61.7	
Light Goods Vehicles	10	0	95	-	105	-	0	200	225	-	425	36	240	_	276	806	
% Light Goods Vehicles	55.6	0.0	26.2	-	27.6	-	-	27.7	32.8	-	30.2	29.5	36.0	-	35.0	31.3	
Buses	0	0	0	-	0	-	0	1	1	-	2	0	1	-	. 1	3	
% Buses	0.0	0.0	0.0	-	0.0	-	_	0.1	0.1	-	0.1	0.0	0.2	_	0.1	0.1	
Single-Unit Trucks	0	0	7	-	7	-	0	13	28	-	41	4	10	-	14	62	
% Single-Unit Trucks	0.0	0.0	1.9	-	1.8	-	_	1.8	4.1	-	2.9	3.3	1.5	-	1.8	2.4	
Articulated Trucks	0	0	10	-	10	-	0	13	33	-	46	0	12	-	12	68	
% Articulated Trucks	0.0	0.0	2.8	-	2.6	-	-	1.8	4.8	-	3.3	0.0	1.8	-	1.5	2.6	
Bicycles on Road	0	0	0	-	0	-	0	0	0	-	0	0	0	-	0	0	
% Bicycles on Road	0.0	0.0	0.0	-	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	

Pedestrians	-	-	-	5	-	3	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	100.0	-	-	-	-	-	-	-	-	-	_



Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



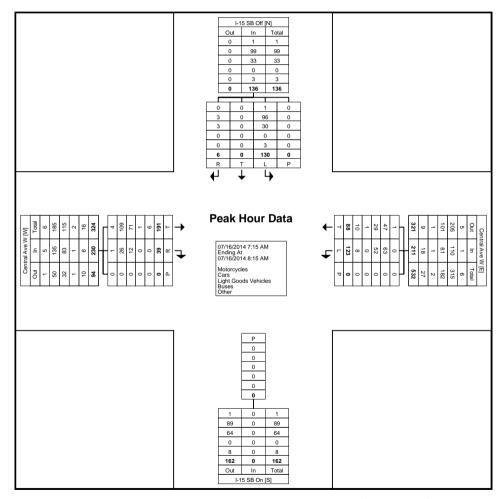
Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:15 AM)

i	I-15 SB Off I-15 SB On Central Ave W Central Ave W															
			I-15 SB Off			I-15	SB On		Centra	l Ave W			Centra	I Ave W		1
Start Time			Southbound			Nort	thbound		West	bound			Eastl	oound		1
Start Time	Right	Thru	Left	Peds	App. Total	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
7:15 AM	1	0	37	0	38	0	0	19	28	0	47	13	33	0	46	131
7:30 AM	2	0	38	0	40	0	0	27	24	0	51	8	69	0	77	168
7:45 AM	1	0	35	0	36	0	0	22	40	0	62	12	47	0	59	157
8:00 AM	2	0	20	0	22	0	0	20	31	0	51	6	42	0	48	121
Total	6	0	130	0	136	0	0	88	123	0	211	39	191	0	230	577
Approach %	4.4	0.0	95.6	-	-	-	-	41.7	58.3	-	-	17.0	83.0	-	-	-
Total %	1.0	0.0	22.5	-	23.6	-	0.0	15.3	21.3	-	36.6	6.8	33.1	-	39.9	-
PHF	0.750	0.000	0.855	-	0.850	-	0.000	0.815	0.769	-	0.851	0.750	0.692	-	0.747	0.859
Motorcycles	0	0	1	-	1	-	0	1	0	-	1	1	4	-	5	7
% Motorcycles	0.0	_	0.8	-	0.7	-	-	1.1	0.0	-	0.5	2.6	2.1	-	2.2	1.2
Cars	3	0	96	-	99	-	0	47	63	-	110	26	109	-	135	344
% Cars	50.0	-	73.8	-	72.8	-	-	53.4	51.2	-	52.1	66.7	57.1	-	58.7	59.6
Light Goods Vehicles	3	0	30	-	33	-	0	29	52	_	81	12	71	_	83	197
% Light Goods Vehicles	50.0	-	23.1	-	24.3	-	-	33.0	42.3	-	38.4	30.8	37.2	-	36.1	34.1
Buses	0	0	0	-	0	-	0	1	0	-	1	0	1	-	1	2
% Buses	0.0	_	0.0	-	0.0	-	-	1.1	0.0	_	0.5	0.0	0.5	_	0.4	0.3
Single-Unit Trucks	0	0	1	-	1	-	0	1	5	-	6	0	2	-	2	9
% Single-Unit Trucks	0.0	-	0.8	-	0.7	-	-	1.1	4.1	-	2.8	0.0	1.0	-	0.9	1.6
Articulated Trucks	0	0	2	-	2	-	0	9	3	-	12	0	4	-	4	18
% Articulated Trucks	0.0	-	1.5	-	1.5	-	-	10.2	2.4	-	5.7	0.0	2.1	-	1.7	3.1
Bicycles on Road	0	0	0	-	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	<u>-</u>	0.0	-	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)



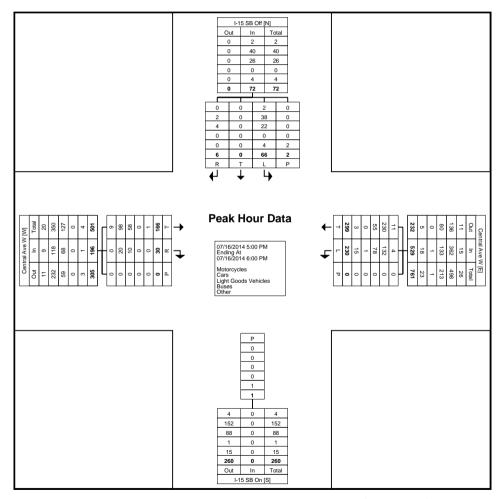
Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (5:00 PM)

1	I-15 SB Off I-15 SB On Central Ave W Central Ave W															
			I-15 SB Off			I-15	SB On		Central	I Ave W						
Start Time			Southbound			Nort	hbound		West	bound			Eastl	oound		
Start Time	Right	Thru	Left	Peds	App. Total	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
5:00 PM	2	0	16	0	18	0	0	75	52	0	127	7	40	0	47	192
5:15 PM	1	0	17	1	18	1	0	86	64	0	150	5	49	0	54	222
5:30 PM	1	0	15	0	16	0	0	66	64	0	130	9	43	0	52	198
5:45 PM	2	0	18	1	20	0	0	72	50	0	122	9	34	0	43	185
Total	6	0	66	2	72	1	0	299	230	0	529	30	166	0	196	797
Approach %	8.3	0.0	91.7	-	-	-	-	56.5	43.5	-	-	15.3	84.7	-	-	-
Total %	0.8	0.0	8.3	-	9.0	-	0.0	37.5	28.9	-	66.4	3.8	20.8	-	24.6	-
PHF	0.750	0.000	0.917	-	0.900	-	0.000	0.869	0.898	-	0.882	0.833	0.847	-	0.907	0.898
Motorcycles	0	0	2	-	2	-	0	11	4	-	15	0	9	-	9	26
% Motorcycles	0.0	-	3.0	-	2.8	-	-	3.7	1.7	-	2.8	0.0	5.4	-	4.6	3.3
Cars	2	0	38	-	40	-	0	230	132	-	362	20	98	-	118	520
% Cars	33.3	-	57.6	-	55.6	-	-	76.9	57.4	-	68.4	66.7	59.0	-	60.2	65.2
Light Goods Vehicles	4	0	22	-	26	-	0	55	78	-	133	10	58	-	68	227
% Light Goods Vehicles	66.7	-	33.3	-	36.1	-	-	18.4	33.9	-	25.1	33.3	34.9	-	34.7	28.5
Buses	0	0	0	-	0	-	0	0	1	-	1	0	0	-	0	1
% Buses	0.0	-	0.0	-	0.0	-	-	0.0	0.4	-	0.2	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	0	0	1	-	1	-	0	3	9	-	12	0	1	-	1	14
% Single-Unit Trucks	0.0	-	1.5	-	1.4	-	-	1.0	3.9	-	2.3	0.0	0.6	-	0.5	1.8
Articulated Trucks	0	0	3	-	3	-	0	0	6	-	6	0	0	-	0	9
% Articulated Trucks	0.0	-	4.5	-	4.2	-	-	0.0	2.6	-	1.1	0.0	0.0	-	0.0	1.1
Bicycles on Road	0	0	0	-	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	2	-	1	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	100.0	-	-	-		-	-	-	-	_	-



Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 7



Turning Movement Peak Hour Data Plot (5:00 PM)



Count Name: 08-CentralAve\_I15SB TMC Site Code: TMC-08 Start Date: 07/16/2014 Page No: 8



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014

Page No: 1

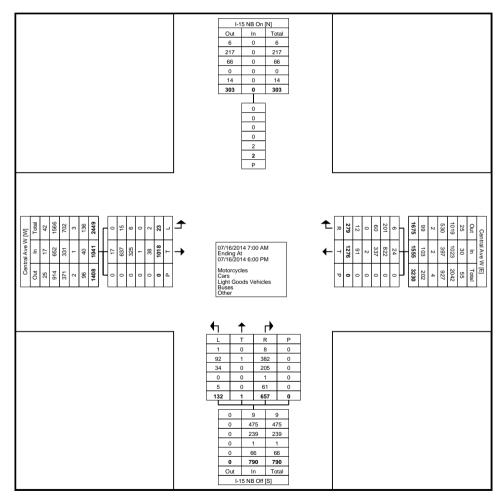
# **Turning Movement Data**

						iai	Tilling Wick	V OILIOITE E	Julu		-					
	I-15	NB On			I-15 NB Off		_		Central	Ave W						
	Sou	thbound			Northbound				West	bound			Eastl	bound		
Start Time	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	0	31	1	0	0	32	8	39	0	47	64	3	0	67	146
7:15 AM	0	0	27	0	7	0	34	6	41	0	47	70	0	0	70	151
7:30 AM	0	0	52	0	7	0	59	7	42	0	49	106	2	0	108	216
7:45 AM	0	0	42	0	1	0	43	11	60	0	71	79	1	0	80	194
Hourly Total	0	0	152	1	15	0	168	32	182	0	214	319	6	0	325	707
8:00 AM	0	0	39	0	3	0	42	11	52	0	63	61	1	0	62	167
8:15 AM	0	0	44	0	4	0	48	15	48	0	63	59	2	0	61	172
8:30 AM	0	0	32	0	3	0	35	11	45	0	56	54	0	0	54	145
8:45 AM	0	0	34	0	9	0	43	4	49	0	53	50	0	0	50	146
Hourly Total	0	0	149	0	19	0	168	41	194	0	235	224	3	0	227	630
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	0	61	0	7	0	68	19	96	0	115	70	1	0	71	254
4:15 PM	0	0	44	0	16	0	60	18	99	0	117	48	1	0	49	226
4:30 PM	0	0	56	0	12	0	68	20	117	0	137	72	1	0	73	278
4:45 PM	0	0	36	0	10	0	46	28	110	0	138	55	0	0	55	239
Hourly Total	0	0	197	0	45	0	242	85	422	0	507	245	3	0	248	997
5:00 PM	0	0	35	0	15	0	50	34	118	0	152	58	1	0	59	261
5:15 PM	1	0	43	0	20	0	63	31	126	0	157	64	3	0	67	287
5:30 PM	0	0	47	0	8	0	55	30	124	0	154	60	1	0	61	270
5:45 PM	1	0	34	0	10	0	44	26	110	0	136	48	6	0	54	234
Hourly Total	2	0	159	0	53	0	212	121	478	0	599	230	11	0	241	1052
Grand Total	2	0	657	1	132	0	790	279	1276	0	1555	1018	23	0	1041	3386
Approach %	-	-	83.2	0.1	16.7	-	-	17.9	82.1	-	-	97.8	2.2	-	-	-
Total %	-	0.0	19.4	0.0	3.9	-	23.3	8.2	37.7	-	45.9	30.1	0.7	-	30.7	-
Motorcycles	-	0	8	0	1	-	9	6	24	-	30	17	0	-	17	56
% Motorcycles	-	-	1.2	0.0	0.8	-	1.1	2.2	1.9	-	1.9	1.7	0.0	-	1.6	1.7
Cars	-	0	382	1	92	-	475	201	822	-	1023	637	15	-	652	2150
% Cars	-	-	58.1	100.0	69.7	-	60.1	72.0	64.4	-	65.8	62.6	65.2	-	62.6	63.5
Light Goods Vehicles	-	0	205	0	34	-	239	60	337	-	397	325	6	-	331	967
% Light Goods Vehicles	-	-	31.2	0.0	25.8	-	30.3	21.5	26.4	-	25.5	31.9	26.1	-	31.8	28.6
Buses	-	0	1	0	0	-	1	0	2	-	2	1	0	-	1	4
% Buses	-	-	0.2	0.0	0.0	-	0.1	0.0	0.2	-	0.1	0.1	0.0	-	0.1	0.1
Single-Unit Trucks	-	0	25	0	5	-	30	8	43	-	51	16	2	-	18	99
% Single-Unit Trucks	-	-	3.8	0.0	3.8	-	3.8	2.9	3.4	-	3.3	1.6	8.7	-	1.7	2.9
Articulated Trucks	-	0	36	0	0	-	36	4	47	-	51	19	0	-	19	106
% Articulated Trucks	-	-	5.5	0.0	0.0	-	4.6	1.4	3.7	-	3.3	1.9	0.0	-	1.8	3.1
Bicycles on Road	-	0	0	0	0	-	0	0	1	-	1	3	0	-	3	4
% Bicycles on Road	-	-	0.0	0.0	0.0	-	0.0	0.0	0.1	-	0.1	0.3	0.0	-	0.3	0.1

Pedestrians	2	-	-	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 4

# Turning Movement Peak Hour Data (7:30 AM)

Visible 1															
I-15	NB On			I-15 NB Off				Central	Ave W			Central	Ave W		
Sout	hbound			Northbound				West	oound			Eastb	ound		
Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
0	0	52	0	7	0	59	7	42	0	49	106	2	0	108	216
0	0	42	0	1	0	43	11	60	0	71	79	1	0	80	194
0	0	39	0	3	0	42	11	52	0	63	61	1	0	62	167
0	0	44	0	4	0	48	15	48	0	63	59	2	0	61	172
0	0	177	0	15	0	192	44	202	0	246	305	6	0	311	749
-	-	92.2	0.0	7.8	-	-	17.9	82.1	-	-	98.1	1.9	-	-	-
-	0.0	23.6	0.0	2.0	-	25.6	5.9	27.0	-	32.8	40.7	0.8	-	41.5	-
-	0.000	0.851	0.000	0.536	-	0.814	0.733	0.842	-	0.866	0.719	0.750	-	0.720	0.867
-	0	0	0	0	-	0	1	0	-	1	2	0	-	2	3
-	-	0.0	_	0.0	-	0.0	2.3	0.0	-	0.4	0.7	0.0	-	0.6	0.4
-	0	89	0	11	-	100	23	120	-	143	185	3	-	188	431
-	-	50.3	-	73.3	-	52.1	52.3	59.4	-	58.1	60.7	50.0	-	60.5	57.5
-	0	69	0	4	-	73	14	57	-	71	108	2	-	110	254
-	-	39.0	_	26.7	-	38.0	31.8	28.2	-	28.9	35.4	33.3	-	35.4	33.9
-	0	0	0	0	-	0	0	1	-	1	1	0	-	1	2
-	_	0.0	_	0.0	-	0.0	0.0	0.5	-	0.4	0.3	0.0	-	0.3	0.3
-	0	7	0	0	-	7	3	10	-	13	2	1	-	3	23
-	-	4.0	-	0.0	-	3.6	6.8	5.0	-	5.3	0.7	16.7	-	1.0	3.1
-	0	12	0	0	-	12	3	13	-	16	4	0	-	4	32
-	-	6.8	_	0.0	-	6.3	6.8	6.4	-	6.5	1.3	0.0	-	1.3	4.3
-	0	0	0	0	-	0	0	1	-	1	3	0	-	3	4
-	-	0.0	_	0.0	-	0.0	0.0	0.5	_	0.4	1.0	0.0	-	1.0	0.5
0	-	-	-	<u>-</u>	0	-	-	-	0	-	-	-	0	-	-
-	-	-	_	_	-	-	-	-	-	-	-	-	-	-	-
	Sout Peds  0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Southbound           Peds         App. Total         Right           0         0         52           0         0         42           0         0         39           0         0         44           0         0         177           -         -         92.2           -         0.0         23.6           -         0.00         0.851           -         0         0           -         0.0         0           -         0.0         89           -         -         50.3           -         0         69           -         -         39.0           -         0         0           -         0.0         7           -         0.0         7           -         -         4.0           -         0         0           -         -         6.8           -         0.0         0	Southbound           Peds         App. Total         Right         Thru           0         0         52         0           0         0         42         0           0         0         39         0           0         0         44         0           0         0         177         0           -         -         92.2         0.0           -         0.00         23.6         0.0           -         0.00         0.851         0.000           -         0         0         0           -         0.0         0         -           -         0         89         0           -         0         69         0           -         0         69         0           -         0         0         0           -         0         0         0           -         0         0         0           -         0         0         -           -         0         0         -           -         0         7         0           -	I-15 NB On   Southbound   Peds   App. Total   Right   Thru   Left	I-15 NB On   Southbound   Peds   App. Total   Right   Thru   Left   Peds	I-15 NB On   Southbound   Right   Thru   Left   Peds   App. Total   Right   I-15 NB On   Southbound   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Right   Thru   Thr	Central   Southbound   Right   Thru	Northbound   No	Northbound   Peds   App. Total   Right   Thru   Peds   App. Total   Thru   L-15 NB On   Southbound   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Thru   Left   Peds   App. Total   Right   Thru   Peds   App. Total   Thru   Total   Thru   Peds   App. Total   Thru   Total   Thru   Total   Tota	Fight   Fig	North-bound   North-bound	H-15 NB On		



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 5

	1-15 NB On [N]	
Central Ave W [W]  Out In Total  Ou 2 2  131 188 319  61 110 171  1 1 2  24 10 34  217 311 528  0 185 3  0 186 2  0 1 0 0  0 108 2  0 1 0 0  0 0 0 0  0 0 0 0	07/16/2014 7:30 AM Ending At 07/16/2014 8:30 AM Motorcycles Care Light Coods Vehicles Buses Other  L T R P 0 0 0 0 0 11 0 89 0	Central Ave W  E      Out   In   Total     2   1   3     274   143   417     177   71   248     1   1   2     28   30   58     482   246   728     1   0   0     23   120   0     1   0   0     23   120   0     1   0   0     44   202   0     44   202   0
	4 0 69 0 0 0 0 0 0 0 19 0 15 0 177 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

Turning Movement Peak Hour Data Plot (7:30 AM)



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (4:30 PM)

i			i		1 01111111	9 1410401	IIIGIILI G	in i ioai i	Julia ( I	00 1 111)						
	I-15	NB On			I-15 NB Off				Central	Ave W			Centra	l Ave W		
Start Time	Sout	hbound			Northbound				West	oound			East	oound		
Start Time	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
4:30 PM	0	0	56	0	12	0	68	20	117	0	137	72	1	0	73	278
4:45 PM	0	0	36	0	10	0	46	28	110	0	138	55	0	0	55	239
5:00 PM	0	0	35	0	15	0	50	34	118	0	152	58	1	0	59	261
5:15 PM	1	0	43	0	20	0	63	31	126	0	157	64	3	0	67	287
Total	1	0	170	0	57	0	227	113	471	0	584	249	5	0	254	1065
Approach %	-	-	74.9	0.0	25.1	-	-	19.3	80.7	-	-	98.0	2.0	-	-	-
Total %	-	0.0	16.0	0.0	5.4	-	21.3	10.6	44.2	-	54.8	23.4	0.5	-	23.8	-
PHF	-	0.000	0.759	0.000	0.713	-	0.835	0.831	0.935	-	0.930	0.865	0.417	-	0.870	0.928
Motorcycles	-	0	3	0	0	-	3	3	15	-	18	6	0	-	6	27
% Motorcycles	-	-	1.8	-	0.0	-	1.3	2.7	3.2	-	3.1	2.4	0.0	_	2.4	2.5
Cars	-	0	106	0	43	-	149	92	315	-	407	156	4	-	160	716
% Cars	-	-	62.4	-	75.4	-	65.6	81.4	66.9	-	69.7	62.7	80.0	-	63.0	67.2
Light Goods Vehicles	-	0	49	0	13	-	62	17	119	-	136	82	1	_	83	281
% Light Goods Vehicles	-	-	28.8	_	22.8	-	27.3	15.0	25.3	-	23.3	32.9	20.0	-	32.7	26.4
Buses	-	0	0	0	0	-	0	0	0	-	0	0	0	-	0	0
% Buses	-	-	0.0	_	0.0	-	0.0	0.0	0.0	_	0.0	0.0	0.0	_	0.0	0.0
Single-Unit Trucks	-	0	6	0	1	-	7	1	12	-	13	3	0	-	3	23
% Single-Unit Trucks	-	-	3.5	-	1.8	-	3.1	0.9	2.5	-	2.2	1.2	0.0	-	1.2	2.2
Articulated Trucks	-	0	6	0	0	-	6	0	10	-	10	2	0	_	2	18
% Articulated Trucks	-	-	3.5	_	0.0	-	2.6	0.0	2.1	-	1.7	0.8	0.0	-	0.8	1.7
Bicycles on Road	-	0	0	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	1	-	-	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	100.0	-	-	<u>-</u>		-	_	-	-	-	-	-	-			-



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 7

	I-15 NB On [N]	
Central Ave W [W]  Out in Total  15 6 21  328 160 518  132 83 215  0 0 0 0  15 6 0  0 158 4  0 158 4  0 158 4  0 158 0  0 158 1  0 158 0  0 158 0  0 158 0  0 158 0  0 158 0  0 158 0  0 158 0	Peak Hour Data    07/16/2014 4:30 PM Ending At 07/16/2014 5:30 PM Motocycles Cars Cars Cars Cars Check	Central Ave W [E]  Out In Total 9 18 27 262 407 669 131 136 267 0 0 0 0 17 23 40 419 584 1003
	L T R P 0 0 0 3 0 43 0 106 0 13 0 49 0 0 0 0 0 1 0 12 0 57 0 170 0  1 0 12 0 57 0 170 0  1 0 62 62 0 0 0 0 0 13 13 0 127 227 Out In Total I-15 NB Off [S]	

Turning Movement Peak Hour Data Plot (4:30 PM)



Count Name: 09-CentralAve\_I15NB TMC Site Code: TMC-09 Start Date: 07/16/2014 Page No: 8



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 1

## **Turning Movement Data**

Otari Tiran		Vaugh Southl					I Ave W bound				ll Ave W bound		
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	10	17	0	27	9	39	0	48	73	13	0	86	161
7:15 AM	13	13	0	26	10	33	0	43	95	12	0	107	176
7:30 AM	14	19	0	33	17	35	0	52	128	20	0	148	233
7:45 AM	16	25	0	41	21	54	0	75	110	21	0	131	247
Hourly Total	53	74	0	127	57	161	0	218	406	66	0	472	817
8:00 AM	19	21	0	40	14	44	0	58	85	12	0	97	195
8:15 AM	11	12	0	23	13	51	0	64	87	18	0	105	192
8:30 AM	15	8	0	23	16	43	0	59	71	12	0	83	165
8:45 AM	10	13	0	23	18	41	0	59	70	15	0	85	167
Hourly Total	55	54	0	109	61	179	0	240	313	57	0	370	719
*** BREAK ***	-	<u>-</u>	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	27	19	0	46	19	90	0	109	99	30	0	129	284
4:15 PM	24	18	0	42	25	96	0	121	77	15	0	92	255
4:30 PM	32	26	0	58	12	104	0	116	111	17	0	128	302
4:45 PM	30	13	1	43	17	106	0	123	74	22	0	96	262
Hourly Total	113	76	1	189	73	396	0	469	361	84	0	445	1103
5:00 PM	31	18	0	49	26	119	0	145	71	16	0	87	281
5:15 PM	28	11	0	39	21	133	0	154	95	11	0	106	299
5:30 PM	34	20	1	54	18	116	0	134	87	19	0	106	294
5:45 PM	33	11	0	44	15	101	0	116	62	14	0	76	236
Hourly Total	126	60	1	186	80	469	0	549	315	60	0	375	1110
Grand Total	347	264	2	611	271	1205	0	1476	1395	267	0	1662	3749
Approach %	56.8	43.2	-	-	18.4	81.6	-	-	83.9	16.1	-	-	-
Total %	9.3	7.0	-	16.3	7.2	32.1	-	39.4	37.2	7.1	-	44.3	-
Motorcycles	2	2	-	4	2	24	_	26	22	2	-	24	54
% Motorcycles	0.6	0.8	-	0.7	0.7	2.0	-	1.8	1.6	0.7	-	1.4	1.4
Cars	190	179	-	369	169	765	-	934	890	146	-	1036	2339
% Cars	54.8	67.8	-	60.4	62.4	63.5	-	63.3	63.8	54.7	-	62.3	62.4
Light Goods Vehicles	139	70	-	209	82	338	-	420	402	99	-	501	1130
% Light Goods Vehicles	40.1	26.5	-	34.2	30.3	28.0	-	28.5	28.8	37.1	-	30.1	30.1
Buses	0	1	-	1	2	3	-	5	2	0	-	2	8
% Buses	0.0	0.4	-	0.2	0.7	0.2	-	0.3	0.1	0.0	-	0.1	0.2
Single-Unit Trucks	10	11	-	21	10	26	-	36	40	10	-	50	107
% Single-Unit Trucks	2.9	4.2	-	3.4	3.7	2.2	-	2.4	2.9	3.7	-	3.0	2.9
Articulated Trucks	6	1	-	7	6	48	-	54	37	10	-	47	108
% Articulated Trucks	1.7	0.4	-	1.1	2.2	4.0		3.7	2.7	3.7	-	2.8	2.9
Bicycles on Road	0	0	-	0	0	1	-	1	2	0	-	2	3
% Bicycles on Road	0.0	0.0	_	0.0	0.0	0.1	-	0.1	0.1	0.0	_	0.1	0.1

Pedestrians	-	-	2	-	-	-	0	-	-	-	0	-	-
% Pedestrians	_	-	100.0	-	-	-	-	-	-	-	-	-	-



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 3

																			Out 4 315 181 2 36 538 2 190 139 0 16 347 R		9th Re In 4 369 209 1 28 611 1 2 179 70 1 12 264 L	1	Section   Sect																		
M	Total	20	1991	978	2	190	3214		۲,	7	146	66	0	%	267		4	•							t	70	271	16	2	82	169	2	١	1650	2 4	2/4	470	1080	24	2	c <sub>e</sub>
Central Ave W [W]	Ē	24	1036	501	2	66	1662	-	Ļ	77	830	402	2	07	1305	2 -	→	•	07/16/2 Ending 07/16/2	2014 At 2014	7:00	AM PM			+		1205	75	3	338	765	24	1#/6	1476	2 0	1 420	420	03/	26	5	Central Ave W [E]
Centr	Ont	56	922	477	9	91	1552		Ļ	0	0	0	0	c	-	۵.			Motorcy Cars Light G Buses Other	ycles	3					ס	•	0	0	0	0	0	5	3 6	1 a	0 32	2003	2002	50	Total	N E
																			0 0 0 0 0 0		0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																		

Turning Movement Data Plot



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

				i airiii ig i	VIOVCITICI	it i can i ic	on Data (	1.00 / ((1))	-				_
		Vaugl	hn Rd	_		Centra	l Ave W			Centra	I Ave W		
Start Time		South	bound			West	bound			Easth	bound		
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:30 AM	14	19	0	33	17	35	0	52	128	20	0	148	233
7:45 AM	16	25	0	41	21	54	0	75	110	21	0	131	247
8:00 AM	19	21	0	40	14	44	0	58	85	12	0	97	195
8:15 AM	11	12	0	23	13	51	0	64	87	18	0	105	192
Total	60	77	0	137	65	184	0	249	410	71	0	481	867
Approach %	43.8	56.2	-	-	26.1	73.9	-	-	85.2	14.8	-	-	-
Total %	6.9	8.9	-	15.8	7.5	21.2	-	28.7	47.3	8.2	_	55.5	-
PHF	0.789	0.770	-	0.835	0.774	0.852	-	0.830	0.801	0.845	-	0.813	0.878
Motorcycles	0	0	-	0	1	1	-	2	3	0	-	3	5
% Motorcycles	0.0	0.0	-	0.0	1.5	0.5	-	0.8	0.7	0.0	_	0.6	0.6
Cars	29	49	-	78	36	92	-	128	255	35	_	290	496
% Cars	48.3	63.6	-	56.9	55.4	50.0	-	51.4	62.2	49.3	-	60.3	57.2
Light Goods Vehicles	27	21	-	48	23	67	-	90	129	31	_	160	298
% Light Goods Vehicles	45.0	27.3	-	35.0	35.4	36.4	_	36.1	31.5	43.7		33.3	34.4
Buses	0	0	-	0	1	2	-	3	1	0	-	1	4
% Buses	0.0	0.0	-	0.0	1.5	1.1	-	1.2	0.2	0.0	_	0.2	0.5
Single-Unit Trucks	3	6	-	9	2	3	_	5	10	2		12	26
% Single-Unit Trucks	5.0	7.8	-	6.6	3.1	1.6	-	2.0	2.4	2.8	-	2.5	3.0
Articulated Trucks	1	1	-	2	2	18	-	20	11	3	_	14	36
% Articulated Trucks	1.7	1.3	-	1.5	3.1	9.8	-	8.0	2.7	4.2	-	2.9	4.2
Bicycles on Road	0	0	-	0	0	1	-	1	1	0	-	1	2
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.5	-	0.4	0.2	0.0	_	0.2	0.2
Pedestrians	-	_	0	-	-	-	0	-	-	_	0	-	-
% Pedestrians	-	_	-	-	-	_	-	-	-	-	-	_	-



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 5

Turning Movement Peak Hour Data Plot (7:30 AM)



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (4:30 PM)

				running	innovenner	ii r can i ii	Jui Dala (	(4.30 FIVI)					
		Vaug	jhn Rd			Centra	l Ave W			Centra	I Ave W		
Start Time		South	nbound			West	tbound			East	bound		
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
4:30 PM	32	26	0	58	12	104	0	116	111	17	0	128	302
4:45 PM	30	13	1	43	17	106	0	123	74	22	0	96	262
5:00 PM	31	18	0	49	26	119	0	145	71	16	0	87	281
5:15 PM	28	11	0	39	21	133	0	154	95	11	0	106	299
Total	121	68	1	189	76	462	0	538	351	66	0	417	1144
Approach %	64.0	36.0	-	-	14.1	85.9	-	-	84.2	15.8	-	-	-
Total %	10.6	5.9	-	16.5	6.6	40.4	-	47.0	30.7	5.8	-	36.5	-
PHF	0.945	0.654	-	0.815	0.731	0.868	-	0.873	0.791	0.750	-	0.814	0.947
Motorcycles	1	1	-	2	1	13	-	14	11	2	-	13	29
% Motorcycles	0.8	1.5	-	1.1	1.3	2.8	-	2.6	3.1	3.0	-	3.1	2.5
Cars	68	50	-	118	54	319	-	373	239	40	-	279	770
% Cars	56.2	73.5	-	62.4	71.1	69.0	-	69.3	68.1	60.6	-	66.9	67.3
Light Goods Vehicles	50	15	-	65	19	114	-	133	86	23	-	109	307
% Light Goods Vehicles	41.3	22.1	-	34.4	25.0	24.7	-	24.7	24.5	34.8	-	26.1	26.8
Buses	0	0	-	0	0	0	-	0	1	0	-	1	1
% Buses	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.3	0.0	-	0.2	0.1
Single-Unit Trucks	1	2	-	3	1	7	-	8	7	1	-	8	19
% Single-Unit Trucks	0.8	2.9	-	1.6	1.3	1.5	-	1.5	2.0	1.5	-	1.9	1.7
Articulated Trucks	1	0	-	1	1	9	-	10	7	0	-	7	18
% Articulated Trucks	0.8	0.0	-	0.5	1.3	1.9	-	1.9	2.0	0.0	-	1.7	1.6
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	1	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 7

																		Out 3 94 42 0 0 3 142	!	ghn R In 2 1188 65 0 4 189 1 50 15 0 2 68 L	:	otal 5 212 107 0 7 3331 0 0 0 1 1 1 P																	
w [w]	otal 27	Н	.,	+	+	1000	Γ	2	40	+	+	+	_	99	٦	ቋ		eak				ata	1	t	Z Z	Ľ	2		54		7	419	16	_	101			Out	Centra
ntral	14 In In In	Н	_	+	+	583 417		0	F	$^{+}$	+	+	0 14		Ь	<b>→</b>		07/16/2 Ending 07/16/2 Motorc Cars Light G Buses Other	ycles	s				+	-	462 0		H	319 0	Н		538 957	18 34	0 1	133 234	373 662	14 26	In Total	é∀
																		0 0 0 0		0 0 0 0		0 0 0 0 0																	

Turning Movement Peak Hour Data Plot (4:30 PM)



Count Name: 10-CentralAve\_VaughnRd TMC Site Code: TMC-10 Start Date: 07/16/2014 Page No: 8



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014

Page No: 1

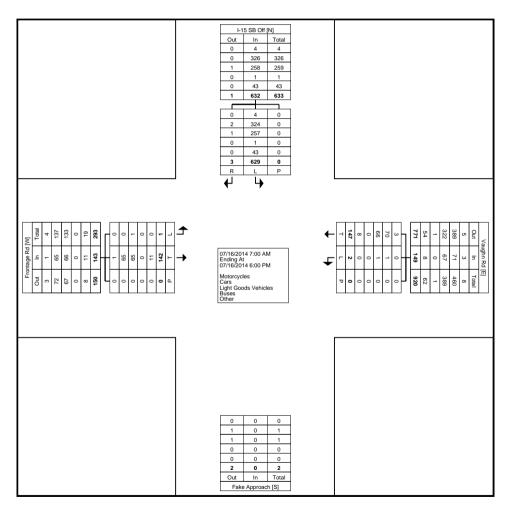
#### **Turning Movement Data**

	i			i	, rumių	j moveme	iii Dala						i
		I-15 S	SB Off			Vaug	jhn Rd			Fronta	ge Rd		1
Ote at Time a		South	bound			West	bound			Eastb	ound		1
Start Time	Right	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	50	0	50	1	0	0	1	8	0	0	8	59
7:15 AM	0	50	0	50	4	0	0	4	6	0	0	6	60
7:30 AM	0	62	0	62	3	1	0	4	5	0	0	5	71
7:45 AM	1	57	0	58	4	0	0	4	8	0	0	8	70
Hourly Total	1	219	0	220	12	1	0	13	27	0	0	27	260
8:00 AM	0	37	0	37	7	0	0	7	7	0	0	7	51
8:15 AM	0	38	0	38	8	0	0	8	6	0	0	6	52
8:30 AM	0	37	0	37	13	0	0	13	7	0	0	7	57
8:45 AM	1	35	0	36	4	0	0	4	9	0	0	9	49
Hourly Total	1	147	0	148	32	0	0	32	29	0	0	29	209
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	32	0	32	9	1	0	10	12	0	0	12	54
4:15 PM	0	38	0	38	14	0	0	14	12	0	0	12	64
4:30 PM	0	35	0	35	13	0	0	13	12	0	0	12	60
4:45 PM	1	38	0	39	14	0	0	14	17	0	0	17	70
Hourly Total	1	143	0	144	50	1	0	51	53	0	0	53	248
5:00 PM	0	23	0	23	14	0	0	14	8	1	0	9	46
5:15 PM	0	29	0	29	16	0	0	16	7	0	0	7	52
5:30 PM	0	35	0	35	11	0	0	11	6	0	0	6	52
5:45 PM	0	33	0	33	12	0	0	12	12	0	0	12	57
Hourly Total	0	120	0	120	53	0	0	53	33	1	0	34	207
Grand Total	3	629	0	632	147	2	0	149	142	1	0	143	924
Approach %	0.5	99.5	-	-	98.7	1.3	-	-	99.3	0.7	-	-	-
Total %	0.3	68.1	-	68.4	15.9	0.2	-	16.1	15.4	0.1	-	15.5	-
Motorcycles	0	4	-	4	3	0	-	3	1	0	-	1	8
% Motorcycles	0.0	0.6	-	0.6	2.0	0.0	-	2.0	0.7	0.0	-	0.7	0.9
Cars	2	324	-	326	70	1	-	71	65	0	-	65	462
% Cars	66.7	51.5	-	51.6	47.6	50.0	-	47.7	45.8	0.0	-	45.5	50.0
Light Goods Vehicles	1	257	-	258	66	1	-	67	65	1	-	66	391
% Light Goods Vehicles	33.3	40.9	-	40.8	44.9	50.0	-	45.0	45.8	100.0	-	46.2	42.3
Buses	0	1	-	1	0	0	-	0	0	0	-	0	1
% Buses	0.0	0.2	-	0.2	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	0	27	-	27	6	0	-	6	7	0	-	7	40
% Single-Unit Trucks	0.0	4.3	-	4.3	4.1	0.0	-	4.0	4.9	0.0	-	4.9	4.3
Articulated Trucks	0	16	-	16	2	0	-	2	4	0	-	4	22
% Articulated Trucks	0.0	2.5	-	2.5	1.4	0.0	-	1.3	2.8	0.0	-	2.8	2.4
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0

Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	_	-	-	-	-	_	-	-	-	-	-	-	-



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 3



Turning Movement Data Plot



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:00 AM)

		I-15 S	SB Off			Vauq				Fronta	age Rd		
		South	bound			West	bound				oound		
Start Time	Right	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	50	0	50	1	0	0	1	8	0	0	8	59
7:15 AM	0	50	0	50	4	0	0	4	6	0	0	6	60
7:30 AM	0	62	0	62	3	1	0	4	5	0	0	5	71
7:45 AM	1	57	0	58	4	0	0	4	8	0	0	. 8	70
Total	1	219	0	220	12	1	0	13	27	0	0	27	260
Approach %	0.5	99.5	-	-	92.3	7.7	-	-	100.0	0.0	-	-	-
Total %	0.4	84.2	_	84.6	4.6	0.4	-	5.0	10.4	0.0	-	10.4	-
PHF	0.250	0.883	-	0.887	0.750	0.250	-	0.813	0.844	0.000	-	0.844	0.915
Motorcycles	0	1	-	1	0	0	-	0	0	0	-	0	1
% Motorcycles	0.0	0.5	-	0.5	0.0	0.0	-	0.0	0.0	-	-	0.0	0.4
Cars	1	128	-	129	6	0	-	6	14	0	-	14	149
% Cars	100.0	58.4	-	58.6	50.0	0.0	-	46.2	51.9	-	-	51.9	57.3
Light Goods Vehicles	0	79	-	79	5	1	-	6	10	0	-	10	95
% Light Goods Vehicles	0.0	36.1	-	35.9	41.7	100.0	-	46.2	37.0	-	-	37.0	36.5
Buses	0	1	-	1	0	0	-	0	0	0	-	0	1
% Buses	0.0	0.5	-	0.5	0.0	0.0	-	0.0	0.0	-	-	0.0	0.4
Single-Unit Trucks	0	5	-	5	1	0	-	1	2	0	-	2	8
% Single-Unit Trucks	0.0	2.3	-	2.3	8.3	0.0	-	7.7	7.4	-	-	7.4	3.1
Articulated Trucks	0	5	-	5	0	0	-	0	1	0	-	1	6
% Articulated Trucks	0.0	2.3	-	2.3	0.0	0.0	-	0.0	3.7	-	-	3.7	2.3
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 5

	1-15 SB Off [N]	
Prontage Rd IVI  Out 1 Total  0 0 0 0  1 3 27 40  13 27 40  0 0 0 0  0 10 0  0 0 10 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0 0 0 0  0 0 0 0 0	Peak Hour Data  07/16/2014 7:00 AM Ending At 07/16/2014 8:00 AM Motorcycles Cars Light Goods Vehicles Buses Other	Vaughn Rd [5]  Out in Total 1 0 1 142 6 95 1 0 1 14 246 13 259  0 0 0 0 5 1 0 0 0 0 0 1 0
	0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 1 0 0 1 0	

Turning Movement Peak Hour Data Plot (7:00 AM)



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 6

Turning Movement Peak Hour Data (4:00 PM)

		I-15 S	SB Off	۱		Vaug	hn Rd	,		Fronta	age Rd		I
Start Time		South	bound			Westl	oound			Easth	oound		l
Start Time	Right	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
4:00 PM	0	32	0	32	9	1	0	10	12	0	0	12	54
4:15 PM	0	38	0	38	14	0	0	14	12	0	0	12	64
4:30 PM	0	35	0	35	13	0	0	13	12	0	0	12	60
4:45 PM	1	38	0	39	14	. 0	0	14	17	0	0	17	70
Total	1	143	0	144	50	1	0	51	53	0	0	53	248
Approach %	0.7	99.3	-	-	98.0	2.0	-	-	100.0	0.0	-	-	-
Total %	0.4	57.7	-	58.1	20.2	0.4	-	20.6	21.4	0.0		21.4	-
PHF	0.250	0.941	-	0.923	0.893	0.250	-	0.911	0.779	0.000	-	0.779	0.886
Motorcycles	0	1	-	1	1	0	-	1	1	0	-	1	3
% Motorcycles	0.0	0.7	-	0.7	2.0	0.0	-	2.0	1.9	-		1.9	1.2
Cars	1	68	-	69	27	1	-	28	23	0		23	120
% Cars	100.0	47.6	-	47.9	54.0	100.0	-	54.9	43.4	-	-	43.4	48.4
Light Goods Vehicles	0	64	-	64	20	0	-	20	25	0		25	109
% Light Goods Vehicles	0.0	44.8	-	44.4	40.0	0.0	-	39.2	47.2	-		47.2	44.0
Buses	0	0	-	0	0	0	-	0	0	0	-	0	0
% Buses	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	-		0.0	0.0
Single-Unit Trucks	0	7	-	7	2	0	-	2	3	0	-	3	12
% Single-Unit Trucks	0.0	4.9	-	4.9	4.0	0.0	-	3.9	5.7	-	-	5.7	4.8
Articulated Trucks	0	3	_	3	0	0	_	0	1	0	_	1	4
% Articulated Trucks	0.0	2.1	-	2.1	0.0	0.0	-	0.0	1.9	-	-	1.9	1.6
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	<u>-</u>	0	-	-	<u>-</u>	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 7

	L+15 SB Off  N   Out   In   Total   O	
10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Peak Hour Data  O7716/2014 4:00 PM Ending At 07716/2014 5:00 PM Motorcycles Cars Light Goods Vehicles Buses Other	- Vaugh
	0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

Turning Movement Peak Hour Data Plot (4:00 PM)



Count Name: 11-VaughnRd\_I15SB TMC Site Code: TMC-11 Start Date: 07/16/2014 Page No: 8



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014

Page No: 1

## **Turning Movement Data**

	i		1		g woverne	ili Dala	1			1	
		NB On		-	hn Rd			•	ghn Rd		
Start Time	Sout	hbound		West	bound			East	bound		
	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	1	. 0	16	. 1	. 0	17	53	0	. 0	53	70
7:15 AM	0	0	23	4	0	27	58	0	0	58	85
7:30 AM	0	0	14	4	0	18	67	0	0	67	85
7:45 AM	0	. 0	18	3	. 0	21	69	0	. 0	69	90
Hourly Total	1	0	71	12	0	83	247	0	0	247	330
8:00 AM	0	0	21	8	0	29	43	0	0	43	72
8:15 AM	0	0	19		0	27	43	0	0	43	70
8:30 AM	0	0	23	12	0	35	40	1	0	41	76
8:45 AM	0	0	31	5	0	36	47	0	0	47	83
Hourly Total	0	0	94	33	0	127	173	1	0	174	301
*** BREAK ***	-	<u>-</u>	-	_	_		-	-	-	-	-
4:00 PM	0	0	61	10	0	71	47	0	0	47	118
4:15 PM	0	0	51	14	0	65	47	0	0	47	112
4:30 PM	0	0	72	14	0	86	48	0	0	48	134
4:45 PM	0	0	73	14	0	87	55	0	0	55	142
Hourly Total	0	0	257	52	0	309	197	0	0	197	506
5:00 PM	0	0	84	13	0	97	35	0	0	35	132
5:15 PM	0	0	91	17	0	108	34	0	0	34	142
5:30 PM	0	0	86	11	0	97	41	0	0	41	138
5:45 PM	0	0	81	11	0	92	41	0	0	41	133
Hourly Total	0	0	342	52	0	394	151	0	0	151	545
Grand Total	1	0	764	149	0	913	768	1	0	769	1682
Approach %	-	-	83.7	16.3	-	-	99.9	0.1	-	-	-
Total %	-	0.0	45.4	8.9	-	54.3	45.7	0.1	-	45.7	-
Motorcycles	-	0	5	2	-	7	4	0	-	4	11
% Motorcycles	-	-	0.7	1.3	-	0.8	0.5	0.0	-	0.5	0.7
Cars	-	0	473	72	-	545	428	0	-	428	973
% Cars	-	-	61.9	48.3	-	59.7	55.7	0.0	-	55.7	57.8
Light Goods Vehicles	-	0	237	68	-	305	282	0	-	282	587
% Light Goods Vehicles	_	_	31.0	45.6	-	33.4	36.7	0.0	-	36.7	34.9
Buses	-	0	2	0	-	2	3	0	-	3	5
% Buses	-	-	0.3	0.0	-	0.2	0.4	0.0	-	0.4	0.3
Single-Unit Trucks	-	0	17	5	-	22	31	1	-	32	54
% Single-Unit Trucks	-	-	2.2	3.4	-	2.4	4.0	100.0	-	4.2	3.2
Articulated Trucks	-	0	30	2	-	32	20	0	-	20	52
% Articulated Trucks	-	-	3.9	1.3	-	3.5	2.6	0.0	-	2.6	3.1
Bicycles on Road	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0

Pedestrians	1	-	-	-	0	-	-	-	0	-	-
% Pedestrians	100.0		-		-	-	-	-	-	-	-



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 3

																		J. Out 5 473 237 2 48 765		B On In 0 0 0 0 0 0 0 0 0 1 1 P	4 2	otal 5 73 37 2 88 65 5																	
Vaughn Rd [W]	ln Total	-	+	+	+	52 59	$\dashv$	[	0 4	<u> </u>	+	0	+	+	+		O E	7/16/20 nding 2 7/16/20	014 7 At	::00 A	AM DAM			<b>←</b>	H	764 149	+	2 0	+	+	$\ $	700	+	+	+	428 545		Out In	Vaughn Rd [E]
Vau	Ont	2	72	88 0	1	· ;	149	L	0	0		0		• •	۵		M	lotorcy ars ight Go uses ther	cles						ס	0	0	0		0	֧֧֖֭֭֭֭֭֭֭֭֭֭֓֞֡֟֝֟֝֓֓֓֟֟֝֟֟֟֟֟֡ ֓	100	1681	o o	587	973	11	Total	1[E]
																		0 0 0 0 0 0 0		0 0 0 0 0 0	To	0 0 0 0 0 0 0 0																	

Turning Movement Data Plot



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 4

Turning Movement Peak Hour Data (7:15 AM)

	I-15	NB On		_	hn Rd	)		Vaug	hn Rd		
	Sout	hbound		West	bound			-	bound		
Start Time	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:15 AM	0	0	23	4	0	27	58	0	0	58	85
7:30 AM	0	0	14	4	0	18	67	0	0	67	85
7:45 AM	0	0	18	3	0	21	69	0	0	69	90
8:00 AM	0	0	21	8	0	29	43	0	0	43	72
Total	0	0	76	19	0	95	237	0	0	237	332
Approach %	-	-	80.0	20.0	-	-	100.0	0.0	-	-	-
Total %	-	0.0	22.9	5.7	_	28.6	71.4	0.0	_	71.4	-
PHF	-	0.000	0.826	0.594	-	0.819	0.859	0.000	-	0.859	0.922
Motorcycles	-	0	0	0	-	0	0	0	-	0	0
% Motorcycles	-	<u>-</u>	0.0	0.0	_	0.0	0.0	<u>-</u>	_	0.0	0.0
Cars	-	0	40	7	-	47	139	0	-	139	186
% Cars	-	-	52.6	36.8	-	49.5	58.6	-	-	58.6	56.0
Light Goods Vehicles	-	0	25	11	_	36	85	0	_	85	121
% Light Goods Vehicles	-	<u>-</u>	32.9	57.9	-	37.9	35.9	-	-	35.9	36.4
Buses	-	0	0	0	-	0	1	0	-	1	1
% Buses	-	<u>-</u>	0.0	0.0	_	0.0	0.4	<u>-</u>	_	0.4	0.3
Single-Unit Trucks	-	0	5	1	-	6	6	0	-	6	12
% Single-Unit Trucks	-	-	6.6	5.3	-	6.3	2.5	-	-	2.5	3.6
Articulated Trucks	-	0	6	0	_	6	6	0	_	6	12
% Articulated Trucks	-	-	7.9	0.0	-	6.3	2.5	-	-	2.5	3.6
Bicycles on Road	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	<u>-</u>	0.0	0.0	-	0.0	0.0	-	-	0.0	0.0
Pedestrians	0	<u>-</u>	-	-	0	-	-	-	0	<u>-</u>	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 5

	I-15 NB On [N]	
Vaaghn Rd IWI Out In Total 0 0 0 0 7 139 96 11 85 96 11 1 12 13 19 237 256 0 139 0 0 139 0 0 130 0 0 12 0 0 13 0 0 14 0 0 15 0 0	Peak Hour Data  07/16/2014 7:15 AM Ending At 07/16/2014 8:15 AM Motorcycles Cars Light Coods Vehicles Buses Other	Vaughn Rd [E]  Out In Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

Turning Movement Peak Hour Data Plot (7:15 AM)



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 6

#### Turning Movement Peak Hour Data (4:45 PM)

	I-15	NB On		•	hn Rd	ai Bata (4.4		Vaug	hn Rd		
		hbound		-	bound			-	oound		
Start Time	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
4:45 PM	0	0	73	14	0	87	55	0	0	55	142
5:00 PM	0	0	84	13	0	97	35	0	0	35	132
5:15 PM	0	0	91	17	0	108	34	0	0	34	142
5:30 PM	0	0	86	11	0	97	41	0	0	41	138
Total	0	0	334	55	0	389	165	0	0	165	554
Approach %	-	-	85.9	14.1	-	-	100.0	0.0	-	-	-
Total %	-	0.0	60.3	9.9	-	70.2	29.8	0.0	_	29.8	-
PHF	-	0.000	0.918	0.809	-	0.900	0.750	0.000	-	0.750	0.975
Motorcycles	-	0	1	1	-	2	2	0	-	2	4
% Motorcycles	-	-	0.3	1.8	-	0.5	1.2	-	-	1.2	0.7
Cars	-	0	219	31	-	250	90	0	-	90	340
% Cars	-	-	65.6	56.4	-	64.3	54.5	-	-	54.5	61.4
Light Goods Vehicles	-	0	96	22	-	118	62	0	_	62	180
% Light Goods Vehicles	-	-	28.7	40.0	-	30.3	37.6	-	-	37.6	32.5
Buses	-	0	2	0	-	2	1	0	-	1	3
% Buses	-	-	0.6	0.0	-	0.5	0.6	-	-	0.6	0.5
Single-Unit Trucks	-	0	5	1	-	6	9	0	-	9	15
% Single-Unit Trucks	-	-	1.5	1.8	-	1.5	5.5	-	-	5.5	2.7
Articulated Trucks	-	0	11	0	-	11	1	0	-	1	12
% Articulated Trucks	-	-	3.3	0.0	-	2.8	0.6	-	-	0.6	2.2
Bicycles on Road	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	0.0	-	0.0	0.0	-	-	0.0	0.0
Pedestrians	0	<u>-</u>	-	<u>-</u>	0	-	-	-	0	<u>-</u>	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-



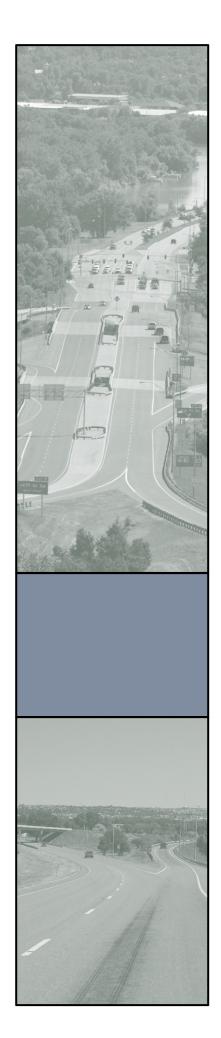
Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 7

																		Out 1 219 96 2 2 16 334	3 On [	N] Total 1 219 96 2 16 334																		
[w]	Total	e 5	2 8	-	7	220	$\parallel$	,	0	0	0	0			$\vdash$	<u></u>		Peak			ta	t	R	334	16	2	96	219		H	165	10	4	62	_	2	Out	Vaug
Vaughn Rd [W]	$\dashv$	2 8	8 8		9	Ť	$\parallel$	۰	7	6	62	-	10	165	F	<b>→</b>		07/16/2 Ending 07/16/2	45 PN 45 PN	И		+		55	1	0	22	31		H	-	4	$\dashv$	_	Ĭ	4	<u> </u>	Vaughn Rd [E]
	Ont	- 2	22 2	0	-	22	]	4		0	0	0	0	0	۵	]		Motorc Cars Light G Buses Other	'ehicle	es			٦	0	0	0	0	0	0		554	27	ω	180	340	4	Total	
																		0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0																		

Turning Movement Peak Hour Data Plot (4:45 PM)



Count Name: 12-VaughnRd\_I15NB TMC Site Code: TMC-12 Start Date: 07/16/2014 Page No: 8





# **APPENDIX C**

**Existing Conditions Traffic Data Analysis** 

	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	Τ	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		astbound 14th Ave
Project Description <i>I-15</i> C			Allalysis Teal	2014	
✓ Oper.(LOS)	•		Pes.(N)	Plar	nning Data
Flow Inputs			. ,		
Volume, V AADT Peak-Hr Prop. of AADT, K	530	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.87 6 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjus	tments				
$f_p$ $E_T$	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.971	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed,	2 55.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	55.0	mph mph mph mph
BFFS LOS and Performanc	e Measures	· · · · · · · · · · · · · · · · · · ·	Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times I \times f_p)$ $S$ $D = v_p / S$ LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	ĒΤ	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsythe 9/15/2014		Highway/Direction of Travel <i>I-315 Westbound</i> From/To <i>I-15 to 14th Ave</i> Jurisdiction		
Analysis Time Period	AM Peak		Analysis Year	2014	
Project Description I-15 (  Oper.(LOS)	Jornaor Study		Occ (NI)	□ Dla	nning Data
Flow Inputs			Des.(N)		Illing Data
Volume, V	454	veh/h	Peak-Hour Factor, PHF	0.76	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	6	
Peak-Hr Prop. of AADT, K		•	%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tmonts		Op/Down 76		
•	1.00		E <sub>R</sub>	1.2	
f <sub>p</sub>	1.50		• •		
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
Speed Inputs			Calc Speed Adj and	FF5	
Lane Width		ft			
Rt-Side Lat. Clearance	_	ft	$f_{LW}$		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	55.0	mph	FFS	55.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performanc	e Measures	<u> </u>	Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
$V_p = (V \text{ or DDHV}) / (PHF x)$	N x f <sub>HV 308</sub>	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x)$	N x f	
x f <sub>p</sub> )	300	ролинг	$x f_p$	· · · · · · · · · · · · · · · · · · ·	pc/h/ln
S	55.0	mph	S S		mph
D = v <sub>p</sub> / S	5.6	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	Α		Required Number of Lane	s N	рс/пі/іп
Glossary			Factor Location		
	C Cnoo	d	l actor Location		
N - Number of lanes	S - Spee		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Dens	-	E <sub>T</sub> - Exhibits 11-10, 11-11	, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate LOS - Level of service		e-flow speed se free-flow	f <sub>p</sub> - Page 11-18		TRD - Page 11-1
speed	ם - פוום	SC II CC-IIUW	LOS, S, FFS, v <sub>p</sub> - Exhibits	11-2,	
DDHV - Directional design	hour volume		11-3		
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsythe 9/15/2014		Highway/Direction of Travel <i>I-315 Eastbound</i> From/To <i>I-15 to 14th Ave</i> Jurisdiction		
Analysis Time Period  Project Description I-15 (	PM Peak		Analysis Year	2014	
✓ Oper.(LOS)	Joinaol Glady		Des.(N)	□Pla	nning Data
Flow Inputs			)C3.(I <b>4</b> )		Timing Data
Volume, V AADT	675	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.83 4	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments		<u> </u>		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)10.980	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f		mph
Number of Lanes, N	2		f <sub>LW</sub> f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	55.0	mph		<i>EE</i> 0	·
Base free-flow Speed, BFFS		mph	FFS	55.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N v f		Design (N) Design LOS		
x f <sub>p</sub> )		pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
S D = v / S	55.0 7.5	mph	s		mph
D = v <sub>p</sub> / S	7.5	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	Α		Required Number of Lane	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11 f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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Westbound o 14th Ave
lanning Data
mph
mph
mph
mph
and the flar
pc/n/in
mph pc/mi/ln
f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		astbound re to Fox Farm
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	979	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.83 4 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.980	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N	2	ft ft	f <sub>LW</sub>		mph mph
Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	55.0	ramps/mi mph mph	TRD Adjustment FFS	55.0	mph mph
LOS and Performanc	e Measures	j	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x I x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 602 55.0 10.9 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		/estbound re to Fox Farm
Project Description <i>I-15</i> C			, manyoto i out		
✓ Oper.(LOS)	•		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	528	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.82 5 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		<u> </u>		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)10 976	
Speed Inputs	1.0		Calc Speed Adj and		
		ft	Calc Opeca Aaj ana	110	
Lane Width  Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV ago</sub>		Design (N) Design LOS	. N £	
x f <sub>p</sub> ) S	55.0	pc/h/ln mph	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	IN X T <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S	6.0	pc/mi/ln	S		mph
LOS	A	рслили	$D = v_p / S$		pc/mi/ln
	, ,		Required Number of Lane	s, N	
Glossary		Factor Location			
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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		LLWA! OL	GMENTS WORKSHEE	. I	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		astbound e to Fox Farm
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	1044	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.90 3 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance	2	ft ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	55.0	ramps/mi mph mph	TRD Adjustment FFS	55.0	mph mph
LOS and Performanc	e Measures	;	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 589 55.0 10.7 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	ĒΤ	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsyt	the	Highway/Direction of Trave From/To Jurisdiction	14th Av	e to Fox Farm
Analysis Time Period  Project Description I-15 (	PM Peak		Analysis Year	2014	
✓ Oper.(LOS)	Joinaor Stady		Des.(N)	□Plai	nning Data
Flow Inputs			700.(14)		ming Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	1279	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		<u> </u>		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 55.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	55.0	mph mph mph mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 683 55.0 12.4 B	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FRE	EWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsyt 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year	el I-15 NB North of 2014	
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			Pes.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	334	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.83 7 0 Level	
DDHV - AADTX K X D		ven/n	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2	
Speed Inputs	1.0		Calc Speed Adj and		
		ft	Daic Opeeu Auj anu	110	
Lane Width  Rt-Side Lat. Clearance		ιι ft	£		mnh
Number of Lanes, N	2	10	f <sub>LW</sub>		mph
Total Ramp Density, TRD	-	ramps/mi	f <sub>LC</sub>		mph
FFS (measured)	65.0	mph	TRD Adjustment	05.0	mph
Base free-flow Speed, BFFS	00.0	mph	FFS	65.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x i	N x f <sub>HV a a a</sub>		Design (N) Design LOS	Nort	
x f <sub>p</sub> ) S	209 65.0	pc/h/ln mph	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	IN X I <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S	3.2	pc/mi/ln	S		mph
LOS	A	ролипли	D = v <sub>p</sub> / S Required Number of Lanes	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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Shane Forsyt 8/7/2014 AM Peak	he	Site Information Highway/Direction of Trave		
8/7/2014 AM Peak	he	Highway/Direction of Trave		
Carridar Ctudy		From/To Jurisdiction Analysis Year	el I-15 SB North of 2014	Central
orridor Study		•		
		Pes.(N)	Plan	ning Data
200	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.83 21 0 Level mi	
		Up/Down %		
tments				
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 )] 0.905	
		Calc Speed Adj and	FFS	
	ft			mph
2	10			mph
-	ramns/mi			mph
65.0	mph mph	FFS	65.0	mph mph
e Measures		Design (N)		
N x f <sub>HV</sub> 133 65.0 2.0 A	pc/h/ln mph pc/mi/ln	$x f_p$ ) S $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	200  tments  1.00  1.5  2  65.0  Max f <sub>HV</sub> 133  65.0  2.0  A  S - Speed D - Densi FFS - Free BFFS - Base mour volume	200 veh/h veh/day  veh/h  tments  1.00 1.5  ft ft ft 2 ramps/mi mph mph mph  Measures  N x f <sub>HV</sub> 133 pc/h/ln 65.0 mph 2.0 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		

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	DASIC FRI	EEWAY SE	GMENTS WORKSHEE	: I	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central Ave
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	359	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.97 8 0 Level mi	
		-	Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.962	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance		ft ft	f <sub>LW</sub>		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	;	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 193 65.0 3.0 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		t f Central Ave
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	309	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.79 14 0 Level mi	
Calculate Flow Adjus	tmonts		Up/Down %		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.935	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	2 65.0	ft ft ramps/mi mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
Base free-flow Speed, BFFS LOS and Performanc	o Mossuros	mph	Dosign (NI)		·
LOS and Performanc	e weasures	<b>5</b>	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 210 65.0 3.2 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Emerson Junction
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			es.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	288	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.89 21 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
$f_p$ $E_T$	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.905	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width  Rt-Side Lat. Clearance		ft ft			
Number of Lanes, N	2	11	f <sub>LW</sub>		mph
·	2		$f_{LC}$		mph
Total Ramp Density, TRD	25.0	ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 179 65.0	pc/h/ln mph	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S LOS	2.8 A	pc/mi/ln	$S$ $D = v_p / S$		mph pc/mi/ln
			Required Number of Lanes	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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Shane Forsyt 8/7/2014 AM Peak	he	Site Information		_
8/7/2014	he	History (Discotion of Toron		
		Highway/Direction of Trave From/To Jurisdiction Analysis Year		Emerson Junction
orridor Study				
		Pes.(N)	Plan	ning Data
548	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.87 6 0 Level mi	
		Up/Down %		
tments				_
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 )] 0.971	
		Calc Speed Adj and	FFS	
2	ft ft	f <sub>LW</sub>		mph
2	ramps/mi			mph mph
65.0	mph mph	FFS	65.0	mph
e Measures		Design (N)		
N x f <sub>HV</sub> 323 65.0 5.0 A	pc/h/ln mph pc/mi/ln	$x f_p$ ) S $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Densi FFS - Free BFFS - Ba	ty -flow speed	E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	tments  1.00 1.5  2  65.0  Measures  X x f <sub>HV</sub> 323 65.0 5.0 A  S - Spee D - Densi FFS - Free BFFS - Ba nour volume	548 veh/h veh/day  veh/h  tments  1.00 1.5  ft ft ft 2 ramps/mi mph mph mph  Measures  X x f <sub>HV</sub> 323 pc/h/ln 65.0 mph 5.0 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		

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		Site Information		
Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		Emerson Junction
Corridor Study				
		Des.(N)	☐Plar	nning Data
696	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.94 6 0 Level mi	
		Up/Down %		
tments				
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.971	
		Calc Speed Adj and	FFS	
2	ft ft	f <sub>LW</sub>		mph mph
65.0	ramps/mi mph mph	TRD Adjustment FFS	65.0	mph mph
e Measures	 }	Design (N)		
N x f <sub>HV</sub> 383 65.0 5.9 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Dens FFS - Free BFFS - Ba	sity e-flow speed	E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	8/7/2014 PM Peak Corridor Study  696  tments 1.00 1.5  2 65.0  e Measures  N x f <sub>HV</sub> 383 65.0 5.9 A  S - Spee D - Dens FFS - Free	PM Peak Corridor Study  696 veh/h veh/day  veh/h  tments  1.00 1.5  ft ft ft 2 ramps/mi mph mph mph  e Measures  N x f HV 383 pc/h/ln 65.0 mph 5.9 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow hour volume	Shane Forsythe  8/7/2014 PM Peak  Sorridor Study  Des.(N)   G96  Veh/h veh/day  RVs, P General Terrain: Veh/h  ft  ft  ft  ft  ft  ft  ft  ft  ft  f	Shane Forsythe $RT/2014$

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Emerson Junction
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	456	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.88 13 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.939	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft		_	
Rt-Side Lat. Clearance Number of Lanes, N	2	ft	f <sub>LW</sub>		mph
·	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	65.0	ramps/mi mph mph	TRD Adjustment FFS	65.0	mph mph
LOS and Performanc	e Measures	<u> </u>	Design (N)		
Operational (LOS)			Design (N) Design LOS		
v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 277 65.0	pc/h/ln mph	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	$N \times f_{HV}$	pc/h/ln
D = v <sub>p</sub> / S LOS	4.3 A	pc/mi/ln	S D = v <sub>p</sub> / S Required Number of Lane	s N	mph pc/mi/ln
Glossary			Factor Location	- ,	
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description <i>I-15 C</i>			7 thatyolo 1 cai	2011	
✓ Oper.(LOS)	,		Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	517	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.90 16	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade -5.00% Length	0 Grade 0.69mi	
			Up/Down %	-5.00	
Calculate Flow Adjus	tments				
$f_p$	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	)] 0.926	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	65.0	mph	FFS	65.0	mph
Base free-flow Speed, BFFS		mph			•
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS)			<u>Design (N)</u> Design LOS		
v <sub>p</sub> = (V or DDHV) / (PHF x I x f <sub>p</sub> )		pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
S	65.0	mph	S S		mph
D = v <sub>p</sub> / S	4.8	pc/mi/ln	D = v <sub>p</sub> / S		pc/mi/ln
LOS	Α		Required Number of Lanes	s, N	•
Glossary			Factor Location		
N - Number of lanes	S - Spee	ed			f Fullities 44.0
V - Hourly volume	D - Dens		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
v <sub>p</sub> - Flow rate LOS - Level of service speed	FFS - Free	e-flow speed ase free-flow	$E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits		f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design	hour volume		11-3		

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			Pes.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	458	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.85 7 0 Grade	
DDHV = AADT x K x D		veh/h	Grade 5.00% Lengt Up/Down %	h 0.69mi 5.00	
Calculate Flow Adjus	tments		·		
f <sub>p</sub> E <sub>T</sub>	1.00 2.8		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	4.5 )] 0.891	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	<b>3</b>	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S	N x f <sub>HV</sub> 303 65.0 4.7	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$	N x f <sub>HV</sub>	pc/h/ln mph pc/mi/ln
LOS	Α		Required Number of Lanes	s, N	ролили
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsy	the	Highway/Direction of Trave From/To Jurisdiction	North of	Gore Hill
Analysis Time Period  Project Description I-15 C	PM Peak Corridor Study		Analysis Year	2014	
✓ Oper.(LOS)	Joinage Glady		Pes.(N)	□Plan	ning Data
Flow Inputs					
Volume, V AADT	722	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.80 10	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade -5.00% Length Up/Down %	0 Grade 0.69mi -5.00	
 Calculate Flow Adjus	tments		ор/Во <b>и</b> п 70	0.00	
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = \frac{1}{[1+P_T(E_T - 1) + P_R(E_R - 1)]}$	1.2	
Speed Inputs	1.0		Calc Speed Adj and		
Lane Width		ft	Caic Opeca Auj and	110	
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2	, .	$f_{LC}$		mph
Total Ramp Density, TRD	65.0	ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x I x f <sub>p</sub> )	N x f <sub>HV</sub> 473	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>	pc/h/ln
S D = v <sub>p</sub> / S LOS	65.0 7.3 A	mph pc/mi/ln	x f <sub>p</sub> ) S D = v <sub>p</sub> / S Required Number of Lanes	s. N	mph pc/mi/ln
Glossary			Factor Location	•	
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т			
General Information			Site Information				
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year	el I-15 SB North of Gore Hill 2014			
	Corridor Study						
✓ Oper.(LOS)			Des.(N)	∐Plar	nning Data		
Flow Inputs					_		
Volume, V AADT Peak-Hr Prop. of AADT, K	630	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.93 10 0			
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade 5.00% Lengt Up/Down %	<i>Grade</i> h 0.69mi 5.00			
Calculate Flow Adjus	tments						
f <sub>p</sub> E <sub>T</sub>	1.00 2.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	4.5 1)] 0.870			
Speed Inputs			Calc Speed Adj and	FFS			
Lane Width Rt-Side Lat. Clearance		ft ft					
Number of Lanes, N	2	IL	f <sub>LW</sub>		mph		
Total Ramp Density, TRD	_	ramps/mi	f <sub>LC</sub>		mph		
FFS (measured)	65.0	•	TRD Adjustment		mph		
Base free-flow Speed, BFFS	05.0	mph mph	FFS	65.0	mph		
LOS and Performanc	e Measures		Design (N)				
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub> 391	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>			
x f <sub>p</sub> ) S	65.0	mph	$x^{r}f_{p}$ )	110	pc/h/ln		
$D = v_p / S$	6.0	pc/mi/ln	S D = v / S		mph		
LOS	Α		$D = v_p / S$ Required Number of Lanes	s, N	pc/mi/ln		
Glossary			Factor Location				
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1		
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т			
General Information			Site Information				
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		of Central		
	Corridor Study						
✓ Oper.(LOS)			Des.(N)	Pla	nning Data		
Flow Inputs							
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	321	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.89 14 0 Level mi			
Coloulata Flow Adius	tmonto		Up/Down %				
Calculate Flow Adjus				4.0			
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2			
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		_		
Speed Inputs			Calc Speed Adj and	FFS			
Lane Width		ft					
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph		
Number of Lanes, N	2		$f_{LC}$		mph		
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph		
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph		
LOS and Performanc	e Measures	3	Design (N)				
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 193 65.0 3.0 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lane  Factor Location		pc/h/ln mph pc/mi/ln		
Glossary			Factor Location				
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1		
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	gency or Company ate Performed 8/7/2014		Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			Des.(N)	☐ Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	352	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.94 8 0 Level mi	
DDHV - AADTX K X D		ven/m	Grade % Length Up/Down %	1111	
Calculate Flow Adjus	tments				
$f_p$ $E_T$	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.962	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l	N x f <sub>HV</sub> 196	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>	
x f <sub>p</sub> ) S	65.0	mph	x f <sub>p</sub> )	п۷	pc/h/ln
D = v <sub>p</sub> / S	3.0	pc/mi/ln	S - x / S		mph
LOS	Α	·	$D = v_p / S$ Required Number of Lane.	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes	S - Spee	ed			
V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	D - Dens FFS - Free BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design  Copyright © 2010 University of Floric		m to d	HCS 2010 <sup>TM</sup> Version 6.2	Cana	rated: 8/7/2014 11:18 A

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		of Central Ave
•	Corridor Study				
✓ Oper.(LOS)			Des.(N)	∐ Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	490	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.87 11 0 Level mi	
DDIIV - AADIXKXD		VEII/II	Up/Down %	1111	
Calculate Flow Adjus	tments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] 0.948	
Speed Inputs			Calc Speed Adj and	FFS	_
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	65.0	mph	FFS	65.0	mph
Base free-flow Speed, BFFS		mph		00.0	трп
LOS and Performanc	e Measures	3	Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 298 65.0	pc/h/ln mph	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$	N x f <sub>HV</sub>	pc/h/ln
$D = v_p / S$	4.6	pc/mi/ln	S		mph
LOS	Α	·	$D = v_p / S$ Required Number of Lanes	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design			HCS 2010 <sup>TM</sup> Version 6.2		rated: 8/7/2014 11:26

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central Ave
	Corridor Study				
✓ Oper.(LOS)			Des.(N)	∐ Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	491	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.90 14 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		Органии 70		
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>Τ</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	65.0	mph	FFS	65.0	mph
Base free-flow Speed, BFFS		mph		00.0	Шрп
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)  V <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub> 293	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>	n a /h // n
x f <sub>p</sub> )	65.0	mnh	x f <sub>p</sub> )		pc/h/ln
S D=v /S	65.0 4.5	mph pc/mi/ln	S		mph
D = v <sub>p</sub> / S LOS	4.5 A	рс/пп/п	$D = v_p / S$		pc/mi/ln
203	^		Required Number of Lanes	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Τ			
General Information			Site Information				
Analyst Agency or Company Date Performed Analysis Time Period	Agency or Company Date Performed 8/7/2014		Highway/Direction of Trave From/To Jurisdiction Analysis Year	f Gore Hill			
Project Description I-15 C	Corridor Study						
✓ Oper.(LOS)			Des.(N)	Plar	nning Data		
Flow Inputs							
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	244	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.92 10 0 Level mi			
			Up/Down %				
Calculate Flow Adjus	tments						
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.952			
Speed Inputs			Calc Speed Adj and	FFS			
Lane Width Rt-Side Lat. Clearance Number of Lanes, N	2	ft ft	f <sub>LW</sub>		mph mph		
Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	65.0	ramps/mi mph mph	TRD Adjustment FFS	65.0	mph mph		
LOS and Performanc	e Measures	<u> </u>	Design (N)				
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 139 65.0 2.1 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln		
Glossary			Factor Location				
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1		

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		of Gore Hill
Project Description I-15 (	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	235	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.79 20 0 Level mi	
Calculate Flow Adjus	tments		Up/Down %		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.909	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 70.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x x f_p)$ S $D = v_p / S$ LOS	N x f <sub>HV</sub> 163 70.0 2.3 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11 f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	hour volume		LOS, S, FFS, v <sub>p</sub> - Exhibits		rated: 8/7/201

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			T	
		Site Information		
nalyst Shane Forsythe gency or Company ate Performed 8/7/2014 nalysis Time Period PM Peak		Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Corridor Study				
		Des.(N)	□Plar	nning Data
249	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.96 12 0 Level mi	
		Up/Down %		
tments				
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.943	
		Calc Speed Adj and	FFS	
2	ft ft ramps/mi	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment		mph mph mph
	mph	FFS	65.0	mph
e Measures	<b>S</b>	Design (N)		
N x f <sub>HV</sub> 138 65.0 2.1 A	pc/h/ln mph pc/mi/ln	$x f_p$ ) S $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Dens FFS - Free BFFS - Ba	ity e-flow speed	E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	8/7/2014 PM Peak Porridor Study  249  tments 1.00 1.5  2 65.0  e Measures  N x f <sub>HV</sub> 138 65.0 2.1 A  S - Spee D - Dens FFS - Free BFFS - Ba nour volume	8/7/2014 PM Peak Forridor Study  249 veh/h veh/day  veh/h   tments  1.00 1.5  ft ft ft 2 ramps/mi 65.0 mph mph  e Measures  N x f HV 138 pc/h/ln 65.0 mph 2.1 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow hour volume	Shane Forsythe  8/7/2014 PM Peak  Sorridor Study  Des.(N)  249  Veh/h Veh/day  Peak-Hour Factor, PHF Veh/day  From/To Jurisdiction Analysis Year  Des.(N)  249  Veh/h Veh/day  Peak-Hour Factor, PHF Warrucks and Buses, Pa Warrucks	Shane Forsythe Highway/Direction of Travel I-15 NB From/To Jurisdiction of Jurisdiction Analysis Year 2014  Forridor Study  Des.(N) Plan  Peak-Hour Factor, PHF 0.96 Veh/day Peak-Hour Factor, PHF 0.96 Veh/day Peak-Hour Factor, PHF 0.96 Weh/day Peak-Hour Factor,

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 8/7/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
•	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	365	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.89 6 0 Level mi	
Calculate Flow Adjus	tmonte		Up/Down %		
				1.2	
f <sub>p</sub>	1.00		E <sub>R</sub>		
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
Speed Inputs			Calc Speed Adj and	<u>FFS</u>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	•	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS  Glossary	N x f <sub>HV</sub> 212 65.0 3.3 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lanes  Factor Location		pc/h/ln mph pc/mi/ln
			l actor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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		RAMP	S AND RAI	MP JUNCTI	ONS WC	RKS	HEET			
General Infor	mation		_ ,	Site Infor			· · · · · ·			
Analyst Agency or Company Date Performed		e Forsythe		Freeway/Dir of Tra Junction Jurisdiction		10th Av I-15 an	ve NB Off-r d I-315	amp		
Analysis Time Period				Analysis Year		2014				
Project Description				j						
Inputs										
Upstream Adj R	amp	l '							Downstre Ramp	am Adj
□Yes	On	Acceleration L	ane Length, L <sub>A</sub>	·					□Yes	On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	740 517					☑ No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	192					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		-Flow Speed, S <sub>FI</sub> low Speed, S <sub>FR</sub>	<sub>F</sub> 65.0 55.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und		111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	517	0.90	Level	16	0	0.	926	1.00	6	22
Ramp	192	0.83	Level	3	0	0.	985	1.00	2	36
UpStream										
DownStream		l l Merge Areas						Diverge Areas		
Estimation of		vierge Areas			Estimat	ion o	fv.	nverge Areas		
		/ D \							/ \D	
_	$V_{12} = V_F$		40.7)		<u> </u>			V <sub>R</sub> + (V <sub>F</sub> - V	–	
L <sub>EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =			Equation 13		•
P <sub>FM</sub> =	_	Equation (	Exhibit 13-6)		P <sub>FD</sub> =			000 using E	quation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			22 pc/h		
$V_3^{}$ or $V_{av34}^{}$			-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equat		r 13-17)
Is $V_3$ or $V_{av34} > 2,70$					Is $V_3$ or $V_{av34} > 2,700$ pc/h? $\square$ Yes $\checkmark$ No					
Is $V_3$ or $V_{av34} > 1.5$					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ Yes $\checkmark$ No					
If Yes,V <sub>12a</sub> =		•	-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equatio	n 13-16, 13	-18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	9)		
Capacity Cite	Actual		apacity	LOS F?	Capacit	y Ciri	Actual		Capacity	LOS F?
	7 totaai	Ì	rapacity	2001:	V <sub>F</sub>		622	Exhibit 13		No
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V-	386	Exhibit 13		No
*FO		EXHIBIT 13-0				- 'R		Exhibit 13		_
	<u> </u>	<u>                                     </u>			V <sub>R</sub>	<u> </u>	236			No
Flow Entering		ir .		Violetion?	FIOW ET			rge Influe Max Desir		Violation?
V <sub>R12</sub>	Actual	Exhibit 13-8	Desirable	Violation?	V <sub>12</sub>		Actual 622	Exhibit 13-8	4400:All	No
Level of Serv	ioo Dotorn		if not E		<del></del>			termination		
								.0086 V <sub>12</sub> - 0		<i>r)</i>
$D_R = 5.475 + 0.$		0.0076 V <sub>12</sub> -	0.00027 L <sub>A</sub>					.0000 v <sub>12</sub> - (	0.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln					''	.9 (pc/r	,			
LOS = (Exhibit							oit 13-2)			
Speed Detern	nination				Speed I					
$M_S = (Exibit 1)$	3-11)				ľ		xhibit 13-	-		
$S_R^=$ mph (Exh	ibit 13-11)				1	-	(Exhibit	-		
	ibit 13-11)				S <sub>0</sub> = N/A mph (Exhibit 13-12)					
S = mph (Exh	ibit 13-13)				S = 6	0.6 mph	(Exhibit	13-13)		
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		MPS AND	RAMP JUNG			EET			
General Inf	ormation			Site Infor	mation				
nalyst		ne Forsythe	Fr	eeway/Dir of Tr	avel	10th Ave NB	On-ramp		
gency or Compa	any			inction		I-15 and I-31	5		
ate Performed		5/2014		risdiction					
nalysis Time Pe		Peak	Ar	nalysis Year		2014			
roject Descriptio	n								
nputs									
Ipstream Adj Rai	mp	Freeway Numb	per of Lanes, N	2				Downstre	am Adi
	r	Ramp Number	of Lanes, N	1				Ramp	•
□ Yes □	On	Acceleration La	ane Length, L₄	590				□Yes	On
		Deceleration L	,,						
✓ No	Off			201				✓ No	Off
= ft		Freeway Volur	•	321				1. =	ft
<sub>up</sub> = ft		Ramp Volume		167				L <sub>down</sub> =	
'u = vel	h/h	Freeway Free-	Flow Speed, S <sub>FF</sub>	65.0				V <sub>D</sub> =	veh/h
u Vei	11/11	Ramp Free-Flo	ow Speed, S <sub>FR</sub>	35.0				ا	
Conversion	n to pc/h Un	der Base (	Conditions						
	V	PHF	Terrain	%Truck	%Rv	f	f	v = \//DH	F x f <sub>HV</sub> x f <sub>p</sub>
(pc/h)	(Veh/hr)		ı <del>C</del> II diil		<u> </u>	f <sub>HV</sub>	f <sub>p</sub>	v - v/FП	
reeway	321	0.89	Level	14	0	0.935	1.00		385
Ramp	167	0.75	Level	7	0	0.966	1.00		232
JpStream									
DownStream		<u> </u>							
- 4! 4!		Merge Areas			<b>F</b> = 45 = 4	· · · · · · · · · · · · · · · · · · ·	Diverge Area	S	
stimation	or v <sub>12</sub>				Estimat	ion of v <sub>1.</sub>	2		
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )				V <sub>1</sub>	$_{2} = V_{R} + (V_{F} - V_{F})$	V <sub>R</sub> )P <sub>FD</sub>	
EQ =	(Equ	uation 13-6 or	13-7)		L <sub>EQ</sub> =	·	(Equation 1	13-12 or 13-	13)
FM =			on (Exhibit 13-6)		P <sub>FD</sub> =				
' = 12	385 p		(=/		$P_{FD}$ = using Equation (Exhibit 13-7) $V_{12}$ = pc/h				.,
	•		10 44 40 47)				•	12 11 12	17\
or V <sub>av34</sub>			13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	. 0.700		on 13-14 or 13-	17)
	2,700 pc/h?						h? ☐ Yes ☐ N		
s V <sub>3</sub> or V <sub>av34</sub> > 1	1.5 * V <sub>12</sub> /2 □ Y∈				Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5 * V <sub>12</sub> /	2 □Yes □N		
Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		tion 13-16, 1	13-18, or
Capacity C	13-19	))				v Checks	13-19)		
араспу С			ana situ	LOS F?	Capacit			Canacity	LOS F
	Actual	<u>'</u>	apacity	LUS F?	<del>                                     </del>	AC		Capacity	LUST
					V <sub>F</sub>		Exhibit '		
$V_{FO}$	617	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit '	13-8	
					$V_R$		Exhibit	13-	
	<del></del>					<u> </u>	10		
low Enteri	ing Merge II			1 15 15 0	Flow En		iverge Influ		,
.,	Actual	<del> </del>	Desirable	Violation?	.,	Actual		Desirable	Violation
V <sub>R12</sub>	617	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-		
	rvice Deteri						Determinat		t <b>F</b> )
$D_{R} = 5.47$	'5 + 0.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> - 0.0	0627 L <sub>A</sub>			$D_{R} = 4.252$	+ 0.0086 V <sub>12</sub> -	- 0.009 L <sub>D</sub>	
<sub>R</sub> = 6.5 (pc)	/mi/ln)				$D_R = (p$	oc/mi/ln)			
	ibit 13-2)					Exhibit 13-2	)		
OS = A (Fxhi)	•								
•					<del>                                     </del>	<u>Determina</u>	auon		
Speed Dete			$M_{\rm S} = 0.287 \text{ (Exhibit 13-11)}$ $P_{\rm S} = \text{ (Exhibit 13-12)}$						
Speed Dete						•			
<b>Speed Dete</b> l <sub>S</sub> = 0.287 (						ph (Exhibit 13	3-12)		
<b>Speed Dete</b> $I_S = 0.287 ($ $R = 58.4 \text{ m}$	(Exibit 13-11) ph (Exhibit 13-11)				S <sub>R</sub> = m	•	•		
Speed Dete S = 0.287 ( R = 58.4 m D = N/A mp	(Exibit 13-11)				$S_R = m$ $S_0 = m$	ph (Exhibit 13	3-12)		

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst Agency or Company	Shar	ne Forsythe		reeway/Dir of Trunction		10th Av	re SB Off-r	amp		
Date Performed		/2014		urisdiction		i io an	41010			
Analysis Time Period	d AM F	Peak	А	nalysis Year		2014				
Project Description										
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	nber of Lanes, N	2					Downstrea Ramp	m Adj
□Yes □	On	1 '	ane Length, L <sub>A</sub>	1					□Yes	On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	463 352					<b>☑</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	192					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		e-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 55.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	352	0.94	Level	8	0	0.	962	1.00	39	)1
Ramp	192	0.83	Level	3	0	0.	985	1.00	23	36
UpStream										
DownStream										
<b>-</b>		Merge Areas			F-4i			iverge Areas		
Estimation of	1 <sub>2</sub>				Estimat	ion o	τν <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Equ	ıation (Exhil	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			01 pc/h	,	,
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			> 2.7		Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$								Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> :			c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	cks				Capacit	y Che	ecks	,		
	Actual	C	Capacity	LOS F?	1		Actual	Ca	pacity	LOS F?
					V <sub>F</sub>		391	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	V <sub>D</sub>	155	Exhibit 13-8	4700	No
FO					V <sub>R</sub>		236	Exhibit 13-10		No
Elow Entoring	Morgo In	fluonoo A	\							110
Flow Entering	Actual	1	Desirable	Violation?	FIOW EI	-	Actual	rge Influend Max Desirab		Violation?
V <sub>R12</sub>	Actual	Exhibit 13-8	Desirable	Violations	V <sub>12</sub>		391	Exhibit 13-8	4400:All	No
	ica Datarr		if no4 <b>[</b> ]	<u> </u>	<del> </del>					
Level of Serv								termination		<del>-)</del>
$D_R = 5.475 + 0.$	7.7	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>					.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	•				I ''	.4 (pc/r	,			
LOS = (Exhibit					+		oit 13-2)			
Speed Detern	nination				Speed L	Deter	minatic	n		
M <sub>S</sub> = (Exibit 1:	•				ľ	-	xhibit 13- (Exhibit	*		
10	ibit 13-11)					-	-	· ·		
	ibit 13-11)				1 -	-	(Exhibit	-		
	ibit 13-13)				S = 6	0.6 mph	(Exhibit	13-13)		
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	F	AMPS AND	RAMP JUN	<u>CTIONS</u> W	ORKSH	EET				
General In	formation			Site Infor						
Analyst	S	hane Forsythe	Fr	eeway/Dir of Tr	avel	10th A	ve SB On-ra	amp		
gency or Comp			Ju	ınction		I-15 ar	d I-315			
ate Performed		/15/2014		ırisdiction						
nalysis Time P		M Peak	Ar	nalysis Year		2014				
roject Descripti	ion									
nputs		l							1	
Jpstream Adj Ra	amp	·	ber of Lanes, N	2					Downstre	am Adj
	10	Ramp Numbe	r of Lanes, N	1					Ramp	
Yes	On	Acceleration L	ane Length, L <sub>A</sub>	1500					□Yes	On
✓ No	Off	Deceleration I	ane Length L <sub>D</sub>							_
	_ 011	Freeway Volu	me, V <sub>E</sub>	458					☑ No	Off
<sub>up</sub> = ft	t	Ramp Volume		287					L <sub>down</sub> =	ft
-r			-Flow Speed, S <sub>FF</sub>	65.0						
' <sub>u</sub> = ve	eh/h		ow Speed, S <sub>FR</sub>	35.0					$V_D =$	veh/h
) - m m - i -	4/ - 1		. 117	33.0						
onversio	n to pc/n t	Inder Base	Conditions	1			1			
(pc/h)	(Veh/hr	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PHI	$F x f_{HV} x f_{p}$
reeway	458	0.85	Level	7	0	0	966	1.00		559
Ramp	287	0.77	Level	5	0		976	1.00		382
JpStream		1		<u> </u>	Ť	+-				
DownStream										
		Merge Areas					D	iverge Areas		
stimation	1 of v <sub>12</sub>				Estimat	tion c	of v <sub>12</sub>			
		V <sub>F</sub> (P <sub>FM</sub> )					V <sub>40</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P_p	
=		quation 13-6 or	· 13_7)		l =			Equation 13		13)
EQ =	-	-			L <sub>EQ</sub> =			-		
FM =			ion (Exhibit 13-6)		P <sub>FD</sub> =			ising Equatio	וו (באוווטונ ו	J-1)
12 =		pc/h			V <sub>12</sub> =			oc/h		
or V <sub>av34</sub>			13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			oc/h (Equation ´	13-14 or 13-	17)
	2,700 pc/h?							]Yes ☐ No		
s $V_3$ or $V_{av34}$ >	1.5 * V <sub>12</sub> /2				Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		]Yes ☐ No		
Yes,V <sub>12a</sub> =	ро 13-	/h (Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub>	=		oc/h (Equatio 3-19)	n 13-16, 1	3-18, or
Capacity C		19)			Capacit			5-19)		
apacity C	Actual		apacity	LOS F?	Joapach	iy On	Actual	Ca	pacity	LOS F?
	Actual	<del>-                                     </del>	apacity	2001:	V <sub>F</sub>		Motual	Exhibit 13-		2001:
						.,			_	
$V_{FO}$	941	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v <sub>R</sub>		Exhibit 13-		
					$V_R$			Exhibit 13 10	-	
low Enter	rina Merae	Influence A	roa		Flow Fr	ntorir	na Diver	ge Influer	ιςο Δτορ	<u> </u>
TOW LINE	Actual		Desirable	Violation?	1 1011 21	-	Actual	Max Des		Violation?
V <sub>R12</sub>	941	Exhibit 13-8	4600:All	No	V <sub>12</sub>	+		Exhibit 13-8		. ioiation
*R12				110		f Sam	vice De	terminatio	n (if not	· <b>E</b> )
aval of C					+				<u> </u>	<i></i>
		+ 0.0078 V <sub>12</sub> - 0.0	JUOZI LA					0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = 5.4	•				1 ., ,,	pc/mi/l	•			
$D_{R} = 5.4$	c/mi/ln)						12 21			
) <sub>R</sub> = 3.2 (po	•				LOS = (I	Exhibit	. 13-2)			
$D_{R} = 5.4$ $D_{R} = 3.2  (potential of the potential	c/mi/ln)	<u> </u>			LOS = (I Speed L			n		
$D_{R} = 5.4^{\circ}$ $D_{R} = 3.2 \text{ (proposed Det}$	c/mi/ln) hibit 13-2) termination	1			Speed I		minatio	n		
$D_{R} = 5.4$ $D_{R} = 3.2 \text{ (pr}$ $D_{R} = 3.2 \text{ (pr}$ $D_{R} = 4 \text{ (Ext)}$ $D_{R} = 4 \text{ (Ext)}$ $D_{R} = 6 \text{ (Ext)}$ $D_{R} = 6 \text{ (Ext)}$ $D_{R} = 6 \text{ (Ext)}$	c/mi/ln) hibit 13-2) cermination (Exibit 13-11)				<b>Speed L</b> D <sub>s</sub> = (E	<b>Deter</b> Exhibit 1	<b>minatio</b> 3-12)	n		
$D_{R} = 5.4^{\circ}$ $D_{R} = 3.2^{\circ}$ $D_{R} = 3.2^{\circ}$ $D_{R} = 4^{\circ}$ $D_{R} = 5.4^{\circ}$ $D_{R} = 5.4^$	c/mi/ln) hibit 13-2) termination (Exibit 13-11) nph (Exhibit 13-	1)			<b>Speed L</b> $D_s = (E_s)^T$ $S_R = m$	<b>Deter</b> Exhibit 1 nph (Exh	minatio 3-12) nibit 13-12)	n		
$D_{R} = 5.4^{\circ}$ $D_{R} = 3.2 \text{ (pr}$ $D_{R} = 3.2 \text{ (pr}$ $D_{R} = 4 \text{ (Ext)}$ $D_{R} = 0.226$ $D_{R} = 0.226$ $D_{R} = 0.226$ $D_{R} = 0.226$ $D_{R} = 0.226$ $D_{R} = 0.226$ $D_{R} = 0.226$	c/mi/ln) hibit 13-2) cermination (Exibit 13-11)	1) 1)			$\begin{array}{ccc} \textbf{Speed I} \\ \textbf{D}_{\text{S}} = & \text{(E} \\ \textbf{S}_{\text{R}} = & \text{m} \\ \textbf{S}_{\text{0}} = & \text{n} \end{array}$	Deter Exhibit 1 nph (Exh nph (Exh	<b>minatio</b> 3-12)	n		

		RAMP	S AND RAN	/IP JUNCTI	ONS WO	RKS	HEET						
General Infor	mation			Site Infor			·						
Analyst		e Forsythe	F	reeway/Dir of Tr		10th Av	e NB Off-r	amp					
Agency or Company	-	,		unction		I-15 an							
Date Performed	9/15/	2014	J	urisdiction									
Analysis Time Period	PM F	Peak	А	Analysis Year		2014							
Project Description													
Inputs													
Upstream Adj Ra	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2					Downstrea	m Adj			
□Yes □	On	l '	ane Length, L <sub>A</sub>	1					Ramp    Yes	On			
✓ No	Off		ane Length L <sub>D</sub>	740					✓No	Off			
L <sub>up</sub> = ff	:	Freeway Volu Ramp Volume		722 436					L <sub>down</sub> =	ft			
·			-Flow Speed, S <sub>FF</sub>	65.0					. ,				
V <sub>u</sub> = ve	eh/h		ow Speed, S <sub>FR</sub>	55.0					V <sub>D</sub> =	veh/h			
Conversion to	pc/h Un	der Base	Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>			
Freeway	722	0.80	Level	10	0	0.	952	1.00	94	8			
Ramp	436	0.83	Level	3	0	0.	985	1.00	53	33			
UpStream													
DownStream													
Merge Areas					<b>-</b>			iverge Areas	as				
Estimation of	v <sub>12</sub>				Estimat	ion o	t v <sub>12</sub>						
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>				
L <sub>EQ</sub> =	(Equa	ition 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13-1	2 or 13-13	)			
P <sub>FM</sub> =		Equation (E			P <sub>FD</sub> =		-	000 using Equ					
V <sub>12</sub> =	pc/h	1 (	,		V <sub>12</sub> =			8 pc/h		on 10 1,			
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 12 14 or	12 17\			
			-14 01 13-17)			<b>&gt; 2 7</b>			11 13-14 01	13-17)			
Is $V_3$ or $V_{av34} > 2,70$								Yes ☑ No					
Is $V_3$ or $V_{av34} > 1.5 *$			40 40 40			-		☐Yes ☑ No	10 10 10	40 40			
If Yes,V <sub>12a</sub> =	pc/n ( 13-19)		-16, 13-18, or		If Yes,V <sub>12a</sub> =	=	p 19	c/h (Equation	13-16, 13-	18, or 13-			
Capacity Che					Capacit	v Ch		<i>5)</i>					
Capacity One	Actual		apacity	LOS F?	Joupaon	, <del>y                                    </del>	Actual	Cal	pacity	LOS F?			
	7 lotadi	Ĭ	αρασιτή	2001:	V <sub>F</sub>		948	Exhibit 13-8	1	No			
V		Fvb:bit 12 0				\/		Exhibit 13-8		_			
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$		415	_	+	No			
					V <sub>R</sub>		533	Exhibit 13-10		No			
Flow Entering		1			Flow Er	-		rge Influen					
	Actual		Desirable	Violation?		1	Actual	Max Desirab	le	Violation?			
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		948	Exhibit 13-8	4400:All	No			
Level of Service Determination (if not F)					Level of	f Serv	vice De	terminatio	n (if not l	F)			
D <sub>R</sub> = 5.475 + 0.00734 v <sub>R</sub> + 0.0078 V <sub>12</sub> - 0.00627 L <sub>A</sub>						D <sub>R</sub> = 4	.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln)		12	, ,		$D_R = 5$	.7 (pc/r	ni/ln)		J				
LOS = (Exhibit					I	**	oit 13-2)						
					<del> </del>			<u> </u>					
Speed Determination					Speed L								
M <sub>S</sub> = (Exibit 13	3-11)				ľ	-	xhibit 13-	*					
$S_R^=$ mph (Exh	ibit 13-11)					-	(Exhibit	· ·					
S <sub>0</sub> = mph (Exh	ibit 13-11)				$S_0 = N$	/A mph	(Exhibit	13-12)					
	ibit 13-13)				S = 6	0.0 mph	(Exhibit	13-13)					
Copyright © 2012 Unive	ersity of Florida,	All Rights Reser	ved		HCS2010 <sup>TM</sup>	l Versio	n 6.41	Ge	nerated: 9/15	/2014 9:08 Al			

		RAN	<b>VIPS AND</b>	<b>RAMP JUN</b>	<b>CTIONS W</b>	ORKSH	EET				
General	Inforn				Site Infor						
Analyst			e Forsythe	F	reeway/Dir of Tr		10th <i>A</i>	ve NB On-ra	amp		
agency or Co				Jı	unction		I-15 a	nd I-315			
ate Perform		9/15/2	2014		urisdiction						
nalysis Tim		PM P	eak	A	nalysis Year		2014				
roject Desc	ription										
nputs											
Jpstream Ad	lj Ramp		•	ber of Lanes, N	2					Downstre	am Adj
			Ramp Numbe	r of Lanes, N	1					Ramp	
Yes	☐ On		Acceleration L	ane Length, L <sub>A</sub>	590					□Yes	On
✓ No	Off		Deceleration L	ane Length L <sub>D</sub>							_
			Freeway Volu	me, V <sub>E</sub>	490					✓ No	Off
up =	ft		Ramp Volume		262					L <sub>down</sub> =	ft
чь				Flow Speed, S <sub>FF</sub>	65.0						
' <sub>u</sub> =	veh/h			ow Speed, $S_{FR}$						$V_D =$	veh/h
				• 110	35.0						
onvers	ion to	pc/n Und	<u>ier Base (</u>	Conditions	1						
(pc/h)	)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PHI	$F x f_{HV} x f_{p}$
reeway		490	0.87	Level	11	0	1	.948	1.00		596
Ramp	$\overline{}$	262	0.92	Level	4	0		.980	1.00		290
JpStream			0.02	20101	<u> </u>	Ť	╅	.000	1.00		200
DownStream	n										
		1	Merge Areas					Ď	iverge Areas		
stimati	on of	V <sub>12</sub>				Estimat	tion (	of v <sub>12</sub>			
		V <sub>12</sub> = V <sub>F</sub> (	( P <sub>=</sub> ,, )						/ <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	.)P_5	
=			ation 13-6 or	. 13_7)		_			Equation 13		13)
EQ =					١	L <sub>EQ</sub> =			-		
FM =				ion (Exhibit 13-6	)	P <sub>FD</sub> =			sing Equatio	וו (באוווטונ ו	J-1)
12 =		596 pc				V <sub>12</sub> =		•	c/h		
or V <sub>av34</sub>	0 -00	-		13-14 or 13-17	)	V <sub>3</sub> or V <sub>av34</sub>			c/h (Equation	13-14 or 13-	17)
	-	pc/h? Yes							]Yes ☐ No		
s V <sub>3</sub> or V <sub>av3</sub>	<sub>4</sub> > 1.5 * \	V <sub>12</sub> /2 □ Yes				Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.		]Yes ☐ No		
Yes,V <sub>12a</sub> =		pc/h ( 13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub>	=		c/h (Equatio -19)	n 13-16, 1	3-18, or
Capacity						Capacit			-19)		
apacity	<i>7 011</i> 00	Actual		apacity	LOS F?	Joapach	y On	Actual	Ca	pacity	LOS F?
		/ lotual	<del>l ĭ</del>	apacity	LOOT:	V <sub>F</sub>		Notual	Exhibit 13-		2001:
							\/			_	
$V_{FO}$	,	886	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v <sub>R</sub>		Exhibit 13-		
						$V_R$			Exhibit 13 10	-	
low En	terina	Merge In	fluence A	roa		Flow Fr	ntorii	na Diver	ge Influer	ιςο Δτορ	)
TOW LIT	<u>tering</u>	Actual		Desirable	Violation?	1 1011 21	_	Actual	Max Des		Violation
V <sub>R12</sub>	$\overline{}$	886	Exhibit 13-8	4600:All	No	V <sub>12</sub>	+	. 101.001	Exhibit 13-8		. ioiation
*R12					NO		f Sor	vice De	terminatio	n (if not	<u> </u>
aval of						+				<u> </u>	<i>F)</i>
			0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>					0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> =						$D_R = (I$	pc/mi/	,			
D <sub>R</sub> =	6 (pc/mi/lr	•									
D <sub>R</sub> =		•				LOS = (I	Exhibi	t 13-2)			
D <sub>R</sub> = 8.6 OS = A (	6 (pc/mi/lr (Exhibit 1	3-2)						t 13-2) <b>rminatio</b>	n		
D <sub>R</sub> = 8.6 OS = A ( <b>Speed D</b>	6 (pc/mi/lr (Exhibit 1: <b>Determ</b>	3-2) ination				Speed I		rminatio	n		
$O_R = 8.6$ OS = A (Speed D) OS = 0.2	6 (pc/mi/lr (Exhibit 13 <b>Determ</b> 289 (Exibi	3-2) ination it 13-11)				<b>Speed L</b> D <sub>s</sub> = (E	<b>Dete</b> Exhibit	<b>rminatio</b> 13-12)	n		
$D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$	6 (pc/mi/lr (Exhibit 1: Determ 289 (Exibi	3-2) ination it 13-11) Exhibit 13-11)				<b>Speed L</b> $D_s = (E_s)^T$ $S_R = m$	<b>Dete</b> Exhibit nph (Ex	rminatio 13-12) hibit 13-12)	n		
$D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$ $D_{R} = 0.00$	6 (pc/mi/lr (Exhibit 1: Determ 289 (Exibi .3 mph (E A mph (E	3-2) ination it 13-11)				$\begin{array}{ccc} \textbf{Speed I} \\ \textbf{D}_{\text{S}} = & \text{(E} \\ \textbf{S}_{\text{R}} = & \text{m} \\ \textbf{S}_{\text{0}} = & \text{n} \end{array}$	Deter Exhibit nph (Ex nph (Ex	<b>rminatio</b> 13-12)	n		

<u> </u>		RAMP	S AND RAI	/P JUNCTI	ONS WO	RKS	HEET						
General Infor	mation		<u> </u>	Site Infor									
Analyst Agency or Company		ne Forsythe		reeway/Dir of Tr		10th Av I-15 an	/e SB Off-r d I-315	amp					
Date Performed	9/15/	2014	J	urisdiction									
Analysis Time Period	l PM F	Peak	A	Analysis Year		2014							
Project Description													
Inputs													
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2					Downstrea Ramp	ım Adj			
□Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	•					□Yes	□On			
✓ No	Off	Deceleration I Freeway Volu	ane Length L <sub>D</sub> me, V <sub>F</sub>	463 491					✓No	Off			
L <sub>up</sub> = f	t	Ramp Volume		239					L <sub>down</sub> =	ft			
V <sub>u</sub> = ve	eh/h	1	-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	55.0 55.0					V <sub>D</sub> =	veh/h			
Conversion to	pc/h Un	der Base	Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>			
Freeway	491	0.90	Level	14	0	0.	935	1.00	58	36			
Ramp	239	0.83	Level	7	0	0.	966	1.00	29	9			
UpStream													
DownStream													
	Merge Areas Stimation of v <sub>12</sub>				Fatimas			Diverge Areas	38				
Estimation of	V <sub>12</sub>				Estimat	mation of v <sub>12</sub>							
	$V_{12} = V_{F}$	(P <sub>FM</sub> )			$V_{12} = V_R + (V_F - V_R)P_{FD}$								
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)			
P <sub>FM</sub> =	using	Equation (E	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Eqเ	uation (Exhi	bit 13-7)			
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			36 pc/h	•	•			
V <sub>3</sub> or V <sub>av34</sub>	•	Fouation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)			
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			,			>27		Yes ☑ No		,			
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 '								Yes ☑ No					
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> :			c/h (Equation	13-16, 13-	18, or 13-			
Capacity Che		,			Capacit	tv Ch		- /					
	Actual		apacity	LOS F?	1		Actual	Ca	pacity	LOS F?			
			, ,		V <sub>F</sub>		586	Exhibit 13-8	<u> </u>	No			
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>		287	Exhibit 13-8	4700	No			
- FO		Extribit 10 0			V <sub>R</sub>		299	Exhibit 13-10		No			
Flanc Frataria	. Можно 1	£1								INO			
Flow Entering		1		Violation?	FIOW EI	-		rge Influend Max Desirab		Violation?			
\/	Actual	Exhibit 13-8	Desirable	Violation?	\/		Actual 586	Exhibit 13-8	4400:All	î e			
V <sub>R12</sub>	. 5 .				V <sub>12</sub>					No			
Level of Service Determination (if not F)					i e			termination	-	<del>-)</del>			
$D_R = 5.475 + 0.00734 \text{ v}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$						$D_R = 4$	1.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 5$	.1 (pc/r	ni/ln)						
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)						
Speed Determination					Speed L	Deter	minatio	on					
M <sub>S</sub> = (Exibit 1:	•				D <sub>s</sub> = 0.195 (Exhibit 13-12)								
S <sub>R</sub> = mph (Exh	ibit 13-11)					-	(Exhibit	-					
$S_0 = mph (Exh$	ibit 13-11)				$S_0 = N$	I/A mph	(Exhibit	13-12)					
S = mph (Exh	ibit 13-13)				S = 6	0.5 mph	(Exhibit	13-13)					
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		RAI	MPS AND	RAMP JUN			EET				
General	Inform	ation			Site Infor	mation					
Analyst		Shan	e Forsythe	Fr	eeway/Dir of Tr	avel	10th A	ve SB On-ra	amp		
gency or Co	ompany			Ju	ınction		I-15 ar	nd I-315			
ate Perform	ned	9/15/	2014	Ju	ırisdiction						
nalysis Tim	e Period	PM P	Peak	Ar	nalysis Year		2014				
roject Desc	ription										
nputs											
pstream Ac	li Ramp		Freeway Num	ber of Lanes, N	2					Downstre	am Adi
pot. 00	-,p		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes	$\square$ On		Acceleration L	ane Length, L <sub>Δ</sub>	1500					□ Vaa	По <sub>т</sub>
_	_			ane Length L <sub>D</sub>						□Yes	☐ On
✓ No	Off				000					✓ No	Off
_	££		Freeway Volu	•	630					=	ft
up =	ft		Ramp Volume	1.	384					L <sub>down</sub> =	11
_	veh/h		Freeway Free	Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
_ =	ven/m		Ramp Free-Fl	ow Speed, S <sub>FR</sub>	35.0					I, D	1011/11
onvers	ion to	pc/h Und	der Base (	Conditions							
		V	PHF		%Truck	0/ Dv		f	f	v = V/PH	F x f <sub>HV</sub> x f <sub>p</sub>
(pc/h	,	(Veh/hr)	L	Terrain		%Rv	$\bot$	f <sub>HV</sub>	f <sub>p</sub>	V - V/F 171	^ 'HV <b>^</b> 'p
reeway		630	0.93	Level	10	0	_	.952	1.00	_	711
Ramp		384	0.94	Level	5	0	0	.976	1.00		419
JpStream											
OownStream	n		<u>.                                    </u>								
- 45 45	6 .		Merge Areas			<b>F</b> = 45 = 4		D	iverge Areas		
stimati	on or v	12				Estimat	ion c	or v <sub>12</sub>			
		$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>	
EQ =		(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13	-12 or 13-1	13)
FM =				ion (Exhibit 13-6)		P <sub>FD</sub> =			Ising Equatio		
12 =		711 p		(=/		V <sub>12</sub> =			oc/h	× (=	• . ,
		•		10 11 10 17				•		12 11 12 -	17\
or V <sub>av34</sub>	. 0 700			13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	. 0		oc/h (Equation		17)
		pc/h? Ye:							]Yes ☐ No		
s V <sub>3</sub> or V <sub>av3</sub>	<sub>34</sub> > 1.5 * V	′ <sub>12</sub> /2 □ Ye				Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.5		]Yes ☐ No		
Yes,V <sub>12a</sub> =				3-16, 13-18, or		If Yes,V <sub>12a</sub> :	=		oc/h (Equatio	n 13-16, 1	3-18, or
Capacity		13-19)				Capacit			3-19)		
apacity	CHEC		1 0	anaoity.	100 52	Capacit	y CII		I Co	nacity.	LOS F?
	+	Actual	<del>                                     </del>	apacity	LOS F?	17		Actual		pacity 。	LUSF
						V <sub>F</sub>			Exhibit 13-		
$V_{FC}$	, [	1130	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-		
						$V_R$			Exhibit 13	i-	
· · · · · · · · · · · · · · · · · · ·	4	14	<u> </u>				. 4	D <i>i</i>	10	4	
iow En	tering		fluence A		\ \f\:_\-t\:\	Flow Er	_		ge Influer		
\/	-+	Actual	<del>†                                      </del>	Desirable	Violation?	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	+	Actual	Max Des	irabie T	Violation <sup>4</sup>
V <sub>R12</sub>		1130	Exhibit 13-8	4600:All	No	V <sub>12</sub>		<u> </u>	Exhibit 13-8	<u> </u>	<u> </u>
			nination (i						terminatio		: F)
D <sub>R</sub> =	5.475 + 0.	00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			$D_R = 4$	4.252 + 0.	0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
R = 4.7	7 (pc/mi/ln	)				$D_R = (p$	oc/mi/l	ln)			
	(Exhibit 13	-2)					Exhibi	t 13-2)			
Speed D	•					Speed L			n		
•						<del>                                     </del>	Exhibit '		••		
•	228 (Exibit					* ·					
<sub>R</sub> = 59		xhibit 13-11)				1 ''		hibit 13-12)			
		hibit 13-11)				$S_0 = m$	iph (Ex	hibit 13-12)			
	A mph (Ex	111011 13-11)				U		,			
,		xhibit 13-11)				ľ	-	hibit 13-13)			

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst		ne Forsythe	F	reeway/Dir of Tr		14th FF	3 Off-ramp			
Agency or Company	Onai	io i oroyano		unction	4101	I-315	on ramp			
Date Performed	9/15/	/2014		urisdiction						
Analysis Time Period	I AM F	Peak	А	nalysis Year		2014				
Project Description		Study								
Inputs		·								
Upstream Adj R	amp	1	ber of Lanes, N	2					Downstrea	m Adj
□Yes □	70-	Ramp Numbe	r of Lanes, N	1					Ramp	
⊔ Yes ∟	On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I	Lane Length L <sub>D</sub>	503					✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	530						
L <sub>up</sub> = fi	t	Ramp Volume	e, V <sub>R</sub>	55					L <sub>down</sub> =	ft
.,		Freeway Free	-Flow Speed, S <sub>FF</sub>	55.0					\/ -	vah/h
V <sub>u</sub> = ve	eh/h	Ramp Free-Fl	low Speed, S <sub>ER</sub>	35.0					V <sub>D</sub> =	veh/h
Conversion to	n nc/h l ln		111							
	<i>∨ ∨</i>	PHF		0/ Truck	0/ Dv		f	f	v = V/PHF	v f v f
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v <b>–</b> v/FHF	* 'HV * 'p
Freeway	530	0.87	Level	6	0	_	971	1.00	62	27
Ramp	55	0.83	Level	5	0	0.	976	1.00	6	8
UpStream		$\vdash$								
DownStream		Merge Areas			<u> </u>			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
Estimation of		Ectimat	ion o		iverge Areas					
Estimation of	V <sub>12</sub>				Estimat	1011 0				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	$V_R + (V_F - V_R)$	P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Equ	ation (Exhil	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			27 pc/h	,	•
V <sub>3</sub> or V <sub>av34</sub>	•	Fauation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			>27		Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$								Yes ☑ No		
			-16, 13-18, or		1	-		c/h (Equation	13_16_13_	18 or 13_
If Yes,V <sub>12a</sub> =	13-19		-10, 10-10, 01		If Yes,V <sub>12a</sub> =	=	19		10-10, 10-	10, 01 13-
Capacity Che	cks	,			Capacit	y Ch	ecks	,		
	Actual		apacity	LOS F?			Actual	Car	pacity	LOS F?
			-		V <sub>F</sub>		627	Exhibit 13-8	4500	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	V_	559	Exhibit 13-8	4500	No
, FO		EXHIBIT 10 0						Exhibit 13-10		
	<u> </u>	<u> </u>			V <sub>R</sub>		68			No
Flow Entering		1		1 10 10 0	Flow Er	-		rge Influenc		1.5.1.5.0
.,	Actual		Desirable	Violation?	.,		Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		627	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)								terminatior		<u>5)                                    </u>
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>			$D_R = 4$	1.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 5$	.1 (pc/r	ni/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Detern					Speed L	-		n		
					<del>  '                                   </del>		xhibit 13-			
M <sub>S</sub> = (Exibit 1:	•						(Exhibit	*		
	ibit 13-11)					-	•			
	ibit 13-11)				1	-	(Exhibit	-		
S = mph (Exh	ibit 13-13)				S = 49	9.4 mph	(Exhibit	13-13)		
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	RA	MPS AND	<b>RAMP JUN</b>	CTIONS W	ORKSH	EET				
General Inf				Site Infor						
Analyst	Shai	ne Forsythe	Fr	eeway/Dir of Tra	avel	14th St	EB On-ram	p		
gency or Compa	iny		Ju	inction		I-315				
ate Performed		/2014		risdiction						
nalysis Time Pe		Peak	Ar	nalysis Year		2014				
	n I-15 Corridor S	Study								
nputs		le N								
Jpstream Adj Rai	mp	1	ber of Lanes, N	2					Downstre	am Adj
□Yes □	0	Ramp Numbe		1					Ramp	
□ Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	930					□Yes	On
✓ No	Off	Deceleration L	ane Length L <sub>D</sub>						✓No	□ O#
	· · ·	Freeway Volu	me, V <sub>F</sub>	979					INO INO	Off
<sub>up</sub> = ft		Ramp Volume	, V <sub>D</sub>	497					L <sub>down</sub> =	ft
			-Flow Speed, S <sub>FF</sub>	55.0						
u = vel	n/h		ow Speed, S <sub>FR</sub>	35.0					V <sub>D</sub> =	veh/h
Na mura wa ia w	40 00/6 110	1	. 117	35.0						
onversion	to pc/h Un		Conditions	1	ι	1				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f	HV	f <sub>p</sub>	v = V/PHI	$= x f_{HV} x f_{p}$
reeway	979	0.83	Level	4	0	0.9	80	1.00	,	1205
Ramp	497	0.83	Level	3	0	0.9		1.00		608
JpStream .										
DownStream										
		Merge Areas				_	Di	verge Areas		
stimation	of v <sub>12</sub>				Estimat	ion of	v <sub>12</sub>			
	V <sub>12</sub> = V <sub>E</sub>	(P <sub>EM</sub> )					V <sub>12</sub> = V	<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P <sub>ED</sub>	
EQ =		ation 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-		3)
FM =			ion (Exhibit 13-6)		P <sub>FD</sub> =			sing Equatio		
гм 12 =	1205		iori (Eximole 10 0)		V <sub>12</sub> =			c/h	II (EXIIIOR I	0 1 /
		•	12 14 or 12 1 <del>7</del> \				•	c/h (Equation 1	2 14 or 12 1	17\
or V <sub>av34</sub>	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	> 0.70	-		3-14 01 13-1	17)
	,700 pc/h? ☐ Ye							Yes No		
	.5 * V <sub>12</sub> /2 □ Ye		16 12 10 0		is v <sub>3</sub> or v <sub>av</sub>	<sub>34</sub> > 1.5 °		Yes No	- 10 10 1	0.40
Yes,V <sub>12a</sub> =	pc/n 13-19		3-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equatio -19)	n 13-16, 1	3-18, or
Capacity C		/			Capacit	v Che		,		
<u>, , , , , , , , , , , , , , , , , , , </u>	Actual	C	apacity	LOS F?	Ϊ ΄		Actual	Car	acity	LOS F?
					V <sub>F</sub>			Exhibit 13-8	3	
\/	1012	Fubibit 12.0		No.	$V_{FO} = V_{F}$	- V <sub>D</sub>		Exhibit 13-8	3	
$V_{FO}$	1813	Exhibit 13-8		No		· R		Exhibit 13-		
					$V_R$			10		
low Enteri	ng Merge Ir	nfluence A	rea		Flow Er	tering	Diver	ge Influen	ce Area	1
	Actual	Max	Desirable	Violation?		A	ctual	Max Desi	rable	Violation
$V_{R12}$	1813	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		
evel of Se	rvice Deteri	mination (i	if not F)		Level of	f Serv	ice Det	erminatio	n (if not	F)
	5 + 0.00734 v <sub>R</sub> +					D <sub>P</sub> = 4.	252 + 0.0	0086 V <sub>12</sub> - 0.	.009 L <sub>D</sub>	•
<sub>R</sub> = 13.5 (p		12	^			oc/mi/ln		12	D	
	bit 13-2)					Exhibit	•			
	•									
Speed Dete					Speed L			71		
l <sub>S</sub> = 0.280 (	Exibit 13-11)					Exhibit 13	•			
	. /=				S <sub>R</sub> = m	ph (Exhi	bit 13-12)			
	oh (Exhibit 13-11)				I.		,			
<sub>R</sub> = 51.4 m <sub>l</sub>	on (Exhibit 13-11) h (Exhibit 13-11)						bit 13-12)			
<sub>R</sub> = 51.4 m <sub>l</sub> <sub>0</sub> = N/A mp					S <sub>0</sub> = m	ph (Exhi	•			

		RAMP	S AND RAN	IP JUNCTI	ONS WO	RKS	HEET						
General Infor	mation			Site Infor		11.10							
Analyst		ne Forsythe	F	reeway/Dir of Ti		14th W	B Off-ramp	)					
Agency or Company	Onai	io i orojalo		unction		I-315	D On rump	•					
Date Performed	9/15/	/2014		urisdiction		1010							
Analysis Time Period				nalysis Year		2014							
Project Description													
Inputs													
•		Freeway Num	ber of Lanes, N	2									
Upstream Adj R	amp	1							Downstrea	m Adj			
□Yes□	On	Ramp Numbe		1					Ramp				
	1011	Acceleration L	ane Length, L <sub>A</sub>						Yes	On			
☑ No □	Off	Deceleration I	Lane Length L <sub>D</sub>	713					✓ No	Off			
		Freeway Volu	me, V <sub>F</sub>	528					<b>™</b> INO				
L <sub>up</sub> = fi	t	Ramp Volume	e. V <sub>D</sub>	216					L <sub>down</sub> =	ft			
٩			-Flow Speed, S <sub>FF</sub>										
V <sub>11</sub> = V(	eh/h								$V_D =$	veh/h			
			ow Speed, S <sub>FR</sub>	35.0									
Conversion to		der Base	Conditions										
(pc/h)	V (1-1-1/1-1)	PHF	Terrain	%Truck	%Rv		$f_HV$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>n</sub>			
. ,	(Veh/hr)	0.00			_	_							
Freeway	528	0.82	Level	1	0		995	1.00	64				
Ramp	216	0.80	Level	0	0	1.	000	1.00	26	9			
UpStream		<del></del>											
DownStream		Marria Arasa						Niverna Areas					
Merge Areas Estimation of v <sub>12</sub>					Ectimot	iono		iverge Areas	is				
Estimation of	V <sub>12</sub>				Estimat	1011 0	1 V <sub>12</sub>		- (\/ \/ \D				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>				
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13-1	2 or 13-13	)			
P <sub>FM</sub> =		Equation (			P <sub>FD</sub> =		-	000 using Equ					
V <sub>12</sub> =	pc/h	Equation (			V <sub>12</sub> =				ation (Exilia	nt 10 1)			
	•	·- ·: 10	44 40 47)					5 pc/h		40.4=\			
V <sub>3</sub> or V <sub>av34</sub>			-14 or 13-17)		$V_3$ or $V_{av34}$			pc/h (Equatio	n 13-14 or	13-17)			
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70								☐Yes ☑ No					
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *	'V <sub>12</sub> /2 □Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	☐Yes 🗹 No					
If Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equation	13-16, 13-	18, or 13-			
	13-19)	)					19	9)					
Capacity Che					Capacit	y Ch	ecks						
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?			
					$V_{F}$		645	Exhibit 13-8	4500	No			
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	376	Exhibit 13-8	4500	No			
					V <sub>R</sub>		269	Exhibit 13-10		No			
		- £1 A				. 4 '				NO			
Flow Entering		1		\/:-I-#:0	Flow En	-		rge Influenc		\/:=I=#:==0			
.,	Actual		Desirable	Violation?	.,		Actual	Max Desirab		Violation?			
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		645	Exhibit 13-8	4400:All	No			
Level of Service Determination (if not F)					Level of	f Serv	<u>vice De</u>	terminatio	า (if not l	<del>-</del> )			
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>			$D_R = 4$	.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 3$	4 (pc/r	ni/ln)						
LOS = (Exhibit	,						oit 13-2)						
Speed Detern	nination				Speed L								
M <sub>S</sub> = (Exibit 13	3-11)				$D_s = 0.$	452 (E	xhibit 13-	·12)					
-	ibit 13-11)				$S_R = 49$	9.1 mph	(Exhibit	13-12)					
	ibit 13-11)					/A mph	(Exhibit	13-12)					
	ibit 13-11)				1	-	(Exhibit	-					
' '		All Districts						-		2044 2 15 1			
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			MPS AND	RAMP JUN			<u>= E I                                  </u>			
General I	nforma				Site Infor	mation				
Analyst		Shan	e Forsythe		eeway/Dir of Tr		14th St WB On-r	amp		·
gency or Con					ınction		I-315			
ate Performe		9/15/			ırisdiction					
nalysis Time		AM F		Ar	nalysis Year		2014			
roject Descrip	otion I-1	5 Corridor S	itudy							
nputs										
Jpstream Adj	Ramp		Freeway Numb	er of Lanes, N	2				Downstre	am Adj
	_		Ramp Number	of Lanes, N	1				Ramp	•
Yes	l On		Acceleration La	ane Length, L <sub>A</sub>	505				□Yes	On
			Deceleration La	ane Length L						_
✓ No	Off		Freeway Volun		454				✓ No	Off
=	ft		1						L <sub>down</sub> =	ft
- <sub>up</sub> =			Ramp Volume,	11	123				down	
/ <sub>u</sub> = ,	veh/h		1	Flow Speed, S <sub>FF</sub>	55.0				V <sub>D</sub> =	veh/h
u			Ramp Free-Flo	w Speed, S <sub>FR</sub>	35.0					
Conversi	on to p	c/h Und	der Base C	Conditions						
(pc/h)		V () ( =     (   -   -   )	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	fp	v = V/PH	F x f <sub>HV</sub> x f <sub>p</sub>
	-	(Veh/hr)						<del>                                     </del>	1	
Freeway	_	454	0.76	Level	6	0	0.971	1.00	+	614
Ramp		123	0.80	Level	5	0	0.976	1.00		157
UpStream			-						-	
DownStream			I I Merge Areas					l Diverge Areas		
Estimatio	n of v		werge Areas			Fetimati	on of v <sub>12</sub>	Diverge Areas		
_Sumatio	711 O1 V					LStimati				
		$V_{12} = V_{F}$	(P <sub>FM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V		
-EQ =		(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-	13)
P <sub>FM</sub> =		1.000	using Equati	on (Exhibit 13-6)	)	P <sub>FD</sub> =		using Equati	on (Exhibit 1	3-7)
/ <sub>12</sub> =		614 p				V <sub>12</sub> =		pc/h		
/ <sub>3</sub> or V <sub>av34</sub>		•		3-14 or 13-17)	1	V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation	13-14 or 13-	17)
Is V <sub>3</sub> or V <sub>av34</sub>	> 2 700 n			0 14 01 10 17)	•		<sub>34</sub> > 2,700 pc/h?			,
Is V <sub>3</sub> or V <sub>av34</sub>	- 1.5 V <sub>1</sub>			16 12 19 or			<sub>34</sub> > 1.5 * V <sub>12</sub> /2			10 10 00
Yes,V <sub>12a</sub> =		13-19)		-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equation 13-19)	on 13-16, 1	13-18, 01
Capacity	Check		'			Canacity	/ Checks	10 10)		
Jupuonty	1	Actual	Ca	apacity	LOS F?	Capacity	Actua	C	apacity	LOS F
		7101441	<del>†                                      </del>	paoli	20011	V <sub>F</sub>	710100	Exhibit 13		
			1 1				1/	_		_
$V_{FO}$		771	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v <sub>R</sub>	Exhibit 13		
			1 1			$V_R$		Exhibit 1: 10	3-	
How Ent	orina 1	lorgo In	fluence A	roa			tering Dive		nco Aros	
TOW EITE	ering n	Actual		esirable	Violation?	FIOW EII	Actual	Max De		Violation
\/		771			t	1/	Actual	+	Silable	Violation
V <sub>R12</sub>			Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
			nination (i			1	Service D			t F)
D <sub>R</sub> = 5.	.475 + 0.0	0734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> - 0.0	0627 L <sub>A</sub>		[	$O_R = 4.252 + 6$	0.0086 V <sub>12</sub> - (	0.009 L <sub>D</sub>	
) <sub>R</sub> = 8.3 (	(pc/mi/ln)					$D_R = (p$	c/mi/ln)			
OS = A (E	xhibit 13-	2)				LOS = (E	xhibit 13-2)			
Speed De		·					eterminati	on		
•						<del>-</del>	xhibit 13-12)	<del></del>		
•	4 (Exibit 1						· ·	۸		
		nibit 13-11)					oh (Exhibit 13-12	•		
$S_0 = N/A$	mph (Exh	ibit 13-11)				S <sub>0</sub> = mp	oh (Exhibit 13-12	!)		
•										
•	mph (Exl	nibit 13-13)				S = mp	oh (Exhibit 13-13	5)		

		RAMP	S AND RAI	MP JUNCTI	ONS WC	RKS	HEET			
General Infor	mation	. W 11111	- / IVAI	Site Infor			···			
Analyst Agency or Company Date Performed		e Forsythe		Freeway/Dir of Tra Junction Jurisdiction		14th El	3 Off-ramp			
Analysis Time Period				Analysis Year		2014				
Project Description		tudy		j						
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2 1					Downstrea Ramp	am Adj
□Yes	On	Acceleration L	ane Length, L <sub>A</sub>						Yes	On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V₌	503 675					☑No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	183					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		-Flow Speed, S <sub>FI</sub> low Speed, S <sub>FR</sub>	<sub>F</sub> 55.0 35.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und	L	111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	675	0.83	Level	4	0	0.	980	1.00	8	30
Ramp	183	0.94	Level	3	0	0.	985	1.00	1	98
UpStream						_				
DownStream		l l Merge Areas						iverge Areas		
Estimation of		vierge Areas			Estimat	tion o	f v	iverge Areas		
<u> </u>		<u> </u>			Lotimat			., ., .,		
	$V_{12} = V_F$				l.			V <sub>R</sub> + (V <sub>F</sub> - V	–	
L <sub>EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =			Equation 13-		
P <sub>FM</sub> =	_	Equation (	Exhibit 13-6)		P <sub>FD</sub> =			000 using Eq	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			0 pc/h		
$V_3^{}$ or $V_{av34}^{}$		-	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equation	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$								☐Yes ☑ No		
Is $V_3$ or $V_{av34} > 1.5$					Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		☐Yes ☑ No		
If Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub> :	=		c/h (Equatior	n 13-16, 13	-18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	<u>")                                    </u>		
Capacity Cite	Actual	1 0	apacity	LOS F?	Capacit	y Cii	Actual		apacity	LOS F?
	7 lotaai	l ĭ	rapaony	2001:	V <sub>F</sub>		830	Exhibit 13-		No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$		632	Exhibit 13-	_	No
*FO		LAHIDIC 10-0						Exhibit 13-1	_	_
	<u> </u>	<u> </u>	i		V <sub>R</sub>		198			No
Flow Entering		v		Violeties	Flow Er	-		rge Influen		\/iolotion2
V	Actual	Exhibit 13-8	Desirable	Violation?	\/		Actual 830	Max Desira Exhibit 13-8	4400:All	Violation?
V <sub>R12</sub>	ioo Dotowa		:f 4 F\		V <sub>12</sub>			terminatio		No No
Level of Serv						•	<u>r)                                    </u>			
$D_R = 5.475 + 0.$		0.0076 V <sub>12</sub> -	0.00627 L <sub>A</sub>					.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln					.,	.9 (pc/ı	,			
LOS = (Exhibit	-						oit 13-2)			
Speed Detern	nination				Speed I					
$M_S = (Exibit 13)$	3-11)				ľ	-	xhibit 13-	*		
$S_R^=$ mph (Exh	ibit 13-11)				1	-	(Exhibit	•		
	ibit 13-11)				$S_0 = N$	I/A mph	(Exhibit 1	13-12)		
S = mph (Exh	ibit 13-13)				S = 4	9.2 mph	(Exhibit	13-13)		
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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Info				Site Infor						
Analyst	Shar	ne Forsythe	Fr	eeway/Dir of Tr		14th S	t EB On-ran	np		
gency or Compan	y		Jι	ınction		I-315				
ate Performed	9/15/	/2014		ırisdiction						
nalysis Time Perio			Aı	nalysis Year		2014				
roject Description	I-15 Corridor S	Study								
nputs										
Jpstream Adj Ramp	)	1	ber of Lanes, N	2					Downstre	am Adj
٦., ۵		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes O	n	Acceleration L	ane Length, L <sub>A</sub>	930					□Yes	On
✓ No 🔲 O	ff	Deceleration L	ane Length L <sub>D</sub>							_
		Freeway Volu	me, V <sub>E</sub>	1044					✓ No	Off
<sub>up</sub> = ft		Ramp Volume	•	523					L <sub>down</sub> =	ft
up.		1	-Flow Speed, S <sub>FF</sub>	55.0						
$v_{\rm u} = {\rm veh/}$	h	1	ow Speed, S <sub>FR</sub>	35.0					V <sub>D</sub> =	veh/h
			. 110	33.0						
Conversion	1	der Base (	Conditions	1					1	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PHF	$= x f_{HV} x f_{p}$
reeway	1044	0.90	Level	3	0	n	.985	1.00	,	1177
Ramp	523	0.94	Level	1	0		.995	1.00		559
JpStream	<del>                                     </del>	<del>                                     </del>				Ť				
DownStream										
		Merge Areas					D	iverge Areas		
stimation o	f v <sub>12</sub>				Estimat	tion o	of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>EM</sub> )					V <sub>40</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P_D	
<sub>EQ</sub> =		ation 13-6 or	13-7)		l =			Equation 13-		(3)
			ion (Exhibit 13-6)		L <sub>EQ</sub> = P =			sing Equation		
) <sub>FM</sub> = ' –	1177		IOIT (EXHIBIT 13-0)	1	P <sub>FD</sub> =			ising Equations/h	JII (EXIIIDIL I	J-1)
' <sub>12</sub> =		•	40 44 - 40 47		V <sub>12</sub> =		•		10 11 10 1	17\
or V <sub>av34</sub>	-		13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>	. 0		oc/h (Equation ′	13-14 OF 13-1	17)
s $V_3$ or $V_{av34} > 2,7$								]Yes ☐ No		
ls V <sub>3</sub> or V <sub>av34</sub> > 1.5					Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		]Yes ☐ No		
Yes,V <sub>12a</sub> =	pc/h 13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub>	=		oc/h (Equatio 5-19)	n 13-16, 1	3-18, or
Capacity Ch		<u>/</u>			Capacit	ty Ch		19)		
apaony on	Actual		apacity	LOS F?	Jupaon	., 0	Actual	Ca	pacity	LOS F?
	7 101001	† Ť	apaony	20011	V <sub>F</sub>		riotaai	Exhibit 13-		120011
						\/		_	_	
$V_{FO}$	1736	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v <sub>R</sub>		Exhibit 13-		
					$V_R$			Exhibit 13 10	-	
low Enterin	a Merge In	fluence A	rea		Flow E	nterir	na Diver	ge Influer	ce Area	,
	Actual		Desirable	Violation?		_	Actual	Max Des		Violation?
V <sub>R12</sub>	1736	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		
						f Sor	vice Det	terminatio	n (if not	<i>F</i> )
DVDI OT SON					+			0086 V <sub>12</sub> - 0		1)
	· 0.00734 V R · (	J.0070 V <sub>12</sub> - 0.0	00027 L <sub>A</sub>					0000 v <sub>12</sub> - 0	.003 L <sub>D</sub>	
D <sub>R</sub> = 5.475	m://m)				I ., ,,	pc/mi/l	,			
) <sub>R</sub> = 12.9 (pc/i	•					C	+ 12 2\			
$D_{R} = 5.475 \cdot 0$ $D_{R} = 12.9 (pc/i)$ $D_{R} = 12.9 (pc/i)$ $D_{R} = 12.9 (pc/i)$	t 13-2)					Exhibi				
$D_{R} = 5.475$ $D_{R} = 12.9 (pc/s)$	t 13-2)						rminatio	n		
$D_R = 5.475 \cdot 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$ $D_R = 12.9 (pc/n)$	t 13-2) mination				Speed		rminatio	n		
$D_{R} = 5.475 \cdot 10^{-10}$ $D_{R} = 12.9 \text{ (pc/n)}$ $D_{S} = B \text{ (Exhibit)}$ $D_{S} = D_{S} = D_{S} = 0.278 \text{ (Exhibit)}$	t 13-2) <b>mination</b> kibit 13-11)				<b>Speed</b> D <sub>s</sub> = (E	<b>Dete</b> Exhibit	rminatio	n		
$D_{R} = 5.475 \cdot 10^{-10}$ $D_{R} = 12.9 \text{ (pc/n)}$ $D_{R} = 12.9 $	t 13-2)  mination  kibit 13-11)  (Exhibit 13-11)				<b>Speed</b> $D_s = (B_s)$	<b>Dete</b> Exhibit nph (Ex	rminatio 13-12) hibit 13-12)	n		
$D_{R} = 5.475 \cdot 10^{-1}$ $D_{R} = 12.9 \text{ (pc/s)}$ $D_{R} = 12.9  $	t 13-2) <b>mination</b> kibit 13-11)				$\begin{array}{ccc} \textbf{Speed I} \\ \textbf{D}_{\text{S}} = & \text{(i} \\ \textbf{S}_{\text{R}} = & \textbf{m} \\ \textbf{S}_{\text{0}} = & \text{n} \end{array}$	Deter Exhibit oph (Exoph  <b>rminatio</b> 13-12)	n			

		RAMP	S AND RAI	MP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		- / IVAI	Site Infori			· · — ·			
Analyst Agency or Company Date Performed		e Forsythe		Freeway/Dir of Tra Junction Jurisdiction		14th W I-315	B Off-ramp	)		
Analysis Time Period				Analysis Year		2014				
Project Description		tudy		·						
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2 1					Downstrea Ramp	am Adj
□Yes	On	Acceleration L	ane Length, L <sub>A</sub>	·					□Yes	□On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	713 1279					<b>☑</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	792					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		-Flow Speed, S <sub>FI</sub> low Speed, S <sub>FR</sub>	<sub>F</sub> 55.0 35.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1279	0.91	Level	3	0	0.	985	1.00	14	27
Ramp	792	0.99	Level	2	0	0.	990	1.00	8	10
UpStream										
DownStream	<u> </u>	l l Verge Areas			<del>                                     </del>			Diverge Areas		
Estimation of				Estima	tion o	fv.	iverge Areas			
		/ D \							/ \D	
	$V_{12} = V_F$		40.7)		L _			V <sub>R</sub> + (V <sub>F</sub> - V	–	
L <sub>EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =		-	Equation 13-		
P <sub>FM</sub> =	_	Equation (	Exhibit 13-6)		P <sub>FD</sub> =			000 using Ed	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			127 pc/h		
$V_3^{}$ or $V_{av34}^{}$		-	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equati		r 13-17)
Is $V_3$ or $V_{av34} > 2,70$								☐Yes 🗹 No		
Is $V_3$ or $V_{av34} > 1.5$					Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		☐Yes 🗹 No		
If Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub>	=		c/h (Equation	n 13-16, 13	-18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	9)		
Capacity Cite	Actual		apacity	LOS F?	Capacit	y Cir	Actual	1	apacity	LOS F?
	7 totaai		rapacity	20011	V <sub>F</sub>		1427	Exhibit 13-		No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>I</sub>	_	617	Exhibit 13-		No
*FO		LXIIIDIL 13-0						Exhibit 13-		_
	<u> </u>	<u> </u>	i		V <sub>R</sub>		810			No
Flow Entering		ir .		Violetian	Flow El			rge Influer		Violeties
V	Actual	Exhibit 13-8	Desirable	Violation?	\/		Actual	Max Desira	1	Violation?
V <sub>R12</sub>	D - 4		:£ 4 <b>-</b> [\		V <sub>12</sub>		1427	Exhibit 13-8	4400:All	No No
Level of Serv		1			terminatio	_ •	F)			
$D_R = 5.475 + 0.$					.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln					l ''	0.1 (pc	,			
LOS = (Exhibit						•	oit 13-2)			
Speed Detern	nination				Speed I	Deter	minatio	on		
M <sub>S</sub> = (Exibit 1:	3-11)				$D_s = 0$	.501 (E	xhibit 13-	-12)		
	ibit 13-11)				S <sub>R</sub> = 4	8.5 mph	(Exhibit	13-12)		
	ibit 13-11)				$S_0 = N$	I/A mph	(Exhibit	13-12)		
	ibit 13-13)				S = 4	8.5 mph	(Exhibit	13-13)		
Copyright © 2012 Unive	ersity of Florida, A	All Rights Reser	ved		HCS2010 <sup>TN</sup>			· · · · · · · · · · · · · · · · · · ·	enerated: 9/15	5/2014 9:48 A

	KAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infori				Site Infor						
Analyst		ne Forsythe	Fr	reeway/Dir of Tr		14th St	WB On-ram	ıp		
gency or Company			Jι	unction		I-315				
ate Performed	9/15/	2014		urisdiction						
nalysis Time Period			Aı	nalysis Year		2014				
roject Description	I-15 Corridor S	Study								
nputs		1							1	
Jpstream Adj Ramp		1	ber of Lanes, N	2					Downstre	am Adj
¬., ¬.		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes On		Acceleration L	ane Length, L <sub>A</sub>	505					□Yes	On
✓ No ☐ Off	;	Deceleration L	ane Length L <sub>D</sub>							_
		Freeway Volu	me, V <sub>E</sub>	646					☑ No	Off
up = ft		Ramp Volume	•	173					L <sub>down</sub> =	ft
ч			-Flow Speed, S <sub>FF</sub>	55.0						
$v_{\rm u} = {\rm veh/h}$			ow Speed, $S_{FR}$						V <sub>D</sub> =	veh/h
			. 110	35.0						
Conversion to	o pc/n Und	der Base (	Conditions	1					I	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	$f_p$	v = V/PHF	$x f_{HV} x f_{p}$
reeway	646	0.93	Level	5	0	0	976	1.00		712
Ramp	173	0.99	Level	1	0		995	1.00		176
JpStream	110	0.00	20101	'	Ť	+ *		1.00		
DownStream										
		Merge Areas		•			Di	verge Areas		
stimation of	V <sub>12</sub>				Estimat	ion o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P)						<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P	
=		tion 13-6 or	· 13_7)		_		.=	Equation 13-		3)
EQ =					L <sub>EQ</sub> =			-		
) <sub>FM</sub> =			ion (Exhibit 13-6)	)	P <sub>FD</sub> =			sing Equatio	ııı (⊏xıııbıt ı.	D-1)
12 =	712 p				V <sub>12</sub> =		•	c/h		_,
7 <sub>3</sub> or V <sub>av34</sub>	-		13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		-	c/h (Equation 1	3-14 or 13-1	7)
s $V_3$ or $V_{av34} > 2,700$								Yes 🗌 No		
s $V_3$ or $V_{av34} > 1.5 *$					Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.5		Yes 🗌 No		
Yes,V <sub>12a</sub> =			3-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equation	n 13-16, 1	3-18, or
Capacity Che	13-19)	)			Capacit			-19)		
apacity Cite	Actual	1 0	apacity	LOS F?	Capacit	y Circ	Actual	Cor	pacity	LOS F?
	Autual	<del>                                     </del>	ωρασιιγ	LU3 F!	V <sub>F</sub>	$\dashv$	Autuai	Exhibit 13-8		LUSP
						· ,			_	+
$V_{FO}$	888	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-8		
,					V <sub>R</sub>			Exhibit 13-	-	
	4		roo	<u> </u>	Flow Fr	torin	a Divor	ge Influen	co Aroa	
low Entoring	Morgo In						y Diver	46 IIIIIUGII	ce Area	
Flow Entering				Violation?	FIOW EI					Violation?
Flow Entering	Actual	Max	Desirable	Violation?			Actual	Max Desi		Violation?
V <sub>R12</sub>	Actual 888	Max Exhibit 13-8	Desirable 4600:All	Violation?	V <sub>12</sub>	,	Actual	Max Desi Exhibit 13-8	rable	
V <sub>R12</sub> .evel of Servi	Actual 888 ice Detern	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level o	f Serv	Actual  /ice Det	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable n (if not	
V <sub>R12</sub> .evel of Servi	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level or	f Serv	Actual  /ice Det	Max Desi Exhibit 13-8	rable n (if not	
V <sub>R12</sub> .evel of Servi  D <sub>R</sub> = 5.475 +  R = 9.2 (pc/mi/l	Actual 888 <b>ice Detern</b> 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level or	f Serv	Actual  /ice Det  1.252 + 0.0	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable n (if not	
V <sub>R12</sub> .evel of Servi  D <sub>R</sub> = 5.475 +	Actual 888 <b>ice Detern</b> 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level or	f Serv	Actual  /ice Det  1.252 + 0.0	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable n (if not	
$V_{R12}$ Level of Servi $D_R = 5.475 + 9.2 \text{ (pc/mi/l}$ OS = A (Exhibit '	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0 ln) 13-2)	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level or	f Server D <sub>R</sub> = 4 Doc/mi/li	Actual  /ice Det  1.252 + 0.0  1)  13-2)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0	rable n (if not	
V <sub>R12</sub> Level of Servi  D <sub>R</sub> = 5.475 +  D <sub>R</sub> = 9.2 (pc/mi/l  OS = A (Exhibit '  Speed Determ	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0 In) 13-2)	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	V <sub>12</sub> Level of  D <sub>R</sub> = (F LOS = (F Speed L	f Server D <sub>R</sub> = 4 Doc/mi/li	Actual  vice Deta  2.252 + 0.0  13-2)  mination	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0	rable n (if not	
$V_{R12}$ Level of Servi $D_R = 5.475 + 9.2 \text{ (pc/mi/l}$ $OS = A \text{ (Exhibit }'$ Speed Determ $S_S = 0.295 \text{ (Exit)}$	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0 ln) 13-2) nination bit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	$V_{12}$ <b>Level of</b> $D_R = (p)$ $LOS = (E)$ <b>Speed L</b> $D_S = (E)$	f Service  D <sub>R</sub> = 4  poc/mi/li  Exhibit  Deterior  Exhibit 1	Actual  Vice Det  1.252 + 0.0  13-2)  mination  3-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0	rable n (if not	
$V_{R12}$ Level of Servi $D_R = 5.475 + 0.2 \text{ (pc/mi/l})$ $D_R = 0.2 \text{ (pc/mi/l})$ $D_R = 0.2 \text{ (Exhibit '}$ $D_R = 0.295 \text{ (Exitor)}$ $D_R = 0.295 \text{ (Exitor)}$ $D_R = 0.295 \text{ (Exitor)}$	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0 In) 13-2) nination oit 13-11) Exhibit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	$\begin{array}{c} V_{12} \\ \hline \\ Level \ o \\ \hline \\ D_R = \\ LOS = \\ \hline \\ LOS = \\ \hline \\ Speed \ L \\ \hline \\ Speed \ L \\ \hline \\ S_R = \\ \end{array}$	f Service  D <sub>R</sub> = 4  Doc/mi/li  Exhibit  Deterrice  Exhibit 1  Deterrice  Det	Actual  Vice Det  1.252 + 0.0  13-2)  mination  3-12)  ibit 13-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0	rable n (if not	
V <sub>R12</sub> .evel of Servi D <sub>R</sub> = 5.475 + B <sub>R</sub> = 9.2 (pc/mi/l OS = A (Exhibit ' Speed Detern B <sub>S</sub> = 0.295 (Exit B <sub>R</sub> = 51.2 mph ( 0 = N/A mph (E	Actual 888 ice Detern 0.00734 v <sub>R</sub> + 0 ln) 13-2) nination bit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	i e	$V_{12}$ <b>Level of</b> $D_R = (p)$ $LOS = (E)$ <b>Speed L</b> $D_S = (E)$ $S_R = m$ $S_0 = m$	f Server D <sub>R</sub> = 4 Doc/mi/lit Exhibit Deterior Exhibit 1 Diph (Exhibit 1 Diph (Exhibit 1) Diph (Exhibit 2)	Actual  Vice Det  1.252 + 0.0  13-2)  mination  3-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0	rable n (if not	

		RAMP	S AND RAI	/P JUNCTI	ONS WC	RKS	HEET			
General Infor	mation			Site Infor						
Analyst Agency or Company Date Performed	Shan	e Forsythe	J	reeway/Dir of Tra lunction lurisdiction		Centra	Ave NB Of	f		
Analysis Time Period			A	Analysis Year		2014				
Project Description	I-15 Corridor S	tudy								
Inputs								ľ		
Upstream Adj R	amp	Freeway Num Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	m Adj
□Yes □	On		Lane Length, L <sub>A</sub>						Yes	On
☑ No	Off	Deceleration   Freeway Volu	Lane Length L <sub>D</sub> ime. V <sub>=</sub>	1388 321					<b>☑</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume	•	192					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		e-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 45.0					V <sub>D</sub> =	veh/h
Canvaraian t	o no/h Un		111	45.0						
Conversion to	o pc/n Und       ∨			T	Π.	$\overline{}$	<u>. 1</u>			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	+	f <sub>HV</sub>		v = V/PHF	
Freeway	321	0.89	Level	14	0	_	935	1.00	38	
Ramp	192	0.83	Level	10	0	0.	952	1.00	24	4
UpStream		<del>                                     </del>				_				
DownStream		<u>I                                    </u>					I	iverge Areas		
Estimation of		merge Areas			Estimat	ion o		iverge Areas		
		(D)						\/ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\D	
ı –	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> ) ition 13-6 or	12 7)		-			$V_R + (V_F - V_F)$		
L <sub>EQ</sub> =					L <sub>EQ</sub> =		-	Equation 13-1		
P <sub>FM</sub> =	_	Equation (I	EXNIBIT 13-6)		P <sub>FD</sub> =			000 using Equ	lation (Exhi	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			6 pc/h		
V <sub>3</sub> or V <sub>av34</sub>			s-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is $V_3$ or $V_{av34} > 2,70$								Yes ✓ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 '			10 10 10		Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.5		Yes ☑ No	10 10 10	10 10
If Yes,V <sub>12a</sub> =	pc/h (1 13-19)		s-16, 13-18, or		If Yes,V <sub>12a</sub> :	=	p: 19	c/h (Equation	13-16, 13-	18, or 13-
Capacity Che		<u> </u>			Capacit	v Ch		')		
	Actual		Capacity	LOS F?		, , , , ,	Actual	Cai	pacity	LOS F?
					V <sub>F</sub>		386	Exhibit 13-8		No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$		142	Exhibit 13-8	4700	No
FO					V <sub>R</sub>	K	244	Exhibit 13-10	+	No
Flow Entering	n Merae In	fluence A	lrea			nterin		ge Influenc		
TOW EMENT	Actual	1	Desirable	Violation?	1011 21		Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		386	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)	-		f Serv	/ice De	terminatio	n (if not l	<del>-</del> )
$D_R = 5.475 + 0.$								0086 V <sub>12</sub> - 0.0	<u> </u>	,
D <sub>R</sub> = (pc/mi/ln		12	^			1.9 (pc/		12	Б	
LOS = (Exhibit							oit 13-2)			
Speed Detern					Speed I			n		
$M_S = (Exibit 1)$							xhibit 13-			
						•	(Exhibit	*		
	ibit 13-11)					-	(Exhibit 1	· ·		
	iibit 13-11) iibit 13-13)				· .	-	(Exhibit	•		
		All Diabta D	wod				-	·	onoret-d- 0'0	/2014 0:01 11
opyright © 2012 Unive	risity of Florida, <i>F</i>	√ıı κıyrııs Keser	veu		HCS2010 <sup>T</sup>	'" Versi	on 6.41	Gi	enerateo: 9/9/	/2014 8:21 A

9/9/2014

	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET			
General Infor				Site Infor					
Analyst Agency or Company Date Performed		ne Forsythe	Ju	eeway/Dir of Tr inction irisdiction	avel	Central Ave NB	On		
Analysis Time Period				nalysis Year					
Project Description				,					
nputs		•							
Jpstream Adj Ramp		Freeway Num Ramp Number	ber of Lanes, N	2				Downstre Ramp	am Adj
☐ Yes ☐ Or	1	Acceleration L	ane Length, L <sub>A</sub>	1491				□Yes	On
☑ No ☐ Of	f	Deceleration L Freeway Volui	ane Length L <sub>D</sub> me, V₌	200				☑No	Off
- <sub>up</sub> = ft		Ramp Volume	, V <sub>R</sub>	50				L <sub>down</sub> =	ft
$V_{\rm u} = {\rm veh/h}$	I		-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	65.0 55.0				V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und	der Base (	Conditions					•	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	fp	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	200	0.83	Level	7	0	0.966	1.00		249
Ramp	50	0.74	Level	40	0	0.833	1.00		82
UpStream						<u> </u>			
DownStream	<u> </u>	Marga Arasa		<u> </u>			Diverge Area		
Estimation of		Merge Areas			Estimati	ion of v <sub>12</sub>	Diverge Area	5	
		(D )					\	( \D	
_	$V_{12} = V_F$		40.7)		_	v <sub>12</sub> =	= V <sub>R</sub> + (V <sub>F</sub> - V		
-EQ =		ation 13-6 or			L <sub>EQ</sub> =			3-12 or 13-1	
P <sub>FM</sub> =			ion (Exhibit 13-6)		P <sub>FD</sub> =			tion (Exhibit 1	3-7)
/ <sub>12</sub> =	249 p				V <sub>12</sub> =		pc/h		
$V_3$ or $V_{av34}$	-		13-14 or 13-17)	)	$V_3$ or $V_{av34}$			n 13-14 or 13-1	17)
Is $V_3$ or $V_{av34} > 2,70$						<sub>34</sub> > 2,700 pc/h?			
Is $V_3$ or $V_{av34} > 1.5$ '					Is V <sub>3</sub> or V <sub>av3</sub>	$_{34} > 1.5 * V_{12}/2$			
f Yes,V <sub>12a</sub> =	pc/h 13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equat 13-19)	tion 13-16, 1	3-18, or
Capacity Che		)				y Checks	13-19)		
Jupuoney Circ	Actual	С	apacity	LOS F?	Capacity	Actua	ıl (	Capacity	LOS F?
		i i			V <sub>F</sub>		Exhibit 1		
V	224	F., b; b; t 40 0		N-	$V_{FO} = V_{F}$	- V <sub>D</sub>	Exhibit 1	_	
$V_{FO}$	331	Exhibit 13-8		No		- K	Exhibit '		
					V <sub>R</sub>		10		
low Entering	g Merge In	fluence A	rea		Flow En	tering Div	erge Influe	ence Area	1
	Actual	1	Desirable	Violation?		Actual	+	esirable	Violation <sup>4</sup>
V <sub>R12</sub>	331	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Serv					1	Service D			<i>F</i> )
$D_R = 5.475 +$	0.00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			D <sub>R</sub> = 4.252 +	0.0086 V <sub>12</sub> -	0.009 L <sub>D</sub>	
	i/ln)				$D_R = (p$	c/mi/ln)			
$P_{R} = -1.3 \text{ (pc/m)}$	13_2\				LOS = (E	Exhibit 13-2)			
	10-2)				Spood F	Peterminat	ion		
.OS = A (Exhibit					Sheen n	ocoac			
OS = A (Exhibit Speed Deterr	nination				+	xhibit 13-12)			
OS = A (Exhibit <b>Speed Detern</b> $M_S = 0.162$ (Exi	mination bit 13-11)				D <sub>s</sub> = (E	xhibit 13-12)			
OS = A (Exhibit <b>Speed Determ</b> $M_S = 0.162$ (Exi $S_R = 61.3$ mph	bit 13-11) (Exhibit 13-11)				D <sub>s</sub> = (E S <sub>R</sub> = mp	xhibit 13-12) ph (Exhibit 13-1	2)		
$S_{\rm COS} = A$ (Exhibit) Speed Determination of the second of the sec	mination bit 13-11)				$D_s = (E S_R = m_F S_0 = m_F $	xhibit 13-12)	2) 2)		

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor						
Analyst Agency or Company	Shan	e Forsythe	J	reeway/Dir of Tra		Central	Ave SB O	ff		
Date Performed	9/9/2			urisdiction		0044				
Analysis Time Period Project Description			A	nalysis Year	·	2014				
Inputs	1-10 Comuoi S	luuy								
-		Freeway Num	ber of Lanes, N	2					1	
Upstream Adj R	amp	Ramp Numbe		1					Downstrea Ramp	am Adj
Yes	On		ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration L Freeway Volu	_ane Length L <sub>D</sub> me. V_	1144 334					☑No	Off
L <sub>up</sub> = fi	:	Ramp Volume		136					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	65.0 45.0					V <sub>D</sub> =	veh/h
Conversion to	nc/h Hn/		111	45.0						
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>iny</sub> x f <sub>-</sub>
Freeway	(Veh/hr) 334	0.83	Level	21	0	_	905	1.00		ну р 45
Ramp	136	0.85	Level	2	0		990	1.00		62
UpStream	100	0.00	20701	<del></del>	Ť	1	300	1.00	'	<u> </u>
DownStream										
		Merge Areas						iverge Areas		
Estimation of	v <sub>12</sub>				Estimati	on o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	R)P <sub>ED</sub>	
L <sub>EQ</sub> =		tion 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-1		3)
P <sub>FM</sub> =		Equation (E			P <sub>FD</sub> =		•	000 using Eq		-
V <sub>12</sub> =	pc/h		,		V <sub>12</sub> =			5 pc/h	,	,
$V_3$ or $V_{av34}$	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equation	on 13-14 o	r 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70		•	,			., > 2,7		Yes ☑ No		,
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *								Yes ☑ No		
f Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	13-16, 13	-18, or 13-
Capacity Che	/				Capacity	/ Che		- /		
	Actual	С	apacity	LOS F?	1		Actual	Ca	pacity	LOS F?
			•		V <sub>F</sub>		445	Exhibit 13-	3 4700	No
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	283	Exhibit 13-	3 4700	No
					V <sub>R</sub>		162	Exhibit 13-1	0 2100	No
Flow Entering	g Merge In	fluence A	rea		Flow En	terin	g Divei	ge Influen	ce Area	
	Actual	Max	Desirable	Violation?		ļ	Actual	Max Desiral	ole	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>	4	445	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)		Level of	Serv	vice De	terminatio	n (if not	<i>F</i> )
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>		[	O <sub>R</sub> = 4	.252 + 0.	.0086 V <sub>12</sub> - 0.	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				D <sub>R</sub> = -2.	.2 (pc/	mi/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Detern	nination				Speed D	eter	minatio	n		
M <sub>S</sub> = (Exibit 13					<del>                                     </del>		xhibit 13-			
	ibit 13-11)						(Exhibit	•		
	ibit 13-11)					-	(Exhibit 1			
	ibit 13-11)				-	-	•	•		
5 =	IDIL 13-13)				S = 57	.8 mph	(Exhibit	13-13)		

	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst Agency or Company Date Performed		ne Forsythe	Ju	eeway/Dir of Tra Inction Irisdiction	avel	Central A	ve SB On			
analysis Time Period	d AM F	Peak	Ar	nalysis Year						
Project Description	I-15 Corridor S	Study								
nputs		L							1	
Jpstream Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	2 1					Downstre Ramp	am Adj
Yes Or	1	Acceleration L	ane Length, L <sub>A</sub>	1379					□Yes	On
☑ No ☐ Of	f	Deceleration L Freeway Volui	ane Length L <sub>D</sub> me, V₌	352					☑No	Off
- <sub>up</sub> = ft		Ramp Volume	, V <sub>R</sub>	162					L <sub>down</sub> =	ft
$V_{\rm u} = {\rm veh/h}$	1		-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	65.0 45.0					V <sub>D</sub> =	veh/h
Conversion t	o pc/h Und		. 117							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>H</sub>	v	f <sub>p</sub>	v = V/PHI	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	352	0.94	Level	8	0	0.96	2	1.00		389
Ramp	162	0.76	Level	5	0	0.97	6	1.00		217
UpStream										
DownStream		<u>.                                    </u>								
Estimation of		Merge Areas			Estimat	ion of	DIN	erge Areas		
Estimation o					ESumat					
	$V_{12} = V_{F}$	(P <sub>FM</sub> )						<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>		
- <sub>EQ</sub> =	(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(E	quation 13-	-12 or 13-1	3)
P <sub>FM</sub> =	1.000	using Equat	ion (Exhibit 13-6)		P <sub>FD</sub> =		us	sing Equation	n (Exhibit 1	3-7)
/ <sub>12</sub> =	389 p	c/h			V <sub>12</sub> =		po	:/h		
/ <sub>3</sub> or V <sub>av34</sub>	0 pc/l	h (Equation	13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		рс	:/h (Equation 1	13-14 or 13-1	17)
ls V <sub>3</sub> or V <sub>av34</sub> > 2,70	00 pc/h?	s 🗹 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 2,700	pc/h?	Yes 🗌 No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5	* V <sub>12</sub> /2	s 🗹 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5 * \	V <sub>12</sub> /2	Yes 🗌 No		
f Yes,V <sub>12a</sub> =		(Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =			:/h (Equatio		3-18, or
Capacity Che	cks				Capacit	y Chec	ks			
	Actual	С	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					$V_{F}$			Exhibit 13-	8	
$V_{FO}$	606	Exhibit 13-8		No	$V_{FO} = V_{F}$	-V <sub>R</sub>		Exhibit 13-	8	
10					V <sub>R</sub>			Exhibit 13	-	
	. 14 - 22 - 12	fl A				. 4	Divore	10	- A # = =	
low Entering	Actual	•	<b>rea</b> Desirable	Violation?	FIOW ET	Act	T-	<b>ge Influer</b> Max Des		Violation
V <sub>R12</sub>	606	Exhibit 13-8	4600:All	No	V <sub>12</sub>	70		Exhibit 13-8	ii dule	violation
Level of Serv				I NO		f Sonii		erminatio	n (if not	<u> </u>
					1					Γ)
	0.00734 v <sub>R</sub> + (	u.uuru v <sub>12</sub> - U.l	JUUZI LA			• • •	.∪∠ ⊤ 0.0	086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
) <sub>R</sub> = 1.5 (pc/mi	•				I ''	oc/mi/ln)	0.0\			
OS = A (Exhibit						Exhibit 1				
Speed Deterr	nination				Speed L			1		
$M_{\rm S} = 0.204  (Exi$	bit 13-11)				,	Exhibit 13-	•			
	(Exhibit 13-11)				S <sub>R</sub> = m	ıph (Exhibi	t 13-12)			
	Exhibit 13-11)				$S_0 = m$	ıph (Exhibi	t 13-12)			
					L					
s = 60.3 mph	(Exhibit 13-13)				S = m	ıph (Exhibi	t 13-13)			

		RAMP	S AND RAN	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor			<b>-</b> •			
Analyst Agency or Company	Shan	e Forsythe	J	reeway/Dir of Trunction		Centra	Ave NB O	ff		
Date Performed	9/9/2 B PM F			urisdiction analysis Year		2014				
Analysis Time Period Project Description				analysis real		2014				
Inputs	1-10 Comuci S	luuy								
-		Freeway Num	ber of Lanes, N	2					Г	
Upstream Adj R	amp _	Ramp Numbe		1					Downstrea Ramp	am Adj
∐Yes L	」On		ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	1388 490					<b>☑</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	227					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		e-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 45.0					V <sub>D</sub> =	veh/h
Conversion to	o nc/h Un/		111	40.0						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	Τ	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	490	0.87	Level	11	0	0	948	1.00		94
Ramp	227	0.75	Level	6	0	_	971	1.00		13
UpStream										
DownStream										
		Merge Areas				_		Diverge Areas		
Estimation of	<sup>f</sup> v <sub>12</sub>				Estimati	ion o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	′ <sub>R</sub> )P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ition 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-	12 or 13-13	3)
P <sub>FM</sub> =	using	Equation (I	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Ed	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			94 pc/h		
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$						, > 2,7		∐Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$								∃Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation		-18, or 13-
Capacity Che					Capacity	v Ch		- /		
, ,	Actual		Capacity	LOS F?			Actual	С	apacity	LOS F?
					V <sub>F</sub>		594	Exhibit 13-	8 4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	281	Exhibit 13-	8 4700	No
					V <sub>R</sub>		313	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	\rea		Flow En	terin	g Dive	rge Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	ble	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		594	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)		Level of	Ser	∕ice De	terminatio	n (if not	<b>F</b> )
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>		ı	O <sub>R</sub> = 4	.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				D <sub>R</sub> = -3.	.1 (pc/	mi/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhil	oit 13-2)			
Speed Detern	nination				Speed D	•	•	on		
$M_S = (Exibit 1)$					<del>                                     </del>		xhibit 13-			
-							(Exhibit	-		
	ibit 13-11)					-	(Exhibit	-		
	iibit 13-11) iibit 13-13)				1	-	(Exhibit	-		
		All Disk D					-	· · · · · · · · · · · · · · · · · · ·	2	V0044 004 ::
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		MPS AND	RAMP JUN			EEI			
General Infori				Site Infor		_			
nalyst	Shan	e Forsythe		eeway/Dir of Tra	avel	Centrall NB On			
Agency or Company Date Performed	9/9/2	014		ınction ırisdiction					
analysis Time Period	9/9/2 PM P			nalysis Year		2014			
Project Description			Al	ialysis real		2014			
nputs	-13 Corridor S	ntudy							
		Freeway Num	ber of Lanes, N	2				<u></u>	A -1'
Ipstream Adj Ramp		Ramp Numbe		1				Downstre Ramp	am Adj
∃Yes □ On				•				Kanip	
		1	ane Length, L <sub>A</sub>	1491				□Yes	☐ On
☑ No ☐ Off		1	ane Length L <sub>D</sub>					✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	359				1.	
<sub>ip</sub> = ft		Ramp Volume	, V <sub>R</sub>	118				L <sub>down</sub> =	ft
		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0				\/ -	voh/h
u = veh/h		1	ow Speed, S <sub>FR</sub>	55.0				V <sub>D</sub> =	veh/h
onversion to	pc/h Und		111						
	V	PHF		0/ Truck	0/ D	f	f	v = \//DL/I	F x f <sub>HV</sub> x f <sub>p</sub>
(pc/h)	(Veh/hr)	707	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v - v/PM	' ^ 'HV X I
reeway	359	0.97	Level	8	0	0.962	1.00		385
Ramp	118	0.81	Level	1	0	0.995	1.00		146
JpStream									
ownStream		<u>.                                    </u>					<u></u>		
otimotion of		Merge Areas			Catimat		Diverge Areas		
stimation of	V <sub>12</sub>				Estimati	ion of v <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )				V <sub>12</sub> =	· V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
<sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-1	13)
 FM =	1.000	using Equat	ion (Exhibit 13-6)		P <sub>FD</sub> =		using Equati	on (Exhibit 1	3-7)
12 =	385 p		,		V <sub>12</sub> =		pc/h	,	,
<sub>3</sub> or V <sub>av34</sub>	•		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation	13-14 or 13-4	17\
s V <sub>3</sub> or V <sub>av34</sub> > 2,700	-		13-14-01-13-17)			<sub>34</sub> > 2,700 pc/h?			''')
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *			16 12 10 or			$_{34} > 1.5 * V_{12}/2$			2 10 or
Yes,V <sub>12a</sub> =	13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =	: ,	pc/h (Equation 13-19)	on 13-16, 1	3-10, 01
Capacity Che					Capacit	y Checks	/		
	Actual	C	apacity	LOS F?		Actua	l Ca	apacity	LOS F
					V <sub>F</sub>		Exhibit 13		
.,	E04			l	$V_{FO} = V_{F}$	- V <sub>D</sub>	Exhibit 13	1-8	
$V_{FO}$	531	Exhibit 13-8		No		- R	Exhibit 13		+
					V <sub>R</sub>		10		
low Entering	Merge In	fluence A	rea	-	Flow En	tering Dive	erge Influe	nce Area	1
	Actual	1	Desirable	Violation?		Actual	Max De	sirable	Violation
V <sub>R12</sub>	531	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
evel of Servi	ce Detern	nination (	if not F)	•		Service D	eterminatio	on (if not	<i>F</i> )
		0.0078 V <sub>12</sub> - 0.0	· · · · · · · · · · · · · · · · · · ·		1	D <sub>R</sub> = 4.252 +			
R = 0.2 (pc/mi/l		12	A			oc/mi/ln)	12	U	
OS = A (Exhibit 1	*					Exhibit 13-2)			
•	<u> </u>						ion		
peed Determ					<del> </del>	Determinati	on		
	it 13-11)				,	xhibit 13-12)			
<sub>S</sub> = 0.164 (Exib					IC - m	ph (Exhibit 13-12	))		
	Exhibit 13-11)				S <sub>R</sub> = m <sub>l</sub>	pii (Exilibit 13-12	-)		
e 61.2 mph (I	Exhibit 13-11) Exhibit 13-11)					ph (Exhibit 13-12 ph (Exhibit 13-12	•		
$_{\rm R}^{=}$ 61.2 mph (I $_{\rm D}^{=}$ N/A mph (E	· ·				S <sub>0</sub> = m <sub>l</sub>	•	2)		

	4*	RAMF	S AND RAM			RKS	HEET				
General Infor				Site Infor							
Analyst Agency or Company Date Performed		ne Forsythe	J	reeway/Dir of Tr unction urisdiction	avel (	Central	Ave SB Of	ff			
Analysis Time Period				nalysis Year	2	2014					
Project Description				inaryolo 1 oai		-011					
Inputs		, , , , , , , , , , , , , , , , , , ,									
Upstream Adj R	Ramp	1	nber of Lanes, N	2					Downstre	am A	Adj
□Yes□	On	I '	er of Lanes, N Lane Length, L <sub>A</sub>	1					Ramp ☐ Yes		On
✓No	Off		Lane Length L <sub>D</sub>	1144					☑ No		Off
L <sub>up</sub> =f	ft	Freeway Volum	'	309 72					L <sub>down</sub> =	ft	
			e, v <sub>R</sub> e-Flow Speed, S <sub>FF</sub>								la /la
V <sub>u</sub> = v	eh/h		low Speed, S <sub>FR</sub>	45.0					V <sub>D</sub> =	ve	h/h
Conversion t	o pc/h Un	der Base	Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f	<sub>IV</sub> x f <sub>p</sub>
Freeway	309	0.79	Level	14	0	0.9	935	1.00	4	19	
Ramp	72	0.90	Level	6	0	0.9	971	1.00		32	
UpStream											
DownStream											
<b>-</b>	<u> </u>	Merge Areas			F 1: 1:		D	iverge Areas			
Estimation of	f V <sub>12</sub>				Estimation	on o	f V <sub>12</sub>				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	$V_R + (V_F - V_F)$	P <sub>FD</sub>		
L <sub>EQ</sub> =	(Equa	ation 13-6 o	r 13-7)		L <sub>EQ</sub> =		(E	Equation 13-1	2 or 13-13	3)	
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.0	000 using Equ	uation (Exh	ibit 13	3-7)
V <sub>12</sub> =	pc/h	•	,		V <sub>12</sub> =			9 pc/h	,		,
V <sub>3</sub> or V <sub>av34</sub>	•	Fouation 13	3-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 n	r 13-	-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			, , , , , , , , , , , , , , , , , , , ,			. > 2 70		Yes ☑ No	11 10 11 0	0	17)
					0 0.0						
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 If Yes,V <sub>12a</sub> =		(Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =	4 ~ 1.5		Yes Moc/h (Equation	13-16, 13	-18,	or 13-
Capacity Che		<i>)</i>			Capacity	Che		· )			
	Actual		Capacity	LOS F?			Actual	Ca	pacity	П	LOS F?
		1			V <sub>F</sub>		419	Exhibit 13-8			No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>	337	Exhibit 13-8	+	十	No
					V <sub>R</sub>		82	Exhibit 13-10	2100		No
Flow Entering	a Merae Ir	ofluence	1			torin	a Diver	ge Influen	co Aroa		
TOW LINETHIS	Actual	Tir Tir Tir Tir Tir Tir Tir Tir Tir Tir	Desirable	Violation?	I IOW LITE		ctual	Max Desirab		Vi	iolation?
V <sub>R12</sub>	7101001	Exhibit 13-8		Violation:	V <sub>12</sub>	1	119	Exhibit 13-8	4400:All	<del>                                     </del>	No
Level of Serv	ice Deteri	nination	(if not F)	<u>,                                      </u>	Level of	Serv	ice De	terminatio	n (if not	F)	
D <sub>R</sub> = 5.475 + 0.			<u> </u>			) <sub>D</sub> = 4	.252 + 0.	0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>		
D <sub>R</sub> = (pc/mi/ln		12	^			1 4 (pc/i		12	D		
LOS = (Exhibit					1		it 13-2)				
Speed Deterr					Speed D	`		<u></u>			
$M_S = (Exibit 1)$					<del>  '                                   </del>		chibit 13-				
	nibit 13-11)				S <sub>R</sub> = 58.	0 mph	(Exhibit	13-12)			
	nibit 13-11)				1	A mph	Exhibit 1	13-12)			
	nibit 13-13)					-	` (Exhibit	•			
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	RAI	MPS AND	<b>RAMP JUN</b>	CTIONS W	ORKSHI	EET			
General Infor				Site Infor		_ <del></del> ·			
Analyst Agency or Company Date Performed		e Forsythe	Ju	reeway/Dir of Tra unction urisdiction	avel	Centrall SB On			
Analysis Time Period			A	nalysis Year		2014			
Project Description	I-15 Corridor S	tudy							
Inputs		<del>,</del>							
Upstream Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	2 1				Downstre Ramp	am Adj
☐ Yes ☐ Or	1		ane Length, L <sub>A</sub>	1379				□Yes	On
☑ No ☐ Of	Ť	Freeway Volu	ane Length L <sub>D</sub> me, V <sub>F</sub>	491				<b>☑</b> No	Off
<sub>-up</sub> = ft		Ramp Volume	$V_R$ -Flow Speed, $S_{FF}$	260 65.0				L <sub>down</sub> =	ft
$V_{\rm u} = {\rm veh/h}$	1		ow Speed, S <sub>FR</sub>	45.0				V <sub>D</sub> =	veh/h
Conversion t	o pc/h Und	der Base	Conditions						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHI	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	491	0.90	Level	14	0	0.935	1.00		584
Ramp	260	0.89	Level	6	0	0.971	1.00		301
UpStream  DownStream	<del>                                     </del>	<del>                                     </del>							
DownStream		I I Merge Areas					l Diverge Areas	<u> </u>	
Estimation o		morgo / modo			Estimat	ion of v <sub>12</sub>	Divolgo 7 il ouc	•	
	V <sub>12</sub> = V <sub>F</sub>	( P.,. )					= V <sub>R</sub> + (V <sub>F</sub> - V	/ <sub>D</sub> )P <sub>ED</sub>	
- <sub>EQ</sub> =		` 「™ / ation 13-6 or	13-7)		L <sub>EQ</sub> =	12	(Equation 1	–	3)
P <sub>FM</sub> =			ion (Exhibit 13-6)	١	P <sub>FD</sub> =		using Equat		
<sub>12</sub> =	584 p		IOTT (EXTIIDIT TO 0)	)	V <sub>12</sub> =		pc/h	IIOII (EXIIIDIC I	01)
<sup>r</sup> 12 / <sub>3</sub> or V <sub>av34</sub>	-		13-14 or 13-17	١	V <sub>12</sub> V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation	13 14 or 13 1	7)
v <sub>3</sub> or v <sub>av34</sub> Is V <sub>3</sub> or V <sub>av34</sub> > 2,70	-		13-14 01 13-17	)		<sub>34</sub> > 2,700 pc/h?			1)
						• .			
Is $V_3$ or $V_{av34} > 1.5$			3-16, 13-18, or			<sub>34</sub> > 1.5 * V <sub>12</sub> /2	□ Yes □ N     pc/h (Equat		3_18 or
f Yes,V <sub>12a</sub> =	13-19)		5-10, 15-10, 01		If Yes,V <sub>12a</sub> =	=	13-19)	1011 13-10, 1	3-10, UI
Capacity Che	ecks				Capacit	y Checks			
	Actual	C	apacity	LOS F?		Actua	al C	Capacity	LOS F?
					V <sub>F</sub>		Exhibit 1	3-8	
$V_{FO}$	885	Exhibit 13-8		No	$V_{FO} = V_{F}$	-V <sub>R</sub>	Exhibit 1	3-8	
10					V <sub>R</sub>		Exhibit 1	3-	
Flow Entering	g Merge In	fluence A	rea		Flow En	ntering Div		ence Area	
	Actual	Max	Desirable	Violation?		Actual		esirable	Violation
V <sub>R12</sub>	885	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Serv	ice Detern	nination (	if not F)		1	f Service D			<i>F</i> )
	· 0.00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			$D_R = 4.252 +$	0.0086 V <sub>12</sub> -	0.009 L <sub>D</sub>	
D <sub>R</sub> = 5.475 +					$D_R = (p$	oc/mi/ln)			
* *	/ln)				L				
* *	•				LOS = (E	Exhibit 13-2)			
$D_R = 3.6 \text{ (pc/mi)}$ $D_R = 3.6 \text{ (pc/mi)}$	13-2)					exhibit 13-2) Determinat	ion		
O <sub>R</sub> = 3.6 (pc/mi LOS = A (Exhibit Speed Deterr	13-2) mination				Speed L		ion		
$D_R = 3.6 \text{ (pc/mi)}$ $D_R = 3.6 \text{ (pc/mi)}$ $D_R = 4 \text{ (Exhibit)}$ $D_R = 6 \text{ (Exhibit)}$ $D_R = 6 \text{ (Exhibit)}$	13-2) <b>mination</b> ibit 13-11)				<b>Speed D</b>	Determinat			
$D_R$ = 3.6 (pc/mi) $D_R$ = 4 (Exhibit) Speed Determand $D_R$ = 0.206 (Exhibit) $D_R$ = 0.206 (Exhibit)	13-2) mination ibit 13-11) (Exhibit 13-11)				<b>Speed L</b> $D_s = (E_s)^2$ $S_R = m$	Determinat Exhibit 13-12) uph (Exhibit 13-12)	2)		
$O_R$ = 3.6 (pc/mi $O_S$ = A (Exhibit) <b>Speed Detern</b> $M_S$ = 0.206 (Exist) $S_R$ = 60.3 mph $S_0$ = N/A mph (	13-2) <b>mination</b> ibit 13-11)				$\begin{array}{ccc} \textbf{Speed L} \\ \textbf{D}_{\text{S}} = & (\textbf{E} \\ \textbf{S}_{\text{R}} = & \textbf{m} \\ \textbf{S}_{0} = & \textbf{m} \end{array}$	Determinat Exhibit 13-12)	2) 2)		

	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET			
General Infor				Site Infor					
Analyst Agency or Company Date Performed	9/9/20		Jı Jı	reeway/Dir of Tr unction urisdiction	avel	Emerson Junc	tion NB On		
Analysis Time Period			A	nalysis Year					
Project Description Inputs	1-15 Comaor S	ludy							
•		Freeway Num	ber of Lanes, N	2				D	A -I'
Jpstream Adj Ramp		Ramp Numbe		1				Downstre Ramp	am Adj
☐ Yes ☐ Or	1	l '	ane Length, L <sub>Δ</sub>	980				1 '	
			Lane Length L <sub>D</sub>	000				□Yes	On
✓ No ☐ Of	i	Freeway Volu		288				✓ No	Off
L <sub>up</sub> = ft		Ramp Volume	•	76				L <sub>down</sub> =	ft
			-Flow Speed, S <sub>FF</sub>						
$V_u = veh/h$	ı		low Speed, S <sub>FR</sub>	55.0				$V_D =$	veh/h
Conversion to			• 110						
	<i>V</i>			0/ TI-	0/ D	f	- t	v = \//DL!!	Evf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	_	F x f <sub>HV</sub> x f <sub>p</sub>
Freeway	288	0.89	Level	21	0	0.905	1.00		358
Ramp	76	0.83	Level	15	0	0.930	1.00		99
UpStream  DownStream						+	+		
Dominou dum	<u> </u>	Merge Areas					Diverge Areas	 S	
Estimation of	V <sub>12</sub>				Estimat	ion of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>EM</sub> )					= V <sub>R</sub> + (V <sub>F</sub> - V	/ <sub>D</sub> )P <sub>CD</sub>	
_ <sub>EQ</sub> =		` ™ ′ ation 13-6 o	r 13-7)		L <sub>EQ</sub> =	12		3-12 or 13-1	13)
P <sub>FM</sub> =			tion (Exhibit 13-6	i)	P <sub>FD</sub> =			tion (Exhibit 1	
V <sub>12</sub> =	358 pc		(	,	V <sub>12</sub> =		pc/h	,	,
V <sub>3</sub> or V <sub>av34</sub>			13-14 or 13-17	)	V <sub>3</sub> or V <sub>av34</sub>		•	n 13-14 or 13-	17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70				,		34 > 2,700 pc/h	? □Yes □ N		,
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 '						• 1	□Yes □ N		
f Yes,V <sub>12a</sub> =	pc/h (		3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equat	tion 13-16, 1	3-18, or
	13-19)						13-19)		
Capacity Che	î-		`anaoity	LOS F?	Сарасп	y Checks Actu	ual (	Canacity	LOS F?
	Actual		Capacity	LUSF?	V <sub>F</sub>	ACIU	Exhibit 1	Capacity	LOSF
.,					$V_{FO} = V_{F}$	- V	Exhibit 1	_	
$V_{FO}$	457	Exhibit 13-8		No		VR.	Exhibit 1		
					V <sub>R</sub>		10		
Flow Entering	g Merge In	fluence A	\rea		Flow En	ntering Div	erge Influe	ence Area	)
	Actual	i r	Desirable	Violation?		Actual		esirable	Violation
V <sub>R12</sub>	457	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Serv		•			1		Determinat		: <i>F</i> )
**	0.00734 v <sub>R</sub> + 0	).0078 V <sub>12</sub> - 0.	00627 L <sub>A</sub>			• •	- 0.0086 V <sub>12</sub> -	0.009 L <sub>D</sub>	
$O_{R} = 2.8 (\text{pc/mi/})$	ln)					oc/mi/ln)			
LOS = A (Exhibit					-	Exhibit 13-2)			
Speed Detern	nination				Speed L	Determina	tion		
M <sub>S</sub> = 0.219 (Exil	bit 13-11)	<u></u>			$D_s = (E_s)$	Exhibit 13-12)			
	(Exhibit 13-11)				1.5	ph (Exhibit 13-	12)		
	Exhibit 13-11)				$S_0 = m$	ph (Exhibit 13-	12)		
	(Exhibit 13-13)				S = m	ph (Exhibit 13-	13)		
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		RAMP	S AND RAN	/IP JUNCTI	ONS WC	RKS	HEET			
General Infor	mation			Site Infor						
Analyst Agency or Company Date Performed	Shan	e Forsythe	J	reeway/Dir of Tra lunction lurisdiction		Emerso	on Junction	SB Off		
Analysis Time Period			Α	Analysis Year		2014				
Project Description	I-15 Corridor S	tudy								
Inputs										
Upstream Adj R	lamp	Freeway Num Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	m Adj
□Yes □	On	Acceleration I	Lane Length, L <sub>A</sub>						□Yes	On
☑ No	Off	Deceleration   Freeway Volu	Lane Length L <sub>D</sub> ıme. V <sub>-</sub>	340 548					✓No	Off
L <sub>up</sub> = f	t	Ramp Volume		220					L <sub>down</sub> =	ft
V <sub>11</sub> = v	oh/h		e-Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
	eh/h		low Speed, S <sub>FR</sub>	50.0					ט־	
Conversion to	o pc/h Und	der Base	Conditions	-						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	548	0.87	Level	6	0	0.	971	1.00	64	19
Ramp	220	0.88	Level	5	0	0.	976	1.00	25	56
UpStream		$\vdash$		+		+-				
DownStream		<u>I                                    </u>					<u>I</u>	iverge Areas		
Estimation of		merge racus			Estimat	ion o		iverge / ileus		
		/ D \						\/ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\D	
ı –	V <sub>12</sub> = V <sub>F</sub>		10.7)		l _			$V_R + (V_F - V_F)$		
L <sub>EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =			Equation 13-1		
P <sub>FM</sub> =	_	Equation (I	EXHIBIT 13-6)		P <sub>FD</sub> =			000 using Equ	lation (Exni	oit 13-7)
V <sub>12</sub> =	pc/h	<b></b>	. 44 40 47)		V <sub>12</sub> =			9 pc/h		40.4=\
V <sub>3</sub> or V <sub>av34</sub>			s-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	. 0.7		pc/h (Equatio	n 13-14 or	13-17)
Is $V_3$ or $V_{av34} > 2,70$								Yes ☑ No		
Is $V_3$ or $V_{av34} > 1.5$			16 12 10 0					Yes ✓ No	10 16 10	10 0 12
If Yes,V <sub>12a</sub> =	13-19)		s-16, 13-18, or		If Yes,V <sub>12a</sub> =	=	р 19	c/h (Equation	13-10, 13-	18, 01 13-
Capacity Che					Capacit	v Ch		- /		
	Actual		Capacity	LOS F?	1		Actual	Ca	pacity	LOS F?
					V <sub>F</sub>		649	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>	393	Exhibit 13-8	4700	No
. •					V <sub>R</sub>		256	Exhibit 13-10	0 2100	No
Flow Entering	g Merge In	fluence A	\rea		Flow Er	nterin	g Diver	ge Influen	ce Area	•
	Actual	7	Desirable	Violation?		_	Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		649	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)	•	Level of	f Serv	vice De	terminatio	n (if not l	<del></del>
$D_R = 5.475 + 0.$	.00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>			D <sub>R</sub> = 4	1.252 + 0.	0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/In	)				D <sub>R</sub> = 6.	.8 (pc/r	mi/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Deterr					Speed L	-		n		
M <sub>S</sub> = (Exibit 1					D <sub>s</sub> = 0.	.256 (E	xhibit 13-	12)		
-	nibit 13-11)				S <sub>R</sub> = 59	9.1 mph	(Exhibit	13-12)		
	nibit 13-11)				$S_0 = N$	/A mph	(Exhibit 1	13-12)		
	nibit 13-13)				1	9.1 mph	(Exhibit	13-13)		
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9/9/2014

		MPS AND	RAMP JUN	CTIONS W	<u>ORKSH</u>	<u>EET</u>				
nform	ation			Site Infor	mation					
	Shan	e Forsythe		•	avel	Emers	son Junction N	NB On		
	0.10.10	044								
						0044				
			Ar	naiysis Year		2014				
ption i-i	5 Corridor S	ludy								
_		Freeway Num	her of Lanes N	2						
Ramp		1							_	am Adj
□ On		l '		•					Ramp	
0			**	980					□Yes	$\square$ On
Off		Deceleration L	ane Length L <sub>D</sub>						✓ No	Off
		Freeway Volui	ne, V <sub>F</sub>	696					l.	
ft		Ramp Volume	, V <sub>R</sub>	334					L <sub>down</sub> =	ft
		Freeway Free	Flow Speed, S <sub>EE</sub>	65.0					_	la /la
veh/h				55.0					v <sub>D</sub> –	veh/h
on to i			111							
1	V			0/ Truels	0/ D	T	f	f	V = V/DH	Tyf yf
	(Veh/hr)		remain	70 ITUCK	70 KV		'HV	'р	V <b>–</b> V/F111	^ 'HV ^ 'p
		+	Level	<del> </del>		_		1.00		763
	334	0.92	Level	5	0	0	).976	1.00		373
		$\vdash$				+-				
		Morgo Aroso					Dis	orgo Arooc		
n of v		Weige Aleas			Estimat	ion	of v	reige Aleas		
),, O, V					LStimat	1011				
							$V_{12} = V$	<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P <sub>FD</sub>	
	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(E	quation 13-	12 or 13-1	3)
	1.000	using Equat	ion (Exhibit 13-6)		P <sub>FD</sub> =		us	sing Equatio	n (Exhibit 1	3-7)
	763 p	c/h			V <sub>12</sub> =		po	:/h		
	0 pc/h	n (Equation	13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		ро	h (Equation 1	3-14 or 13-1	7)
> 2,700 p						,34 > 2,	700 pc/h? 🔲	Yes 🗆 No		
			-16, 13-18, or						n 13-16, 1	3-18, or
	13-19)						13-			
Check		•			Capacit	y Ch				
	Actual	C	apacity	LOS F?			Actual			LOS F?
								Exhibit 13-8	8	
	1136	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-8	8	
					V				-	
	<del></del>	<u> </u>							<u> </u>	
ering I		•		1 10 10 0	Flow En					
_		1		1	\/	+			rabie	Violation?
<u> </u>				INO						_,
										<i>F)</i>
.475 + 0.0	00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0.0	086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
					$D_R = (p$	oc/mi/	ln)			
(pc/mi/ln)					LOS = (E	=xhibi	t 13-2)			
(pc/mi/ln) Exhibit 13-	2)				LOS - (E		/			
					· ·		rminatior	7		
Exhibit 13- e <b>termi</b> i	nation				Speed L	Dete	rminatio	ו		
Exhibit 13- E <b>termii</b> 25 (Exibit	<b>nation</b> 13-11)				Speed L	<b>Dete</b>	<b>rminatior</b> 13-12)	1		
Exhibit 13- Exhibit 13- Exhibit 25 (Exibit 3 mph (Ex	nation 13-11) hibit 13-11)				$\begin{array}{ccc} \textbf{Speed L} \\ \textbf{D}_{\text{S}} = & \text{(E} \\ \textbf{S}_{\text{R}} = & \text{m} \end{array}$	<b>Dete</b> Exhibit oph (Ex	rmination 13-12) hibit 13-12)	1		
Exhibit 13- Exhibit 13- 25 (Exibit 3 mph (Exhibit mph (Ex	<b>nation</b> 13-11)				$\begin{array}{ccc} \textbf{Speed L} \\ \textbf{D}_{\text{S}} = & (\textbf{E} \\ \textbf{S}_{\text{R}} = & \textbf{m} \\ \textbf{S}_{\text{0}} = & \textbf{m} \end{array}$	Deter Exhibit oph (Exoph (Ex	<b>rminatior</b> 13-12)	1		
	mpany ad Period Period Off Ramp On Off ft veh/h on to  > 2,700 p > 1.5 * V.	Shan mpany sid 9/9/2 Period PM P ption I-15 Corridor S  Ramp On Off ft  veh/h  on to pc/h Und V (Veh/hr) 696 334  On of V <sub>12</sub> V <sub>12</sub> = V <sub>F</sub> (Equa 1.000 763 p 0 pc/h > 2,700 pc/h? Yes > 1.5 * V <sub>12</sub> /2 Yes pc/h (13-19)  Checks Actual 1136	Shane Forsythe  mpany  yd 9/9/2014  Period PM Peak  ption I-15 Corridor Study  Ramp Freeway Number  Acceleration L  Deceleration L  Freeway Volume  Freeway Free- Ramp Free-Fix  On to pc/h Under Base (  V(Veh/hr) PHF  696 0.94  334 0.92  V12 = VF (PM)  (Equation 13-6 or  1.000 using Equation  763 pc/h  0 pc/h (Equation 13-6 or  1.000 using Equation  763 pc/h  0 pc/h (Equation 13-19)  Checks  Actual C  Actual C  Pering Merge Influence A  Actual Exhibit 13-8	Shane Forsythe Frieddown Shane Forsythe Managery Shane Forsythe Managery Shane Forsythe Managery Shane Shane Forsythe Managery Shane	Shane Forsythe mpany of 9/9/2014 Jurisdiction Period PM Peak Analysis Year option I-15 Corridor Study  Ramp Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L <sub>A</sub> 980 Deceleration Lane Length, L <sub>B</sub> 980 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 696 ft Ramp Volume, V <sub>R</sub> 334 Freeway Free-Flow Speed, S <sub>FF</sub> 65.0 Ramp Free-Flow Speed, S <sub>FF</sub> 55.0  **On to pc/h Under Base Conditions**  V(Veh/hr) PHF Terrain %Truck 696 0.94 Level 6 334 0.92 Level 5  **Merge Areas**  **On of V <sub>12</sub> **V12 = V <sub>F</sub> (P <sub>FM</sub> ) (Equation 13-6 or 13-7) 1.000 using Equation (Exhibit 13-6) 763 pc/h 0 pc/h (Equation 13-14 or 13-17)  > 2,700 pc/h? Yes No pc/h (Equation 13-16, 13-18, or 13-19)  **Checks**  **Actual Capacity LOS F?**  **Actual Capacity LOS F?**  **Actual Max Desirable Violation?**  **Prioridor Marge Influence Area**  **Actual Max Desirable Violation?**  **Actual Max Desirable Violation.**  **Actual Max Desira	Shane Forsythe   Freeway/Dir of Travel   Junction   Jurisdiction   PM Peak   Analysis Year	Shane Forsythe   Freeway/Dir of Travel   Emers   Junction   Junisdiction   Period   PM Peak   Analysis Year   2014	Shane Forsythe	Shane Forsythe   Freeway/Dir of Travel   Emerson Junction NB On Junction   Junction	Shane Forsythe   Freeway Dir of Travel   Emerson Junction NB On Junction

		RAMP	S AND RAI	MP JUNCTI	ONS WOR	RKSI	HEET			
General Info	ormation			Site Infor						
Analyst	Shar	ne Forsythe	ı	reeway/Dir of Tr	avel E	merso	n Junction	SB Off		
Agency or Compa	-			Junction						
Date Performed	9/9/2			Jurisdiction	_					
Analysis Time Per			/	Analysis Year	20	014				
Project Description	n I-15 Corridor S	Study								
Inputs		Ir N	L Cl NI							
Upstream Ad	j Ramp	•	ber of Lanes, N	2					Downstrea	am Adj
□v		Ramp Numbe	r of Lanes, N	1					Ramp	
□Yes	On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I	Lane Length L <sub>D</sub>	340					✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	456					I NO	
L <sub>up</sub> =	ft	Ramp Volume	e, V <sub>D</sub>	144					L <sub>down</sub> =	ft
			-Flow Speed, S <sub>FI</sub>	= 65.0					.,	
$V_u =$	veh/h		low Speed, S <sub>FR</sub>	50.0					V <sub>D</sub> =	veh/h
Conversion	to no/h lin		110							
	to pc/h Un			1	1	1	1			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f	HV	f <sub>p</sub>	v = V/PHF	$x f_{HV} x f_{p}$
Freeway	456	0.88	Level	13	0	0.9	39	1.00	5	52
Ramp	144	0.94	Level	7	0	0.9		1.00	1:	59
UpStream										
DownStream										
		Merge Areas						iverge Areas		
Estimation	of v <sub>12</sub>				Estimation	on of	<sup>F</sup> V <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>I</sub>	R)P <sub>ED</sub>	
- <sub>EQ</sub> =		ation 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-1		)
P <sub>FM</sub> =		Equation (E			P <sub>FD</sub> =			000 using Eq		
/ <sub>12</sub> =	pc/h				V <sub>12</sub> =			2 pc/h		J. 10 1 )
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equation	n 12 14 or	- 12 17\
	,700 pc/h? ☐ Ye		14 01 10 17)			> 2.70		Yes ☑ No	)   13-1 <del>4</del> 0	13-17)
					0 4.0.					
	.5 * V <sub>12</sub> /2		-16, 13-18, or			/ 1.5		☐Yes ☑ No c/h (Equation	12 16 12	10 or 12
f Yes,V <sub>12a</sub> =	13-19		-10, 13-16, 01		If Yes,V <sub>12a</sub> =		19		13-10, 13-	-10, 01 13-
Capacity Cl		<i>!</i>			Capacity	Che				
, ,	Actual	C	apacity	LOS F?	<u> </u>		Actual	Ca	pacity	LOS F?
			•		V <sub>F</sub>		552	Exhibit 13-8	3 4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_F$ -	Vo	393	Exhibit 13-8	_	No
FO					V <sub>R</sub>	R	159	Exhibit 13-1		No
	<del></del>		1		<u> </u>					INO
Flow Enteri	ng Merge Ir	1		\/ialatia=2	Flow Ent	_		ge Influen		\/inlatia.c
\/	Actual		Desirable	Violation?	\/		ctual	Max Desirat		Violation
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		52	Exhibit 13-8	4400:All	No
	rvice Deteri							terminatio		F)
	0.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	· 0.00627 L <sub>A</sub>		D <sub>1</sub>	<sub>R</sub> = 4	.252 + 0.	0086 V <sub>12</sub> - 0.	009 L <sub>D</sub>	
O <sub>R</sub> = (pc/mi	/ln)				$D_R = 5.9$	(pc/n	ni/ln)			
OS = (Exhib	it 13-2)				LOS = A (E	Exhib	it 13-2)			
Speed Dete	rmination				Speed De	eterr	ninatio	n		
	13-11)				<del>  '                                   </del>		hibit 13-			
							(Exhibit	-		
	xhibit 13-11)					-	Exhibit 1	•		
•	xhibit 13-11)					-		· ·		
S = mph (Exhibit 13-13)					1		(Exhibit			
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		RAMP	S AND RAM	P JUNCT	IONS WOR	RKSH	IEET			
General Info	rmation			Site Infor						
Analyst Agency or Compar Date Performed		ne Forsythe	Ju	eeway/Dir of Tonction	ravel G	ore Hill	I NB Off			
Analysis Time Peri				nalysis Year	20	014				
Project Description	I-15 Corridor S	Study		•						
Inputs										
Upstream Adj	Ramp	Freeway Numl Ramp Number	per of Lanes, N	2 1					Downstrea Ramp	ım Adj
□Yes	☐ On	Acceleration L		ı					Yes	On
✓ No	Off	Deceleration L Freeway Volur	_	323 244					<b>☑</b> No	Off
L <sub>up</sub> =	ft	Ramp Volume	•	17				L	-down =	ft
V <sub>u</sub> =	veh/h	Freeway Free- Ramp Free-Flo	Flow Speed, S <sub>FF</sub>	65.0 50.0				\	√ <sub>D</sub> =	veh/h
Conversion	to nc/h Uni		. 110	30.0						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f	HV	f <sub>p</sub>	/ = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	244	0.92	Level	10	0	0.9	52	1.00	27	78
Ramp	17	0.74	Level	35	0	0.8	51	1.00	2	7
UpStream										
DownStream										
Estimation o		Merge Areas			Estimation	on of		erge Areas		
Estimation					LStillatio	)II				
l =	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> ) ation 13-6 or	13_7)		  =			/ <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub> quation 13-12		١
L <sub>EQ</sub> = P <sub>FM</sub> =		Equation (E			L <sub>EQ</sub> = P <sub>FD</sub> =			0 using Equ		
ты V <sub>12</sub> =	pc/h	Equation (E	Allibit 10 0)		V <sub>12</sub> =			pc/h	ation (Exili	bit 15-7)
v <sub>12</sub> V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13-	14 or 13-17)		V <sub>12</sub> V <sub>3</sub> or V <sub>av34</sub>			oc/h (Equation	2 12 14 or	12 17)
s V <sub>3</sub> or V <sub>av34</sub> > 2,7			14 01 10 17)		Is V <sub>3</sub> or V <sub>av34</sub>	> 2 70			1 13-14 01	13-17)
Is $V_3$ or $V_{av34} > 2.5$					Is V <sub>3</sub> or V <sub>av34</sub>					
f Yes,V <sub>12a</sub> =		Equation 13-	16, 13-18, or		If Yes,V <sub>12a</sub> =	7 1.0		/h (Equation	13-16, 13-	18, or 13-
Capacity Ch		·			Capacity	Che				
	Actual	C	apacity	LOS F?			Actual	Сар	acity	LOS F?
					V <sub>F</sub>		278	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub> -	· V <sub>R</sub>	251	Exhibit 13-8	4700	No
					V <sub>R</sub>		27	Exhibit 13-10	2100	No
Flow Enterin	na Merae In	fluence A	rea	*		erinc	Diverd	ge Influenc	e Area	<del></del>
	Actual	1	Desirable	Violation?			ctual	Max Desirabl		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	2	78	Exhibit 13-8	4400:All	No
Level of Ser	vice Detern	nination (i	f not F)	•	Level of	Serv	ice Dete	ermination	(if not	<del>.</del> F)
D <sub>R</sub> = 5.475 + 0	0.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>		D	<sub>R</sub> = 4.	252 + 0.0	086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	•
D <sub>R</sub> = (pc/mi/l	ln)				$D_R = 3.7$	(pc/m	i/ln)		_	
 LOS = (Exhibi	t 13-2)					Exhibi	t 13-2)			
Speed Deter					Speed De			)		
$M_S = (Exibit)$					<del>  '</del>		hibit 13-1			
	(hibit 13-11)						Exhibit 1	•		
••	(hibit 13-11)					-	Exhibit 13	-		
	•						(Exhibit 1	•		
	mph (Exhibit 13-13) right © 2012 University of Florida, All Rights Reserved				1 00.0	p., (	n 6.41	Ge		

0		WIPS AND	RAMP JUN			<u>EE I</u>			
General Inform				Site Inform		<u> </u>			
Analyst	Shan	e Forsythe		eeway/Dir of Tra	avel	Gore Hill NB On			
Agency or Company Date Performed	9/9/2	014		ınction ırisdiction					
analysis Time Period	AM P			nalysis Year					
Project Description	7 441 1	oun		iai y o.o . ou.					
nputs									
Jpstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Downstre	am Adi
posteam Auj Ramp		Ramp Numbe	r of Lanes, N	1				Ramp	annira
☐ Yes ☐ On		1 '	ane Length, L	1500					□ o
		1	ane Length L <sub>D</sub>					□Yes	☐ On
✓ No ☐ Off		Freeway Volu		517				✓ No	
= ft		1	•					L <sub>down</sub> =	ft
<sub>up</sub> = ft		Ramp Volume	11	301				down	
'u = veh/h		1	-Flow Speed, S <sub>FF</sub>	65.0				$V_D =$	veh/h
			ow Speed, S <sub>FR</sub>	50.0					
Conversion to		der Base	Conditions	,	1				
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHI	$F \times f_{HV} \times f_{p}$
reeway	517	0.90	Grade	16	0	0.926	1.00	†	620
Ramp	301	0.82	Level	23	0	0.897	1.00	+	407
JpStream					-				-
DownStream									
		Merge Areas					Diverge Areas		
stimation of	v <sub>12</sub>				Estimati	ion of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	R)P <sub>FD</sub>	
EQ =	(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-1	13)
) = FM =			ion (Exhibit 13-6)		P <sub>FD</sub> =		using Equati		
' <sub>12</sub> =	620 p			V <sub>12</sub> =		pc/h	,	,	
<sup>12</sup> <sup>1</sup> or V <sub>av34</sub>	•		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation	13-14 or 13-1	17)
s V <sub>3</sub> or V <sub>av34</sub> > 2,700	-		10-14-01-10-17)	'		34 > 2,700 pc/h?			''',
ls V <sub>3</sub> or V <sub>av34</sub> > 1.5 *						<sub>34</sub> > 1.5 * V <sub>12</sub> /2			
			3-16, 13-18, or				pc/h (Equati		3-18 or
Yes,V <sub>12a</sub> =	13-19)		7 10, 10 10, 01		If Yes,V <sub>12a</sub> =		3-19)	011 10 10, 1	0 10, 01
Capacity Chec	cks				Capacit	y Checks			
	Actual	C	apacity	LOS F?		Actual		apacity	LOS F
					$V_{F}$		Exhibit 13	3-8	
$V_{FO}$	1027	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit 13	3-8	
10					V <sub>R</sub>		Exhibit 1	3-	
		<u> </u>		<u> </u>		<u> </u>	10		
low Entering		1			Flow En	tering Dive	_		•
	Actual	<del>1</del>	Desirable 4000 All	Violation?	\/	Actual	Max De		Violation
V <sub>R12</sub>	1027	Exhibit 13-8	4600:All	No	V <sub>12</sub>	<u> </u>	Exhibit 13-8		
evel of Servi						Service De		<u> </u>	: F)
		0.0078 V <sub>12</sub> - 0.0	JU62/ L <sub>A</sub>			$D_R = 4.252 + 0$	).0086 V <sub>12</sub> - (	υ.009 L <sub>D</sub>	
<sub>R</sub> = 3.9 (pc/mi/li	*					oc/mi/ln)			
OS = A (Exhibit 1	3-2)				LOS = (E	Exhibit 13-2)			
	ination				Speed L	Determinati	on		
Speed Determ					D <sub>s</sub> = (E	Exhibit 13-12)			
•	it 13-11)					•			
I <sub>S</sub> = 0.182 (Exib	•				S <sub>R</sub> = m	ph (Exhibit 13-12	)		
l <sub>S</sub> = 0.182 (Exib <sub>R</sub> = 60.8 mph (E	Exhibit 13-11)				'''		•		
$ _{S}$ = 0.182 (Exib $ _{R}$ = 60.8 mph (E $ _{0}$ = N/A mph (E	•				S <sub>0</sub> = m	ph (Exhibit 13-12 ph (Exhibit 13-12 ph (Exhibit 13-13	)		

		RAMP	S AND RAN	/IP JUNCTI	ONS WC	RKS	HEET			
General Infor	mation	10	<u> </u>	Site Infor						
Analyst Agency or Company Date Performed	Shan	e Forsythe	J	reeway/Dir of Tra lunction lurisdiction		Gore H	ill SB Off			
Analysis Time Period				Analysis Year		2014				
Project Description										
Inputs		•								
Upstream Adj R	amp	Freeway Num Ramp Numbe	nber of Lanes, N	2 1				<b> </b>	Downstrea Ramp	m Adj
□Yes	On	l '	ane Length, L <sub>A</sub>	·					Yes	On
☑ No	Off	Deceleration   Freeway Volu	Lane Length L <sub>D</sub>	358					<b>✓</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume		458 309					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		e-Flow Speed, S <sub>FF</sub>					,	V <sub>D</sub> =	veh/h
Conversion t	o no/h Un		low Speed, S <sub>FR</sub>	50.0						
Conversion to	V	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	fp	v = V/PHF	x f x f
Freeway	(Veh/hr) 458	0.85	Grade	70114610	0	+	·н∨ 891	1.00	60	· ·
Ramp	309	0.79	Level	7	0	_	966	1.00	40	
UpStream		55		· ·		<b>—</b>				
DownStream										
		Merge Areas						iverge Areas		
Estimation of	<sup>1</sup> V <sub>12</sub>				Estimat	ion o	f v <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	tion 13-6 or	13-7)		L <sub>EQ</sub> =		(E	equation 13-1	2 or 13-13)	
P <sub>FM</sub> =	using	Equation (I	Exhibit 13-6)		P <sub>FD</sub> =		1.0	000 using Equ	ation (Exhib	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		60	5 pc/h		
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		0	pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70	0 pc/h?	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	, <sub>34</sub> > 2,7	00 pc/h?	Yes ☑ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 '	°V <sub>12</sub> /2	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	, <sub>34</sub> > 1.5	* V <sub>12</sub> /2 $\square$	Yes ☑ No		
If Yes,V <sub>12a</sub> =	pc/h (l 13-19)	Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub>	=	po 19	c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	cks				Capacit	y Ch	ecks			
	Actual		Capacity	LOS F?			Actual	Car	oacity	LOS F?
					$V_{F}$		605	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	202	Exhibit 13-8	4700	No
					$V_R$		403	Exhibit 13-10	2100	No
Flow Entering	g Merge In	fluence A	\rea	=	Flow Er	nterin	g Diver	ge Influenc	ce Area	
	Actual	1	Desirable	Violation?			Actual	Max Desirab		Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		605	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)	•	Level o	f Serv	vice Det	ermination	if not F	<del>-</del> )
D <sub>R</sub> = 5.475 + 0.	00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub>	- 0.00627 L <sub>A</sub>			D <sub>R</sub> = 4	.252 + 0.	0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 6$	.2 (pc/r	ni/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhil	oit 13-2)			
Speed Detern	nination				Speed I			n		
M <sub>S</sub> = (Exibit 1:					$D_s = 0$	.269 (E	xhibit 13-	12)		
-	ibit 13-11)					8.8 mph	(Exhibit	13-12)		
	ibit 13-11)				$S_0 = N$	/A mph	(Exhibit 1	3-12)		
	ibit 13-13)				S = 5	8.8 mph	(Exhibit	13-13)		
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0		MPS AND	IVAIIII JUIN			<u> </u>			
General Infori				Site Infor					
Analyst	Shan	ne Forsythe		eeway/Dir of Tra	avel (	Gore Hill NB On			
agency or Company Oate Performed	9/9/2	014		inction irisdiction					
nalysis Time Period				nalysis Year					
roject Description			Al	iaiysis reai					
nputs	1-13 Corridor S	nuuy							
•		Freeway Num	ber of Lanes, N	2				Dannatas	A al:
pstream Adj Ramp		Ramp Numbe		1				Downstrea Ramp	am Adj
☐Yes ☐ On		1 '		•				1 '	
		1	ane Length, L <sub>A</sub>	1500				□Yes	On
☑ No ☐ Off		Deceleration I	_ane Length L <sub>D</sub>					✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	235					
<sub>up</sub> = ft		Ramp Volume	e, V <sub>R</sub>	38				L <sub>down</sub> =	ft
		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0				_	1- //-
u = veh/h			ow Speed, S <sub>FR</sub>	50.0				V <sub>D</sub> =	veh/h
conversion to	nc/h Una		111						
	<i>γ γ γ γ</i>			0/	0/10	_ f	£	V = V/DLIF	vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x i <sub>HV</sub> x ī
reeway	235	0.79	Level	20	0	0.909	1.00		327
Ramp	38	0.62	Level	40	0	0.833	1.00		73
JpStream									
)ownStream									
		Merge Areas					Diverge Areas		
stimation of	v <sub>12</sub>				Estimati	on of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
EQ =	(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-1	3)
FM =			ion (Exhibit 13-6)		P <sub>FD</sub> =		using Equati		
-M - 12 =	327 p		ion (Exhibit 10 0)		V <sub>12</sub> =		pc/h	OTT (EXTINUIT TO	, , ,
	•		40 44 - 40 47)				•	10 11 - 10 1	7)
or V <sub>av34</sub>	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation		7)
s $V_3$ or $V_{av34} > 2,700$						<sub>4</sub> > 2,700 pc/h? [			
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *					Is V <sub>3</sub> or V <sub>av34</sub>	<sub>4</sub> > 1.5 * V <sub>12</sub> /2 [			
Yes,V <sub>12a</sub> =	pc/h ( 13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equatio 3-19)	on 13-16, 1	3-18, or
Capacity Che					Capacity		<u> </u>		
	Actual		apacity	LOS F?		Actual	Ca	apacity	LOS F
	, totaai	† Ť	apaony	20011	V <sub>F</sub>	7101001	Exhibit 13		1 2001
								, ,	
					-	1/			
$V_{FO}$	400	Exhibit 13-8		No	$V_{FO} = V_F$	- V <sub>R</sub>	Exhibit 13	_	
$V_{FO}$	400	Exhibit 13-8		No	-	- V <sub>R</sub>	Exhibit 13	_	
			rea .	No	$V_{FO} = V_F - V_R$		Exhibit 13 Exhibit 13 10	3-	
	ı Merge In	ofluence A			$V_{FO} = V_F - V_R$	tering Dive	Exhibit 13 Exhibit 13 10  rge Influe	nce Area	Violation
low Entering	<b>Merge In</b> Actual	fluence A	Desirable	Violation?	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13 Exhibit 13 10  rge Influe Max De	nce Area	Violation
Flow Entering  V <sub>R12</sub>	Merge In Actual 400	Max Exhibit 13-8	Desirable 4600:All		$V_{FO} = V_F - V_R$ Flow Ent	tering Dive	Exhibit 13 Exhibit 13 10 rge Influe Max De: Exhibit 13-8	nce Area sirable	
low Entering  V <sub>R12</sub> evel of Servi	Merge In Actual 400 fice Determ	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Entirely $V_{12}$ Level of	tering Dive Actual Service De	Exhibit 13 Exhibit 13 10 rge Influe Max De: Exhibit 13-8	nce Area sirable on (if not	
V <sub>R12</sub> evel of Servi	Actual 400 fice Determ 0.00734 v R + C	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Entirely $V_{12}$ Level of	Actual  Service De	Exhibit 13 Exhibit 13 10 rge Influe Max De: Exhibit 13-8	nce Area sirable on (if not	
V <sub>R12</sub> evel of Servi  D <sub>R</sub> = 5.475 + ( R = -0.8 (pc/mi/	Actual 400 fice Determ 0.00734 v R + 0	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Ent $V_{12}$ Level of $D_R = (pc)$	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)	Exhibit 13 Exhibit 13 10 rge Influe Max De: Exhibit 13-8	nce Area sirable on (if not	
Flow Entering $V_{R12}$ Evel of Servi $D_{R} = 5.475 + 0$ $R = -0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 1)}$	Actual 400 ice Detern 0.00734 v <sub>R</sub> + 0 //In) 13-2)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Ent $V_{12}$ Level of $D_R = (pc)$ LOS = (Expression 1)	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)  xhibit 13-2)	Exhibit 13 Exhibit 13 To rge Influe Max De: Exhibit 13-8 Eterminatio	nce Area sirable on (if not	
Flow Entering $V_{R12}$ evel of Servi $D_{R} = 5.475 + 0$ $R = -0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 1)}$	Actual 400 ice Detern 0.00734 v <sub>R</sub> + 0 //In) 13-2)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Ent $V_{12}$ Level of $D_R = (pc)$ LOS = (Expression 1)	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)	Exhibit 13 Exhibit 13 To rge Influe Max De: Exhibit 13-8 Eterminatio	nce Area sirable on (if not	
Flow Entering $V_{R12}$ evel of Servi $D_R = 5.475 + 0$ $R = -0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 1)}$ Epeed Determination	Actual 400  ice Detern 0.00734 v R + 0 13-2)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Entirely $V_{12}$ Level of $D_R = (polytomer)$ LOS = (Express Speed D	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)  xhibit 13-2)	Exhibit 13 Exhibit 13 To rge Influe Max De: Exhibit 13-8 Eterminatio	nce Area sirable on (if not	
Flow Entering $V_{R12}$ Evel of Servi $D_R = 5.475 + 0$ $C_R = -0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 16)}$ $C_R = 0.177 \text{ (Exibotic 20)}$	Actual 400 ice Determ 0.00734 v R + 0 13-2) inination bit 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Ent $V_{12}$ Level of $D_R = (polytomer)$ $D_S = (Expended)$ $D_S = (Expended)$	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)  xhibit 13-2)  etermination	Exhibit 13 Exhibit 13 10 rge Influe Max De: Exhibit 13-8 terminatio	nce Area sirable on (if not	
Flow Entering $V_{R12}$ evel of Servi $D_R = 5.475 + 0$ $R = -0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 1)}$ $Coped Determines = 0.177 \text{ (Exibers)}$ $R = 60.9 \text{ mph (line)}$	Actual 400 ice Detern 0.00734 v R + 0 13-2) inination bit 13-11) Exhibit 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Entrol $V_{12}$ Level of $D_R = (pc)$ $LOS = (Ex)$ Speed D $D_S = (Ex)$ $S_R = (Ex)$	Actual  Service De  C/mi/ln)  xhibit 13-2)  etermination  khibit 13-12)  bh (Exhibit 13-12)	Exhibit 13 Exhibit 13 Exhibit 13 In the second of the seco	nce Area sirable on (if not	
Flow Entering $V_{R12}$ Level of Servi $D_R = 5.475 + 0.8 \text{ (pc/mi/OS} = A \text{ (Exhibit 1} \text{ (Exhibit 1} \text{ (Popeed Determine)} \text{ (Exhibit 2} \text{ (Popeed Determine)} \text{ (Exhibit 2} \text{ (Popeed Determine)}  (Popeed Determine$	Actual 400 ice Determ 0.00734 v R + 0 13-2) inination bit 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F - V_R$ Flow Ent $V_{12}$ Level of $D_R = (px)$ $LOS = (Ex)$ Speed D $D_S = (Ex)$ $S_R = mp$ $S_0 = mp$	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)  xhibit 13-2)  etermination  khibit 13-12)	Exhibit 13 Exhibit 13 10  rge Influe Max De: Exhibit 13-8 sterminatio .0086 V <sub>12</sub> - 0	nce Area sirable on (if not	Violation <b>F</b> )

		RAMP	S AND RAM	MP JUNCTI	ONS WC	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst Agency or Company Date Performed	Shan	e Forsythe	J	reeway/Dir of Traunction urisdiction		Gore H	ill NB Off			
Analysis Time Period				nalysis Year		2014				
Project Description										
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	nber of Lanes, N	2 1				<b> </b>	Downstrea Ramp	m Adj
□Yes	On		Lane Length, L <sub>A</sub>	·					Yes	On
☑ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	323					✓No	Off
L <sub>up</sub> = f	t	Ramp Volume		249 35					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		e-Flow Speed, S <sub>FF</sub>					,	V <sub>D</sub> =	veh/h
Camuranaian 4	/b      -		low Speed, S <sub>FR</sub>	50.0						
Conversion to	o pc/n Und       ∨	ier Base	Conditions		1		ı			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	+	f <sub>HV</sub>		v = V/PHF	
Freeway	249	0.96	Level	12	0	_	943	1.00	27	
Ramp	35	0.74	Level	42	0	0.	826	1.00	57	<u>'</u>
UpStream DownStream				<del> </del>	-					
Downoucam		Merge Areas					<u>I</u>	iverge Areas		
Estimation of					Estimat	ion o				
	V <sub>12</sub> = V <sub>F</sub>	( P )			<del>                                     </del>			V <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	\D	
l =		tion 13-6 or	13_7)		l =			VR ' (VF - VR Equation 13-1:		
L <sub>EQ</sub> = P =		Equation (I			L <sub>EQ</sub> = P =		-	- T	•	
P <sub>FM</sub> = V =	pc/h	Equation (	EXHIBIT 13-0)		P <sub>FD</sub> = V <sub>12</sub> =			000 using Equ	iation (Exilic	10-7)
V <sub>12</sub> =	•	Equation 12	114 or 12 17)					5 pc/h	10 11	40.47\
V <sub>3</sub> or V <sub>av34</sub> Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	> 2.7		pc/h (Equatio ]Yes	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 ' If Yes,V <sub>12a</sub> =	pc/h (	Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> :	-	p	Yes V No c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	))		
Capacity Cite	Actual		Capacity	LOS F?	Capacit	y Ciri	Actual	Car	pacity	LOS F?
	7101001		Jupuoity	20011	V <sub>F</sub>		275	Exhibit 13-8	<del>1 '</del>	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$		218	Exhibit 13-8	_	No
*FO		LAMBIC 13-0			V <sub>FO</sub> V <sub>R</sub>	* R	57	Exhibit 13-10	+	No
Class Entarin	l Navas la	fluoroo	\							INU
Flow Entering	Actual	ī	Desirable	Violation?	FIOW EI		Actual	ge Influence Max Desirab		Violation?
V <sub>R12</sub>	Actual	Exhibit 13-8	Desirable	Violations	V <sub>12</sub>		275	Exhibit 13-8	4400:All	No
Level of Serv	ico Dotorn		if not E)					termination		
$D_{R} = 5.475 + 0.$								0086 V <sub>12</sub> - 0.0		<i>,</i>
		0.0070 V <sub>12</sub>	0.00027 LA					0000 v <sub>12</sub> 0.0	703 L <sub>D</sub>	
						.7 (pc/r				
•							oit 13-2)	-		
Speed Detern					Speed I					
M <sub>S</sub> = (Exibit 1:					ľ	•	xhibit 13-	•		
	ibit 13-11)					-	(Exhibit	•		
	ibit 13-11)				ľ	-	(Exhibit 1	•		
	ibit 13-13)						(Exhibit	13-13)		
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9/9/2014

	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor		• 7 1112		Site Infor						
Analyst Agency or Company Date Performed		e Forsythe	Jı	reeway/Dir of Trunction unction urisdiction	avel	Gore Hill N	NB On			
Analysis Time Period			А	nalysis Year		2014				
Project Description	I-15 Corridor S	itudy								
Inputs		<u> </u>							1	
Jpstream Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	2 1					Downstre Ramp	am Adj
☐ Yes ☐ Or	1	1	ane Length, L <sub>A</sub>	1500					□Yes	On
☑ No ☐ Of	f	Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	722					☑ No	Off
- <sub>up</sub> = ft		Ramp Volume	$P_{R}$ -Flow Speed, $S_{FF}$	506 65.0					L <sub>down</sub> =	ft
$V_{\rm u} = {\rm veh/h}$			ow Speed, S <sub>FR</sub>	50.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>H\</sub>		$f_p$		x f <sub>HV</sub> x f <sub>p</sub>
Freeway	722	0.80	Grade	10	0	0.952		1.00	+	948
Ramp	506	0.74	Level	9	0	0.957	<u>'</u>	1.00		714
UpStream  DownStream	<del></del>					+				
Downoudum	<u> </u>	Merge Areas					Div	erge Areas	1	
Estimation of	V <sub>12</sub>				Estimat	tion of v	12			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>514</sub> )						+ (V <sub>F</sub> - V <sub>F</sub>	)P <sub>EB</sub>	
- <sub>EQ</sub> =		` r™ / ation 13-6 o	13-7)		L <sub>EQ</sub> =			quation 13	–	3)
P <sub>FM</sub> =			ion (Exhibit 13-6	)	P <sub>FD</sub> =			sing Equation		
/ <sub>12</sub> =	948 pc			1	V <sub>12</sub> =		pc		(=	.,
V <sub>3</sub> or V <sub>av34</sub>			13-14 or 13-17	١	V <sub>3</sub> or V <sub>av34</sub>		•	/h (Equation	13_14 or 13_1	<b> 7</b>
ls V <sub>3</sub> or V <sub>av34</sub> > 2,70			13-14-01-13-17	,		> 2 700	-	Yes □ No		11)
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5								Yes □ No		
			3-16, 13-18, or					:/h (Equatio		3-18. or
f Yes,V <sub>12a</sub> =	13-19)				If Yes,V <sub>12a</sub>		13-			
Capacity Che	cks				Capacit					-
	Actual		apacity	LOS F?	ļ.,		Actual		pacity	LOS F?
					V <sub>F</sub>			Exhibit 13-		
$V_{FO}$	1662	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-		
					V <sub>R</sub>			Exhibit 13 10	B-	
Flow Entering	a Merge In	fluence A	rea	<u> </u>	Flow Er	nterina	Diverd	ge Influer	ce Area	
zcim	Actual	1	Desirable	Violation?		Acti		Max Des		Violation
V <sub>R12</sub>	1662	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		
Level of Serv	ice Detern	nination (	if not F)	•		f Service	e Dete	erminatio	n (if not	F)
	0.00734 v <sub>R</sub> + 0	•						086 V <sub>12</sub> - 0		
O <sub>R</sub> = 8.7 (pc/mi/		12	,,			pc/mi/ln)			5	
OS = A (Exhibit	•					Exhibit 13	3-2)			
Speed Detern					Speed I			)		
-					<del>                                     </del>	Exhibit 13-1		•		
M <sub>S</sub> = 0.192 (Exi	•					nph (Exhibit	•			
	(Exhibit 13-11)					ipii (Exhibit				
	Exhibit 13-11)				1					
	(Exhibit 13-13)					nph (Exhibit				
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		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor			·— •			
Analyst Agency or Company	Shan	e Forsythe		reeway/Dir of Tr unction		Gore H	ill SB Off			
Date Performed	9/9/2			urisdiction						
Analysis Time Period			A	nalysis Year	2	2014				
Project Description	I-15 Corridor S	tudy								
Inputs		le v							1	
Upstream Adj R	amp	Ramp Numbe	ber of Lanes, Ner of Lanes, N	2 1					Downstre Ramp	am Adj
□Yes	On	1	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>E</sub>	358 630					<b>☑</b> No	Off
L <sub>up</sub> = f	t	Ramp Volume		290					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h	1	e-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 50.0					V <sub>D</sub> =	veh/h
Conversion t	o pc/h Uni		111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	630	0.93	Grade	10	0	0.	952	1.00	7	11
Ramp	290	0.80	Level	16	0	0.	926	1.00	3	91
UpStream										
DownStream		<u>.                                    </u>								
Estimation of		Merge Areas			Ectimoti	ono		Diverge Areas		
Estimation of	V <sub>12</sub>				Estimati	on o	1 V 12			
	$V_{12} = V_{F}$						V <sub>12</sub> =	· V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ition 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13-	12 or 13-13	3)
P <sub>FM</sub> =	using	Equation (I	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Ed	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		71	11 pc/h		
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		$V_3$ or $V_{av34}$		0	pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$	0 pc/h?	s 🗌 No			Is V <sub>3</sub> or V <sub>av3</sub>	<sub>4</sub> > 2,7	00 pc/h?	]Yes ☑ No		
Is $V_3$ or $V_{av34} > 1.5$						•		∃Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =	•		c/h (Equation	า 13-16, 13	-18, or 13-
Capacity Che	cks				Capacity	/ Ch	ecks			
	Actual		Capacity	LOS F?			Actual	С	apacity	LOS F?
					V <sub>F</sub>		711	Exhibit 13-		No
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	320	Exhibit 13-	8 4700	No
					$V_R$		391	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	\rea		Flow En	terin	g Dive	rge Influer	ice Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desira	ble	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		711	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)	<u>,                                      </u>	Level of	Ser	ice De	terminatio	n (if not	<del>;</del>
D <sub>R</sub> = 5.475 + 0.								.0086 V <sub>12</sub> - 0		
D <sub>R</sub> = (pc/mi/ln	• •	12	^			l (pc/r		12	D	
LOS = (Exhibit							oit 13-2)			
Speed Deterr					Speed D	•		<u> </u>		
					<del>                                     </del>					
$M_S = (Exibit 1)$							xhibit 13-	-		
	nibit 13-11)					-	(Exhibit	•		
	nibit 13-11)				ľ	-	(Exhibit	-		
	nibit 13-13)						(Exhibit	13-13)		
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	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst Agency or Company Date Performed	Shan 9/9/2	e Forsythe	Jι	reeway/Dir of Trunction	avel	Gore F	lill SB On			
Analysis Time Period	I PM P	Peak	Aı	nalysis Year		2014				
Project Description	I-15 Corridor S	itudy								
Inputs		,							1	
Upstream Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	2 1					Downstre Ramp	am Adj
☐ Yes ☐ On	ı	Acceleration L	ane Length, L <sub>A</sub>	1500					□Yes	On
☑ No ☐ Off	F	Deceleration L Freeway Volui	ane Length L <sub>D</sub> me, V <sub>F</sub>	365					☑ No	Off
<sub>-up</sub> = ft		Ramp Volume	11	39					L <sub>down</sub> =	ft
V <sub>u</sub> = veh/h		1	-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	65.0 50.0					V <sub>D</sub> =	veh/h
Conversion to	pc/h Und	der Base (	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PH	F x f <sub>HV</sub> x f <sub>p</sub>
Freeway	365	0.93	Level	6	0	0.	.971	1.00		404
Ramp	39	0.65	Level	41	0	0.	.830	1.00		72
UpStream				-		+				
DownStream		<u>l</u> Merge Areas						iverge Areas		
Estimation of		merge Areas			Estimat	ion o	of $V_{42}$	iverge Areas		
	V <sub>12</sub> = V <sub>F</sub>	( P )						/ <sub>R</sub> + (V <sub>F</sub> - V	' \P	
=		( ' <sub>FM</sub> ) ation 13-6 or	. 12 7)		_			R · (V <sub>F</sub> · V Equation 13		13)
- <sub>EQ</sub> =					L <sub>EQ</sub> =			-		
P <sub>FM</sub> =			ion (Exhibit 13-6)	)	P <sub>FD</sub> =			ising Equat	IOII (EXIIIDIL I	3-1)
/ <sub>12</sub> =	404 p				V <sub>12</sub> =		-	oc/h	40.44 40.	4 = '
V <sub>3</sub> or V <sub>av34</sub>	-		13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		-	oc/h (Equation		17)
Is $V_3$ or $V_{av34} > 2,70$								Yes No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *			16 12 10 0					Yes No		2 10 0"
f Yes,V <sub>12a</sub> =	13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		oc/h (Equati 3-19)	011 13-16, 1	3-18, 01
Capacity Che	cks				Capacit	y Ch	ecks	,		
	Actual	C	apacity	LOS F?			Actual	С	apacity	LOS F?
					$V_{F}$			Exhibit 13	3-8	
$V_{FO}$	476	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13	3-8	
FU	•				V <sub>R</sub>			Exhibit 1	3-	
	<u> </u>	<u>                                     </u>			<del>,</del>			10		
Flow Entering				Violation?	Flow Er		T	<b>ge Influe</b> Max De		•
V	Actual 476	Exhibit 13-8	Desirable 4600:All	No No	V <sub>12</sub>	+-	Actual	Exhibit 13-8		Violation
V <sub>R12</sub> Level of Serv				INU		f Sam	vice De	terminati		 
	0.00734 v <sub>R</sub> + 0	•			1			0086 V <sub>12</sub> -		. F)
		5.0010 v <sub>12</sub> - 0.0	JOULI LA					0000 v <sub>12</sub> -	0.009 L <sub>D</sub>	
$D_R = -0.3 \text{ (pc/mi)}$	•					oc/mi/l				
OS = A (Exhibit						Exhibit				
Speed Detern					Speed L			n		
M <sub>S</sub> = 0.177 (Exil	•				`	Exhibit 1	•			
	Exhibit 13-11)				, · · ·		nibit 13-12)			
$S_0 = N/A \text{ mph (I)}$	Exhibit 13-11)				ľ		nibit 13-12)			
60.9  mph (	Exhibit 13-13)				S = m	ph (Exh	nibit 13-13)			
pyright © 2012 Unive	rsity of Florida, A	All Rights Reserv	red		HCS2010	TM Vers	sion 6.41		Generated:	9/9/2014 8:4



I-15 Corridor Study

Vistro File: F:\...\I-15 Corridor.vistropdb Report File: F:\...\LOS\_Report\_AM.pdf Scenario 1: AM Scenario

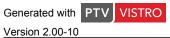
Scenario 1: 1: AM Scenario

9/15/2014

# **Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Tri Hill and Frontage Airport Rd	Two-way stop	HCM2010	NEBL	0.202	13.5	В
2	I-15 NB and Airport Rd	Two-way stop	HCM2010	NEBT	0.000	16.9	С
3	I-15 SB On and Airport RD	Two-way stop	HCM2010	NWBL	0.046	8.6	Α
4	I-15 SB Off and Airport RD Frontage	Two-way stop	HCM2010	SWBL	0.272	12.7	В
5	14th St SW and I-315 EB	Signalized	HCM2010	SBL	0.175	14.4	В
6	14th St SW and I-315 WB	Signalized	HCM2010	EBR	0.254	23.0	С
7	Fox Farm and I-315	Signalized	HCM2010	NEBL	0.687	45.3	D
8	Central Ave and I15 SB	Two-way stop	HCM2010	SBL	0.499	28.0	D
9	Central Ave and I-15 NB	Two-way stop	HCM2010	NBL	0.080	19.9	С
10	Central Ave and Vaughn Rd	Two-way stop	HCM2010	SBL	0.377	27.1	D
11	Vaughn Rd and I-15 SB	Two-way stop	HCM2010	SBL	0.260	10.1	В
12	Vaughn Rd and I-15 NB	Two-way stop	HCM2010	EBL	0.000	7.3	Α

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.



ersion 2.00-10

Intersection Level Of Service Report #1: Tri Hill and Frontage Airport Rd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 13.5
Level Of Service: B
Volume to Capacity (v/c): 0.202

Scenario 1: 1: AM Scenario

## Intersection Setup

Name						
Approach	Northeastbound Northwestbound		estbound	Southea	astbound	
Lane Configuration	-	r	٦	1	1	<b>+</b>
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30	.00	30	.00	30	0.00
Grade [%]	0.	00	0.	00	0.00	
Crosswalk	y	es	ye	es	у	es

Name						
Base Volume Input [veh/h]	83	19	9	189	97	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.70	31.10	22.20	28.60	25.70	5.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	19	9	189	97	88
Peak Hour Factor	0.7410	0.4750	0.5630	0.8750	0.9330	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	10	4	54	26	29
Total Analysis Volume [veh/h]	112	40	16	216	104	116
Pedestrian Volume [ped/h]		0		0		0
Bicycle Volume [bicycles/h]		0		0		0

3



Version 2.00-10

# Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.05	0.01	0.00	0.00	0.00			
d_M, Delay for Movement [s/veh]	13.48	11.42	7.94	0.00	0.00	0.00			
Movement LOS	В	В	Α	A	A	A			
95th-Percentile Queue Length [veh]	0.99	0.99	0.04	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	24.73 24.73		0.98	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	12	93	0.	55	0.	00			
Approach LOS	E	3	,	A	A				
d_I, Intersection Delay [s/veh]		3.47							
Intersection LOS		В							

Shane Forsythe 9/15/2014



# Intersection Level Of Service Report #2: I-15 NB and Airport Rd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 16.9
Level Of Service: C
Volume to Capacity (v/c): 0.000

Scenario 1: 1: AM Scenario

4

## Intersection Setup

Name													
Approach	No	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration		+						F			4		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00		30.00			30.00			
Grade [%]		0.00			0.00		0.00			0.00			
Crosswalk		yes			yes		yes			yes			

Name													
Base Volume Input [veh/h]	4	0	13	0	0	0	0	49	222	79	173	0	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	0.00	0.00	46.20	2.00	2.00	2.00	2.00	38.80	26.60	12.70	10.90	2.00	
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	4	0	13	0	0	0	0	49	222	79	173	0	
Peak Hour Factor	0.5000	1.0000	0.8130	1.0000	1.0000	1.0000	1.0000	0.7210	0.8670	0.7050	0.9010	1.0000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	2	0	4	0	0	0	0	17	64	28	48	0	
Total Analysis Volume [veh/h]	8	0	16	0	0	0	0	68	256	112	192	0	
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]		0			0			0			0		



Version 2.00-10

# Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
d_M, Delay for Movement [s/veh]	14.89	16.91	10.09	0.00	0.00	0.00	0.00	0.00	0.00	8.38	0.00	0.00
Movement LOS	В	С	В					Α	Α	Α	Α	
95th-Percentile Queue Length [veh]	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	1.03	1.03	0.00
95th-Percentile Queue Length [ft]	3.34	3.34	3.34	0.00	0.00	0.00	0.00	0.00	0.00	25.85	25.85	0.00
d_A, Approach Delay [s/veh]		11.69		0.00			0.00				3.09	
Approach LOS		В		Α Α						A		
d_I, Intersection Delay [s/veh]		1.87										
Intersection LOS				С								



## Intersection Level Of Service Report #3: I-15 SB On and Airport RD

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 8.6
Level Of Service: A
Volume to Capacity (v/c): 0.046

Scenario 1: 1: AM Scenario

6

#### Intersection Setup

Name							
Approach	Northea	Northeastbound		estbound	Southeastbound		
Lane Configuration			+	1	F		
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00	12.00 12.00		12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		.00	
Grade [%]	0.	0.00		0.00		00	
Crosswalk	y	yes		es	yes		

Name							
Base Volume Input [veh/h]	0	0	32	23	251	6	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	2.00	2.00	43.80	21.70	14.00	16.70	
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	0	0	32	23	251	6	
Peak Hour Factor	1.0000	1.0000	0.6670	0.6390	0.8720	0.3750	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	0	0	12	9	72	4	
Total Analysis Volume [veh/h]	0	0	48 36		288	16	
Pedestrian Volume [ped/h]		0		0	0		
Bicycle Volume [bicycles/h]		0	0 0			0	



Version 2.00-10

# Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.05	0.00	0.00	0.00			
d_M, Delay for Movement [s/veh]	0.00	0.00 8.58		0.00	0.00	0.00			
Movement LOS			Α	А	Α	A			
95th-Percentile Queue Length [veh]	0.00	0.00	0.26	0.26	0.00	0.00			
95th-Percentile Queue Length [ft]	0.00	0.00	6.49	6.49	0.00	0.00			
d_A, Approach Delay [s/veh]	0.	00	4	.90	0.	00			
Approach LOS	/	A		A	A				
d_I, Intersection Delay [s/veh]		1.06							
Intersection LOS		A							



# Intersection Level Of Service Report #4: I-15 SB Off and Airport RD Frontage

Control Type:Two-way stopDelay (sec / veh):12.7Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.272

## Intersection Setup

Name													
Approach	No	Northeastbound			Southwestbound			rthwestbo	und	Southeastbound			
Lane Configuration	₩			46			4			H			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00		30.00			30.00			
Grade [%]	0.00				0.00		0.00			0.00			
Crosswalk		yes			yes			yes			yes		

Name												
Base Volume Input [veh/h]	5	0	44	159	54	96	8	12	0	0	40	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	11.30	10.10	7.40	3.10	12.50	8.30	2.00	2.00	2.50	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	44	159	54	96	8	12	0	0	40	4
Peak Hour Factor	0.4170	1.0000	0.5240	0.8110	0.9000	0.7060	0.4000	0.7500	1.0000	1.0000	0.7690	0.5000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	21	49	15	34	5	4	0	0	13	2
Total Analysis Volume [veh/h]	12	0	84	196	60	136	20	16	0	0	52	8
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]		0			0			0			0	

9

# Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no		
Number of Storage Spaces in Median	0	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.09	0.27	0.08	0.13	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.78	0.00	9.10	12.67	12.44	8.90	7.47	0.00	0.00	0.00	0.00	0.00
Movement LOS	В		Α	В	В	Α	Α	Α			Α	Α
95th-Percentile Queue Length [veh]	0.34	0.00	0.34	1.59	1.59	0.44	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	8.59	0.00	8.59	39.68	39.68	11.00	1.87	1.87	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		9.31			11.33			4.15			0.00	
Approach LOS		Α			В			Α			Α	
d_I, Intersection Delay [s/veh]				9.39								
Intersection LOS						E	3					



#### Intersection Level Of Service Report #5: 14th St SW and I-315 EB

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 14.4
Level Of Service: B
Volume to Capacity (v/c): 0.175

Scenario 1: 1: AM Scenario

## Intersection Setup

Name												
Approach	١	Northboun	d	S	outhboun	d	I	Eastbound	d	٧	Vestbound	d
Lane Configuration		Thru Right			٦١٢			٦١٢			٦١٢	
Turning Movement	Left				Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00		100.00 100.00 100.0			100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00		0.00			
Crosswalk	yes		yes			yes			yes			

Name												
Base Volume Input [veh/h]	7	66	286	142	91	60	44	69	3	20	30	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.30	1.50	1.70	3.50	4.40	5.00	0.00	4.30	0.00	10.00	3.30	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	66	286	142	91	60	44	69	3	20	30	5
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	20	86	43	27	18	13	21	1	6	9	2
Total Analysis Volume [veh/h]	8	80	345	171	110	72	53	83	4	24	36	6
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0		0			0			
Bicycle Volume [bicycles/h]		0			0			0			0	

# Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	2	3	0	6	7	7	4	0	3	8	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	15	0	5	15	15	5	0	15	15	0
Maximum Green [s]	0	50	20	0	50	20	20	60	0	20	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	22	18	0	22	18	18	20	0	18	20	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	5	0	5	0	0	5	0	5	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	10	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

# **Lane Group Calculations**

Lane Group	L	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	5.00	5.00	5.00	4.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	15	15	34	15	15	33	28	12	12	28	10	10
g / C, Green / Cycle	0.24	0.24	0.57	0.24	0.24	0.54	0.47	0.20	0.20	0.47	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04	0.22	0.13	0.06	0.05	0.03	0.05	0.00	0.02	0.02	0.00
s, saturation flow rate [veh/h]	1140	1872	1588	1294	1820	1538	1631	1822	1615	1432	1839	1615
c, Capacity [veh/h]	299	452	912	342	439	836	920	360	319	797	307	270
d1, Uniform Delay [s]	21.49	18.04	6.95	23.72	18.38	6.55	8.80	20.24	19.36	8.71	21.23	20.89
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.19	0.26	1.13	0.30	0.04	0.03	0.32	0.02	0.02	0.17	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

# Lane Group Results

X, volume / capacity	0.03	0.18	0.38	0.50	0.25	0.09	0.06	0.23	0.01	0.03	0.12	0.02
d, Delay for Lane Group [s/veh]	21.52	18.22	7.21	24.85	18.67	6.60	8.83	20.56	19.38	8.72	21.39	20.92
Lane Group LOS	С	В	Α	С	В	Α	Α	С	В	Α	С	С
Critical Lane Group	no	no	yes	no	no	no	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.09	0.84	1.92	2.26	1.18	0.37	0.33	0.94	0.04	0.15	0.42	0.07
50th-Percentile Queue Length [ft]	2.32	20.94	47.91	56.41	29.43	9.15	8.37	23.62	1.09	3.74	10.46	1.72
95th-Percentile Queue Length [veh]	0.17	1.51	3.45	4.06	2.12	0.66	0.60	1.70	0.08	0.27	0.75	0.12
95th-Percentile Queue Length [ft]	4.18	37.70	86.24	101.54	52.97	16.46	15.06	42.51	1.95	6.74	18.82	3.09

Scenario 1: 1: AM Scenario Version 2.00-10

# Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.52	18.22	7.21	24.85	18.67	6.60	8.83	20.56	19.38	8.72	21.39	20.92	
Movement LOS	C B A			С	C B A			С	В	Α	С	С	
d_A, Approach Delay [s/veh]		9.51			19.20			16.09		16.74			
Approach LOS	Α				В			В					
d_I, Intersection Delay [s/veh]						14							
Intersection LOS				В									
Intersection V/C						0.1	175						

# Sequence

		_														
Ring 1	2	7	4	1	-	-	-	-	-	-	-	ı	-	-	-	ı
Ring 2	6	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rina 4	_	_	-	-	_	-	-	-	-	-	-	-	-	-	-	-





#### Intersection Level Of Service Report #6: 14th St SW and I-315 WB

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 23.0
Level Of Service: C
Volume to Capacity (v/c): 0.254

Scenario 1: 1: AM Scenario

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## Intersection Setup

Name												
Approach	١	lorthboun	d	S	outhboun	d	ı	Eastbound	d	V	Vestbound	d
Lane Configuration		Left Thru Right			٦ŀ			+			4	
Turning Movement	Left				Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00		100.00 100.00		100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00		30.00			
Grade [%]	0.00			0.00		0.00			0.00			
Crosswalk	yes			yes		yes			yes			

Name												
Base Volume Input [veh/h]	11	17	90	26	136	0	0	7	15	162	16	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	9.10	0.00	4.40	7.70	1.50	0.00	0.00	0.00	0.00	2.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	17	90	26	136	0	0	7	15	162	16	38
Peak Hour Factor	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	5	28	8	42	0	0	2	5	50	5	12
Total Analysis Volume [veh/h]	14	21	112	32	169	0	0	9	19	201	20	47
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0		0			0			
Bicycle Volume [bicycles/h]	0			0		0		0				



Version 2.00-10

# Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	1	2	0	1	0	0	3	0	0	2	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	5	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	35	40	0	35	0	0	25	0	0	40	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	25	19	0	25	0	0	16	0	0	19	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	7	0	9	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	11	7	0	11	0	0	0	0	0	7	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		no	no		no			no			no	
Maximum Recall		no	no		no			no			no	
Pedestrian Recall		no	no		no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

I-15 Corridor Study Scenario 1: 1: AM Scenario

## **Lane Group Calculations**

Lane Group	L	С	R	L	С	С	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	11	11	27	11	11	2	11	11
g / C, Green / Cycle	0.19	0.19	0.45	0.19	0.19	0.03	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.08	0.03	0.10	0.02	0.14	0.03
s, saturation flow rate [veh/h]	1019	1710	1392	1181	1685	1527	1636	1454
c, Capacity [veh/h]	178	321	624	283	316	48	290	257
d1, Uniform Delay [s]	27.05	20.04	9.94	22.89	22.00	28.67	23.49	20.99
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.08	0.14	0.17	1.40	10.79	4.15	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

X, volume / capacity	0.08	0.07	0.18	0.11	0.53	0.58	0.76	0.18
d, Delay for Lane Group [s/veh]	27.24	20.13	10.07	23.06	23.41	39.47	27.64	21.33
Lane Group LOS	С	С	В	С	С	D	С	С
Critical Lane Group	no	no	no	no	yes	yes	yes	no
50th-Percentile Queue Length [veh]	0.19	0.23	0.79	0.39	2.12	0.52	3.10	0.55
50th-Percentile Queue Length [ft]	4.78	5.84	19.74	9.76	53.01	13.05	77.54	13.75
95th-Percentile Queue Length [veh]	0.34	0.42	1.42	0.70	3.82	0.94	5.58	0.99
95th-Percentile Queue Length [ft]	8.60	10.51	35.54	17.57	95.41	23.49	139.58	24.76

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.24	20.13	10.07	23.06	23.41	23.41	39.47	39.47	39.47	27.64	27.64	21.33
Movement LOS	С	С	В	С	С	С	D	D	D	С	С	С
d_A, Approach Delay [s/veh]		13.14			23.35			39.47			26.53	
Approach LOS		В			С			D			С	
d_I, Intersection Delay [s/veh]						23	.05					
Intersection LOS	С											
Intersection V/C	0.254											

# Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	ı	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report #7: Fox Farm and I-315

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 45.3
Level Of Service: D
Volume to Capacity (v/c): 0.687

Scenario 1: 1: AM Scenario

## Intersection Setup

Name												
Approach	١	Northboun	d	S	outhboun	d	No	rtheastbo	und	Sou	ıthwestbo	und
Lane Configuration		Left Thru Right			۱۱۱۲			Шь		,	ıIIIr	
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	2.00 12.00 12.00 1			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]	0.00			0.00				0.00			0.00	
Crosswalk	Crosswalk yes			yes				yes			yes	

Name												
Base Volume Input [veh/h]	50	219	437	172	90	121	161	732	45	101	335	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.90	0.70	1.80	2.20	4.10	6.20	5.20	2.20	4.00	6.00	3.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	219	437	172	90	121	161	732	45	101	335	136
Peak Hour Factor	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	69	137	54	28	38	50	229	14	32	105	43
Total Analysis Volume [veh/h]	63	274	548	216	113	152	202	917	56	127	420	170
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0			0			0	0			
Bicycle Volume [bicycles/h]		0			0			0		0		

## Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	1	8	0	3	6	6	4	0	8	2	5
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	5	0	5	5	5	5	0	5	5	0
Maximum Green [s]	0	60	60	0	60	60	60	60	0	60	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	21	47	0	28	76	76	54	0	47	25	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## **Lane Group Calculations**

Lane Group	С	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00	3.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	31	31	99	27	27	53	20	44	44	31	54	54
g / C, Green / Cycle	0.21	0.21	0.66	0.18	0.18	0.35	0.14	0.29	0.29	0.20	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.34	0.15	0.03	0.10	0.12	0.27	0.04	0.04	0.12	0.11
s, saturation flow rate [veh/h]	1793	1714	1604	1414	3540	1551	1704	3439	1580	3379	3413	1557
c, Capacity [veh/h]	370	353	1058	290	649	547	231	997	458	688	1222	557
d1, Uniform Delay [s]	48.99	56.26	13.19	60.81	51.67	34.87	63.55	51.55	39.19	49.42	35.26	34.71
k, delay calibration	0.11	0.11	0.35	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	3.68	1.29	3.78	0.13	0.27	9.88	4.00	0.12	0.13	0.17	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

X, volume / capacity	0.17	0.78	0.52	0.74	0.17	0.28	0.87	0.92	0.12	0.18	0.34	0.30
d, Delay for Lane Group [s/veh]	49.21	59.94	14.48	64.59	51.80	35.14	73.43	55.55	39.31	49.55	35.42	35.01
Lane Group LOS	D	E	В	E	D	D	E	E	D	D	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	no	no	no	no
50th-Percentile Queue Length [veh]	1.99	10.20	9.77	8.38	1.83	4.11	8.23	17.25	1.56	2.01	5.74	4.60
50th-Percentile Queue Length [ft]	49.82	255.07	244.37	209.46	45.76	102.67	205.68	431.14	39.12	50.27	143.52	114.99
95th-Percentile Queue Length [veh]	3.59	15.44	14.90	13.13	3.29	7.39	12.93	24.06	2.82	3.62	9.67	8.12
95th-Percentile Queue Length [ft]	89.67	386.04	372.56	328.14	82.36	184.80	323.28	601.41	70.42	90.48	241.76	202.92

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.21	59.94	14.48	64.59	51.80	35.14	73.43	55.55	39.31	49.55	35.42	35.01
Movement LOS	D	E	В	E	D	D	E	Е	D	D	D	D
d_A, Approach Delay [s/veh]		31.02			52.28			57.85			37.83	
Approach LOS		С			D			E			D	
d_I, Intersection Delay [s/veh]						45	.33					
Intersection LOS	D											
Intersection V/C	0.687											

# Sequence

F	Ring 1	1	3	8	4	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 2		-	6	2	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report #8: Central Ave and I15 SB

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 28.0
Level Of Service: D
Volume to Capacity (v/c): 0.499

Scenario 1: 1: AM Scenario

## Intersection Setup

Name												
Approach	S	Southbound		-	Eastbound			Westbound			Northwestbound	
Lane Configuration		ጎተ		ÎΓ		111						
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]		0.00		0.00		0.00			0.00			
Crosswalk		yes		yes		yes			yes			

Name												
Base Volume Input [veh/h]	130	0	6	0	191	39	123	88	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.30	0.00	0.00	2.00	3.10	0.00	6.50	11.30	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	0	6	0	191	39	123	88	0	0	0	0
Peak Hour Factor	0.8550	1.0000	0.7500	1.0000	0.6920	0.7500	0.7690	0.8150	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	0	2	0	69	13	40	27	0	0	0	0
Total Analysis Volume [veh/h]	152	0	8	0	276	52	160	108	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0			0				
Bicycle Volume [bicycles/h]	0			0			0			0		

## Intersection Settings

Priority Scheme	Stop	Free	Free	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

V/C, Movement V/C Ratio	0.50	0.00	0.01	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	28.03	27.54	8.82	0.00	0.00	0.00	8.27	0.00	0.00	0.00	0.00	0.00
Movement LOS	D	D	Α		Α	Α	Α	Α				
95th-Percentile Queue Length [veh]	2.63	2.63	0.03	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	65.65	65.65	0.64	0.00	0.00	0.00	10.86	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		27.07			0.00			4.94		0.00		
Approach LOS		D		А				Α		А		
d_I, Intersection Delay [s/veh]	7.48											
Intersection LOS	D											



### Intersection Level Of Service Report #9: Central Ave and I-15 NB

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 19.9
Level Of Service: C
Volume to Capacity (v/c): 0.080

Scenario 1: 1: AM Scenario

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## Intersection Setup

Name												
Approach	١	Northbound		-	Eastbound			Westbound			Southeastbound	
Lane Configuration		ት			1			IIr				
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]		0.00		0.00		0.00			0.00			
Crosswalk		yes		yes		yes			yes			

Name													
Base Volume Input [veh/h]	15	0	177	6	305	0	0	202	44	0	0	0	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	0.00	0.00	10.80	16.70	2.00	2.00	2.00	11.40	13.60	2.00	2.00	2.00	
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	15	0	177	6	305	0	0	202	44	0	0	0	
Peak Hour Factor	0.5360	1.0000	0.8510	0.7500	0.7190	1.0000	1.0000	0.8420	0.7330	1.0000	1.0000	1.0000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	7	0	52	2	106	0	0	60	15	0	0	0	
Total Analysis Volume [veh/h]	28	0	208	8	424	0	0	240	60	0	0	0	
Pedestrian Volume [ped/h]	0		0		0			0					
Bicycle Volume [bicycles/h]		0			0			0			0		

## Intersection Settings

Priority Scheme	Stop	Free	Free	Stop
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

V/C, Movement V/C Ratio	0.08	0.00	0.34	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	19.87	19.21	15.45	7.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS	С	С	С	Α	Α			Α	Α			
95th-Percentile Queue Length [veh]	2.07	2.07	2.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	51.73	51.73	51.73	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		15.98		0.15				0.00		0.00		
Approach LOS		С			Α			Α			А	
d_I, Intersection Delay [s/veh]	3.96											
Intersection LOS	С											



# Intersection Level Of Service Report #10: Central Ave and Vaughn Rd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 27.1
Level Of Service: D
Volume to Capacity (v/c): 0.377

Scenario 1: 1: AM Scenario

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### Intersection Setup

Name							
Approach	South	nbound	East	bound	Westbound		
Lane Configuration	-	r	-	1	T <b>F</b>		
Turning Movement	Left	Left Right		Thru	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		.00	
Grade [%]	0.00		0	.00	0.00		
Crosswalk	yes		У	res	yes		

Name						
Base Volume Input [veh/h]	77	60	71	410	184	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	9.10	6.70	7.00	5.10	11.40	6.20
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	60	71	410	184	65
Peak Hour Factor	0.7700	0.7890	0.8450	0.8010	0.8520	0.7740
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	19	21	128	54	21
Total Analysis Volume [veh/h]	100	76	84	512	216	84
Pedestrian Volume [ped/h]		0	(	)		0
Bicycle Volume [bicycles/h]		0	(	)		0

## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

V/C, Movement V/C Ratio	0.38	0.10	0.07	0.01	0.00	0.00			
d_M, Delay for Movement [s/veh]	27.07	18.19	8.13	0.00	0.00	0.00			
Movement LOS	D	С	Α	A	A	A			
95th-Percentile Queue Length [veh]	2.47	2.47	0.22	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	61.70	61.70	5.47	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	23	.23	1.	15	0.	00			
Approach LOS	(	<u> </u>		A	,	4			
d_I, Intersection Delay [s/veh]	4.45								
Intersection LOS	D								



# Intersection Level Of Service Report #11: Vaughn Rd and I-15 SB

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 10.1
Level Of Service: B
Volume to Capacity (v/c): 0.260

Scenario 1: 1: AM Scenario

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## Intersection Setup

Crosswalk	y	es	yes		yes	
Grade [%]	0.00		0.00		0.00	
Speed [mph]	30	30.00		30.00		0.00
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Pocket	0	0	0	0	0	0
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Configuration	Π	Ŧ				
Approach	South	bound	East	Eastbound		bound
Name						

Name						
Base Volume Input [veh/h]	219	1	0	27	12	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.60	0.00	2.00	11.10	8.30	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	219	1	0	27	12	0
Peak Hour Factor	0.8830	0.2500	1.0000	0.8440	0.7500	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	1	0	8	4	0
Total Analysis Volume [veh/h]	248	4	0	32	16	0
Pedestrian Volume [ped/h]		0		0	(	)
Bicycle Volume [bicycles/h]		0	0		(	)

## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

V/C, Movement V/C Ratio	0.26	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.11	9.71	0.00	0.00	0.00	0.00
Movement LOS	В	A		A	A	
95th-Percentile Queue Length [veh]	1.06	1.06	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	26.50	26.50	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10	.10	0.	.00	0.	00
Approach LOS	E	3	А		A	
d_I, Intersection Delay [s/veh]	8.49					
Intersection LOS	В					



Intersection Level Of Service Report

#12: Vaughn Rd and I-15 NB

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 7.3
Level Of Service: A
Volume to Capacity (v/c): 0.000

Scenario 1: 1: AM Scenario

## Intersection Setup

Name							
Approach	Eastl	bound	West	bound	Southeastbound		
Lane Configuration	,	1		ÎΓ			
Turning Movement	Left	Thru	Thru	Right	Left	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00		
Crosswalk	y	es	yes		yes		

Nama						
Name						1
Base Volume Input [veh/h]	0	237	19	76	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	5.30	14.50	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	237	19	76	0	0
Peak Hour Factor	1.0000	0.8590	0.5940	0.8260	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	69	8	23	0	0
Total Analysis Volume [veh/h]	0	276	32	92	0	0
Pedestrian Volume [ped/h]		0		0		)
Bicycle Volume [bicycles/h]		0	0			0

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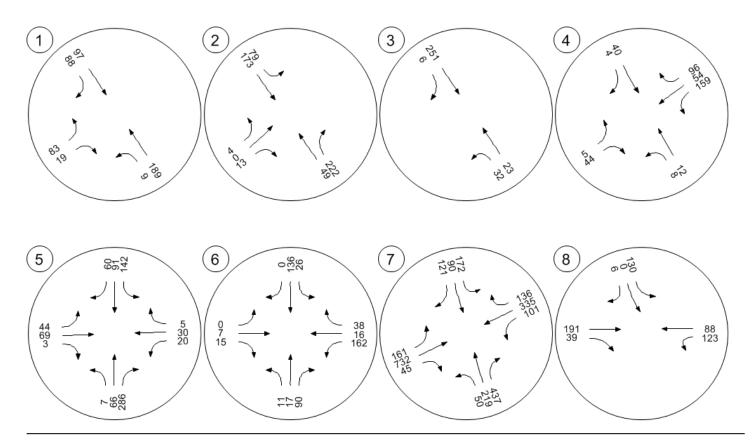
## Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	
d_M, Delay for Movement [s/veh]	7.26	0.00	0.00	0.00	0.00	0.00	
Movement LOS	Α	A	Α	А			
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]	0.	00	0	.00	0.	00	
Approach LOS	,	A A				А	
d_I, Intersection Delay [s/veh]	0.00						
Intersection LOS	A						

# Traffic Volume - Base Volume

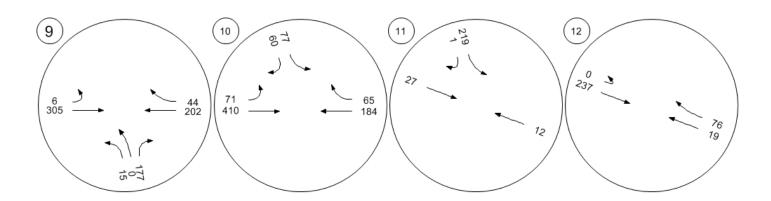




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# Traffic Volume - Base Volume

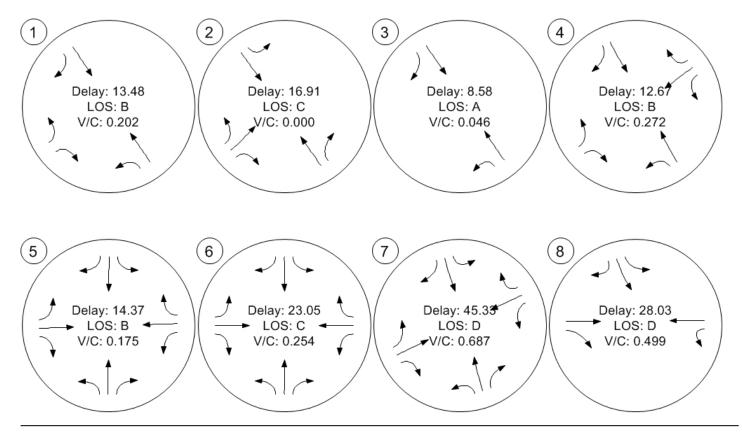




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## **Traffic Conditions**

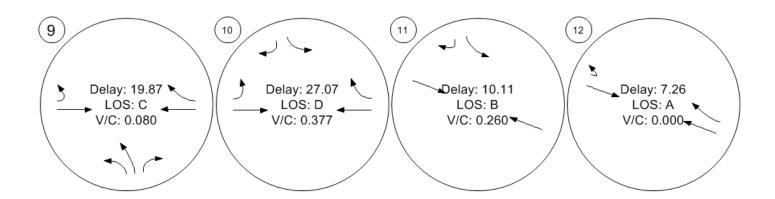




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# Traffic Conditions





TRO I-15 Corridor Study Scenario 2: 2: PM Scenario

## I-15 Corridor Study

Vistro File: F:\...\I-15 Corridor.vistropdb Report File: F:\...\LOS\_Report\_PM.pdf Scenario 2: PM Scenario

9/15/2014

# **Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Tri Hill and Frontage Airport Rd	Two-way stop	HCM2010	NEBL	0.256	14.5	В
2	I-15 NB and Airport Rd	Two-way stop	HCM2010	NEBT	0.053	55.4	F
3	I-15 SB On and Airport RD	Two-way stop	HCM2010	NWBL	0.063	11.0	В
4	I-15 SB Off and Airport RD Frontage	Two-way stop	HCM2010	SWBL	0.660	35.3	Е
5	14th St SW and I-315 EB	Signalized	HCM2010	NBL	0.368	13.0	В
6	14th St SW and I-315 WB	Signalized	HCM2010	EBR	0.536	19.4	В
7	Fox Farm and I-315	Signalized	HCM2010	NBT	0.795	38.5	D
8	Central Ave and I15 SB	Two-way stop	HCM2010	SBL	0.432	42.0	Е
9	Central Ave and I-15 NB	Two-way stop	HCM2010	NBL	0.303	29.1	D
10	Central Ave and Vaughn Rd	Two-way stop	HCM2010	SBL	0.576	65.0	F
11	Vaughn Rd and I-15 SB	Two-way stop	HCM2010	SBL	0.177	10.1	В
12	Vaughn Rd and I-15 NB	Two-way stop	HCM2010	EBL	0.000	7.3	Α

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Generated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

# Intersection Level Of Service Report #1: Tri Hill and Frontage Airport Rd

Control Type:Two-way stopDelay (sec / veh):14.5Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.256

## Intersection Setup

Name							
Approach	Northea	stbound	Northwe	estbound	Southeastbound		
Lane Configuration	т		ηİ		1	<b>+</b>	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00		
Crosswalk	y	yes		yes		yes	

Name						
Base Volume Input [veh/h]	75	7	9	160	207	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.70	0.00	22.20	33.80	18.90	15.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	7	9	160	207	70
Peak Hour Factor	0.5680	0.4380	0.7500	0.8000	0.8480	0.8330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	4	3	50	61	21
Total Analysis Volume [veh/h]	132	16	12	200	244	84
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]		0		0		0



## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

V/C, Movement V/C Ratio	0.26	0.02	0.01	0.00	0.00	0.00		
d_M, Delay for Movement [s/veh]	14.52 12.30		8.23	8.23 0.00		0.00		
Movement LOS	В	В	А	A	Α	A		
95th-Percentile Queue Length [veh]	1.12	1.12	0.03	0.00	0.00	0.00		
95th-Percentile Queue Length [ft]	28.04	28.04	0.81	0.00	0.00	0.00		
d_A, Approach Delay [s/veh]	14	.28	0.	47	0.0	00		
Approach LOS	E	3	A					
d_I, Intersection Delay [s/veh]	3.22							
Intersection LOS	В							

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# Intersection Level Of Service Report #2: I-15 NB and Airport Rd

Control Type:Two-way stopDelay (sec / veh):55.4Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):0.053

## Intersection Setup

Name												
Approach	No	Northeastbound		Sou	Southwestbound		Northwestbound			Southeastbound		
Lane Configuration		+					F		4			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00		12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00		30.00		30.00	
Grade [%]	0.00			0.00		0.00		0.00				
Crosswalk		yes			yes			yes		yes		

Name												
Base Volume Input [veh/h]	2	2	31	0	0	0	0	47	197	307	236	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	47.40	2.00	2.00	2.00	2.00	40.40	20.80	0.70	17.40	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	2	31	0	0	0	0	47	197	307	236	0
Peak Hour Factor	0.5000	0.5000	0.7750	1.0000	1.0000	1.0000	1.0000	0.6910	0.8210	0.6910	0.8680	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	10	0	0	0	0	17	60	111	68	0
Total Analysis Volume [veh/h]	4	4	40	0	0	0	0	68	240	444	272	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]		0	•		0		0			0		

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## Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

V/C, Movement V/C Ratio	0.05	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00
d_M, Delay for Movement [s/veh]	48.66	55.37	12.63	0.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00
Movement LOS	E	F	В					Α	А	Α	Α	
95th-Percentile Queue Length [veh]	0.56	0.56	0.56	0.00	0.00	0.00	0.00	0.00	0.00	3.74	3.74	0.00
95th-Percentile Queue Length [ft]	13.96	13.96	13.96	0.00	0.00	0.00	0.00	0.00	0.00	93.56	93.56	0.00
d_A, Approach Delay [s/veh]		19.19	0.00			0.00				5.83		
Approach LOS		С			Α Α					A		
d_I, Intersection Delay [s/veh]	4.75											
Intersection LOS	F											

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## Intersection Level Of Service Report #3: I-15 SB On and Airport RD

Control Type:Two-way stopDelay (sec / veh):11.0Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.063

## Intersection Setup

Name							
Approach	Northea	astbound	Northwe	estbound	Southeastbound		
Lane Configuration			•	1	F		
Turning Movement	Left	Right	Left Thru		Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	0.00	30.00		30.00		
Grade [%]	0.	.00	0.00		0.	.00	
Crosswalk	у	es	у	es	yes		

Name						
Base Volume Input [veh/h]	0	0	25	21	542	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	64.00	19.10	7.30	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [v	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	25	21	542	14
Peak Hour Factor	1.0000	1.0000	0.6250	0.7500	0.7450	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	10	7	182	5
Total Analysis Volume [veh/h]	0	0	40	28	728	20
Pedestrian Volume [ped/h]	(	0		0		0
Bicycle Volume [bicycles/h]	0			0		0



Version 2.00-10

## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

V/C, Movement V/C Ratio	0.00	0.00	0.06	0.00	0.01	0.00			
d_M, Delay for Movement [s/veh]	0.00	0.00	11.03	0.00	0.00	0.00			
Movement LOS			В	A	A	A			
95th-Percentile Queue Length [veh]	0.00	0.00	0.36	0.36	0.00	0.00			
95th-Percentile Queue Length [ft]	0.00	0.00	8.91	8.91 8.91		0.00			
d_A, Approach Delay [s/veh]	0.	00	6.	49	0.00				
Approach LOS	/	A	,	,	4				
d_I, Intersection Delay [s/veh]	0.54								
Intersection LOS	В								

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# Intersection Level Of Service Report #4: I-15 SB Off and Airport RD Frontage

Scenario 2: 2: PM Scenario

Control Type:Two-way stopDelay (sec / veh):35.3Analysis Method:HCM2010Level Of Service:EAnalysis Period:15 minutesVolume to Capacity (v/c):0.660

## Intersection Setup

Name												
Approach	No	Northeastbound		Sou	Southwestbound		Northwestbound			Southeastbound		
Lane Configuration		T			4		+		F			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00		12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00	00 30.00		30.00		30.00		
Grade [%]	0.00		0.00		0.00			0.00				
Crosswalk		yes			yes			yes		yes		

Name												
Base Volume Input [veh/h]	0	0	55	217	26	47	8	15	0	0	286	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	1.80	18.90	11.50	2.10	37.50	6.70	2.00	2.00	1.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	55	217	26	47	8	15	0	0	286	1
Peak Hour Factor	1.0000	1.0000	0.7240	0.8350	0.7220	0.6910	0.6670	0.7500	1.0000	1.0000	0.6810	0.2500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	19	65	9	17	3	5	0	0	105	1
Total Analysis Volume [veh/h]	0	0	76	260	36	68	12	20	0	0	420	4
Pedestrian Volume [ped/h]	0		0		0			0				
Bicycle Volume [bicycles/h]		0			0			0			0	

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## Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no		
Number of Storage Spaces in Median	0	0	0	0

V/C, Movement V/C Ratio	0.00	0.00	0.12	0.66	0.08	0.06	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	14.08	0.00	11.47	35.33	33.80	8.64	8.76	0.00	0.00	0.00	0.00	0.00
Movement LOS	В		В	E	D	Α	Α	Α			Α	Α
95th-Percentile Queue Length [veh]	0.41	0.00	0.41	5.82	5.82	0.21	0.10	0.10	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	10.19	0.00	10.19	145.42	145.42	5.15	2.56	2.56	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		11.47			30.19			3.29			0.00	
Approach LOS		В			D			Α		A		
d_I, Intersection Delay [s/veh]					13.35							
Intersection LOS						E	Е					

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### Intersection Level Of Service Report #5: 14th St SW and I-315 EB

Control Type: Signalized Delay (sec / veh): 13.0
Analysis Method: HCM2010 Level Of Service: B
Analysis Period: 15 minutes Volume to Capacity (v/c): 0.368

## Intersection Setup

Name												
Approach	١	lorthboun	d	S	outhboun	d	E	Eastbound	d	٧	Vestbound	d
Lane Configuration		<b>1 Pri</b> Left Thru Right			חור			٦١٢			٦١٢	
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00		12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00		30.00			
Grade [%]	0.00			0.00		0.00			0.00			
Crosswalk	yes		yes		yes			yes				

Name												
Base Volume Input [veh/h]	13	82	260	95	396	262	107	168	10	102	50	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.40	1.20	4.30	1.30	0.40	0.90	0.00	0.00	1.00	0.00	12.90
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	82	260	95	396	262	107	168	10	102	50	31
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	22	69	25	106	70	29	45	3	27	13	8
Total Analysis Volume [veh/h]	14	87	277	101	422	279	114	179	11	109	53	33
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0		0		0			0			
Bicycle Volume [bicycles/h]	0				0			0			0	



Version 2.00-10

## Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	2	3	0	6	7	7	4	0	3	8	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	15	0	5	15	15	5	0	15	15	0
Maximum Green [s]	0	50	20	0	50	20	20	45	0	20	45	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	22	18	0	22	18	18	20	0	18	20	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	5	0	5	0	0	5	0	5	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	10	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Scenario 2: 2: PM Scenario

## **Lane Group Calculations**

Lane Group	L	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00	4.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	18	18	38	18	18	38	32	14	14	32	14	14
g / C, Green / Cycle	0.31	0.31	0.64	0.31	0.31	0.64	0.54	0.24	0.24	0.54	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.17	0.08	0.22	0.17	0.07	0.09	0.01	0.07	0.03	0.02
s, saturation flow rate [veh/h]	980	1855	1596	1276	1876	1609	1573	1900	1615	1497	1900	1430
c, Capacity [veh/h]	181	566	1018	416	572	1027	1004	459	390	897	459	345
d1, Uniform Delay [s]	26.77	15.19	4.75	19.22	18.69	4.75	6.76	19.06	17.38	6.92	17.75	17.67
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.12	0.14	0.30	1.88	0.14	0.05	0.54	0.03	0.06	0.11	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

X, volume / capacity	0.08	0.15	0.27	0.24	0.74	0.27	0.11	0.39	0.03	0.12	0.12	0.10
d, Delay for Lane Group [s/veh]	26.95	15.32	4.89	19.52	20.56	4.89	6.81	19.60	17.41	6.98	17.86	17.79
Lane Group LOS	С	В	Α	В	С	Α	Α	В	В	Α	В	В
Critical Lane Group	no	no	no	no	yes	yes	no	yes	no	no	no	no
50th-Percentile Queue Length [veh]	0.19	0.81	1.09	1.12	5.03	1.10	0.59	2.00	0.11	0.57	0.55	0.34
50th-Percentile Queue Length [ft]	4.75	20.31	27.29	28.03	125.69	27.47	14.87	49.98	2.78	14.22	13.67	8.53
95th-Percentile Queue Length [veh]	0.34	1.46	1.96	2.02	8.70	1.98	1.07	3.60	0.20	1.02	0.98	0.61
95th-Percentile Queue Length [ft]	8.55	36.56	49.12	50.46	217.62	49.44	26.77	89.97	5.01	25.60	24.60	15.36



Version 2.00-10

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.95	15.32	4.89	19.52	20.56	4.89	6.81	19.60	17.41	6.98	17.86	17.79
Movement LOS	С	C B A			С	Α	Α	В	В	Α	В	В
d_A, Approach Delay [s/veh]		8.11			14.98			14.72		11.77		
Approach LOS		А			В			В				
d_I, Intersection Delay [s/veh]						13						
Intersection LOS						I	3					
Intersection V/C				0.368								

# Sequence

Ring 1	2	7	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Generated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

### Intersection Level Of Service Report #6: 14th St SW and I-315 WB

Control Type: Signalized Delay (sec / veh): 19.4
Analysis Method: HCM2010 Level Of Service: B
Analysis Period: 15 minutes Volume to Capacity (v/c): 0.536

## Intersection Setup

Name												
Approach	١	lorthboun	d	S	Southboun	d	ı	Eastbound	d	٧	Vestbound	d
Lane Configuration		Left Thru Right			٦F			+			<b>4</b> r	
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00 100.00 100.00			100.00	100.00
Speed [mph]	30.00			30.00			30.00		30.00			
Grade [%]	0.00		0.00				0.00		0.00			
Crosswalk	yes		yes				yes		yes			

Name												
Base Volume Input [veh/h]	5	76	146	22	131	2	3	5	19	638	12	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	40.00	6.60	0.70	0.00	2.30	0.00	0.00	0.00	15.80	1.80	8.30	4.20
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	76	146	22	131	2	3	5	19	638	12	142
Peak Hour Factor	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	37	6	33	1	1	1	5	161	3	36
Total Analysis Volume [veh/h]	5	77	148	22	133	2	3	5	19	646	12	144
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0	0		0		0			0		
Bicycle Volume [bicycles/h]	0				0			0			0	



## Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	1	2	0	1	0	0	3	0	0	2	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	5	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	35	40	0	35	0	0	25	0	0	40	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	25	19	0	25	0	0	16	0	0	19	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	7	0	9	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	11	7	0	11	0	0	0	0	0	7	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		no	no		no			no			no	
Maximum Recall		no	no		no			no			no	
Pedestrian Recall		no	no		no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Scenario 2: 2: PM Scenario

# Lane Group Calculations

Lane Group	L	С	R	L	С	С	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	44	10	10	2	29	29
g / C, Green / Cycle	0.17	0.17	0.73	0.17	0.17	0.03	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.10	0.02	0.08	0.02	0.44	0.10
s, saturation flow rate [veh/h]	819	1604	1443	1209	1667	1514	1505	1395
c, Capacity [veh/h]	164	265	1050	223	275	46	721	668
d1, Uniform Delay [s]	27.03	21.97	2.49	25.56	22.75	28.72	14.48	9.09
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.19	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.60	0.06	0.19	1.35	11.38	8.39	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

X, volume / capacity	0.03	0.29	0.14	0.10	0.49	0.59	0.91	0.22
d, Delay for Lane Group [s/veh]	27.10	22.57	2.55	25.75	24.11	40.09	22.87	9.25
Lane Group LOS	С	С	Α	С	С	D	С	Α
Critical Lane Group	no	no	no	no	yes	yes	yes	no
50th-Percentile Queue Length [veh]	0.07	0.94	0.29	0.29	1.72	0.51	8.46	0.96
50th-Percentile Queue Length [ft]	1.71	23.40	7.27	7.21	43.07	12.75	211.56	24.03
95th-Percentile Queue Length [veh]	0.12	1.68	0.52	0.52	3.10	0.92	13.23	1.73
95th-Percentile Queue Length [ft]	3.07	42.12	13.09	12.99	77.53	22.96	330.84	43.26



## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.10	22.57	2.55	25.75	24.11	24.11	40.09	40.09	40.09	22.87	22.87	9.25
Movement LOS	С	С	Α	С	С	С	D	D	D	С	С	А
d_A, Approach Delay [s/veh]		9.78			24.34			40.09			20.42	
Approach LOS		Α			С			D			С	
d_I, Intersection Delay [s/veh]						19	.35					
Intersection LOS	В											
Intersection V/C	0.536											

## Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	_	-	-	-	-	-	-	-	1	-
Ring 3	-	-	-	-	-	-	_	-	-	-	-	-	-	-	1	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



nerated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

#### Intersection Level Of Service Report #7: Fox Farm and I-315

Control Type:SignalizedDelay (sec / veh):38.5Analysis Method:HCM2010Level Of Service:DAnalysis Period:15 minutesVolume to Capacity (v/c):0.795

#### Intersection Setup

Name												
Approach	١	Northboun	d	S	outhboun	d	No	rtheastbo	und	Sou	ıthwestbo	und
Lane Configuration		117			۱۱۱۲			Шь		•	ıIIIr	
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0 0 0			0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]	0.00				0.00			0.00			0.00	
Crosswalk		yes			yes			yes			yes	

#### Volumes

Name												
Base Volume Input [veh/h]	71	155	227	153	274	325	242	706	103	486	874	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.80	1.90	0.40	1.30	0.70	2.10	2.50	3.60	2.90	0.40	3.90	1.60
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	155	227	153	274	325	242	706	103	486	874	250
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	42	62	42	74	88	66	192	28	132	238	68
Total Analysis Volume [veh/h]	77	168	247	166	298	353	263	767	112	528	950	272
Presence of On-Street Parking	no		no									
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0			0			0				
Bicycle Volume [bicycles/h]		0			0			0			0	



## Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

## Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	1	8	0	3	6	6	4	0	8	2	5
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	5	0	5	5	5	5	0	5	5	0
Maximum Green [s]	0	60	60	0	60	60	60	60	0	60	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	31	28	0	20	25	25	41	0	28	44	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

I-15 Corridor Study Scenario 2: 2: PM Scenario

## **Lane Group Calculations**

Lane Group	С	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00	3.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	16	16	75	25	25	55	25	42	42	24	40	40
g / C, Green / Cycle	0.13	0.13	0.62	0.21	0.21	0.46	0.21	0.35	0.35	0.20	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.17	0.13	0.09	0.25	0.17	0.24	0.08	0.17	0.30	0.19
s, saturation flow rate [veh/h]	1604	1527	1448	1279	3233	1424	1589	3143	1413	3150	3134	1431
c, Capacity [veh/h]	211	201	903	303	682	657	332	1093	491	624	1055	482
d1, Uniform Delay [s]	47.76	50.63	10.25	45.27	41.14	23.11	44.98	33.77	27.73	46.37	37.89	32.60
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.21	7.40	0.16	1.55	0.44	0.68	4.26	0.83	0.23	3.29	3.12	1.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

X, volume / capacity	0.40	0.81	0.27	0.55	0.44	0.54	0.79	0.70	0.23	0.85	0.90	0.56
d, Delay for Lane Group [s/veh]	48.97	58.03	10.41	46.82	41.59	23.80	49.23	34.60	27.96	49.65	41.02	33.65
Lane Group LOS	D	E	В	D	D	С	D	С	С	D	D	С
Critical Lane Group	no	no	yes	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.37	5.13	2.92	4.73	3.88	7.19	7.80	9.70	2.33	7.85	13.56	6.60
50th-Percentile Queue Length [ft]	59.22	128.16	73.04	118.23	97.06	179.81	194.94	242.50	58.19	196.24	339.12	164.94
95th-Percentile Queue Length [veh]	4.26	8.84	5.26	8.30	6.99	11.59	12.38	14.81	4.19	12.44	19.60	10.81
95th-Percentile Queue Length [ft]	106.59	220.99	131.48	207.39	174.71	289.77	309.43	370.20	104.74	311.11	490.12	270.25

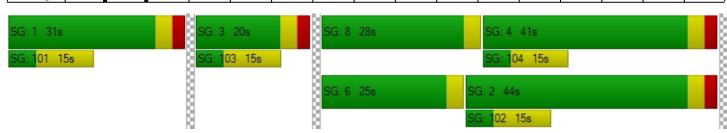


## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.97	57.68	10.41	46.82	41.59	23.80	49.23	34.60	27.96	49.65	41.02	33.65
Movement LOS	D	E	В	D	D	С	D	С	С	D	D	С
d_A, Approach Delay [s/veh]		32.58			34.96			37.32			42.48	
Approach LOS		С			С			D			D	
d_I, Intersection Delay [s/veh]						38	.46					
Intersection LOS	D											
Intersection V/C	0.795											

## Sequence

F	Ring 1	1	3	8	4	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 2		-	6	2	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Generated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

#### Intersection Level Of Service Report #8: Central Ave and I15 SB

Control Type:Two-way stopDelay (sec / veh):42.0Analysis Method:HCM2010Level Of Service:EAnalysis Period:15 minutesVolume to Capacity (v/c):0.432

#### Intersection Setup

Name												
Approach	S	outhboun	d		Eastbound	d	\	Vestboun	d	Nor	rthwestboo	und
Lane Configuration		ጎፐ			٦٢			1				
Turning Movement	Left	Left Thru Right			Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				30.00			30.00			30.00	
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk		yes			yes			yes			yes	

#### Volumes

Name												
Base Volume Input [veh/h]	66	0	6	0	166	30	230	299	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	2.00	0.60	0.00	6.50	1.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	0	6	0	166	30	230	299	0	0	0	0
Peak Hour Factor	0.9170	1.0000	0.7500	1.0000	0.8470	0.8330	0.8980	0.8690	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	0	2	0	49	9	64	86	0	0	0	0
Total Analysis Volume [veh/h]	72	0	8	0	196	36	256	344	0	0	0	0
Pedestrian Volume [ped/h]	0				0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Priority Scheme	Stop	Free	Free	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.43	0.00	0.01	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	
d_M, Delay for Movement [s/veh]	42.03	39.90	10.18	0.00	0.00	0.00	8.29	0.00	0.00	0.00	0.00	0.00	
Movement LOS	E	E	В		Α	Α	Α	Α					
95th-Percentile Queue Length [veh]	1.96	1.96	0.03	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	48.88	48.88	0.86	0.00	0.00	0.00	17.46	0.00	0.00	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]		38.84		0.00		3.54			0.00				
Approach LOS		E	A					A			А		
d_I, Intersection Delay [s/veh]		5.73											
Intersection LOS						-	E						

Generated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

#### Intersection Level Of Service Report #9: Central Ave and I-15 NB

Control Type:Two-way stopDelay (sec / veh):29.1Analysis Method:HCM2010Level Of Service:DAnalysis Period:15 minutesVolume to Capacity (v/c):0.303

#### Intersection Setup

Name												
Approach	١	Northboun	d	1	Eastbound		Westbound			Southeastbound		und
Lane Configuration		<b>†</b>		1		lir						
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]		0.00		0.00		0.00			0.00			
Crosswalk		yes			yes		yes			yes		

#### Volumes

Name												
Base Volume Input [veh/h]	57	0	170	5	249	0	0	471	113	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.80	0.00	7.00	0.00	2.00	2.00	2.00	4.60	0.90	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	0	170	5	249	0	0	471	113	0	0	0
Peak Hour Factor	0.7130	1.0000	0.7590	0.4170	0.8650	1.0000	1.0000	0.9350	0.8310	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	0	56	3	72	0	0	126	34	0	0	0
Total Analysis Volume [veh/h]	80	0	224	12	288	0	0	504	136	0	0	0
Pedestrian Volume [ped/h]		0		0		0			0			
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Priority Scheme	Stop	Free	Free	Stop
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.30	0.00	0.30	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	29.07	27.04	20.30	8.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS	D	D	С	Α	Α			Α	Α			
95th-Percentile Queue Length [veh]	3.98	3.98	3.98	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	99.39	99.39	99.39	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		22.61 0.34		0.00			0.00					
Approach LOS		С	C A A					А				
d_I, Intersection Delay [s/veh]	5.61											
Intersection LOS							)					

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## Intersection Level Of Service Report #10: Central Ave and Vaughn Rd

Control Type:Two-way stopDelay (sec / veh):65.0Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):0.576

#### Intersection Setup

Name							
Approach	South	Southbound		oound	Westbound		
Lane Configuration	₩.		٦	1	i h		
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		0.00	
Grade [%]	0.00		0.	00	0.00		
Crosswalk	y	es	ye	es	yes		

#### Volumes

Name						
Base Volume Input [veh/h]	68	121	66	361	462	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	1.60	1.50	4.00	3.40	2.60
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	68	121	66	361	462	76
Peak Hour Factor	0.6540	0.9450	0.7500	0.7910	0.8680	0.7310
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	32	22	114	133	26
Total Analysis Volume [veh/h]	104	128	88	456	532	104
Pedestrian Volume [ped/h]		0		0		0
Bicycle Volume [bicycles/h]		0		0		0



## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.58	0.25	0.09	0.00	0.01	0.00	
d_M, Delay for Movement [s/veh]	65.02	52.12	9.18	0.00	0.00	0.00	
Movement LOS	F	F	Α	A	Α	Α	
95th-Percentile Queue Length [veh]	6.75	6.75	0.31	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	168.80	168.80	7.64	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]	57.	.91	1.	48	0.0	00	
Approach LOS	F	=	,	4	A		
d_I, Intersection Delay [s/veh]			10	.09			
Intersection LOS		F					

Generated with PTV VISTRO I-15 Corridor Study Scenario 2: 2: PM Scenario

## Intersection Level Of Service Report #11: Vaughn Rd and I-15 SB

Control Type:Two-way stopDelay (sec / veh):10.1Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.177

#### Intersection Setup

Name							
Approach	South	bound	Eastl	bound	Westbound		
Lane Configuration	1	Ŧ				1	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	30.00		30.00		0.00	
Grade [%]	0.00		0.	0.00		.00	
Crosswalk	у	es	y	es	yes		

#### Volumes

Name							
Base Volume Input [veh/h]	143	1	0	53	50	0	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	7.00	0.00	2.00	7.60	4.00	2.00	
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	143	1	0	53	50	0	
Peak Hour Factor	0.9410	0.2500	1.0000	0.7790	0.8930	1.0000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	38	1	0	17	14	0	
Total Analysis Volume [veh/h]	152	4	0	68	56	0	
Pedestrian Volume [ped/h]	0			0	0		
Bicycle Volume [bicycles/h]		0		0		0	

## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.11	9.46	0.00	0.00	0.00	0.00
Movement LOS	В	А		А	Α	
95th-Percentile Queue Length [veh]	0.66	0.66	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	16.44	16.44	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10	.09	0.00		0.00	
Approach LOS	E	3	A		A	
d_I, Intersection Delay [s/veh]	5.62					
Intersection LOS				В		

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## Intersection Level Of Service Report #12: Vaughn Rd and I-15 NB

Control Type:Two-way stopDelay (sec / veh):7.3Analysis Method:HCM2010Level Of Service:AAnalysis Period:15 minutesVolume to Capacity (v/c):0.000

#### Intersection Setup

Name						
Approach	East	bound	West	Westbound		astbound
Lane Configuration	4		ĺΓ			
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30	30.00		30.00		.00
Grade [%]	0.00		0.00		0.00	
Crosswalk	у	es	у	yes		es

#### Volumes

Name						
Base Volume Input [veh/h]	0	165	55	334	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	6.10	1.80	4.80	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [ve	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	165	55	334	0	0
Peak Hour Factor	1.0000	0.7500	0.8090	0.9180	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	55	17	91	0	0
Total Analysis Volume [veh/h]	0	220	68	364	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	-	0	0		0	

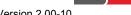


## Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

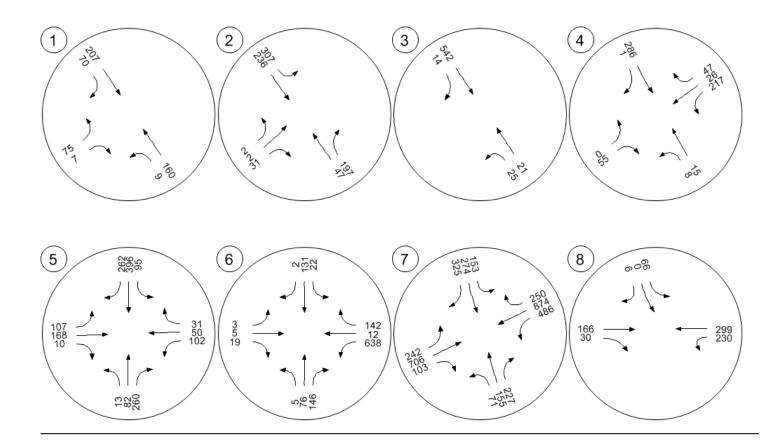
## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	0.00	0.00	0.00
Movement LOS	Α	А	Α	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.	00	0.00		0.00	
Approach LOS	,	4		A	J.	A
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS				A		



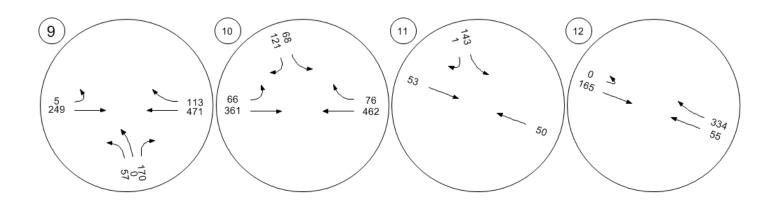
## Traffic Volume - Base Volume





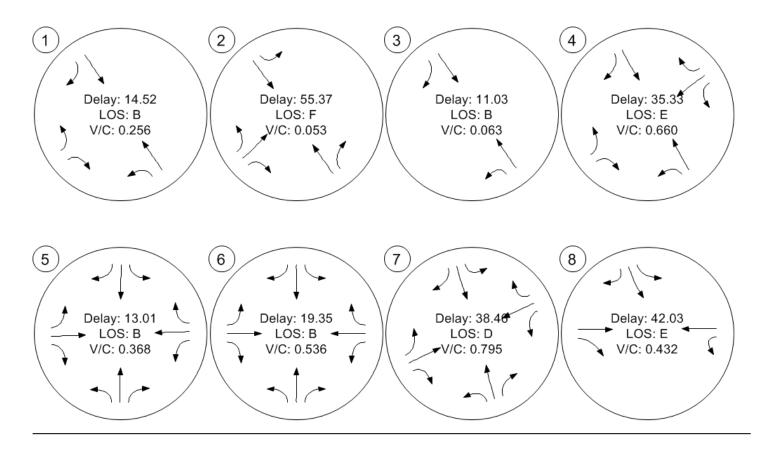
## Traffic Volume - Base Volume





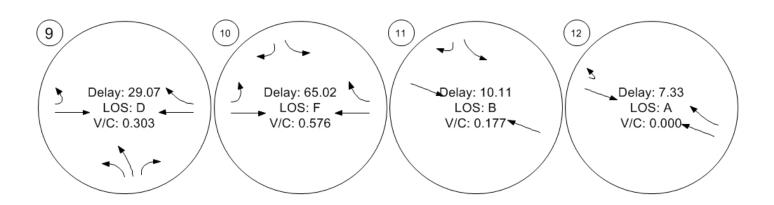
#### **Traffic Conditions**

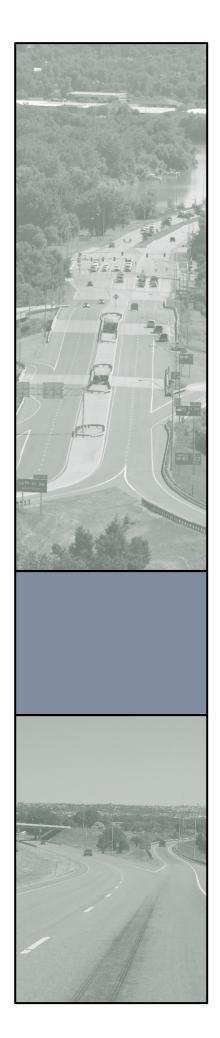




## **Traffic Conditions**









# **APPENDIX D**

**Projected Conditions Traffic Data Analysis** 

	BASIC FRE	EWAY SE	GMENTS WORKSHEE	ΪT	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsyt 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year	el <i>I-315 Ea</i> 2035	astbound
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	627	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.87 6 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.971	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x I x f_p)$ S D = $v_p / S$ LOS	N x f <sub>HV</sub> 371 55.0 6.7 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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Shane Forsyt		Site Information		
_				
9/15/2014	ne	Highway/Direction of Trave From/To Jurisdiction	I-15 to 1	
AM Peak Corridor Study		Analysis Year	2035	
		Des.(N)	□Plan	ning Data
				<u> </u>
514	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.76 6 0	
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
tments				
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 )] 0.971	
		Calc Speed Adj and	FFS	
2 55.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	55.0	mph mph mph mph
e Measures		Design (N)		
N x f <sub>HV</sub> 348 55.0 6.3 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x f}_p)$ $S$ $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Densi FFS - Free BFFS - Ba	ty -flow speed	E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	tments  1.00  1.5  2  55.0  Measures  N x f <sub>HV</sub> 348  55.0  6.3  A  S - Spee D - Densi FFS - Free BFFS - Ba  nour volume	514 veh/h veh/day  veh/h  tments  1.00 1.5  ft ft ft 2 ramps/mi mph mph mph  Measures  X x f <sub>HV</sub> 348 pc/h/ln 55.0 mph 6.3 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsy 9/15/2014	the	Highway/Direction of Trave From/To Jurisdiction	I-15 to	astbound 14th Ave
Analysis Time Period  Project Description I-15 (	PM Peak		Analysis Year	2035	
✓ Oper.(LOS)	Joinadi Glady		Pes.(N)	□ Plai	nning Data
Flow Inputs			703.(14)		Timing Data
Volume, V AADT	799	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.83 4	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments		<u> </u>		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)10.980	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft	- Suite operating and		
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures	;	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>		Design (N) Design LOS		
x f <sub>p</sub> ) S	*** 491 55.0	pc/h/ln mph	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x t <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S	8.9	pc/mi/ln	S		mph
LOS	A	ρο	$D = v_p / S$ Required Number of Lane	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11 f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design  Copyright © 2010 University of Floric		rved			rated: 9/15/2014 7:

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Shane Forsyti 9/15/2014 PM Peak orridor Study	he	Site Information Highway/Direction of Trave	el <i>I-315 W</i>	
9/15/2014 PM Peak	he		el <i>I-315 W</i>	
		Jurisdiction	I-15 to 1 2035	
		Analysis Year	2035	
		Des.(N)	Plan	ning Data
		. ,		
728	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.93 5 0	
	veh/h	Grade % Length Up/Down %	mi	
ments				
1.00 1.5		$E_{R}$ $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 )] 0.976	
2	ft ft	$f_{LW}$		mph
55.0	ramps/mi mph mph	TRD Adjustment	55.0	mph mph mph
Measures		Design (N)		
I x f <sub>HV</sub> 401 55.0 7.3 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Densit FFS - Free BFFS - Bas	ty -flow speed	f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	iments  1.00  1.5  2  55.0  Measures  I x f <sub>HV</sub> 401  55.0  7.3  A  S - Speed D - Densit FFS - Free BFFS - Base accour volume	veh/h  veh/h  veh/h  tments  1.00  1.5  ft ft ft 2 ramps/mi mph mph  se Measures  I x f <sub>HV</sub> 401 pc/h/ln 55.0 mph 7.3 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		astbound e to Fox Farm
Project Description <i>I-15</i> C			Analysis real	2000	
✓ Oper.(LOS)	,		Des.(N)	Plai	nning Data
Flow Inputs			. ,		
Volume, V AADT Peak-Hr Prop. of AADT, K	979	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.83 4 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.980	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance	_	ft ft	f <sub>LW</sub>		mph
Number of Lanes, N Total Ramp Density, TRD FFS (measured)	<i>2 55.0</i>	ramps/mi mph	f <sub>LC</sub> TRD Adjustment FFS	55.0	mph mph mph
Base free-flow Speed, BFFS		mph			<u></u>
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 602 55.0	pc/h/ln mph	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S LOS	10.9 A	pc/mi/ln	S D = v <sub>p</sub> / S Required Number of Lane	s, N	mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		/estbound re to Fox Farm
Project Description <i>I-15</i> C			, manyoto i out		
✓ Oper.(LOS)	•		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	585	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.82 5 0 Level mi	
DDHV - AADIXKXD		VEII/II	Up/Down %	1111	
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.976	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f		mph
Number of Lanes, N	2		f <sub>LW</sub> f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures	<b></b>	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub> 366	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	: N x f <sub>HV</sub>	n o /h /hn
x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	55.0 6.7 A	mph pc/mi/ln	$x f_p$ ) $S$ $D = v_p / S$ Required Number of Lane	s, N	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		astbound e to Fox Farm
	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	1216	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.90 3 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft ft			
Rt-Side Lat. Clearance Number of Lanes, N	2	IL	f <sub>LW</sub>		mph
·	2	ra mana /mai	f <sub>LC</sub>		mph
Total Ramp Density, TRD	55.0	ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 686 55.0	pc/h/ln mph	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S LOS	12.5 B	pc/mi/ln	S $D = v_p / S$ Required Number of Lanes	s, N	mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/15/2014 PM Peak	rthe	Highway/Direction of Trave From/To Jurisdiction Analysis Year		/estbound re to Fox Farm
Project Description <i>I-15</i> C			, manyoto i out		
✓ Oper.(LOS)	•		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	1418	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		<u> </u>		
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R -$	1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	55.0	mph mph	FFS	55.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S	N x f <sub>HV</sub> 758 55.0	pc/h/ln mph	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$	N x f <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S LOS	13.8 B	pc/mi/ln	S $D = v_p / S$ Required Number of Lane	s, N	mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11 f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		<sup>f</sup> Central
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	384	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.83 7 0 Level mi	
70.51 21.72		VOIDII	Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.966	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	2 65.0	ft ft ramps/mi mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment		mph mph mph
Base free-flow Speed, BFFS		mph	FFS	65.0	mph
LOS and Performanc	e Measures	}	Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x   x   f_p)$ $S$ $D = v_p / S$ LOS	N x f <sub>HV</sub> 239 65.0 3.7 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			es.(N)	☐ Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	230	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.83 21 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
$f_p$ $E_T$	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.905	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance	_	ft	$f_{LW}$		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	5	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV 452</sub>	n o /lo /lo	Design (N) Design LOS	Nyf	
x f <sub>p</sub> ) S	65.0	pc/h/ln mph	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	IN X IHV	pc/h/ln
D = v <sub>p</sub> / S	2.4	pc/mi/ln	S		mph
LOS	A	pomini	D = v <sub>p</sub> / S Required Number of Lane	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes	S - Spee				
V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	D - Dens FFS - Free BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design  Copyright © 2010 University of Floric		nuod	HCS 2010 <sup>TM</sup> Version 6.2	Con	erated: 9/8/2014 2:07 F

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	413	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.97 8 0 Level mi	
Calculate Flow Adjus	tmonte		Up/Down %		
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] 0.962	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times V)$ $x f_p)$ $S$ $D = v_p / S$ $LOS$	N x f <sub>HV</sub> 221 65.0 3.4 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
,	Corridor Study				
✓ Oper.(LOS)			Des.(N)	∐ Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	356	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.79 14 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.935	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f		mph
Number of Lanes, N	2	.,	f <sub>LW</sub>		mph
Total Ramp Density, TRD		ramps/mi	f <sub>LC</sub> TRD Adjustment		•
FFS (measured)	65.0	mph	_	05.0	mph
Base free-flow Speed, BFFS	00.0	mph	FFS	65.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 241 65.0 3.7 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p$ S $D = v_p / S$		pc/h/ln mph pc/mi/ln
			Required Number of Lane	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design			HCS 2010 <sup>TM</sup> Version 6.2		erated: 9/8/2014 2:08 l

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		r f Emerson Junction
Project Description I-15 (	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	351	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.89 21 0 Level mi	
Calculate Flow Adjus	tments		Up/Down %		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.905	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 65.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
LOS and Performanc	e Measures	<u> </u>	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x x f <sub>p</sub> )  S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 218 65.0 3.4 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p$ S $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design		nud	11-3 HCS 2010 <sup>TM</sup> Version 6.2	Con	erated: 9/8/2014 2:1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Emerson Junction
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)		nning Data
<b>Flow Inputs</b> Volume, V AADT	669	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.87 6	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.971	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 65.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
LOS and Performanc	e Measures	;	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times x f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Emerson Junction
	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	776	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.94 6 0 Level mi	
			Up/Down %		
Calculate Flow Adjus					
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_{R}$ $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 1)] <b>0</b> .971	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD	2	ft ft ramps/mi	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment		mph mph mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures		Design (N)		_
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 425 65.0 6.5 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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Shane Forsyth 9/8/2014 PM Peak orridor Study		Site Information  Highway/Direction of Trave From/To Jurisdiction Analysis Year		
9/8/2014 PM Peak		From/To Jurisdiction		
orridor Study		· · · · · · · · · · · · · · · · · · ·	2035	Emerson Junction
		Des.(N)	∐ Plan	ning Data
557	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	0.88 13 0	
	veh/h	Grade % Length Up/Down %	mi	
ments		· · · · · · · · · · · · · · · · · · ·		
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 )] 0.939	
		Calc Speed Adj and I	FFS	
2 65.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
Measures		Design (N)		
× f <sub>HV</sub> 337 65.0 5.2 A	pc/h/ln mph pc/mi/ln	x f <sub>p</sub> ) S D = v <sub>p</sub> / S Required Number of Lanes		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Densit FFS - Free- BFFS - Bas	y flow speed	f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	1.00 1.5  2 65.0  Measures  x f <sub>HV</sub> 337 65.0 5.2 A  S - Speed D - Densit FFS - Free- BFFS - Bas	veh/h  ments  1.00  1.5  ft ft ft 2 ramps/mi 65.0 mph mph  Measures	$\begin{array}{c} \text{weh/h} & \text{WRVs, P}_{R} \\ \text{General Terrain:} \\ \text{Grade} & \text{W}  \text{Length} \\ \text{Up/Down } \text{W} \\ \\ \hline \\ \textbf{Measures} \\ \hline \textbf{Measures} \\ \hline \textbf{Measures} \\ \hline \textbf{Measures} \\ \hline \textbf{Measures} \\ \hline \textbf{S}_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)] \\ \hline \textbf{Calc Speed Adj and I} \\ \textbf{S}_{LC} \\ \textbf{TRD Adjustment} \\ \textbf{FFS} \\ \textbf{MPh} \\ \hline \textbf{Measures} \\ \hline \textbf{Design (N)} \\ \hline \textbf{Design LOS} \\ \textbf{V}_{p} = (\text{V or DDHV}) / (\text{PHF x} \\ \textbf{X} \text{ f}_{p}) \\ \textbf{S} \\ \textbf{D} = \text{V}_{p} / \text{S} \\ \textbf{Required Number of Lanes} \\ \hline \textbf{Factor Location} \\ \hline \textbf{S}_{T} - \text{Exhibits 11-10, 11-12} \\ \textbf{E}_{T} - \text{Exhibits 11-10, 11-11, f}_{p} - \text{Page 11-18} \\ \textbf{LOS, S, FFS, v}_{p} - \text{Exhibits 11-3} \\ \hline \textbf{Our volume} \\ \hline \end{array}$	$\begin{array}{c} \text{Weh/h} & \begin{array}{c} \text{WeNy, P}_{R} & 0 \\ \text{General Terrain:} & Level \\ \text{Grade} & \begin{array}{c} \text{W} & \text{Length} \\ \text{Up/Down \%} \end{array} \end{array}$

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsy 9/8/2014	the	Highway/Direction of Trave From/To Jurisdiction	North of	Gore Hill
Analysis Time Period Project Description I-15 (	AM Peak Corridor Study		Analysis Year	2035	
✓ Oper.(LOS)	Jointagi Stady		Pes.(N)	□Plan	nning Data
Flow Inputs			700.(14)		ming Data
Volume, V AADT	803	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.90 16	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade -5.00% Length Up/Down %	0 Grade 0.69mi -5.00	
Calculate Flow Adjus	tments		Op/Down 70	0.00	
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = \frac{1}{[1+P_T(E_T - 1) + P_R(E_R - 1)]}$	1.2	
Speed Inputs	1.5		Calc Speed Adj and		
•		ft	Calc Speed Auj and	113	
Lane Width Rt-Side Lat. Clearance		ft	f <sub>LW</sub>		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> )	N x f <sub>HV</sub> 482	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>	pc/h/ln
S D = v <sub>p</sub> / S LOS	65.0 7.4 A	mph pc/mi/ln	x f <sub>p</sub> ) S D = v <sub>p</sub> / S Required Number of Lanes	s, N	mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	□Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	712	veh/h veh/day veh/h		0.85 7 0 <i>Grade</i> h 0.69mi	
			Up/Down %	5.00	
Calculate Flow Adjus					
f <sub>p</sub> E <sub>T</sub>	1.00 2.8		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	4.5 1)] 0.891	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 65.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
LOS and Performanc	e Measures	· · · · · · · · · · · · · · · · · · ·	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times x f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	1	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction	North of	f Gore Hill
Analysis Time Period Project Description <i>I-15</i> C	Corridor Study		Analysis Year	2035	
✓ Oper.(LOS)			Des.(N)	☐ Plar	nning Data
Flow Inputs					-
Volume, V AADT	1122	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.80 10	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade -5.00% Length	0 Grade 0.69mi	
			Up/Down %	-5.00	
Calculate Flow Adjus	tments				
$f_p$	1.00		$E_R$	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	)] <b>0</b> .952	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	i	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x I	N v f		Design (N) Design LOS		
x f <sub>p</sub> )		pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
S D = v <sub>p</sub> / S	65.0 11.3	mph pc/mi/ln	S		mph
LOS	В	рсліплі	D = v <sub>p</sub> / S Required Number of Lanes	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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В	ASIC FREEWAY SE	GMENTS WORKSHEE	T	
General Information		Site Information		
Agency or Company Date Performed 9, Analysis Time Period A	nane Forsythe 3/2014 M Peak	Highway/Direction of Trave From/To Jurisdiction Analysis Year	l I-15 SB North of 0 2035	Gore Hill
Project Description I-15 Corp				
✓ Oper.(LOS)		Des.(N)	∐ Plann	ning Data
Flow Inputs				
/olume, V 9 AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	'9 veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade 5.00% Length	0.93 10 0 Grade n 0.69mi	
		Up/Down %	5.00	
Calculate Flow Adjustm	ents			
f <sub>p</sub> 1. E <sub>T</sub> 2.	00 5	$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	4.5 )] 0.870	
Speed Inputs		Calc Speed Adj and F	FS	
ane Width Rt-Side Lat. Clearance Number of Lanes, N 2 Total Ramp Density, TRD	ft ft ramps/mi	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment		mph mph mph
Base free-flow Speed, BFFS	.0 mph mph	FFS	65.0	mph
OS and Performance I	leasures	Design (N)		
Operational (LOS)  Y <sub>p</sub> = (V or DDHV) / (PHF x N x x f <sub>p</sub> ) S O = v <sub>p</sub> / S OS	f <sub>HV</sub> 605 pc/h/ln 65.0 mph 9.3 pc/mi/ln A	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary		Factor Location		
N - Number of lanes  / - Hourly volume  / <sub>p</sub> - Flow rate  .OS - Level of service  speed  DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow	$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
N - Number of lanes  / - Hourly volume  /p - Flow rate  OS - Level of service	D - Density FFS - Free-flow speed BFFS - Base free-flow r volume	$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits	11-2,	3

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
Project Description I-15 C	Corridor Study		-		
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	519	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.89 14 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		·		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)1 <b>0.935</b>	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f		mph
Number of Lanes, N	2		f <sub>LW</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	 }	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x l	N x f <sub>HV</sub> 312	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub>	pc/h/ln
x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	65.0 4.8 A	mph pc/mi/ln	$x f_p$ ) S $D = v_p / S$		mph pc/mi/ln
			Required Number of Lane	s, N	_
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		of Central
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	569	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.94 8 0 Level mi	
DDIIV 701D I XIXXD			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.962	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD	2	ft ft	f <sub>LW</sub>		mph mph
FFS (measured) Base free-flow Speed, BFFS	65.0	ramps/mi mph mph	TRD Adjustment FFS	65.0	mph mph
LOS and Performanc	e Measures	;	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x I x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 315 65.0 4.8 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x} f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Central
	Corridor Study				
✓ Oper.(LOS)			Des.(N)	∐ Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	792	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.87 11 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		·		
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] <i>0.948</i>	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	65.0	mph	FFS	65.0	mph
Base free-flow Speed, BFFS		mph		00.0	
LOS and Performanc	e Measures	}	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>uv</sub>		<u>Design (N)</u> Design LOS		
x f <sub>p</sub> ) S	11 <sup>v</sup> 480 65.0	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f <sub>HV</sub>	pc/h/ln
D = v <sub>p</sub> / S	7.4	mph pc/mi/ln	S		mph
LOS	7. <del>4</del> A	рслили	$D = v_p / S$		pc/mi/ln
203			Required Number of Lane	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
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Shane Forsyt	he	Site Information		
j	he			
PM Peak		Highway/Direction of Trave From/To Jurisdiction Analysis Year	el I-15 SB South of 2035	<sup>:</sup> Central
orridor Study		,		
		Des.(N)	Plan	ning Data
793	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.90 14 0 Level mi	
		Up/Down %		
tments				
1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 )] 0.935	
		Calc Speed Adj and	FFS	
2	ft ft ramps/mi	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment		mph mph mph
65.0	mph mph	FFS	65.0	mph
e Measures		Design (N)		
N x f <sub>HV</sub> 471 65.0 7.2 A	pc/h/ln mph pc/mi/ln	$x f_p$ ) S $D = v_p / S$		pc/h/ln mph pc/mi/ln
		Factor Location		
D - Densi FFS - Free BFFS - Ba	ty -flow speed	E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18		f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
	793  timents  1.00 1.5  2  65.0  Measures  I x f <sub>HV</sub> 471 65.0 7.2 A  S - Spee D - Densi FFS - Free BFFS - Ba nour volume	793 veh/h veh/day  veh/h  tments  1.00 1.5  ft ft ft 2 ramps/mi mph mph mph  **Measures  I x f <sub>HV</sub> 471 pc/h/ln 65.0 mph 7.2 pc/mi/ln A  S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow		

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description I-15 C	Corridor Study		•		
✓ Oper.(LOS)			Pes.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	297	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.92 10 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments		·		
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.952	
Speed Inputs			Calc Speed Adj and		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	$f_{LW}$		mph
Number of Lanes, N	2		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v <sub>p</sub> = (V or DDHV) / (PHF x	N x f <sub>HV</sub> 169	pc/h/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x	N x f.n.	
x f <sub>p</sub> ) S	65.0	mph	x f <sub>p</sub> )	HV	pc/h/ln
D = v <sub>p</sub> / S	2.6	pc/mi/ln	S		mph
LOS	Α	·	$D = v_p / S$ Required Number of Lane.	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design  Copyright © 2010 University of Floric		d	HCS 2010 <sup>TM</sup> Version 6.2	Con	erated: 9/8/2014 2:23 F

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	BASIC FRI	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 AM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			es.(N)	□Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	286	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.79 20 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.909	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance		ft ft	f <sub>LW</sub>		mph
Number of Lanes, N	2		$f_{LC}$		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x l x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 199 65.0 3.1 A	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \text{ x} \text{ x } f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	Shane Forsy 9/8/2014 PM Peak	the	Highway/Direction of Trave From/To Jurisdiction Analysis Year		f Gore Hill
Project Description I-15 C	Corridor Study				
✓ Oper.(LOS)			Des.(N)	☐ Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	303	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain:	0.96 12 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_{R}$ $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2	
Speed Inputs	1.5		Calc Speed Adj and		
			Caic Speeu Auj anu	rrs	
Lane Width		ft			_
Rt-Side Lat. Clearance Number of Lanes, N	2	ft	f <sub>LW</sub>		mph
•	2	rompo/mi	f <sub>LC</sub>		mph
Total Ramp Density, TRD	65.0	ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	65.0	mph mph	FFS	65.0	mph
LOS and Performanc	e Measures	}	Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x   x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 167 65.0 2.6 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11, $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1

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	BASIC FRI	EWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed	Shane Forsyt	the	Highway/Direction of Trave From/To Jurisdiction	South o	f Gore Hill
Analysis Time Period  Project Description I-15 C	PM Peak Corridor Study		Analysis Year	2035	
✓ Oper.(LOS)	onnaer Grady		Des.(N)	□Plai	nning Data
Flow Inputs					9
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	444	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.89 6 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f <sub>p</sub> E <sub>T</sub>	1.00 1.5		$E_R$ $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 0.971	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 65.0	ft ft ramps/mi mph mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	65.0	mph mph mph mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)  v <sub>p</sub> = (V or DDHV) / (PHF x I x f <sub>p</sub> ) S D = v <sub>p</sub> / S LOS	N x f <sub>HV</sub> 257 65.0 4.0 A	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \text{ x})$ $x f_p)$ $S$ $D = v_p / S$ Required Number of Lane		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service speed	BFFS - Ba		$E_R$ - Exhibits 11-10, 11-12 $E_T$ - Exhibits 11-10, 11-11 $f_p$ - Page 11-18 LOS, S, FFS, $v_p$ - Exhibits 11-3	, 11-13	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design			HCS 2010 <sup>TM</sup> Version 6.2		erated: 9/8/2014 2:26 F

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		RAMP	S AND RAN	IP JUNCTI	ONS WO	RKS	HEET				
General Infor	mation			Site Infor							
Analyst Agency or Company		ne Forsythe		reeway/Dir of Trunction	avel	10th Av	re NB Off-r d I-315	amp			
Date Performed	9/15/	2014	J	urisdiction							
Analysis Time Period	AM F	Peak	Α	nalysis Year		2035					
Project Description											
Inputs											
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2 1					Downstrea Ramp	m Adj	
□Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	'					□Yes	□On	
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>E</sub>	740 803					<b>☑</b> No	Off	
L <sub>up</sub> = fi	t	Ramp Volume	e, V <sub>R</sub>	206					L <sub>down</sub> =	ft	
V <sub>u</sub> = ve	eh/h	1	-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 55.0					V <sub>D</sub> =	veh/h	
Conversion to	pc/h Un	der Base	Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	803	0.90	Level	16	0	0.	926	1.00	96	57	
Ramp	206	0.83	Level	3	0	0.	985	1.00	25	53	
UpStream											
DownStream											
<b>-</b>	Merge Areas							iverge Areas			
Estimation of	V <sub>12</sub>				Estimation of v <sub>12</sub>						
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>		
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)	
P <sub>FM</sub> =		Equation (			P <sub>FD</sub> =		-	000 using Equ			
V <sub>12</sub> =	pc/h	, ,	,		V <sub>12</sub> =			67 pc/h	(=	,	
V <sub>3</sub> or V <sub>av34</sub>	•	Faustion 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13_17)	
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			-14-01-13-17)			> 2 7		Yes ☑ No	11 13-14 01	13-17)	
Is $V_3$ or $V_{av34} > 1.5$ *			10 10 10		1			Yes ✓ No	10 10 10	40 40	
If Yes,V <sub>12a</sub> =	pc/n ( 13-19)		-16, 13-18, or		If Yes,V <sub>12a</sub> =	=	19	c/h (Equation	13-16, 13-	18, OF 13-	
Capacity Che		<u> </u>			Capacit	v Ch		<i>5)</i>			
	Actual		apacity	LOS F?	Joupaon	<del>y 0</del>	Actual	Cal	pacity	LOS F?	
	7101001	† ĭ	ναρασιτή	20011	V <sub>F</sub>	-	967	Exhibit 13-8		No	
V		Fvb:bit 12 0				\/		Exhibit 13-8		+	
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$		714	_	+	No	
					V <sub>R</sub>		253	Exhibit 13-10		No	
Flow Entering	g Merge In	fluence A	rea		Flow Er	<u>iterin</u>	g Dive	rge Influen			
	Actual		Desirable	Violation?		1	Actual	Max Desirab	le	Violation?	
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		967	Exhibit 13-8	4400:All	No	
Level of Serv	ice Detern	nination (	if not F)		Level or	f Serv	vice De	terminatio	n (if not l	<b>F</b> )	
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>			D <sub>R</sub> = 4	.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>		
D <sub>R</sub> = (pc/mi/ln			, ,		$D_R = 5$	.9 (pc/r	ni/ln)				
LOS = (Exhibit '	,				1		oit 13-2)				
Speed Detern					Speed L			<u> </u>			
					<del>                                     </del>						
M <sub>S</sub> = (Exibit 13	•				ľ	-	xhibit 13-	*			
S <sub>R</sub> = mph (Exh	ibit 13-11)					-	(Exhibit	· ·			
$S_0 = mph (Exh$	ibit 13-11)				$S_0 = N$	/A mph	(Exhibit	13-12)			
	ibit 13-13)				S = 60	0.6 mph	(Exhibit	13-13)			
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			MPS AND	RAMP JUN			<u>EE I</u>				
General	Inform	ation			Site Infor	mation					
nalyst		Shar	ne Forsythe	Fr	eeway/Dir of Tr	avel	10th A	ve NB On-ra	amp		
gency or Co	mpany			Ju	ınction		I-15 an	d I-315			
ate Perform	ed	9/15/	2014	Ju	ırisdiction						
nalysis Time	e Period	AM F	Peak	Ar	nalysis Year		2035				
roject Descr	iption										
nputs											
pstream Ad	i Ramp		Freeway Numl	ber of Lanes, N	2					Downstre	am Adi
pot. ou	, . top		Ramp Number	of Lanes, N	1					Ramp	
Yes	☐ On		Acceleration L	ane Length, L <sub>Δ</sub>	590						□ o=
_	_		1	ane Length L <sub>D</sub>						□Yes	☐ On
✓ No	Off		1		E40					✓ No	Off
_	£		Freeway Volur	•	519					. =	ft
<sup>nb</sup> =	ft		Ramp Volume	13	175					L <sub>down</sub> =	11
=	veh/h		Freeway Free-	Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
u <sup>—</sup>	veii/ii		Ramp Free-Flo	ow Speed, S <sub>FR</sub>	35.0					I. D	701111
onvers	ion to	pc/h Un	der Base (	Conditions							
		V	PHF		%Truck	0/ Dv		f	f	v = V/PH	F x f <sub>HV</sub> x f <sub>p</sub>
(pc/h)		(Veh/hr)		Terrain		%Rv	_	f <sub>HV</sub>	f <sub>p</sub>	V - V/FIT	' ^ 'HV ^ 'p
reeway		519	0.89	Level	14	0		935	1.00		623
Ramp		175	0.75	Level	7	0	0.	966	1.00		243
JpStream											
ownStream			<u> </u>								
- 4! 4!	<b>-</b> -		Merge Areas			F = 45 4		<u>,                                    </u>	iverge Areas		
stimati	on ot v	12				Estimat	ion c	τν <sub>12</sub>			
		$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	R)P <sub>FD</sub>	
EQ =		(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13	-12 or 13-	13)
-\(\frac{1}{2} = \frac{1}{2} =				ion (Exhibit 13-6)	ı	P <sub>FD</sub> =			Ising Equatio		
гм 12 =		623 p		(=/5.1. 10 0)		V <sub>12</sub> =			oc/h	o (=/o	• . /
		•		10 44 40 47)						10 11 10	17\
<sub>3</sub> or V <sub>av34</sub>	. 0.700	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	. 0 =		oc/h (Equation		17)
		oc/h?  Ye							]Yes ☐ No		
s V <sub>3</sub> or V <sub>av3</sub>	<sub>1</sub> > 1.5 * V	<sub>12</sub> /2 □ Ye				Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.5		]Yes ☐ No		
Yes,V <sub>12a</sub> =				-16, 13-18, or		If Yes,V <sub>12a</sub> :	=		oc/h (Equatio	on 13-16, 1	3-18, or
apacity	Choc	13-19)	)			Capacit			3-19)		
араспу	Cireci	Actual	Γ	apacity	LOS F?	Capacit	y Cir	Actual	Ca	pacity	LOS F
	-	notual	<del>                                     </del>	αρασιιγ	LUUF!	1/	$\dashv$	nuluai	Exhibit 13-		LUST
						V <sub>F</sub>					
$V_{FO}$		866	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-		
						V <sub>R</sub>			Exhibit 13	3-	
· · · · · · · · · · · · · · · · · · ·	<u> </u>	1/	<u>                                     </u>				. 4	- D'	10	4	
iow En	tering i		fluence A		1 10 10 0	Flow Er	_		ge Influer		
	-+	Actual	<del>1</del>	Desirable	Violation?		+	Actual	Max Des	sirable 	Violation
V <sub>R12</sub>		866	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		<u></u>
			nination (i			<del> </del>			terminatio		t <i>F)</i>
$D_R = $	5.475 + 0.0	00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			$D_R = 4$	1.252 + 0.	0086 V <sub>12</sub> - 0	).009 L <sub>D</sub>	
<sub>R</sub> = 8.4	(pc/mi/ln)					$D_R = (p$	oc/mi/l	n)			
	Exhibit 13					., .,	Exhibit	•			
peed D						Speed L			n		
•									.,		
•	89 (Exibit	-					Exhibit 1				
- 50	4 mph (Ex	hibit 13-11)				I		nibit 13-12)			
•											
•	A mph (Ex	hibit 13-11)				$S_0 = m$	iph (Exh	nibit 13-12)			
,= N/A		hibit 13-11) hibit 13-13)				ľ		nibit 13-12) nibit 13-13)			

		RAMP	S AND RAN	IP JUNCTI	ONS WO	RKS	HEET				
General Infor	mation		<u> </u>	Site Infor							
Analyst Agency or Company		ne Forsythe		reeway/Dir of Trunction		10th Av	re SB Off-r	amp			
Date Performed	9/15/	2014	J	urisdiction							
Analysis Time Period	AM F	Peak	A	nalysis Year		2035					
Project Description											
Inputs											
Upstream Adj Ra	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2					Downstrea Ramp	ım Adj	
□Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	•					□Yes	On	
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	463 671					✓ No	Off	
L <sub>up</sub> = fi		Ramp Volume		206					L <sub>down</sub> =	ft	
V <sub>u</sub> = ve	eh/h	1	-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 55.0					V <sub>D</sub> =	veh/h	
Conversion to	pc/h Un	der Base	Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	671	0.94	Level	8	0	0.	962	1.00	74	16	
Ramp	206	0.83	Level	3	0	0.	985	1.00	25	53	
UpStream											
DownStream					ļ						
F-4:4:4	Merge Areas					Diverge Areas  Estimation of v <sub>12</sub>					
Estimation of	V <sub>12</sub>				Estimat	ion o	τν <sub>12</sub>				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>		
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)	
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Equ	ation (Exhil	bit 13-7)	
V <sub>12</sub> =	pc/h	. ,	,		V <sub>12</sub> =			6 pc/h	,	,	
V <sub>3</sub> or V <sub>av34</sub>	•	Faustion 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13 <sub>-</sub> 14 or	13_17)	
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			14 01 10 17)			> 2 7		Yes ☑ No	11 13-14 01	10-17)	
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> :			Yes Mo c/h (Equation	13-16, 13-	18, or 13-	
Capacity Che		<i></i>			Capacit	tv Ch		-,			
	Actual	1 0	apacity	LOS F?		. <del>)</del>	Actual	Car	pacity	LOS F?	
			- cip areas		V <sub>F</sub>		746	Exhibit 13-8	1	No	
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>		493	Exhibit 13-8		No	
<b>V</b> FO		EXHIBIT 13-0			-			Exhibit 13-10			
		<u> </u>			V <sub>R</sub>		253			No	
Flow Entering		1		1 1/2-1-60	Flow Er	-		rge Influenc		17.1.0.0	
	Actual		Desirable	Violation?			Actual	Max Desirab		Violation?	
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		746	Exhibit 13-8	4400:All	No	
Level of Serv					_			terminatio	•	<u>F)                                    </u>	
$D_R = 5.475 + 0.0$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>			$D_R = 4$	.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>		
D <sub>R</sub> = (pc/mi/ln)	)				$D_R = 6$	.5 (pc/r	ni/ln)				
LOS = (Exhibit 1	13-2)				LOS = A	(Exhib	oit 13-2)				
Speed Detern	nination				Speed I	Deter	minatio	on			
M <sub>S</sub> = (Exibit 13					<del></del>		xhibit 13-				
S <sub>R</sub> = mph (Exh	ibit 13-11)				$S_R = 6$	0.6 mph	(Exhibit	13-12)			
	ibit 13-11)					I/A mph	(Exhibit	13-12)			
• • •	ibit 13-13)				1	-	(Exhibit	-			
. `		All Rights Reser	ved		HCS2010 <sup>TM</sup>		-	-	nerated: 9/15/	/2014 9:03 AI	

		RAI	MPS AND	RAMP JUN	CTIONS W		<u>EET</u>				
General	Inform	ation			Site Infor	mation					
Analyst		Shan	e Forsythe	Fr	eeway/Dir of Tr	avel	10th A	ve SB On-ra	amp		
gency or Co	ompany			Ju	ınction		I-15 ar	nd I-315			
ate Perform	ned	9/15/	2014	Jι	ırisdiction						
nalysis Tim	e Period	AM P	Peak	Ar	nalysis Year		2035				
roject Desc	ription										
nputs											
pstream Ad	li Ramp		Freeway Numl	oer of Lanes, N	2					Downstre	am Adi
pot. 00	.j . top		Ramp Number	of Lanes, N	1					Ramp	· · · · · · · · · · · · · · · · · · ·
Yes	On		Acceleration L	ane Length, L <sub>Δ</sub>	1500						
_	_			ane Length L <sub>D</sub>						□Yes	☐ On
✓ No	Off				740					✓ No	Off
_	££		Freeway Volur		713					=	ft
<sub>nb</sub> =	ft		Ramp Volume	1.	339					L <sub>down</sub> =	IL
_	veh/h		Freeway Free-	Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
_ =	veii/ii		Ramp Free-Flo	ow Speed, S <sub>FR</sub>	35.0					1.0	VO.1111
onvers	ion to	pc/h Und	der Base (	Conditions						•	
		V	PHF	Terrain	%Truck	%Rv		f I	f	V = \//DU	F x f <sub>HV</sub> x f <sub>p</sub>
(pc/h	,	(Veh/hr)	r'nr	i ci i aii i	/0 ITUCK		$\bot$	f <sub>HV</sub>	f <sub>p</sub>	V - V/F []	
reeway		713	0.85	Level	7	0		.966	1.00	1	870
Ramp		339	0.77	Level	5	0	0	.976	1.00		451
JpStream											
OownStrean	1		<u> </u>								
- 4! 4!	·		Merge Areas			F - 4' 4		D	iverge Areas		
stimati	on or v	12				Estimat	ion c	or v <sub>12</sub>			
		$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
EQ =		(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(	Equation 13	3-12 or 13-	13)
FM =				on (Exhibit 13-6)	1	P <sub>FD</sub> =			ısing Equati		
' <sub>12</sub> =		870 p		(=/		V <sub>12</sub> =			oc/h	O (=/	.,
		•		10 44 40 47)				•		12 14 12	17)
or V <sub>av34</sub>	. 0.700	-		13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>	. 0 -		oc/h (Equation		17)
		pc/h? Ye					• .		]Yes □ No		
s V <sub>3</sub> or V <sub>av3</sub>	<sub>4</sub> > 1.5 * V	′ <sub>12</sub> /2 □ Ye				Is V <sub>3</sub> or V <sub>av</sub>	, <sub>34</sub> > 1.5		]Yes □ No		
Yes,V <sub>12a</sub> =				-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equation	on 13-16, 1	13-18, or
Capacit		13-19)				Capacit			3-19)		
apacity	Cirec		1 0	ana aitu	LOS F?	Capacit	y CII	Actual	1 0	anacity.	LOS F?
	-	Actual	<del>                                     </del>	apacity	LUSF?	\ \/		Actual		apacity	LUSF?
						V <sub>F</sub>			Exhibit 13		
$V_{FO}$	,	1321	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13	i-8	
						V <sub>R</sub>			Exhibit 13	3-	
		<del></del>	<u></u>						10		
low En	tering		fluence A		1 10 10 0	Flow Er	_		ge Influe		,
	-+	Actual	<del>†                                      </del>	Desirable	Violation?		+	Actual	Max De	siradie 	Violation <sup>4</sup>
V <sub>R12</sub>		1321	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8	1	<u></u>
			nination (i						terminatio		t F)
$D_R =$	5.475 + 0.	00734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	0627 L <sub>A</sub>			$D_R = 4$	4.252 + 0.	0086 V <sub>12</sub> - 0	0.009 L <sub>D</sub>	
<sub>R</sub> = 6.2	2 (pc/mi/ln	)				$D_R = (p$	oc/mi/l	n)			
	Exhibit 13					1 ., ,,		13-2)			
peed D	•					Speed L			n		
•						<del>                                     </del>					
•	231 (Exibit					°	Exhibit 1	•			
	.7 mph (E:	xhibit 13-11)				S <sub>R</sub> = m		nibit 13-12)			
		hibit 13-11)				$S_0 = m$	ıph (Exl	nibit 13-12)			
= N/.	A mph (Ex	thibit 13-11) xhibit 13-13)				ľ		nibit 13-12) nibit 13-13)			

		RAMP	S AND RAN	MP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor						
Analyst Agency or Company	Shar	ne Forsythe		reeway/Dir of Tr	avel	10th Av I-15 an	e NB Off-r d I-315	amp		
Date Performed		/2014		urisdiction						
Analysis Time Period	d PM F	Peak	Δ	nalysis Year		2035				
Project Description										
Inputs		l						ı		
Upstream Adj R	amp	Ramp Numbe	ber of Lanes, N of Lanes, N	2 1					Downstrea Ramp	ım Adj
□Yes □	On		ane Length, L <sub>A</sub>	740					□Yes	On
☑ No	Off	Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	740 1122					✓ No	Off
L <sub>up</sub> = f	t	Ramp Volume		543					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	65.0 55.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1122	0.80	Level	10	0	0.	952	1.00	14	73
Ramp	543	0.83	Level	3	0	0.	985	1.00	66	64
UpStream										
DownStream		ــــــــــــــــــــــــــــــــــــــ								
Fatimatian at	Merge Areas					ion o		iverge Areas		
Estimation of	V <sub>12</sub>				Estimat	ion o				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	$V_R + (V_F - V_F)$	P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Equ	ıation (Exhi	bit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		14	73 pc/h		
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		0	pc/h (Equatio	n 13-14 or	13-17)
Is $V_3$ or $V_{av34} > 2,70$	0 pc/h?	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 2,7	00 pc/h? [	]Yes ☑ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *	'V <sub>12</sub> /2 □ Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	Yes <b>☑</b> No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	cks				Capacit	y Che	ecks			
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					$V_{F}$		1473	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	809	Exhibit 13-8	4700	No
					V <sub>R</sub>		664	Exhibit 13-10	2200	No
Flow Entering	a Merae Ir	ofluence A	rea			terin	a Dive	ge Influenc	ce Area	·
	Actual	1	Desirable	Violation?			Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		473	Exhibit 13-8	4400:All	No
Level of Serv	ice Deterr	nination (	if not F)			f Serv	ice De	terminatio	ı (if not i	<del></del>
D <sub>R</sub> = 5.475 + 0.								.0086 V <sub>12</sub> - 0.0		,
D <sub>R</sub> = (pc/mi/ln	7.7	12	^			0.3 (pc/		12	5	
LOS = (Exhibit	•				I ***		oit 13-2)			
Speed Detern					Speed L			n n		
					<del>  '                                   </del>		xhibit 13-			
M <sub>S</sub> = (Exibit 1:	•							-		
	ibit 13-11)						(Exhibit			
	ibit 13-11)				1	-	(Exhibit	•		
	ibit 13-13)						(Exhibit	-		
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_			MPS AND	RAIVIP JUIN							
General	Inforn				Site Infor						
Analyst		Shan	e Forsythe	Fr	eeway/Dir of Tr			e NB On-rai	mp		
gency or Co					inction		I-15 and	l I-315			
ate Perform			2014		risdiction						
nalysis Time		PM F	<sup>2</sup> eak	Ar	nalysis Year		20				
Project Desci	ription										
nputs			L								
lpstream Ad	lj Ramp		Freeway Numb		2					Downstre	am Adj
٦.,			Ramp Number	of Lanes, N	1					Ramp	
Yes	On		Acceleration La	ane Length, L <sub>A</sub>	590					□Yes	On
✓ No	Off		Deceleration La	ane Length L <sub>n</sub>							
Y NO			Freeway Volun		792					✓ No	Off
up =	ft		Ramp Volume,	•	274					L <sub>down</sub> =	ft
ир			1	<sup>v</sup> R Flow Speed, S <sub>FF</sub>						uomi	
/ <sub>u</sub> =	veh/h		1		65.0					V <sub>D</sub> =	veh/h
			Ramp Free-Flo	111	35.0						
Convers	ion to	•	der Base C	Conditions	·	T		1		<u> </u>	
(pc/h)	)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	1	HV	f <sub>p</sub>	v = V/PHI	x f <sub>HV</sub> x f <sub>p</sub>
reeway		792	0.87	Level	11	0		948	1.00		963
Ramp	-+	274	0.07	Level	4	0		980	1.00		304
JpStream	$\overline{}$	214	0.32	FGAGI	<del>  "</del>	U	0.8	,00	1.00		JU <del>1</del>
DownStream	n						+				
Journou Gair	·· <u>I</u>		Merge Areas		<u> </u>			Div	verge Areas		
stimati	on of v					Estimati	ion o				
			/D \						. (\) \	\D	
		$V_{12} = V_F$							<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>		
EQ =			ation 13-6 or			L <sub>EQ</sub> =		(E	Equation 13-	12 or 13-1	3)
) <sub>FM</sub> =		1.000	using Equati	on (Exhibit 13-6)		P <sub>FD</sub> =		us	sing Equatio	n (Exhibit 1	3-7)
' <sub>12</sub> =		963 p	c/h			V <sub>12</sub> =		po	c/h		
′ <sub>3</sub> or V <sub>av34</sub>		0 pc/l	h (Equation 1	3-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		ро	c/h (Equation 1	3-14 or 13-	17)
	, > 2,700	pc/h? Ye		•			, > 2,70	00 pc/h? 🖂	Yes No		·
	-	/ <sub>12</sub> /2 □ Ye							Yes ☐ No		
				-16, 13-18, or					c/h (Equation	n 13-16. 1	3-18. or
Yes,V <sub>12a</sub> =		13-19)				If Yes,V <sub>12a</sub> =			·19)		,
Capacity	/ Chec	ks				Capacit	y Che	ecks			
		Actual	Ca	pacity	LOS F?			Actual	Car	acity	LOS F
			1 1			$V_{F}$			Exhibit 13-8	3	
\/		1267	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>D</sub>		Exhibit 13-8	3	
$V_{FO}$	)	1207	EXHIBIT 13-0		INO		K		Exhibit 13-	_	
						$V_R$			10		
low En	tering	Merge In	fluence A	rea		Flow En	terin	g Diverg	ge Influen	ce Area	
	Ĭ	Actual	1	esirable	Violation?			ctual	Max Desi		Violation
V <sub>R12</sub>	·	1267	Exhibit 13-8	4600:All	No	V <sub>12</sub>		7	Exhibit 13-8		
		e Detern	nination (i	f not F)	-		Serv	ice Det	erminatio	n (if not	F)
			0.0078 V <sub>12</sub> - 0.0						086 V <sub>12</sub> - 0.	_	•
	.5 (pc/mi/l		12	А			c/mi/ln		12	U	
••		-									
	(Exhibit 13						xhibit				
peed D	eterm	ination				Speed L			1		
I <sub>S</sub> = 0.2	294 (Exibit	13-11)					xhibit 13	3-12)			
.5	2 mnh /E	xhibit 13-11)				S <sub>R</sub> = m	ph (Exhi	bit 13-12)			
ū	.∠ mpn (⊏										
S <sub>R</sub> = 58.		· ·				$S_0 = m$	ph (Exhi	bit 13-12)			
$_{R}^{=}$ 58.	A mph (Ex	chibit 13-11) xhibit 13-13)				ľ		bit 13-12) bit 13-13)			

		RAMP	S AND RAI	MP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		- /	Site Infor			· · · · · ·			
Analyst Agency or Company Date Performed		e Forsythe		Freeway/Dir of Tra Junction Jurisdiction		10th Av I-15 an	/e NB Off-r d I-315	ramp		
Analysis Time Period				Analysis Year		2035				
Project Description				•						
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes. N	2 1					Downstre Ramp	am Adj
□Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	·					□Yes	□On
✓ No	Off	Deceleration L Freeway Volu	∟ane Length L <sub>D</sub> me, V <sub>⊏</sub>	463 936					✓No	Off
L <sub>up</sub> = f	t	Ramp Volume	e, V <sub>R</sub>	256					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	= 65.0 55.0					V <sub>D</sub> =	veh/h
Conversion to	o pc/h Und	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHI	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	936	0.90	Level	14	0	0.	935	1.00	1	118
Ramp	256	0.83	Level	7	0	0.	966	1.00		320
UpStream						_				
DownStream		Merge Areas						Diverge Areas		
Estimation of		werge Areas			Estima	tion o	f v	iverge Areas	·	
<u> </u>					LStilla					
	$V_{12} = V_F$							· V <sub>R</sub> + (V <sub>F</sub> -	–	
<sub>-EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =		-	-	-12 or 13-1	•
P <sub>FM</sub> =	using	Equation (E	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using E	quation (Ex	nibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		11	118 pc/h		
$V_3^{}$ or $V_{\rm av34}^{}$		•	-14 or 13-17)		$V_3$ or $V_{av34}$				tion 13-14 c	or 13-17)
Is $V_3$ or $V_{av34} > 2,70$								☐Yes ☑ N		
Is $V_3$ or $V_{av34} > 1.5$					Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		Yes 🗹 N		
f Yes,V <sub>12a</sub> =		•	-16, 13-18, or		If Yes,V <sub>12a</sub>	=			on 13-16, 13	3-18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	9)		
capacity che	Actual	1 ^	apacity	LOS F?	Capacit	y Cir	Actual	1	Capacity	LOS F?
	Actual	Ĭ	αρασιτή	2001:	V <sub>F</sub>		1118	Exhibit 1		No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{I}$	_	798	Exhibit 1	_	No
*FO		EXHIBIT 13-0			-			Exhibit 13	_	_
	<u> </u>	<u> </u>			V <sub>R</sub>		320			No
Flow Entering		·		Violetian	Flow El				nce Area	
V	Actual		Desirable	Violation?	\/		Actual	Max Desi		Violation?
V <sub>R12</sub>	. 5 (	Exhibit 13-8	· ( =)		V <sub>12</sub>		1118	Exhibit 13-8		No No
Level of Serv					+				on (if not	<i>F)</i>
D <sub>R</sub> = 5.475 + 0.	• •	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>					.0086 V <sub>12</sub> -	0.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln					I ''	.7 (pc/r	,			
LOS = (Exhibit	13-2)				LOS = A	(Exhil	oit 13-2)			
Speed Detern	nination				Speed I	Deter	minatio	on		
M <sub>S</sub> = (Exibit 1:	3-11)				$D_s = 0$	.197 (E	xhibit 13-	-12)		
	ibit 13-11)				$S_R = 6$	0.5 mph	(Exhibit	13-12)		
	ibit 13-11)				$S_0 = N$	I/A mph	(Exhibit	13-12)		
	ibit 13-13)				1	0.5 mph	(Exhibit	13-13)		
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0		MPS AND	RAMP JUN							
General Info				Site Infor						
nalyst		ne Forsythe		eeway/Dir of Tr			SB On-ram	ıp		
gency or Compan ate Performed	-	70014		ınction ırisdiction		I-15 and I-	-315			
nalysis Time Peri		i/2014 Peak		nalysis Year		2035				
Project Description	Ja i ivi i	Cak	74	idiyələ i cai		2000				
nputs										
-	_	Freeway Numb	per of Lanes, N	2					Daumatra	om Adi
Ipstream Adj Ram	p	Ramp Number		1					Downstre Ramp	am Adj
□Yes □C	)n	1	ane Length, L	1500						
_			- 7	1300					□Yes	☐ On
✓ No 🗆 C	)ff	Deceleration L		004					✓ No	Off
- ft		Freeway Volur		981					I. =	ft
<sub>up</sub> = ft		Ramp Volume	1.	453					L <sub>down</sub> =	10
'u = veh/	'h		Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
u ro		Ramp Free-Flo	ow Speed, S <sub>FR</sub>	35.0					В	
Conversion	to pc/h Un	der Base (	Conditions		ı	_				
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>H</sub>	v	$f_p$	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
reeway	981	0.93	Level	10	0	0.95	2	1.00	,	108
Ramp	453	0.94	Level	5	0	0.97	6	1.00		494
UpStream										
DownStream										
		Merge Areas						erge Areas		
stimation o	of V <sub>12</sub>				Estimati	on of	V <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> = V <sub>F</sub>	+ (V <sub>F</sub> - V <sub>R</sub>	)P <sub>FD</sub>	
EQ =	(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(E	quation 13-	12 or 13-1	3)
) <sub>FM</sub> =	1.000	using Equati	on (Exhibit 13-6)		P <sub>FD</sub> =		us	ing Equatio	n (Exhibit 1	3-7)
′ <sub>12</sub> =	1108	pc/h			V <sub>12</sub> =		рс	/h		
<sup>12</sup> <sub>3</sub> or V <sub>av34</sub>		•	3-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		pc/	h (Equation 1	3-14 or 13-1	7)
s V <sub>3</sub> or V <sub>av34</sub> > 2,7	-		,			, > 2,700		Yes □ No		,
ls V <sub>3</sub> or V <sub>av34</sub> > 1.5								res □ No		
			-16, 13-18, or		1 "			/h (Equatio	n 13-16, 1	3-18, or
Yes,V <sub>12a</sub> =	13-19				If Yes,V <sub>12a</sub> =		13-1			
Capacity Ch				-	Capacity	y Chec				
	Actual	C	apacity	LOS F?	ļ		Actual	1	pacity	LOS F?
					V <sub>F</sub>			Exhibit 13-8	3	
$V_{FO}$	1602	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-8	3	
					V <sub>R</sub>			Exhibit 13	-	
Jan Cataria	 					40 25 20 20	Divore	10		
low Enterin	Actual		Desirable	Violation?	FIOW EII	Act		e Influen Max Desi		Violation?
V <sub>R12</sub>	1602	Exhibit 13-8	4600:All	No	V <sub>12</sub>	AUL		Exhibit 13-8	. 4510	v iolation!
*R12				110		Sorviv		rminatio	n (if not	E)
								086 V <sub>12</sub> - 0.		Γ)
evel of Ser		0.0070 v <sub>12</sub> - 0.0	0027 L <sub>A</sub>				32 1 0.00	000 v <sub>12</sub> - 0.	.003 L <sub>D</sub>	
<b>D<sub>R</sub> = 5.475</b>	• • • • • • • • • • • • • • • • • • • •				$D_R = (p$	c/mi/ln)				
D <sub>R</sub> = $5.475$	ni/ln)									
Level of Ser $D_R = 5.475$ $D_R = 8.3 \text{ (pc/m}$ $D_R = 8.3 \text{ (pc/m}$ $D_R = 8.3 \text{ (Exhibited}$	ni/ln) t 13-2)					xhibit 13				
Level of Ser $D_R = 5.475$ $D_R = 8.3 \text{ (pc/m)}$ $OS = A \text{ (Exhibit}$	ni/ln) t 13-2)				Speed D					
D <sub>R</sub> = 5.475 D <sub>R</sub> = 8.3 (pc/m OS = A (Exhibition (Exhi	ni/ln) t 13-2)				Speed D		ination			
Level of Ser $D_R = 5.475$ $D_R = 8.3 \text{ (pc/m}$ $OS = A \text{ (Exhibit}$ $OS = Deter$ $M_S = 0.235 \text{ (Exhibit}$	ni/ln) it 13-2) imination				Speed D	Determ	ination 12)			
$\begin{array}{ccc} \textbf{Level of Ser} \\ & D_{R} = 5.475 \\ D_{R} = & 8.3 \text{ (pc/m} \\ OS = & A \text{ (Exhib)} \\ \textbf{Speed Deter} \\ M_{S} = & 0.235 \text{ (Exhib)} \\ D_{R} = & 59.6 \text{ mph} \end{array}$	ni/ln) t 13-2) tmination xibit 13-11)				Speed D D <sub>s</sub> = (E S <sub>R</sub> = m	<b>Determ</b> xhibit 13-1	<b>ination</b> 12) t 13-12)			

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst		ne Forsythe	F	reeway/Dir of Ti		14th FF	3 Off-ramp			
Agency or Company	Onai	io i orojalo		unction		I-315	on ramp			
Date Performed	9/15/	/2014		urisdiction		1010				
Analysis Time Period				nalysis Year		2035				
Project Description										
Inputs										
•		Freeway Num	ber of Lanes, N	2				ĺ		
Upstream Adj R	amp	Ramp Numbe							Downstrea	m Adj
□Yes□	On	1 '	•	1					Ramp	
	1011		ane Length, L <sub>A</sub>						☐Yes	On
☑ No □	Off	Deceleration I	Lane Length L <sub>D</sub>	503					✓ No	Off
	_	Freeway Volu	me, V <sub>F</sub>	627					INO	
L <sub>up</sub> = fi	t	Ramp Volume	e, V <sub>D</sub>	68					L <sub>down</sub> =	ft
.,			-Flow Speed, S <sub>FF</sub>	55.0						
V <sub>u</sub> = ve	eh/h								$V_D =$	veh/h
			ow Speed, S <sub>FR</sub>	35.0						
Conversion to		der Base	Conditions	-	•					
(pc/h)	() (a b /b v)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	f <sub>p</sub>	v = V/PHF	$x f_{HV} x f_{n}$
. ,	(Veh/hr)	0.07	11			_				<u> </u>
Freeway	627	0.87	Level	6	0	_	971	1.00	74	
Ramp	68	0.83	Level	5	0	0.	976	1.00	8	4
UpStream		+		-	-	+-				
DownStream		Merge Areas		<u> </u>	<del>                                     </del>			iverge Areas		
Estimation of		Merge Areas			Ectimat	ion o		iverge Areas		
Estimation of	V <sub>12</sub>				Estimat	1011 0	1 12			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13	)
P <sub>FM</sub> =		Equation (			P <sub>FD</sub> =			000 using Equ		
V <sub>12</sub> =	pc/h	_4			V <sub>12</sub> =			2 pc/h	iation (Exim	on 10 1 j
	•	(F	44 - 40 47)					•	10.11	40.47)
V <sub>3</sub> or V <sub>av34</sub>			-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70								☐Yes ☑ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *	'V <sub>12</sub> /2 □Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	☐Yes 🗹 No		
If Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equation	13-16, 13-	18, or 13-
	13-19)	)					19	9)		
Capacity Che		1			Capacit	y Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	<u> </u>	pacity	LOS F?
					$V_{F}$		742	Exhibit 13-8	4500	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	658	Exhibit 13-8	4500	No
					V <sub>R</sub>		84	Exhibit 13-10	2000	No
		- £1 A				4				INO
Flow Entering		1		1 Mininting	Flow En	-		rge Influenc		\/:=\=\::=0
.,	Actual		Desirable	Violation?	<b>.</b>		Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		742	Exhibit 13-8	4400:All	No
Level of Serv	ice Deterr	nination (	if not F)		Level of	f Serv	<u>rice De</u>	<u>terminatior</u>	า (if not l	<u>F)</u>
D <sub>R</sub> = 5.475 + 0.	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>			$D_R = 4$	.252 + 0	.0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 6.$	1 (pc/r	ni/ln)			
LOS = (Exhibit	,				I ''		oit 13-2)			
					<u> </u>					
Speed Detern	nination				Speed L					
M <sub>S</sub> = (Exibit 13	3-11)				$D_s = 0.$	436 (E	xhibit 13-	12)		
-	ibit 13-11)				$S_R = 49$	9.3 mph	(Exhibit	13-12)		
	ibit 13-11)					-	Exhibit (	· ·		
	ibit 13-11)				1 -	-	(Exhibit	-		
' '		All District			1			-		10044 0 == ::
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	KAI	MPS AND	KAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst	Shan	ne Forsythe	Fr	eeway/Dir of Tr	avel	14th St	EB On-ram	ρ		
gency or Company			Ju	ınction		I-315				
ate Performed	9/15/			ırisdiction						
nalysis Time Period			Ar	nalysis Year		2035				
roject Description	I-15 Corridor S	Study								
nputs		l								
Ipstream Adj Ramp		I -	ber of Lanes, N	2					Downstre	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes On	İ	Acceleration L	ane Length, L <sub>A</sub>	930					□Yes	On
✓ No ☐ Off	F	Deceleration L	ane Length L <sub>D</sub>						□ Nia	□ o#
		Freeway Volu	me, V <sub>F</sub>	1140					✓ No	Off
<sub>up</sub> = ft		Ramp Volume		617					L <sub>down</sub> =	ft
			-Flow Speed, S <sub>FF</sub>	55.0						
u = veh/h			ow Speed, S <sub>FR</sub>	35.0					V <sub>D</sub> =	veh/h
<u> </u>	//-		* 110	33.0						
Conversion to	o pc/n Und   ∨	ger Base (	Conditions	1		1				
(pc/h)	v (Veh/hr)	PHF	Terrain	%Truck	%Rv	1	: HV	$f_p$	v = V/PHF	$x f_{HV} x f_{p}$
reeway	1140	0.83	Level	4	0	0.9	80	1.00	1	403
Ramp	617	0.83	Level	3	0	_	985	1.00		755
JpStream	<b>V</b>	1 1		<u> </u>	<u> </u>	+ ***				
DownStream										
		Merge Areas					Di	verge Areas		
stimation of	V <sub>12</sub>				Estimat	ion o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P.,,)					V <sub>40</sub> = V	<sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P_D	
=		ation 13-6 or	13_7)		=			Equation 13-		3)
EQ =					L <sub>EQ</sub> = D -			-		
FM =			ion (Exhibit 13-6)		P <sub>FD</sub> =			sing Equatio	II (EXIIIDIL I	0-1)
12 =	1403	•			V <sub>12</sub> =		•	c/h		_\
or V <sub>av34</sub>	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	0 =	-	c/h (Equation 1	3-14 or 13-1	7)
s $V_3$ or $V_{av34} > 2,70$								Yes 🗌 No		
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *					Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5		Yes No		
Yes,V <sub>12a</sub> =	pc/h ( 13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =	:		c/h (Equation ·19)	n 13-16, 1	3-18, or
Capacity Che		)			Capacit			19)		
apacity Cite	Actual	Τ	apacity	LOS F?	Capacit	y Circ	Actual	Car	acity	LOS F?
	Actual	<del>t ĭ</del>	apacity	L001:	V <sub>F</sub>	_	Actual	Exhibit 13-8		LOGTE
						\ <u></u>		+	_	
$V_{FO}$	2158	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-8		
	1				$V_R$			Exhibit 13- 10	-	
								10		
low Entoring	Mergo In	Iffuence A	roa			torin	a Divor	na Influan	CO Aros	
Flow Entering		,		Violation?				<b>ge Influen</b> Max Desi		
Flow Entering	Actual	Max	Desirable	Violation?	Flow En		ctual	Max Desi		Violation?
V <sub>R12</sub>	Actual 2158	Max Exhibit 13-8	Desirable 4600:All	Violation?	Flow En	A	ctual	Max Desi Exhibit 13-8	rable	Violation
V <sub>R12</sub> .evel of Servi	Actual 2158 ice Detern	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv	ctual	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable <b>n (if not</b>	Violation
V <sub>R12</sub> .evel of Servi	Actual 2158 <b>ice Detern</b> 0.00734 v <sub>R</sub> + (	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv	rice Dete	Max Desi Exhibit 13-8	rable <b>n (if not</b>	Violation
V <sub>R12</sub> .evel of Servi D <sub>R</sub> = 5.475 +	Actual 2158 <b>ice Detern</b> 0.00734 v <sub>R</sub> + 0 i/ln)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv	ctual  ice Dete	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable <b>n (if not</b>	Violation
V <sub>R12</sub> .evel of Servi D <sub>R</sub> = 5.475 +	Actual 2158 <b>ice Detern</b> 0.00734 v <sub>R</sub> + 0 i/ln)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv	ctual  ice Dete	Max Desi Exhibit 13-8 e <b>rminatio</b>	rable <b>n (if not</b>	Violation <sup>4</sup>
$V_{R12}$ Level of Servi $D_R = 5.475 + $ $R = 16.1 \text{ (pc/m)}$ $OS = B \text{ (Exhibit)}$	Actual 2158 ice Detern 0.00734 v <sub>R</sub> + 0 i/ln) 13-2)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv D <sub>R</sub> = 4 oc/mi/ln Exhibit	ctual ice Deta 252 + 0.0	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0.	rable <b>n (if not</b>	Violation <sup>4</sup>
V <sub>R12</sub> .evel of Servi D <sub>R</sub> = 5.475 + B <sub>R</sub> = 16.1 (pc/m OS = B (Exhibit of Speed Determ	Actual 2158  ice Detern 0.00734 v <sub>R</sub> + 0 i/ln) 13-2) mination	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv D <sub>R</sub> = 4 oc/mi/ln Exhibit	ctual ice Dete 252 + 0.0 ) 13-2) mination	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0.	rable <b>n (if not</b>	Violation <sup>4</sup>
$V_{R12}$ Level of Servi $D_R = 5.475 + $ $R = 16.1 \text{ (pc/m}$ $D_R = 8 \text{ (Exhibit of Speed Detern)}$ $S_R = 0.290 \text{ (Exit)}$	Actual 2158  ice Detern 0.00734 v <sub>R</sub> + 0 id/ln) 13-2) inination bit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		V <sub>12</sub>   Level of     D <sub>R</sub> = (p   LOS = (E   Speed L   D <sub>S</sub> = (E   C   C   C   C   C   C   C   C   C	F Serv D <sub>R</sub> = 4 pc/mi/In Exhibit Deterr	ctual  ice Dete 252 + 0.0  13-2)  mination 3-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0.	rable <b>n (if not</b>	Violation
V <sub>R12</sub> D <sub>R</sub> = 5.475 +  B = 16.1 (pc/m  CS = B (Exhibit of Speed Detern  Speed Detern  B = 0.290 (Exite  B = 51.2 mph (	Actual 2158 ice Detern 0.00734 v <sub>R</sub> + 0 ii/ln) 13-2) inination bit 13-11) (Exhibit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		Flow En	F Serv D <sub>R</sub> = 4 pc/mi/ln Exhibit Deterr Exhibit 13 ph (Exhi	ctual  ice Deta .252 + 0.0  13-2)  mination 3-12)  bit 13-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0.	rable <b>n (if not</b>	Violation
V <sub>R12</sub> D <sub>R</sub> = 5.475 +  R = 16.1 (pc/m  OS = B (Exhibit of the content of the con	Actual 2158  ice Detern 0.00734 v <sub>R</sub> + 0 id/ln) 13-2) inination bit 13-11)	Max Exhibit 13-8	Desirable 4600:All <b>if not F</b> )		V <sub>12</sub>   Level of     D <sub>R</sub> = (F   COS = (E   C) = (E   COS = (E   COS = (E   COS = (E   COS = (E   COS = (E   COS = (E   COS = (E   C) = (E   COS = (E   C) = (E   COS = (E   C	F Serv  D <sub>R</sub> = 4  Dc/mi/ln  Exhibit  Deterr  Exhibit 13  ph (Exhi  ph (Exhi	ctual  ice Dete 252 + 0.0  13-2)  mination 3-12)	Max Desi Exhibit 13-8 erminatio 0086 V <sub>12</sub> - 0.	rable <b>n (if not</b>	Violation

		RAMP	S AND RAI	MP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation	. W 11111	to 10A	Site Infor			· · — ·			
Analyst Agency or Company Date Performed		e Forsythe		Freeway/Dir of Tra Junction Jurisdiction		14th W I-315	B Off-ramp	)		
Analysis Time Period	AM P	eak	A	Analysis Year		2035				
Project Description	I-15 Corridor S	tudy								
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes. N	2 1					Downstrea Ramp	am Adj
□Yes □	On	Acceleration L	ane Length, L <sub>A</sub>	·					□Yes	On
✓ No	Off	Deceleration L Freeway Volu	ane Length L <sub>D</sub>	713 585					<b>☑</b> No	Off
L <sub>up</sub> = fi	t	Ramp Volume	, V <sub>R</sub>	251					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h		-Flow Speed, $S_{Ff}$ ow Speed, $S_{FR}$	<sub>=</sub> 55.0 35.0					V <sub>D</sub> =	veh/h
Conversion to	pc/h Und		111						<u> </u>	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	585	0.82	Level	1	0	0.	995	1.00	7	14
Ramp	251	0.80	Level	0	0	1.	000	1.00	3	12
UpStream						_				
DownStream		l l Merge Areas						Diverge Areas		
Estimation of		vierge Areas			Estima	tion o	fv	iverge Areas		
<u> </u>		<u> </u>			Lotima					
	$V_{12} = V_F$							V <sub>R</sub> + (V <sub>F</sub> - V		
L <sub>EQ</sub> =		tion 13-6 or			L <sub>EQ</sub> =		-	Equation 13-		
P <sub>FM</sub> =	_	Equation (E	Exhibit 13-6)		P <sub>FD</sub> =			000 using Ed	luation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			4 pc/h		
$V_3^{}$ or $V_{av34}^{}$			-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$								☐Yes 🗹 No		
Is $V_3$ or $V_{av34} > 1.5$ *					Is V <sub>3</sub> or V <sub>av</sub>	<sub>v34</sub> > 1.5		☐Yes 🗹 No		
If Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub>	=		c/h (Equation	า 13-16, 13	-18, or 13-
Capacity Che	13-19)				Capacit		19 ocks	9)		
Capacity Cite	Actual		apacity	LOS F?	Capacit	y Cir	Actual	1 0	apacity	LOS F?
	7 totaai	Ĭ	αρασιτή	2001:	V <sub>F</sub>		714	Exhibit 13-		No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V	_	402	Exhibit 13-	_	No
*FO		EXHIBIT 13-0						Exhibit 13-	_	_
	<u> </u>	<u> </u>			V <sub>R</sub>		312			No
Flow Entering		ir .		Violetian	Flow El	T T		rge Influer		1 Violetian?
V	Actual	Exhibit 13-8	Desirable	Violation?	\/		Actual	Max Desira	1	Violation?
V <sub>R12</sub>	. 5 .		· · · · · · ·		V <sub>12</sub>		714	Exhibit 13-8	4400:All	No No
Level of Serv								terminatio	_	F)
$D_R = 5.475 + 0.1$		0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>					.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln					l ''	.0 (pc/r	,			
LOS = (Exhibit '	13-2)				LOS = A	(Exhil	oit 13-2)			
Speed Detern	nination				Speed I	Deter	minatio	on		
M <sub>S</sub> = (Exibit 13	3-11)				$D_s = 0$	.456 (E	xhibit 13-	-12)		
-	ibit 13-11)				S <sub>R</sub> = 4	9.1 mph	(Exhibit	13-12)		
	ibit 13-11)				$S_0 = N$	I/A mph	(Exhibit	13-12)		
	ibit 13-13)					9.1 mph	(Exhibit	13-13)		
Copyright © 2012 Unive	ersity of Florida, A	All Rights Reserv	/ed		HCS2010 <sup>TN</sup>			· · · · · · · · · · · · · · · · · · ·	enerated: 9/15	5/2014 9:46 A

		RAI	MPS AND	<b>RAMP JUN</b>	CTIONS W	ORKSH	EET				
General In	forma				Site Infor						
Analyst			e Forsythe	F	reeway/Dir of Tra		14th S	St WB On-ra	mp		
gency or Com				Jı	unction		I-315				
ate Performed		9/15/2			urisdiction						
nalysis Time F		AM P		A	nalysis Year		2014				
roject Descript	tion I-15	Corridor S	tudy								
nputs			l							I	
Jpstream Adj R	amp		1	ber of Lanes, N	2					Downstre	am Adj
	7.0		Ramp Number	r of Lanes, N	1					Ramp	
Yes	On		Acceleration L	ane Length, L <sub>A</sub>	505					□Yes	On
✓ No	Off		Deceleration L	ane Length L <sub>D</sub>							_
	_ 011		Freeway Volui	me, V <sub>F</sub>	514					☑ No	Off
<sub>up</sub> = f	t		Ramp Volume	•	142					L <sub>down</sub> =	ft
-r				Flow Speed, S <sub>FF</sub>							
' <sub>u</sub> = v	eh/h			ow Speed, S <sub>FR</sub>	35.0					$V_D =$	veh/h
)	4	- /l-		* 111	33.0						
onversio	<u>n to p</u>	<u>c∕n Unc</u> ∨	ier Base (	Conditions	1	1		ı			
(pc/h)	(	v Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PH	$F x f_{HV} x f_{p}$
reeway	<del>-   '</del>	514	0.76	Level	6	0	1	).971	1.00		696
Ramp		142	0.80	Level	5	0	_	0.976	1.00		181
JpStream			1	2010.	<del>                                     </del>	<u> </u>	+				
DownStream											
		ı	Merge Areas					D	iverge Areas		
stimatio	$n$ of $v_1$	2				Estimat	tion (	of v <sub>12</sub>			
		V <sub>12</sub> = V <sub>F</sub>	(P.,,)					V <sub>40</sub> = \	/ <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	)P_p	
=			ation 13-6 or	13_7)		=			Equation 13		13)
EQ =					\	L <sub>EQ</sub> =			-		
= = -				ion (Exhibit 13-6	)	P <sub>FD</sub> =			ising Equatio	וו (באוווטונ ו	J-1)
' <sub>12</sub> =		696 p				V <sub>12</sub> =		•	oc/h		,
or V <sub>av34</sub>		-		13-14 or 13-17	)	V <sub>3</sub> or V <sub>av34</sub>		-	oc/h (Equation	13-14 or 13-	17)
s V <sub>3</sub> or V <sub>av34</sub> >									∃Yes □ No		
s $V_3$ or $V_{av34}$ >	1.5 * V <sub>12</sub>					Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.		]Yes ☐ No		
Yes,V <sub>12a</sub> =			(Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub>	=		oc/h (Equatio	n 13-16, 1	3-18, or
Capacity (	Chock	13-19)				Capacit			3-19)		
араспу (	JIIECK		1 0	angoity	LOS F?	Lapacii	y Ci		Co	naoity	LOS F?
		Actual	<del>                                     </del>	apacity	LUSF!	\/		Actual	Exhibit 13-	pacity	LUST!
						V <sub>F</sub>			_	-	
$V_{FO}$		877	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-		
						$V_R$			Exhibit 13 10	-	
low Ento	rina M	lorgo In	<u>l                                    </u>	<u> </u>			atori	na Divo	ge Influer	l loo Aros	
TOW EITE		Actual		Desirable	Violation?	FIOW EI	T	Actual Actual	Max Des		Violation
\/		877	Exhibit 13-8	4600:All	1	V <sub>12</sub>	+	Actual	Exhibit 13-8	lable	Violation
V <sub>R12</sub>					No		<u> </u>			<i>(:f</i>	<u> </u>
			nination (i						terminatio	<u> </u>	: F)
$D_{R} = 5.4$	75 + 0.00	734 v <sub>R</sub> + 0	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			$D_R =$	4.252 + 0.	0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
$r_{R} = 9.1  (p)$	c/mi/ln)					$D_R = ($	pc/mi/	ln)			
OS = A (Ex	hibit 13-2	)				LOS = (I	Exhibi	t 13-2)			
Speed Det	termin	ation				Speed	Dete	rminatio	n		
						<u> </u>	Exhibit				
Ü	Exibit 13	=						hibit 13-12)			
		bit 13-11)						•			
•	nph (Exhil					ď	-	hibit 13-12)			
= 51.2 i	mph (Exhi	bit 13-13)				lS= m	ומר (Ex	hibit 13-13)			
							· (				

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst		ne Forsythe	F	reeway/Dir of Ti		14th F	3 Off-ramp			
Agency or Company	Onai	io i oroyano		unction	4701	I-315	on ramp			
Date Performed	9/15/	/2014		urisdiction						
Analysis Time Period	I PM F	Peak	А	nalysis Year		2035				
Project Description		Study		,						
Inputs		·								
Upstream Adj R	amp	1	ber of Lanes, N	2					Downstrea	m Adj
□Yes □	70-	Ramp Numbe	r of Lanes, N	1					Ramp	
∟ Yes ∟	On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I	Lane Length L <sub>D</sub>	503					✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	799						
L <sub>up</sub> = fi	t	Ramp Volume	e, V <sub>R</sub>	226					L <sub>down</sub> =	ft
.,		Freeway Free	-Flow Speed, S <sub>FF</sub>	55.0				ļ,	\/ <b>-</b>	veh/h
V <sub>u</sub> = ve	eh/h	Ramp Free-Fl	low Speed, S <sub>FR</sub>	35.0					V <sub>D</sub> =	ven/m
Conversion to	n nc/h l ln		111							
	<i>∨ ∨</i>	PHF		%Truck	%Rv		f	f	, - \//DHE	vf vf
(pc/h)	(Veh/hr)	РПГ	Terrain	% Huck	70TV	_	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x	
Freeway	799	0.83	Level	4	0	_	980	1.00	98	
Ramp	226	0.94	Level	3	0	0.	985	1.00	24	4
UpStream				-	<del>                                     </del>					
DownStream		Merge Areas						iverge Areas		
Estimation of		Merge Areas			Estimat	ion o		iverge Areas		
LStillation of					LStillat	.1011 0				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	$V_R + (V_F - V_R)$	)P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(I	Equation 13-1	2 or 13-13)	1
P <sub>FM</sub> =	using	Equation (	Exhibit 13-6)		P <sub>FD</sub> =		1.0	000 using Equ	ation (Exhib	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		98	2 pc/h		
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		0	pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70						.24 > 2,7		Yes ☑ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 *								Yes ☑ No		
			-16, 13-18, or			-		c/h (Equation	13-16. 13-	18. or 13-
If Yes,V <sub>12a</sub> =	13-19				If Yes,V <sub>12a</sub> =	-	19		, -	
Capacity Che	cks				Capacit	y Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	Car	pacity	LOS F?
					V <sub>F</sub>		982	Exhibit 13-8	4500	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	- V <sub>D</sub>	738	Exhibit 13-8	4500	No
10					V <sub>R</sub>		244	Exhibit 13-10	+	No
Class Cotorins	l Maraa Ir	-fluoroo A								140
Flow Entering		1		Violation?	FIOW ET	-	<del>-</del>	rge Influence Max Desirab		Violation?
\/	Actual	Exhibit 13-8	Desirable	Violation?	\/		Actual	T		
V <sub>R12</sub>	. 5 .				V <sub>12</sub>		982	Exhibit 13-8	4400:All	No No
Level of Serv								terminatior	•	<del>-)</del>
$D_R = 5.475 + 0.1$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	· 0.00627 L <sub>A</sub>			$D_R = 4$	.252 + 0.	0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				$D_R = 8$	.2 (pc/r	ni/ln)			
LOS = (Exhibit '	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Detern	nination				Speed L	Deter	minatio	n		
M <sub>S</sub> = (Exibit 13					1 -		xhibit 13-			
-	ibit 13-11)						(Exhibit	•		
	-					-	(Exhibit '	•		
	ibit 13-11)				1 *	-	-	•		
. ,	ibit 13-13)				1		(Exhibit			
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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Int				Site Infor						
Analyst	Sha	ne Forsythe	Fr	eeway/Dir of Tra	avel	14th St I	EB On-ram	p		
gency or Comp	any		Ju	inction		I-315				
ate Performed		5/2014		risdiction						
nalysis Time Pe		Peak	Ar	nalysis Year		2014				
	on I-15 Corridor	Study								
nputs		l								
Jpstream Adj Ra	ımp	1 '	ber of Lanes, N	2					Downstre	am Adj
	0	Ramp Number		1					Ramp	
☐ Yes ☐	On	Acceleration L	ane Length, L <sub>A</sub>	930					□Yes	On
✓ No	Off	Deceleration L	ane Length L <sub>D</sub>						✓No	□ O#
	<b></b>	Freeway Volui	me, V <sub>F</sub>	1216					INO INO	Off
<sub>up</sub> = ft		Ramp Volume	, V <sub>D</sub>	648					L <sub>down</sub> =	ft
· r			-Flow Speed, S <sub>FF</sub>	55.0						
' <sub>u</sub> = ve	h/h		ow Speed, S <sub>FR</sub>	35.0					V <sub>D</sub> =	veh/h
Sa mura va la	n 40 ma/h 11m		. 117	35.0						
onversion	n to pc/h Un		Conditions	1	ι	т —	1			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f	HV	$f_p$	v = V/PHI	$= x f_{HV} x f_{p}$
reeway	1216	0.90	Level	3	0	0.9	85	1.00	,	1371
Ramp	648	0.94	Level	1	0	0.9		1.00		693
JpStream		1								
DownStream										
		Merge Areas					Di	verge Areas		
stimation	of v <sub>12</sub>				Estimat	ion of	v <sub>12</sub>			
	V <sub>12</sub> = V <sub>1</sub>	(P <sub>EM</sub> )					V <sub>12</sub> = V	' <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P <sub>ED</sub>	
· <sub>EQ</sub> =		uation 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-		3)
) <sub>FM</sub> =			ion (Exhibit 13-6)		P <sub>FD</sub> =		-	sing Equatio		
' = 12	1371		ion (Eximple 10 0)		V <sub>12</sub> =			c/h	II (Exiliate I	0 1 /
12 / <sub>3</sub> or V <sub>av34</sub>		•	12 14 or 12 1 <del>7</del> \					c/h (Equation 1	2 14 or 12 1	17\
	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	> 0.70	-		3-14 01 13-1	17)
	2,700 pc/h? ☐ Y€							Yes No		
	1.5 * V <sub>12</sub> /2		) 16 12 19 or		is v <sub>3</sub> or v <sub>av</sub>	34 > 1.5		Yes No	- 12 16 1	2 10 00
Yes,V <sub>12a</sub> =	pc/n 13-19		3-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		c/h (Equatio -19)	n 13-16, 1	3-18, or
Capacity C		.,			Capacit	v Che		,		
	Actual	C	apacity	LOS F?	Τ΄ Τ		Actual	Car	acity	LOS F?
					V <sub>F</sub>			Exhibit 13-	3	
W	2064	Fyb;b;t 12.0		No.	$V_{FO} = V_{F}$	- V <sub>D</sub>		Exhibit 13-8	3	
$V_{FO}$	2064	Exhibit 13-8		No		- R		Exhibit 13		_
					$V_R$			10		
low Enter	ing Merge I	nfluence A	rea		Flow Er	tering	Diver	ge Influen	ce Area	
	Actual	Max I	Desirable	Violation?		A	ctual	Max Desi	rable	Violation?
$V_{R12}$	2064	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		
evel of Se	ervice Deter	mination (i	if not F)		Level of	f Serv	ice Det	erminatio	n (if not	F)
	′5 + 0.00734 v <sub>R</sub> +					D <sub>P</sub> = 4.	252 + 0.0	0086 V <sub>12</sub> - 0.	.009 L <sub>D</sub>	•
	oc/mi/ln)	12	^			oc/mi/ln		12	D	
	ibit 13-2)					Exhibit '	•			
•	· · · · · · · · · · · · · · · · · · ·							<u> </u>		
	ermination				Speed L			TI		
M <sub>S</sub> = 0.287	(Exibit 13-11)					Exhibit 13				
	ph (Exhibit 13-11)				S <sub>R</sub> = m	ph (Exhil	bit 13-12)			
<sub>R</sub> = 51.3 m	ipii (Exilibit 10 11)									
	ph (Exhibit 13-11)					ph (Exhil	bit 13-12)			
0= N/A m					S <sub>0</sub> = m		bit 13-12) bit 13-13)			

		RAMP	S AND RAI	/P JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		<u> </u>	Site Infor						
Analyst Agency or Company		ne Forsythe		reeway/Dir of Tr		14th W I-315	B Off-ramp	)		
Date Performed	9/15/	2014		urisdiction		1010				
Analysis Time Period	l PM F	Peak	A	Analysis Year		2035				
Project Description	I-15 Corridor S	Study								
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2					Downstrea Ramp	m Adj
□Yes □	On	· '	ane Length, L <sub>A</sub>	'					Yes	On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V⊏	713 1418					<b>☑</b> No	Off
L <sub>up</sub> = fi	t	Ramp Volume	e, V <sub>R</sub>	919					L <sub>down</sub> =	ft
V <sub>u</sub> = ve	eh/h	1	-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	55.0 35.0				,	V <sub>D</sub> =	veh/h
Conversion to	pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1418	0.91	Level	3	0	0.	985	1.00	158	82
Ramp	919	0.99	Level	2	0	0.	990	1.00	93	19
UpStream										
DownStream										
Catimatian at		Merge Areas			Catimat			iverge Areas		
Estimation of	V <sub>12</sub>				Estimat	ion o	1 V <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	$V_R + (V_F - V_R)$	P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-1	2 or 13-13)	)
P <sub>FM</sub> =	using	Equation (E	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Equ	ation (Exhib	oit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			82 pc/h	,	•
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			,			ر > 2.7		Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$ *								Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> :	-		c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	cks				Capacit	y Che	ecks	,		
	Actual	C	apacity	LOS F?			Actual	Car	pacity	LOS F?
					V <sub>F</sub>		1582	Exhibit 13-8	4500	No
$V_{FO}$		Exhibit 13-8			V <sub>FO</sub> = V <sub>F</sub>	V <sub>D</sub>	643	Exhibit 13-8	4500	No
FO					V <sub>R</sub>		939	Exhibit 13-10	+	No
Flow Entering	Morgo Ir	fluonco A	roa					ge Influenc		1 110
I low Lintering	Actual	1	Desirable	Violation?	I IOW LI	-	Actual	Max Desirab		Violation?
V <sub>R12</sub>	7 totaai	Exhibit 13-8	Doonable	Violation:	V <sub>12</sub>		582	Exhibit 13-8	4400:All	No
Level of Serv	ico Dotorr		if not E)					termination		
								.0086 V <sub>12</sub> - 0.0		,
$D_R = 5.475 + 0.0$		0.0076 V <sub>12</sub> -	0.00027 L <sub>A</sub>					.0080 v <sub>12</sub> - 0.0	DO9 LD	
D <sub>R</sub> = (pc/mi/ln	,				I ''	1.4 (pc/	•			
LOS = (Exhibit							oit 13-2)			
Speed Detern	nination				Speed L	Deter	minatio	n		
M <sub>S</sub> = (Exibit 13	•				ľ	-	xhibit 13-	-		
S <sub>R</sub> = mph (Exh	ibit 13-11)					-	(Exhibit	*		
$S_0 = mph (Exh$	ibit 13-11)				$S_0 = N$	/A mph	(Exhibit	13-12)		
	ibit 13-13)				S = 48	8.3 mph	(Exhibit	13-13)		
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			MPS AND	RAMP JUN			:E1		
General	Infori				Site Infor	mation			
Analyst		Shan	ne Forsythe		reeway/Dir of Ti		14th St WB On-ra	amp	
Agency or C			10044		unction	Į.	-315		
Date Perforn		9/15/			urisdiction	_			
Analysis Tim		PM F		A	nalysis Year	2	2035		
	cription	I-15 Corridor S	Study						
nputs			<u> </u>						_
Jpstream Ad	dj Ramp		1	ber of Lanes, N	2				Downstream Adj
			Ramp Number	r of Lanes, N	1				Ramp
Yes	∐ On		Acceleration L	ane Length, L <sub>A</sub>	505				□Yes □On
<b>☑</b> No	Off		Deceleration L	ane Length L <sub>n</sub>					
<b>™</b> NO			Freeway Volur		728				☑ No ☐ Off
_ <sub>up</sub> =	ft		Ramp Volume	'	201				L <sub>down</sub> = ft
-up			1						down
√ <sub>u</sub> =	veh/h		1	-Flow Speed, S <sub>FF</sub>	55.0				$V_D = veh/h$
u			Ramp Free-Flo	ow Speed, S <sub>FR</sub>	35.0				
Convers	sion to	pc/h Und	der Base (	Conditions					
(pc/h	1)	V	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	fp	$v = V/PHF \times f_{HV} \times f_{g}$
	,	(Veh/hr)	+		ļ			<u> </u>	,
Freeway		728	0.93	Level	5	0	0.976	1.00	802
Ramp		201	0.99	Level	1	0	0.995	1.00	204
UpStream			++			<u> </u>	<u> </u>		
DownStrear	m [		Marga Arasa				<u> </u>	Diverse Areas	
Estimati	ion of		Merge Areas			Ectimati	on of v <sub>12</sub>	Diverge Areas	
_Suman	1011 01					LSuman			
		$V_{12} = V_{F}$	(P <sub>FM</sub> )				V <sub>12</sub> =	$V_R + (V_F - V$	<sub>R</sub> )P <sub>FD</sub>
- <sub>EQ</sub> =		(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-13)
P <sub>FM</sub> =		1.000	using Equat	ion (Exhibit 13-6)	)	P <sub>FD</sub> =		using Equati	on (Exhibit 13-7)
/ <sub>12</sub> =		802 p				V <sub>12</sub> =		pc/h	,
/ <sub>3</sub> or V <sub>av34</sub>		•		13-14 or 13-17	١	V <sub>3</sub> or V <sub>av34</sub>		•	13-14 or 13-17)
	> 2 700	) pc/h? TYe		10 14 01 10 17	,		4 > 2,700 pc/h?		
	-	V <sub>12</sub> /2 □ Ye		16 12 10 or			<sub>4</sub> > 1.5 * V <sub>12</sub> /2		
f Yes,V <sub>12a</sub> =	=	13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/n (⊑qualic 3-19)	on 13-16, 13-18, or
Capacit	v Che		<u> </u>			Capacity		0 10)	
		Actual	С	apacity	LOS F?		Actual	Ca	apacity LOS F
			<del>† i</del>			V <sub>F</sub>		Exhibit 13	
						-	\/	Exhibit 13	
$V_{FC}$		1006	Exhibit 13-8		No	$V_{FO} = V_{F}$	· V <sub>R</sub>		
						$V_R$		Exhibit 13	3-
	40 "	Morgo In	fluonco A	<u>roa</u>		Flow En	tering Dive		nco Aroa
Elow En			iiiueiice A			I TOW LIN			sirable Violation
Flow En	itering		,	∩ocirahlo	Violation?				
		Actual	Max [	Desirable 4600:AII	Violation?	\ <u>\</u>	Actual		Violation
V <sub>R12</sub>	2	Actual 1006	Max I Exhibit 13-8	4600:AII	Violation? No	V <sub>12</sub>		Exhibit 13-8	
V <sub>R12</sub> Level of	<sub>2</sub> F Servi	Actual 1006 ce Detern	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of	Service De	Exhibit 13-8	on (if not F)
V <sub>R12</sub> Level of	<sub>2</sub> F Servi	Actual 1006 ce Detern	Max I Exhibit 13-8	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of		Exhibit 13-8	on (if not F)
V <sub>R12</sub> L <b>evel of</b> D <sub>R</sub> =	<sub>2</sub> F Servi	Actual 1006 (ce Detern 0.00734 v <sub>R</sub> + 0	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of	Service De	Exhibit 13-8	on (if not F)
$V_{R12}$ Level of $D_R = D_R = 10$	2 <b>Servi</b> 5.475 + 0	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + 0	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of  D <sub>R</sub> = (po	<b>Service De</b> O <sub>R</sub> = 4.252 + (c/mi/ln)	Exhibit 13-8	on (if not F)
$V_{R12}$ Level of $D_R = D_R = 0$ .0S = B	2 F <b>Servi</b> 5.475 + ( 0.1 (pc/mi (Exhibit 1	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + ( /ln) 3-2)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of  D <sub>R</sub> = (po	<b>Service De</b> D <sub>R</sub> = 4.252 + 0 C/mi/ln) xhibit 13-2)	Exhibit 13-8 etermination 0.0086 V <sub>12</sub> - 0	on (if not F)
D <sub>R</sub> = 10 OS = B	2 F Servi 5.475 + ( 0.1 (pc/mi (Exhibit 1	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + ( //In) 3-2)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of  D <sub>R</sub> = (po LOS = (E: Speed D	Service De O <sub>R</sub> = 4.252 + ( c/mi/ln) xhibit 13-2) etermination	Exhibit 13-8 etermination 0.0086 V <sub>12</sub> - 0	on (if not F)
$V_{R12}$ Level of $D_R = 0$ OS = B Speed E $M_S = 0$	5.475 + 0 0.1 (pc/mi (Exhibit 1 <b>Determ</b> 296 (Exib	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + ( /ln) 3-2) innation iit 13-11)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of   C	Service De D <sub>R</sub> = 4.252 + 0 c/mi/ln) xhibit 13-2) etermination	Exhibit 13-8 etermination 0.0086 V <sub>12</sub> - 0	on (if not F)
$V_{R12}$ Level of $D_R = 0$ $D_R = 10$ $D_$	2 <b>F Servi</b> 5.475 + ( 0.1 (pc/mi (Exhibit 1) <b>Determ</b> 296 (Exib	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + 0 //In) 3-2) innation it 13-11) Exhibit 13-11)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of   C	Service De D <sub>R</sub> = 4.252 + 0 c/mi/ln) xhibit 13-2) etermination xhibit 13-12) h (Exhibit 13-12)	Exhibit 13-8 eterminatio 0.0086 V <sub>12</sub> - 0	on (if not F)
$V_{R12}$ Level of $D_R = 0$ $D_R = 10$ $D_$	2 <b>F Servi</b> 5.475 + ( ).1 (pc/mi (Exhibit 1 <b>Determ</b> 296 (Exib 1.1 mph (I	Actual 1006 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 //In) 3-2) <b>nination</b> it 13-11) Exhibit 13-11)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	Level of   C	Service De D <sub>R</sub> = 4.252 + 0 c/mi/ln) xhibit 13-2) etermination	Exhibit 13-8 eterminatio 0.0086 V <sub>12</sub> - 0	on (if not F)
V <sub>R12</sub> <b>.evel of</b> D <sub>R</sub> = 10  OS = B <b>Speed D</b> 1 <sub>S</sub> = 0 R = 51 0 = N/	2 <b>F Servi</b> 5.475 + ( ).1 (pc/mi (Exhibit 1 <b>Determ</b> 296 (Exib 1.1 mph (I	Actual 1006 Ce Detern 0.00734 v <sub>R</sub> + 0 //In) 3-2) innation it 13-11) Exhibit 13-11)	Max I Exhibit 13-8 mination (i	4600:All <b>if not F)</b>	<del>†                                      </del>	$\begin{array}{ccc} \textbf{Level of} \\ & & \square \\ \textbf{D}_{R} = & (\text{po} \\ \textbf{LOS} = & (\text{E}: \\ \textbf{Speed D} \\ \textbf{D}_{S} = & (\text{Ex} \\ \textbf{S}_{R} = & \text{mp} \\ \textbf{S}_{0} = & \text{mp} \end{array}$	Service De D <sub>R</sub> = 4.252 + 0 c/mi/ln) xhibit 13-2) etermination xhibit 13-12) h (Exhibit 13-12)	Exhibit 13-8 etermination 0.0086 V <sub>12</sub> - 0	on (if not F)

		RAMP	S AND RAI	/IP JUNCTI	ONS WO	RKS	HEET			
General Info	ormation			Site Infor						
Analyst Agency or Compa Date Performed		ne Forsythe	J	reeway/Dir of Tr lunction lurisdiction			Ave NB Of	f		
Analysis Time Per		Peak	, ,	Analysis Year		2035				
Project Description Inputs	<u>n</u>									
		Freeway Num	ber of Lanes, N	2						
Upstream Ad	j Ramp	Ramp Numbe		1					Downstrea Ramp	m Adj
□Yes	On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off		ane Length L <sub>D</sub>	1388					✓No	Off
L <sub>up</sub> =	ft	Freeway Volu Ramp Volume		519 315					L <sub>down</sub> =	ft
.,		1	-Flow Speed, S <sub>FF</sub>	65.0						la /la
V <sub>u</sub> =	veh/h		ow Speed, S <sub>FR</sub>	45.0					V <sub>D</sub> =	veh/h
Conversion	to pc/h Un		111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	519	0.89	Level	14	0	0.	935	1.00	62	4
Ramp	315	0.83	Level	10	0	0.	952	1.00	40	0
UpStream	_									
DownStream		Merge Areas					<u>I</u> D	iverge Areas		
Estimation		go			Estimat	ion o				
	V <sub>12</sub> = V <sub>F</sub>	(P)						V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	.)P	
L <sub>EQ</sub> =		ation 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-1		١
P <sub>FM</sub> =		Equation (E			P <sub>FD</sub> =			000 using Equ		
V <sub>12</sub> =	pc/h	_4(-			V <sub>12</sub> =			4 pc/h		,
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2			,			<sub>24</sub> > 2,7		Yes ☑ No		,
Is V <sub>3</sub> or V <sub>av34</sub> > 1								Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	13-16, 13-	18, or 13-
Capacity Cl		,			Capacit	y Ch		,		
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					$V_{F}$		624	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	224	Exhibit 13-8	4700	No
					$V_R$		400	Exhibit 13-10	2100	No
Flow Enteri	ng Merge In	fluence A	rea		Flow En	terin	g Diver	ge Influen	ce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		624	Exhibit 13-8	4400:All	No
	rvice Detern							termination		<del>5)</del>
	0.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>					0086 V <sub>12</sub> - 0.0	009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi	/ln)					.9 (pc/				
<u> </u>	it 13-2)						oit 13-2)			
Speed Dete	rmination				Speed L					
M <sub>S</sub> = (Exibit	13-11)				, a	•	xhibit 13-	•		
	xhibit 13-11)					-	(Exhibit	•		
	xhibit 13-11)				l *	-	(Exhibit 1	· ·		
	xhibit 13-13)						(Exhibit	13-13)		
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	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET			
General Infor				Site Infor					
Analyst Agency or Company		e Forsythe	Ju	reeway/Dir of Tru	avel	Central NB O	n		
Date Performed Analysis Time Period	9/9/2 d AM P			urisdiction nalysis Year		2035			
Project Description	A AIVI F	Gan	Λ.	naiysis i cai		2000			
Inputs									
Jpstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1				Ramp	ani 7 taj
☐ Yes ☐ Or	า	Acceleration L	ane Length, L <sub>A</sub>	1491				□Yes	On
☑ No ☐ Of	f	Deceleration I	Lane Length L <sub>D</sub>						
		Freeway Volu	me, V <sub>F</sub>	230				✓ No	Off
<sub>-up</sub> = ft		Ramp Volume	e, V <sub>R</sub>	82				L <sub>down</sub> =	ft
		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0				V <sub>D</sub> =	veh/h
$V_{\rm u} = {\rm veh/r}$	]	Ramp Free-Fl	ow Speed, S <sub>FR</sub>	55.0				V <sub>D</sub>	VCII/II
Conversion t	o pc/h Und	der Base	Conditions						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	fp	v = V/PH	F x f <sub>HV</sub> x f <sub>p</sub>
Freeway	230	0.83	Level	7	0	0.966	1.00		287
Ramp	82	0.74	Level	14	0	0.935	1.00		119
UpStream									
DownStream		Merge Areas					Diverge Area	<u> </u>	
Estimation of		merge Areas			Estimat	tion of v <sub>12</sub>		<u> </u>	
	V <sub>12</sub> = V <sub>F</sub>	( P )					= V <sub>R</sub> + (V <sub>F</sub> - V	V_)P	
- <sub>EQ</sub> =		ation 13-6 o	r 13-7)		L <sub>EQ</sub> =	- 12		אי אט  3-12 or 13-1	13)
P <sub>FM</sub> =			tion (Exhibit 13-6)	)	P <sub>FD</sub> =			tion (Exhibit 1	
V <sub>12</sub> =	287 p			,	V <sub>12</sub> =		pc/h	(======	- ',
V <sub>3</sub> or V <sub>av34</sub>	•		13-14 or 13-17	)	V <sub>3</sub> or V <sub>av34</sub>		•	n 13-14 or 13-	17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70	-		•	,		, <sub>34</sub> > 2,700 pc/l	n? ☐ Yes ☐ N		,
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5							2 □Yes □N		
f Yes,V <sub>12a</sub> =	pc/h		3-16, 13-18, or		If Yes,V <sub>12a</sub>		pc/h (Equa	tion 13-16, 1	3-18, or
	13-19)						13-19)		
Capacity Che	Actual	1 0	Capacity	LOS F?	Capacit	ty Checks Act		Capacity	LOS F?
	Actual		papacity	LOGTE	V <sub>F</sub>	Au	Exhibit 1		10011
.,	400	E 1 11 11 40 0		l	$V_{FO} = V_{F}$	V_	Exhibit 1		
$V_{FO}$	406	Exhibit 13-8		No		· · K	Exhibit 1		+
					V <sub>R</sub>		10		
Flow Entering					Flow Er		verge Influe		1
	Actual	1	Desirable 4000-All	Violation?	\	Actual	_	esirable	Violation
V <sub>R12</sub>	406	Exhibit 13-8	4600:All	No	V <sub>12</sub>	f Comitee	Exhibit 13-8		<u> </u>
Level of Serv					1		Determinat		( F)
	0.00734 v <sub>R</sub> + 0	1.0010 V <sub>12</sub> - 0.0	00021 L <sub>A</sub>			• •	+ 0.0086 V <sub>12</sub> -	0.009 L <sub>D</sub>	
$D_R = -0.8 \text{ (pc/m)}$	•				I ''	pc/mi/ln) Exhibit 13 3			
OS = A (Exhibit	<u> </u>					Exhibit 13-2			
Speed Deterr					<del> </del>	Determina	เนอก		
M <sub>S</sub> = 0.163 (Exi	•					Exhibit 13-12)	12)		
	(Exhibit 13-11)				1.5	nph (Exhibit 13	•		
	Exhibit 13-11)				1 '	nph (Exhibit 13			
•	(Exhibit 13-13)					nph (Exhibit 13			
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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General In	formation			Site Infor						
Analyst	5	Shane Forsythe	F	reeway/Dir of Tr	avel C	Central	Ave SB O	ff		
Agency or Comp	-			lunction						
Date Performed		/9/2014		lurisdiction						
Analysis Time Po		M Peak		Analysis Year	2	035				
Project Descripti	on									
Inputs		<u> </u>								
Upstream A	dj Ramp		ber of Lanes, N	2					Downstrea	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	
□Yes	☐ On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I	ane Length L <sub>D</sub>	1144					√ No	Off
		Freeway Volu	me, V <sub>F</sub>	376					INO INO	
L <sub>up</sub> =	ft	Ramp Volume	, V <sub>D</sub>	191					L <sub>down</sub> =	ft
			-Flow Speed, S <sub>FF</sub>	65.0					l ,	
$V_u =$	veh/h		ow Speed, S <sub>FR</sub>	45.0					V <sub>D</sub> =	veh/h
0	4 //- /		111	45.0						
	n to pc/n (	Inder Base	Conaitions	1	1		ı		1	
(pc/h)	(Veh/hi	) PHF	Terrain	%Truck	%Rv	1	: HV	$f_p$	v = V/PHF	$x f_{HV} x f_{p}$
Freeway	376	0.83	Level	21	0	0.9	05	1.00	5	01
Ramp	191	0.85	Level	2	0	0.9		1.00		27
UpStream	1	1000		<u> </u>					_	
DownStream										
		Merge Areas						iverge Areas		
Estimation	of v <sub>12</sub>				Estimation	on o	f v <sub>12</sub>			
	V <sub>40</sub> =	· V <sub>F</sub> ( P <sub>FM</sub> )					V <sub>40</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>		
- <sub>EQ</sub> =		quation 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-1		3)
	•	ing Equation (			P <sub>FD</sub> =			000 using Eq		
P <sub>FM</sub> =			_XIIIDIL 13-0)						uation (Exil	IDIL 13-1)
/ <sub>12</sub> =	pc		44 40 47		V <sub>12</sub> =			)1 pc/h		
V <sub>3</sub> or V <sub>av34</sub>		/h (Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>	0 =		pc/h (Equation	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} >$					0 0.0.	•		☐Yes ☑ No		
Is $V_3$ or $V_{av34}$ >					Is V <sub>3</sub> or V <sub>av34</sub>	> 1.5		☐Yes ☑ No		
f Yes,V <sub>12a</sub> =		/h (Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	13-16, 13	-18, or 13-
Capacity C		·19)			Capacity	Cho	19 ocks	9)		
capacity c	Actua		apacity	LOS F?	Capacity		Actual	Ca	pacity	LOS F?
	Actua		apacity	LOST!	V <sub>F</sub>			Exhibit 13-8	<del></del>	
					<u> </u>	.,	501	_	+	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	· V <sub>R</sub>	274	Exhibit 13-8		No
					$V_R$		227	Exhibit 13-1	0 2100	No
Flow Enter	ring Merge	Influence A	rea		Flow Ent	erin	g Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?		Α	ctual	Max Desirat	ole	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>	5	501	Exhibit 13-8	4400:All	No
Level of Se	ervice Det	ermination (	if not F)	_	Level of	Serv	ice De	terminatio	n (if not	F)
D <sub>R</sub> = 5.475 -	+ 0.00734 v <sub>i</sub>	+ 0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>		D	) <sub>R</sub> = 4	.252 + 0.	.0086 V <sub>12</sub> - 0.	009 L <sub>D</sub>	
O <sub>R</sub> = (pc/m	ni/ln)				D <sub>R</sub> = -1.7	7 (pc/r	ni/ln)			
	bit 13-2)						it 13-2)			
		2			(			<u> </u>		
Speed Det		<u> </u>			Speed Do					
•	it 13-11)				1 -		chibit 13-	-		
$S_R = mph (1)$	Exhibit 13-11	)				-	(Exhibit	*		
	Exhibit 13-11	)			$S_0 = N/A$	mph (	Exhibit 1	13-12)		
	T., b; b; t 40, 40									
S = mph (	Exhibit 13-13	5)			S = 57.	/ mph	(Exhibit	13-13)		

0		WIPS AND	RAMP JUN			<u>:</u> EI			
General Inform				Site Infor					
Analyst	Shan	e Forsythe		reeway/Dir of Tr	avel	Central SB On			
Agency or Company Date Performed	9/9/2	01/		ınction ırisdiction					
Analysis Time Period	AM P			nalysis Year		2035			
Project Description	AIVI I	can	711	idiyələ i cai		2000			
nputs									
		Freeway Num	ber of Lanes, N	2				Downstra	om Adi
Jpstream Adj Ramp		Ramp Numbe	•	1				Downstre Ramp	am Auj
☐ Yes ☐ On		· '	ane Length, L	1144				1 '	_
		1	,,	1144				☐Yes	☐ On
✓ No ☐ Off		1	ane Length L <sub>D</sub>	0=4				✓ No	Off
- tı		Freeway Volu	'	671				=	ft
<sub>up</sub> = ft		Ramp Volume	11	228				L <sub>down</sub> =	10
'u = veh/h		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0				V <sub>D</sub> =	veh/h
u VCIIII		Ramp Free-Fl	ow Speed, S <sub>FR</sub>	45.0					
Conversion to	pc/h Und	der Base	Conditions				_		
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>r</sub>
reeway	671	0.94	Level	8	0	0.962	1.00		742
Ramp	228	0.76	Level	5	0	0.976	1.00		306
JpStream		0.70	20101	Ť	Ť	0.070	1.00		000
DownStream								1	
		Merge Areas					Diverge Areas		
stimation of	v <sub>12</sub>				Estimati	ion of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>EM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	<sub>B</sub> )P <sub>ED</sub>	
EQ =		ation 13-6 o	13-7)		L <sub>EQ</sub> =	.=	(Equation 13		3)
EQ FM =			ion (Exhibit 13-6)	1	P <sub>FD</sub> =		using Equati		
гм / <sub>12</sub> =	742 p		IOTT (EXTILOR TO 0)		V <sub>12</sub> =		pc/h	OII (EXIIIDIC II	31)
	•		40 44 40 47)				•	12 14 12 1	7\
or V <sub>av34</sub>			13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation		7)
s V <sub>3</sub> or V <sub>av34</sub> > 2,700						<sub>34</sub> > 2,700 pc/h?			
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *			16 12 10 0			<sub>34</sub> > 1.5 * V <sub>12</sub> /2			2 10 00
Yes,V <sub>12a</sub> =	13-19)		3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equation 3-19)	on 13-16, 1	3-18, OI
Capacity Chec					Capacity	y Checks			
	Actual	C	apacity	LOS F?		Actual	Ca	apacity	LOS F
					V <sub>F</sub>		Exhibit 13	-8	
$V_{FO}$	1048	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit 13	-8	
*FO	1040	LAHIDIC 13-0		INO			Exhibit 13	_	
					V <sub>R</sub>		10		
low Entering	Merge In	fluence A	rea		Flow En	tering Dive	_		
.,	Actual	i r	Desirable	Violation?	\ ,,	Actual	Max De	sirable	Violation
V <sub>R12</sub>	1048	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
evel of Servi						Service De		<u> </u>	<i>F</i> )
$D_{p} = 5.475 + 0$		0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>		[	$D_{R} = 4.252 + 0$	).0086 V <sub>12</sub> - (	0.009 L <sub>D</sub>	
	1)				$D_R = (p$	c/mi/ln)			
	3-2)				LOS = (E	xhibit 13-2)			
R = 6.3 (pc/mi/li	0 Z)				Speed D	eterminati	on		
R = 6.3 (pc/mi/li	<u> </u>								
os = 6.3 (pc/mi/li os = A (Exhibit 1	ination				D <sub>s</sub> = (E	xhibit 13-12)			
$_{\rm R}$ = 6.3 (pc/mi/los) 6.3 (pc/mi/los) 6.3 (Exhibit 1) 6.	it 13-11)				,	•	)		
$_{\rm R}$ = 6.3 (pc/mi/h OS = A (Exhibit 1 <b>Speed Determ</b> $_{\rm S}$ = 0.229 (Exib $_{\rm R}$ = 59.7 mph (I	it 13-11) Exhibit 13-11)				S <sub>R</sub> = m	oh (Exhibit 13-12)			
$_{\rm R}$ = 6.3 (pc/mi/li OS = A (Exhibit 1 <b>Speed Determ</b> $_{\rm S}$ = 0.229 (Exib $_{\rm R}$ = 59.7 mph (I $_{\rm O}$ = N/A mph (E	it 13-11)				S <sub>R</sub> = mր S <sub>0</sub> = mր	•	)		

		RAMP	S AND RAI	MP JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor						
Analyst Agency or Company Date Performed	Shar	ne Forsythe	J	Freeway/Dir of Traduction		Centra	Ave NB O	ff		
Analysis Time Perio				Analysis Year		2035				
Project Description	- 11111	Oun	•							
Inputs										
Upstream Adj F	Ramp	Freeway Num Ramp Numbe	nber of Lanes, N	2					Downstre Ramp	am Adj
□Yes	On	· '	Lane Length, L <sub>A</sub>	ı					Yes	On
☑ No [	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	1388 792					<b>☑</b> No	Off
L <sub>up</sub> =	ft	Ramp Volume	'	372					L <sub>down</sub> =	ft
V <sub>u</sub> = \(\frac{1}{2}\)	reh/h		e-Flow Speed, $S_{FF}$ low Speed, $S_{FR}$	65.0 45.0					V <sub>D</sub> =	veh/h
Conversion	o pc/h Un		111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	792	0.87	Level	11	0	0.	948	1.00	9	60
Ramp	372	0.75	Level	6	0	0.	971	1.00	5	13
UpStream										
DownStream		<u> </u>								
Estimation o		Merge Areas			Estimati	iono		iverge Areas		
Estimation o					ESumau	OH O				
	$V_{12} = V_{F}$							V <sub>R</sub> + (V <sub>F</sub> - V		
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-	12 or 13-13	3)
P <sub>FM</sub> =	using	Equation (I	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Ed	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =		96	60 pc/h		
V <sub>3</sub> or V <sub>av34</sub>			3-14 or 13-17)		$V_3$ or $V_{av34}$		0	pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2.7$	00 pc/h? 🗌 Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av3</sub>	<sub>34</sub> > 2,7	00 pc/h? [	]Yes ☑No		
Is $V_3$ or $V_{av34} > 1.5$	* V <sub>12</sub> /2	s 🗌 No			Is V <sub>3</sub> or V <sub>av3</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	]Yes ☑ No		
If Yes,V <sub>12a</sub> =	pc/h ( 13-19)		i-16, 13-18, or		If Yes,V <sub>12a</sub> =	:	p 19	c/h (Equation 9)	า 13-16, 13	-18, or 13-
Capacity Ch	ecks				Capacity	y Ch	ecks			
	Actual		Capacity	LOS F?			Actual	_	apacity	LOS F?
					V <sub>F</sub>		960	Exhibit 13-	8 4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	$-V_R$	447	Exhibit 13-	8 4700	No
					$V_R$		513	Exhibit 13-	10 2100	No
Flow Enterin	g Merge In	fluence A	\rea		Flow En	terin	g Dive	rge Influer	ice Area	
	Actual	Max	Desirable	Violation?		,	Actual	Max Desira	ble	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		960	Exhibit 13-8	4400:All	No
Level of Serv	ice Deterr	nination (	if not F)	•	Level of	Ser	ice De	terminatio	n (if not	<del>;</del>
D <sub>R</sub> = 5.475 + 0						O <sub>R</sub> = 4	.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/lr	7.7				$D_R = 0.0$	) (pc/r	ni/ln)			
LOS = (Exhibit	•				111		oit 13-2)			
Speed Deter					Speed D	•		n e		
					<del>                                     </del>		xhibit 13-			
$M_S = (Exibit 1)$							(Exhibit	-		
	nibit 13-11)					-				
	nibit 13-11)				ľ	-	(Exhibit	-		
	nibit 13-13)						(Exhibit	· · · · · · · · · · · · · · · · · · ·		
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	ormation			Site Infor	mation				
Analyst Agency or Compa	ny	ne Forsythe	Ju	eeway/Dir of Tr nction	avel (	Central NB On			
Date Performed Analysis Time Per	9/9/2 riod PM F			risdiction alysis Year	,	2035			
Project Description		-eak	All	iaiysis reai		2033			
nputs	11								
		Freeway Num	ber of Lanes, N	2				D	A .I'
Jpstream Adj Ran	np	Ramp Numbe		1				Downstrea Ramp	am Adj
□Yes □	On	1 '	ane Length, L	1491				l '	
			Lane Length L <sub>D</sub>	1401				□Yes	☐ On
✓ No 🔲 (	Off	Freeway Volu		413				✓ No	Off
up = ft				193				L <sub>down</sub> =	ft
up		Ramp Volume	11					down	
/ <sub>u</sub> = veh	n/h	1	-Flow Speed, S <sub>FF</sub>	65.0				$V_D =$	veh/h
			low Speed, S <sub>FR</sub>	55.0					
Conversion	to pc/h Un	der Base	Conditions	1	_	_			
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
reeway	413	0.97	Level	8	0	0.962	1.00	1	143
Ramp	193	0.81	Level	1	0	0.995	1.00		239
JpStream									
DownStream									
		Merge Areas			F (: (:		Diverge Areas		
stimation	of V <sub>12</sub>				Estimation	on of v <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )				V <sub>12</sub> =	$V_R + (V_F - V_R)$	P <sub>FD</sub>	
<sub>EQ</sub> =	(Equ	ation 13-6 o	r 13-7)		L <sub>EQ</sub> =		(Equation 13-	-12 or 13-1	3)
) <sub>FM</sub> =	1.000	using Equat	tion (Exhibit 13-6)		P <sub>FD</sub> =		using Equation	n (Exhibit 13	i-7)
′ <sub>12</sub> =	443 p	c/h			V <sub>12</sub> =		pc/h		
′ <sub>3</sub> or V <sub>av34</sub>	0 pc/	h (Equation	13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation 1	13-14 or 13-1	7)
s V <sub>3</sub> or V <sub>av34</sub> > 2	,700 pc/h? □ <b>Y</b> e	s 🗹 No			Is V <sub>3</sub> or V <sub>av34</sub>	4 > 2,700 pc/h?	☐Yes ☐ No		
Is V <sub>3</sub> or V <sub>av34</sub> > 1	.5 * V <sub>12</sub> /2 □ Ye	s 🗹 No			Is V <sub>3</sub> or V <sub>av34</sub>	<sub>4</sub> > 1.5 * V <sub>12</sub> /2	☐Yes ☐ No		
f Yes,V <sub>12a</sub> =	pc/h	(Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =		pc/h (Equatio	n 13-16, 13	3-18, or
	13-19	)					13-19)		
Capacity Cl	T .	1 6	\\t	1.00.50	Capacity		1 0-		1 100 50
	Actual		Capacity	LOS F?	V <sub>F</sub>	Actual	Exhibit 13-	pacity 。【	LOS F?
						\/	_	_	-
		Exhibit 13-8		No	$V_{FO} = V_{F}$	- v <sub>R</sub>	Exhibit 13-	_	-
$V_{FO}$	682						Exhibit 13	-	
$V_{FO}$	682				$V_R$		<b>I</b>		1
			Area			terina Dive	10	ce Area	
	682 ng Merge Ir Actual	nfluence A	<b>Area</b> Desirable	Violation?		tering Dive	<b>I</b>		Violation
Flow Enteri	ng Merge Ir	nfluence A		Violation?	Flow En		10 erge Influer		Violation
Flow Enteri	ng Merge Ir Actual 682	nfluence A Max Exhibit 13-8	Desirable 4600:All		Flow Ent	Actual	10 erge Influer Max Des Exhibit 13-8	irable	
V <sub>R12</sub>	ng Merge Ir Actual 682 rvice Deterr	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Ent	Actual Service De	10 erge Influer Max Des Exhibit 13-8 etermination	irable on (if not	
V <sub>R12</sub> Level of Sei	ng Merge Ir Actual 682 rvice Deterr 5+0.00734 v <sub>R</sub> +	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Ent	Actual  Service De  O <sub>R</sub> = 4.252 + 6	10 erge Influer Max Des Exhibit 13-8	irable on (if not	
V <sub>R12</sub> Level of Sel  D <sub>R</sub> = 5.475	Actual 682 rvice Deterr 5 + 0.00734 v <sub>R</sub> + mi/ln)	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Ent	Actual  Service De  O <sub>R</sub> = 4.252 + 0  c/mi/ln)	10 erge Influer Max Des Exhibit 13-8 etermination	irable on (if not	
Flow Enterior $V_{R12}$ Level of Set $D_R = 5.475$ $D_R = 1.3 \text{ (pc/r)}$ $D_R = 1.3 \text{ (pc/r)}$ $D_R = 1.3 \text{ (pc/r)}$	ng Merge Ir Actual 682 rvice Deterr 5 + 0.00734 v <sub>R</sub> + mi/ln) bit 13-2)	Max Exhibit 13-8	Desirable 4600:All if not F)		V <sub>12</sub> Level of  D <sub>R</sub> = (pc	Actual  Service De  O <sub>R</sub> = 4.252 + ( c/mi/ln)  xhibit 13-2)	Max Des Exhibit 13-8 Eterminatio	irable on (if not	
Flow Enterion $V_{R12}$ Level of Sein $D_{R} = 5.475$ $D_{R} = 1.3 \text{ (pc/s)}$ $OS = A \text{ (Exhibit)}$ Speed Dete	ng Merge Ir Actual 682 rvice Deterr 5 + 0.00734 v <sub>R</sub> + mi/ln) bit 13-2) rmination	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Ent	Actual  Service Do  DR = 4.252 + (c/mi/ln)  xhibit 13-2)  Determinati	Max Des Exhibit 13-8 Eterminatio	irable on (if not	
Flow Entering $V_{R12}$ Level of Set $D_R = 5.475$ $O_R = 1.3 (pc/c)$ $O_S = A (Exhibit)$ Speed Dete $O_S = A (Exhibit)$	ng Merge Ir Actual 682 rvice Deterr 5 + 0.00734 v R + mi/ln) bit 13-2) rmination Exibit 13-11)	Max Exhibit 13-8	Desirable 4600:All if not F)		V <sub>12</sub>   Level of   D <sub>R</sub> = (po   LOS = (E: Speed D   D <sub>S</sub> = (Ex	Actual  Service De  OR = 4.252 + (c/mi/ln)  xhibit 13-2)  Seterminati  xhibit 13-12)	max Des Exhibit 13-8 Exertification 0.0086 V <sub>12</sub> - 0	irable on (if not	
Flow Enterior $V_{R12}$ Level of Sei $D_R = 5.475$ $OS = A \text{ (Exhit)}$ Speed Dete $M_S = 0.165 \text{ (E}$ $G_R = 61.2 \text{ mp}$	ng Merge Ir Actual 682 rvice Deterr 5 + 0.00734 v <sub>R</sub> + mi/ln) bit 13-2) rmination Exibit 13-11) bh (Exhibit 13-11)	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Entrol  V <sub>12</sub> Level of  D <sub>R</sub> = (po LOS = (E: Speed D D <sub>S</sub> = (Ex S <sub>R</sub> = mp	Actual  Service Do  R = 4.252 + (c/mi/ln)  xhibit 13-2)  eterminati  xhibit 13-12)  ch (Exhibit 13-12)	max Des Exhibit 13-8 Etermination 0.0086 V <sub>12</sub> - 0	irable on (if not	
V <sub>R12</sub> Level of Sel  D <sub>R</sub> = 5.475  D <sub>R</sub> = 1.3 (pc/ OS = A (Exhibit  Speed Dete  1 <sub>S</sub> = 0.165 (E  R <sub>R</sub> = 61.2 mp  T <sub>O</sub> = N/A mp	ng Merge Ir Actual 682 rvice Deterr 5 + 0.00734 v R + mi/ln) bit 13-2) rmination Exibit 13-11)	Max Exhibit 13-8	Desirable 4600:All if not F)		Flow Entire V <sub>12</sub> Level of D <sub>R</sub> = (po LOS = (E: Speed D) D <sub>S</sub> = (Ex S <sub>R</sub> = mp S <sub>0</sub> = mp	Actual  Service De  OR = 4.252 + (c/mi/ln)  xhibit 13-2)  Seterminati  xhibit 13-12)	max Des Exhibit 13-8 Exercise	irable on (if not	

		RAMP	S AND RAI	MP JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor						
Analyst Agency or Company	Shar	e Forsythe	J	reeway/Dir of Tra lunction		Central	Ave SB O	ff		
Date Performed	9/9/2			lurisdiction						
Analysis Time Perio	d PM F	Peak	<i>F</i>	Analysis Year		2035				
Project Description										
Inputs		Erooway Num	ber of Lanes, N						Т	
Upstream Adj F	Ramp	Ramp Numbe		2 1					Downstre Ramp	am Adj
□Yes	On	I '	ane Length, L	I					1_ `	
	7		Lane Length L <sub>D</sub>	1144					∐Yes	On
☑ No	_l Off	Freeway Volu	5	348					✓ No	Off
L <sub>up</sub> =	ft	Ramp Volume		101					L <sub>down</sub> =	ft
		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
$V_u = V$	eh/h	Ramp Free-Fi	low Speed, S <sub>FR</sub>	45.0					V <sub>D</sub> -	VEII/II
Conversion t	o pc/h Un	der Base	Conditions						•	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	348	0.79	Level	14	0		935	1.00	_	71
Ramp	101	0.90	Level	6	0	0.	971	1.00	1	15
UpStream DownStream		<del>                                     </del>				+			<u> </u>	
DownStream	<u> </u>	I I Merge Areas						Diverge Areas	<u> </u>	
Estimation o		<b>J</b> -			Estimati	ion o		. <b>y</b>		
	V <sub>12</sub> = V <sub>F</sub>	( P )						· V <sub>R</sub> + (V <sub>F</sub> - V	/_\P	
L <sub>EQ</sub> =		tion 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-		3)
P <sub>FM</sub> =		Equation (			P <sub>FD</sub> =			000 using Ed		-
V <sub>12</sub> =	pc/h	1 (	,		V <sub>12</sub> =			'1 pc/h	1	
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$		-	,			2,7		]Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$								☐Yes ☑No		
f Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equatio		-18, or 13-
Capacity Che	ecks				Capacity	y Ch	ecks			
	Actual	C	Capacity	LOS F?			Actual	_	apacity	LOS F?
					V <sub>F</sub>		471	Exhibit 13	<del></del>	No
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	356	Exhibit 13	-8 4700	No
					$V_R$		115	Exhibit 13-	10 2100	No
Flow Enterin					Flow En	_		rge Influer		
	Actual		Desirable	Violation?			Actual	Max Desira		Violation?
V <sub>R12</sub>	<u> </u>	Exhibit 13-8			V <sub>12</sub>		471	Exhibit 13-8	4400:All	No
Level of Serv								terminatio		F)
$D_R = 5.475 + 0$		0.0078 V <sub>12</sub> -	· 0.00627 L <sub>A</sub>					.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/lr	•				l ''	.0 (pc/	,			
LOS = (Exhibit						•	oit 13-2)			
Speed Deteri	mination				Speed D					
$M_S = (Exibit 1)$					1 -		xhibit 13-	-		
••	nibit 13-11)					-	(Exhibit	-		
	nibit 13-11)				l *	-	(Exhibit	•		
	nibit 13-13)				L		(Exhibit	· · · · · · · · · · · · · · · · · · ·		
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0		MPS AND	RAMP JUN			<u>:El</u>		
General Infori				Site Infor		0 1 105 5		
Analyst	Shan	e Forsythe		reeway/Dir of Tr unction	avel	Central SB On		
Agency or Company Date Performed	9/9/20	014		urisdiction				
Analysis Time Period	PM P			nalysis Year		2035		
Project Description				,				
nputs								
Jpstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Downstream Adj
potroum raj ramp		Ramp Numbe	r of Lanes, N	1				Ramp
☐ Yes ☐ On		Acceleration I	ane Length, L <sub>Δ</sub>	1144				☐Yes ☐On
□N- □O#		1	Lane Length L <sub>D</sub>					
✓ No ☐ Off		Freeway Volu		936				☑ No ☐ Off
<sub>rup</sub> = ft		Ramp Volume		366				L <sub>down</sub> = ft
up		1	-Flow Speed, S <sub>FF</sub>	65.0				
$v_{\rm u} = {\rm veh/h}$		1						$V_D = veh/h$
			ow Speed, S <sub>FR</sub>	45.0				
Conversion to	pc/n Und	ger Base	Conditions	1	Ι	1		1
(pc/h)	v (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	f <sub>p</sub>	$V = V/PHF \times f_{HV} \times f$
reeway	936	0.90	Level	14	0	0.935	1.00	1113
Ramp	366	0.89	Level	6	0	0.971	1.00	423
JpStream								
DownStream								
		Merge Areas					Diverge Areas	
stimation of	v <sub>12</sub>				Estimati	ion of v <sub>12</sub>		
	$V_{12} = V_{F}$	(P <sub>FM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	r)P <sub>FD</sub>
EQ =	(Equa	ation 13-6 oi	r 13-7)		L <sub>EQ</sub> =		(Equation 13	3-12 or 13-13)
 FM =	1.000	using Equat	tion (Exhibit 13-6)	)	P <sub>FD</sub> =		using Equat	ion (Exhibit 13-7)
12 =	1113		,	'	V <sub>12</sub> =		pc/h	,
or V <sub>av34</sub>		•	13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		•	13-14 or 13-17)
s V <sub>3</sub> or V <sub>av34</sub> > 2,700	-		10 11 01 10 11	,		<sub>34</sub> > 2,700 pc/h?		
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *						<sub>34</sub> > 1.5 * V <sub>12</sub> /2		
			3-16, 13-18, or					on 13-16, 13-18, or
Yes,V <sub>12a</sub> =	13-19)		7 10, 10 10, 01		If Yes,V <sub>12a</sub> =		13-19)	011 10 10, 10 10, 01
Capacity Che	cks				Capacity	y Checks		
	Actual	С	Capacity	LOS F?		Actua	I C	apacity LOS F
					$V_{F}$		Exhibit 13	3-8
$V_{FO}$	1536	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit 13	3-8
FO					V <sub>R</sub>		Exhibit 1	3-
		1 1			1 TR		10	
		<del></del>			T=- =			
low Entering		1		Lynun	Flow En	tering Dive		
	Actual	Max	Desirable	Violation?		Actual	Max De	sirable Violatio
V <sub>R12</sub>	Actual 1536	Max Exhibit 13-8	Desirable 4600:All	Violation?	V <sub>12</sub>	Actual	Max De Exhibit 13-8	esirable Violation
V <sub>R12</sub> .evel of Servi	Actual 1536 <b>ce Detern</b>	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of	Actual Service D	Max De Exhibit 13-8 eterminati	violation violat
V <sub>R12</sub> .evel of Servi	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of	Actual  Service D  OR = 4.252 +	Max De Exhibit 13-8 eterminati	violation violat
V <sub>R12</sub> .evel of Servi	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of	Actual Service D	Max De Exhibit 13-8 eterminati	violation violat
V <sub>R12</sub> .evel of Servi  D <sub>R</sub> = 5.475 + 0  R = 10.1 (pc/mi	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of  D <sub>R</sub> = (p	Actual  Service D  OR = 4.252 +	Max De Exhibit 13-8 eterminati	violation violat
D <sub>R</sub> = 5.475 + 0 D <sub>R</sub> = 10.1 (pc/mi	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 /ln) 3-2)	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of  D <sub>R</sub> = (p LOS = (E	Actual  Service D  O <sub>R</sub> = 4.252 + oc/mi/ln)	Max De Exhibit 13-8 <b>eterminati</b> 0.0086 V <sub>12</sub> -	violation violat
V <sub>R12</sub> Level of Servi  D <sub>R</sub> = 5.475 + 0  R <sub>R</sub> = 10.1 (pc/mi  OS = B (Exhibit 1	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 //ln) 3-2)	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of  D <sub>R</sub> = (p  LOS = (E	Actual  Service D  C  C  C  C  C  C  C  C  C  C  C  C  C	Max De Exhibit 13-8 <b>eterminati</b> 0.0086 V <sub>12</sub> -	violation violat
$V_{R12}$ Level of Servi $D_R = 5.475 + 0$ $C_R = 10.1 \text{ (pc/mi)}$ $C_R = 10.236 \text{ (Exib}$	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 /ln) 3-2) <b>nination</b> it 13-11)	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	V <sub>12</sub> Level of  [D <sub>R</sub> = (p LOS = (E Speed D D <sub>S</sub> = (E	Actual  Service D  Complete A 2.52 + 10 c/mi/ln)  Exhibit 13-2)  Determination  Exhibit 13-12)	Max De Exhibit 13-8 <b>eterminati</b> 0.0086 V <sub>12</sub> -	violation violat
$V_{R12}$ Level of Servi $D_R = 5.475 + 0.00$ $D_R = 5.475 + 0.00$ $D_R = 0.00$	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 //ln) 3-2) <b>nination</b> it 13-11) Exhibit 13-11)	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	$\begin{array}{c} V_{12} \\ \hline Level \ of \\ \hline \\ D_R =  (p\\ LOS =  (E\\ \hline Speed \ D\\ D_s =  (E\\ S_R =  mp \end{array}$	Actual  Service D  Copy = 4.252 + c/mi/ln)  Exhibit 13-2)  Determination  Actual	Max De Exhibit 13-8 eterminati 0.0086 V <sub>12</sub> -	violation violat
$V_{R12}$ Level of Servi $D_R = 5.475 + 0.000$ $D_R = 0.475  $D_R = 0.236$	Actual 1536 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0 /ln) 3-2) <b>nination</b> it 13-11)	Max Exhibit 13-8 mination (	Desirable 4600:All <b>if not F)</b>	1	$\begin{array}{c} V_{12} \\ \hline Level \ of \\ \hline D_R = & (p) \\ LOS = & (E) \\ \hline Speed \ D \\ S_R = & mp \\ S_0 = & mp \\ \hline S_0 = & mp \\ \hline \end{array}$	Actual  Service D  Complete A 2.52 + 10 c/mi/ln)  Exhibit 13-2)  Determination  Exhibit 13-12)	Max De Exhibit 13-8 eterminati 0.0086 V <sub>12</sub> -	violation violat

General Inform		J AILD	RAMP JUNG	Site Infor						
Analyst		ne Forsythe		eeway/Dir of Tr		Emercon	Junction N	IR On		
Agency or Company	Snan	ie roisyttie		nction	avei i	Lineison	JUNICUON N	ID UII		
ate Performed	9/9/2	<u>'</u> 014		risdiction						
nalysis Time Period	AM P	<sup>2</sup> eak	An	nalysis Year	2	2035				
roject Description										
nputs										
Jpstream Adj Ramp		Freeway Numb	per of Lanes, N	2					Downstrea	ım Adj
		Ramp Number	of Lanes, N	1					Ramp	•
☐ Yes ☐ On		Acceleration L	ane Length, L₄	980					□Yes	On
✓ No ☐ Off		Deceleration L	ane Length Ln							
¥ NO □ OII		Freeway Volur	- 0	351					✓ No	Off
<sub>up</sub> = ft		Ramp Volume		104					L <sub>down</sub> =	ft
ıρ			Flow Speed, S <sub>FF</sub>							
'u = veh/h		1		65.0					$V_D =$	veh/h
		Ramp Free-Flo	- 111	55.0						
Conversion to	•	der Base (	Conditions	1	1			ı		
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f⊦	IV	f <sub>p</sub>	v = V/PHF	$x \: f_{HV} \: x \: f_p$
reeway	351	0.89	Level	21	0	0.90	5	1.00	4	36
Ramp	104	0.83	Level	15	0	0.93		1.00		35
JpStream										
OownStream										
		Merge Areas					Div	erge Areas		
stimation of v	V <sub>12</sub>				Estimati	on of	v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> = V <sub>1</sub>	+ (V <sub>F</sub> - V <sub>R</sub> )	P <sub>FD</sub>	
EQ =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(E	quation 13-	12 or 13-13	3)
FM =			on (Exhibit 13-6)		P <sub>FD</sub> =			ing Equation		
' <sub>12</sub> =	436 p		(=/:511 10 0)		V <sub>12</sub> =		pc		(=:::::::::::::::::::::::::::::::::::::	.,
<sub>3</sub> or V <sub>av34</sub>	•		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			/h (Equation 1	3 1/1 or 13 1	7)
s V <sub>3</sub> or V <sub>av34</sub> > 2,700	-		13-14-01-13-17)			> 2.700	-	Yes 🗌 No	0-14-01-10-11	,
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 * \			16 12 10 or					Yes □ No :/h (Equatior	12 16 12	10 or
Yes,V <sub>12a</sub> =	13-19)		-16, 13-18, or		If Yes,V <sub>12a</sub> =		13-		1 13-10, 13	5- 10, UI
Capacity Chec	ks				Capacity	y Che		,		
	Actual	С	apacity	LOS F?			Actual	Сар	acity	LOS F?
					$V_{F}$			Exhibit 13-8	3	
.,	571	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		Exhibit 13-8	3	
V I	57 1	Exhibit 10 0		140	V <sub>R</sub>			Exhibit 13-		
V <sub>FO</sub>					I VD			10		
				<u> </u>				e Influen		
Flow Entering	Actual	Max [	Desirable	Violation?	Flow En		tual	Max Desi		Violation
Flow Entering  V <sub>R12</sub>	Actual 571	Max [ Exhibit 13-8	Desirable 4600:All	Violation?	Flow En	Ac	tual	Max Desii Exhibit 13-8	rable	
Flow Entering	Actual 571	Max [ Exhibit 13-8	Desirable 4600:All	1	Flow En	Ac	tual	Max Desi	rable	
Flow Entering V <sub>R12</sub>	Actual 571 ce <b>Detern</b>	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	Flow En	Servi	tual ce Dete	Max Desii Exhibit 13-8	rable n (if not	
V <sub>R12</sub> .evel of Service D <sub>R</sub> = 5.475 + 0	Actual 571 <b>ce Detern</b> 0.00734 v <sub>R</sub> + 0	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	V <sub>12</sub> Level of	Servi	tual ce Dete	Max Desi Exhibit 13-8 Ermination	rable n (if not	
V <sub>R12</sub> <b>evel of Servic</b> D <sub>R</sub> = 5.475 + 0  R <sub>R</sub> = 3.7 (pc/mi/ln	Actual 571  Ce Detern (0.00734 v R +	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	Flow En	According Accor	ce <b>Dete</b>	Max Desi Exhibit 13-8 Ermination	rable n (if not	
Flow Entering $V_{R12}$ Level of Service $D_R = 5.475 + 0$ $C_R = 3.7 \text{ (pc/mi/ln}$ $C_R = 3.7 \text{ (pc/mi/ln}$ $C_R = 3.7 \text{ (pc/mi/ln}$	Actual 571 <b>Ce Detern</b> 1.00734 v <sub>R</sub> + (0) 3-2)	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	V <sub>12</sub> Level of  D <sub>R</sub> = (pi	Servi $D_R = 4.2$ c/mi/ln)	ce Dete 252 + 0.0	Max Desi Exhibit 13-8 <b>ermination</b> 086 V <sub>12</sub> - 0.	rable n (if not	
V <sub>R12</sub> Level of Servic  D <sub>R</sub> = 5.475 + 0  D <sub>R</sub> = 3.7 (pc/mi/ln  OS = A (Exhibit 13	Actual 571 <b>ce Detern</b> 0.00734 v <sub>R</sub> + (1) 3-2) <b>ination</b>	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	Flow En	Servi D <sub>R</sub> = 4.2 c/mi/ln) exhibit 1	ce Dete 252 + 0.0 3-2)	Max Desi Exhibit 13-8 <b>ermination</b> 086 V <sub>12</sub> - 0.	rable n (if not	
Flow Entering $V_{R12}$ Level of Servic $D_R = 5.475 + 0$ $D_R = 3.7 \text{ (pc/mi/ln}$ $D_R = 3.7 \text$	Actual 571 <b>ce Detern</b> 1.00734 v <sub>R</sub> + (1) 1) 3-2) <b>ination</b> t 13-11)	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	V <sub>12</sub>   Level of   D <sub>R</sub> = (pi   LOS = (E)   Speed D   D <sub>S</sub> = (E)   C   C   C   C   C   C   C   C   C	Accomplete Accomplete	ce Dete 252 + 0.0 3-2) ination	Max Desi Exhibit 13-8 <b>ermination</b> 086 V <sub>12</sub> - 0.	rable n (if not	
Flow Entering $V_{R12}$ Evel of Servic $D_R = 5.475 + 0$ $D_R = 3.7 \text{ (pc/mi/ln}$ $D_R = 3.7 $	Actual 571 <b>ce Detern</b> 0.00734 v <sub>R</sub> + (  n) 3-2) <b>ination</b> t 13-11) Exhibit 13-11)	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	Flow En	Ac  Servi  C <sub>R</sub> = 4.2  c/mi/ln)  Exhibit 1  Determ  xhibit 13-  bh (Exhibit	ce Dete 252 + 0.0 3-2) ination 12) it 13-12)	Max Desi Exhibit 13-8 <b>ermination</b> 086 V <sub>12</sub> - 0.	rable n (if not	
Flow Entering $V_{R12}$ Evel of Servic $D_R = 5.475 + 0$ $D_R = 3.7 \text{ (pc/mi/ln}$ $D_R = 3.7 $	Actual 571 <b>ce Detern</b> 0.00734 v <sub>R</sub> + (  n) 3-2) <b>ination</b> t 13-11) Exhibit 13-11)	Max [ Exhibit 13-8 mination (i	Desirable 4600:All <b>f not F)</b>	1	Flow En	Accomplete Accomplete	ce Dete 252 + 0.0 3-2) ination 12) it 13-12) it 13-12)	Max Desi Exhibit 13-8 <b>ermination</b> 086 V <sub>12</sub> - 0.	rable n (if not	

		RAMP	S AND RAI	/IP JUNCTI	ONS WOF	RKSH	EET			
General Int	formation			Site Infor	mation					
Analyst	SI	hane Forsythe	F	reeway/Dir of Tr	avel E	merson	Junction S	SB Off		
Agency or Comp	-			lunction						
Date Performed		9/2014		lurisdiction						
Analysis Time Pe		M Peak		Analysis Year	2	035				
Project Description	on									
Inputs		le	h							
Upstream A	dj Ramp	1 .	ber of Lanes, N	2					Downstrea	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	
□Yes	☐ On	Acceleration L	ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I	ane Length L <sub>D</sub>	340						□ O#
E 140		Freeway Volu	me, V <sub>E</sub>	673					<b>☑</b> No	Off
L <sub>up</sub> =	ft	Ramp Volume		299					L <sub>down</sub> =	ft
űþ.			-Flow Speed, S <sub>ee</sub>							
$V_u =$	veh/h								V <sub>D</sub> =	veh/h
	4 / / /		ow Speed, S <sub>FR</sub>	50.0						
Conversion		Inder Base	conaitions	1	1	1	Т			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>H</sub>	,	f <sub>p</sub>	v = V/PHF	$x f_{HV} x f_{p}$
Freeway	673	0.87	Level	6	0	0.97		1.00		97
Ramp	299	0.88	Level	5	0	0.970		1.00		48
UpStream	255	0.00	20101	<del>                                     </del>	<u> </u>	0.07		1.00		10
DownStream										
	•	Merge Areas				•		verge Areas		
Estimation	of V <sub>12</sub>				Estimation	on of v	/12			
		V <sub>F</sub> ( P <sub>FM</sub> )			1			/ <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	-)P	
=		ververm? quation 13-6 or	13 7)					quation 13-1		2)
L <sub>EQ</sub> =	· ·	-			L <sub>EQ</sub> =			-		
P <sub>FM</sub> =		ng Equation(E ·	EXHIBIT 13-0)		P <sub>FD</sub> =			00 using Equ	uation (Exn	IDIT 13-7)
V <sub>12</sub> =	pc/				V <sub>12</sub> =			pc/h		
$V_3$ or $V_{av34}$		h (Equation 13	-14 or 13-17)		$V_3$ or $V_{av34}$		-	oc/h (Equatio	n 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2$					Is $V_3$ or $V_{av34}$	> 2,700	pc/h?	Yes 🗹 No		
Is $V_3$ or $V_{av34} > 1$	1.5 * V <sub>12</sub> /2 🔲 ·	Yes 🗌 No			Is $V_3$ or $V_{av34}$	> 1.5 * \				
f Yes,V <sub>12a</sub> =		h (Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			/h (Equation	13-16, 13	-18, or 13-
	13-	19)				06.0	19)			
Capacity C				1	Capacity	Chec		T 0		1.00.50
	Actual		apacity	LOS F?	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	_	Actual		pacity	LOS F?
					V <sub>F</sub>		797	Exhibit 13-8		No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$ -	·V <sub>R</sub>	449	Exhibit 13-8	4700	No
					$V_R$		348	Exhibit 13-1	0 2100	No
Flow Enter	ina Merae	Influence A	rea	-	Flow Ent	erina	Diver	ge Influen	ce Area	
	Actual		Desirable	Violation?		Act		Max Desirab		Violation
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	79	7	Exhibit 13-8	4400:All	No
	ervice Dete	ermination (	if not F)			Servic	e Det	erminatio	n (if not	F)
		+ 0.0078 V <sub>12</sub> -						086 V <sub>12</sub> - 0.		- /
		3.337.3 112	A					12 0.	- <b></b> D	
					I ''	(pc/mi/	•			
LOS = (Exhi	bit 13-2)				·	Exhibit				
	ermination	1			Speed De	<u>eterm</u>	inatio	1		
Speed Dete					$D_{s} = 0.26$	64 (Exh	ibit 13-1	2)		
•	it 13-11)				S 0.20	01 (EXII		,		
M <sub>S</sub> = (Exib		)					Exhibit 1	-		
$M_S = (Exib)$ $S_R = mph (B)$	Exhibit 13-11)				S <sub>R</sub> = 58.9	9 mph (E		3-12)		
$M_S = (Exib)$ $S_R = mph (I_S)$ $S_0 = mph (I_S)$		)			$S_R = 58.9$ $S_0 = N/A$	9 mph (E mph (E	Exhibit 1	3-12) 3-12)		

Canaval Infa		WPS AND	RAMP JUN			== 1			
General Infor		- "		Site Infor			NIP C		
Analyst	Shan	e Forsythe		reeway/Dir of Tr	avel	Emerson Juncti	on NB On		
gency or Company ate Performed	9/9/2	014		ınction ırisdiction					
nalysis Time Period				nalysis Year		2035			
roject Description	FIVIE	can		idiyələ i cai		2033			
nputs									
•		Freeway Num	ber of Lanes, N	2				Dournotro	om Adi
pstream Adj Ramp		Ramp Numbe	roflanes N	1				Downstre Ramp	am Auj
☐ Yes ☐ On		l '	ane Length, L	980				1 '	_
			- ^	300				□Yes	☐ On
☑ No ☐ Off	1		ane Length L <sub>D</sub>	0.40				✓ No	Off
- £1		Freeway Volu	•	849				. =	ft
<sub>up</sub> = ft		Ramp Volume	11	458				L <sub>down</sub> =	11
u = veh/h		Freeway Free	-Flow Speed, S <sub>FF</sub>	65.0				V <sub>D</sub> =	veh/h
u veniini		Ramp Free-Fl	ow Speed, S <sub>FR</sub>	55.0				, , , , , , , , , , , , , , , , , , ,	
onversion to	pc/h Und	der Base	Conditions						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHI	F x f <sub>HV</sub> x f <sub>p</sub>
reeway	849	0.94	Level	6	0	0.971	1.00	+	930
Ramp	458	0.92	Level	5	0	0.976	1.00		511
JpStream	100	0.02	20101	Ť	Ť	0.070	1.00		011
OownStream						1	1		
		Merge Areas					Diverge Areas	5	
stimation of	v <sub>12</sub>				Estimati	ion of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )				V <sub>12</sub> :	= V <sub>R</sub> + (V <sub>F</sub> - \	/ <sub>R</sub> )P <sub>ED</sub>	
EQ =		ation 13-6 or	13-7)		L <sub>EQ</sub> =	.2	(Equation 1	2	13)
-u <sub>FM</sub> =			ion (Exhibit 13-6)	1	P <sub>FD</sub> =		using Equa		
12 =	930 p		(=/		V <sub>12</sub> =		pc/h		- ' /
or V <sub>av34</sub>	•		13-14 or 13-17)	<b>\</b>	V <sub>3</sub> or V <sub>av34</sub>		•	n 13-14 or 13-1	17\
<sub>3</sub>			13-14-01-13-17)	1		> 2 700 nc/h2	Yes N		17)
0 0,0,									
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *			3-16, 13-18, or				☐ Yes ☐ N pc/h (Equat		3_18 or
Yes,V <sub>12a</sub> =	13-19)		5-10, 13-10, 01		If Yes,V <sub>12a</sub> =		13-19)	1011 13-10, 1	J-10, UI
Capacity Che	cks				Capacity	y Checks			
	Actual	C	apacity	LOS F?		Actua		Capacity	LOS F
					V <sub>F</sub>		Exhibit 1	3-8	
$V_{FO}$	1441	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit 1	3-8	
10					V <sub>R</sub>		Exhibit 1	13-	
						<u> </u>	10		
low Entering	Actual	1	<b>Irea</b> Desirable	Violation?	Flow En	Actual	erge Influe	ence Area esirable	Violation
V <sub>R12</sub>	1441	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Actual	Exhibit 13-8		Violation
evel of Servi				INO		Sarvina D	eterminat		 
		•					0.0086 V <sub>12</sub> -	<u> </u>	. <i>F)</i>
		0.0078 V <sub>12</sub> - 0.0	JUUZI LA				0.0000 V <sub>12</sub> -	0.009 L <sub>D</sub>	
R = 10.3 (pc/mi	-				1	c/mi/ln)			
OS = B (Exhibit 1	<u> </u>					xhibit 13-2)			
Speed Detern	nination				<del>+                                    </del>	eterminat	ion		
$I_{S} = 0.230 \text{ (Exit)}$	oit 13-11)				,	xhibit 13-12)			
	Evhihit 13_11)				S <sub>R</sub> = mp	ph (Exhibit 13-1	2)		
<sub>R</sub> = 59.7 mph (	LAHIDIC 13-11)								
	Exhibit 13-11)					ph (Exhibit 13-1	2)		
= N/A mph (E	•				S <sub>0</sub> = mp	oh (Exhibit 13-1 oh (Exhibit 13-1	•		

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation		44	Site Infor						
Analyst Agency or Company Date Performed		e Forsythe	Jı	reeway/Dir of Trunction		Emerso	on Junction	SB Off		
Analysis Time Period				nalysis Year		2035				
Project Description	, , , , , ,	-								
Inputs										
Upstream Adj R	amp	Freeway Num Ramp Numbe	ber of Lanes, N	2 1					Downstre Ramp	am Adj
□Yes	On	i '	ane Length, L <sub>A</sub>	'					Yes	On
✓ No	Off	Deceleration I Freeway Volu	ane Length L <sub>D</sub>	340 560					☑ No	Off
L <sub>up</sub> = f	t	Ramp Volume		195					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		-Flow Speed, $S_{FF}$ ow Speed, $S_{FR}$	65.0 50.0					V <sub>D</sub> =	veh/h
Conversion t	o pc/h Uni		111							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	560	0.88	Level	13	0	0.9	939	1.00	6	78
Ramp	195	0.94	Level	7	0	0.9	966	1.00	2	16
UpStream		$\sqcup$				_				
DownStream		 Merge Areas						iverge Areas		
Estimation of		werge Areas			Estimati	on o		iverge Areas		
L3timation of					Louinau	011 0				
	$V_{12} = V_F$							V <sub>R</sub> + (V <sub>F</sub> - V		
-EQ =		ition 13-6 or			L <sub>EQ</sub> =			Equation 13-		-
P <sub>FM</sub> =	_	Equation (	Exhibit 13-6)		P <sub>FD</sub> =			000 using Eq	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			'8 pc/h		
$V_3$ or $V_{av34}$		-	-14 or 13-17)		$V_3$ or $V_{av34}$			pc/h (Equation	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$								☐Yes ☑ No		
Is $V_3$ or $V_{av34} > 1.5$					Is V <sub>3</sub> or V <sub>av3</sub>	<sub>4</sub> > 1.5		☐Yes ☑ No		
f Yes,V <sub>12a</sub> =	pc/h ( 13-19)		-16, 13-18, or		If Yes,V <sub>12a</sub> =		p 19	c/h (Equatior	13-16, 13	-18, or 13-
Capacity Che		1			Capacity			<u>")                                    </u>		
Supucity One	Actual		apacity	LOS F?		1	Actual	Ca	apacity	LOS F?
	7101001	† Ť	apaony	20011	V <sub>F</sub>		678	Exhibit 13-	<del></del>	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V_	462	Exhibit 13-		No
- FO		Eximon 10 0			V <sub>R</sub>	·R	216	Exhibit 13-1		No
Flance Frataria	 	<u> </u>				40 11/10				INO
Flow Entering	Actual		Desirable	Violation?	FIOW ETT	-	g Dive	rge Influen Max Desira		Violation?
V <sub>R12</sub>		Exhibit 13-8		Violation?	V <sub>12</sub>	(	678	Exhibit 13-8	4400:All	No
Level of Serv								terminatio		<i>F</i> )
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	0.00627 L <sub>A</sub>			$O_R = 4$	.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/In	)				$D_R = 7.0$	(pc/r	ni/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Deterr	nination				Speed D	eter	minatio	n		
M <sub>S</sub> = (Exibit 1					<del>                                     </del>		xhibit 13-			
	ibit 13-11)				1	-	(Exhibit	-		
	-					-	(Exhibit	•		
So= mnh/Fvh	iibit 1:3-111				O₁- N//	A MIDN	(⊏XHIDIL	13-12)		
$S_0$ = mph (Exh S = mph (Exh	iibit 13-11) iibit 13-13)				ľ	-	(Exhibit	*		

		RAMP	S AND RAM	IP JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor			<b>-</b>			
Analyst Agency or Company		e Forsythe	Jı	reeway/Dir of Tr unction		Gore H	ill NB Off			
Date Performed	9/9/2			urisdiction						
Analysis Time Period	l AM F	Peak	A	nalysis Year		2035				
Project Description										
Inputs		Erooway Num	ber of Lanes, N						Γ	
Upstream Adj R	amp	Ramp Numbe		2 1					Downstre Ramp	am Adj
□Yes □	On		ane Length, L <sub>A</sub>						□Yes	On
✓ No	Off	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	323 442					☑No	Off
L <sub>up</sub> = f	t	Ramp Volume	'	33					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		Flow Speed, $S_{FF}$ low Speed, $S_{FR}$	65.0 50.0					V <sub>D</sub> =	veh/h
Conversion to	o nc/h Un/		111	30.0						
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>uv</sub> x f <sub>n</sub>
Freeway	(Veh/hr) 442	0.92	Level	10	0	-	952	1.00		04
Ramp	33	0.92	Level	35	0	_	851	1.00		52
UpStream		0.74	Level	33		0.0	001	1.00	<del>                                     </del>	) <u>L</u>
DownStream						1				
		Merge Areas						iverge Areas		
Estimation of	<sup>r</sup> v <sub>12</sub>				Estimati	on o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
L <sub>EQ</sub> =		ntion 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-		3)
P <sub>FM</sub> =		Equation (			P <sub>FD</sub> =			000 using Eq		-
V <sub>12</sub> =	pc/h	. ,	,		V <sub>12</sub> =			4 pc/h	,	,
V <sub>3</sub> or V <sub>av34</sub>	•	Equation 13	-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equation	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$		-	,			, > 2,7		Yes ☑ No		,
Is $V_3$ or $V_{av34} > 1.5$								Yes ☑ No		
f Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	13-16, 13	-18, or 13-
Capacity Che					Capacity	/ Che		· /		
•	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					V <sub>F</sub>		504	Exhibit 13-	8 4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	$-V_R$	452	Exhibit 13-	8 4700	No
					$V_R$		52	Exhibit 13-1	0 2100	No
Flow Entering	g Merge In	fluence A	rea		Flow En	terin	g Diver	ge Influen	ce Area	
	Actual	Max	Desirable	Violation?		ļ	Actual	Max Desira	ble	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>	,	504	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)		Level of	Serv	vice De	terminatio	n (if not	F)
$D_R = 5.475 + 0.$	00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>			O <sub>R</sub> = 4	.252 + 0.	0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln	)				$D_{R} = 5.7$	7 (pc/r	ni/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Deterr	nination				Speed D	eter	minatio	n		
M <sub>S</sub> = (Exibit 1					<del>                                     </del>		xhibit 13-			
	ibit 13-11)					-	(Exhibit	•		
	ibit 13-11)					-	(Exhibit 1			
-U 111411 ( <b>LVI</b>						1	,	,		
S = mph(Exh	ibit 13-13)				S = 59.	.5 mnh	(Exhibit	13-13)		

	RA	MPS AND	RAMP JUN	<u>CTIONS W</u>	<u>ORKSH</u>	EET				
General Infor	mation			Site Infor	mation					
Analyst		ne Forsythe		eeway/Dir of Tr	avel	Gore Hil	NB On			
Agency or Company		204.4		inction						
Date Performed	9/9/2			risdiction		2025				
Analysis Time Period Project Description	d AM F	Реак	AI	nalysis Year		2035				
nputs										
•		Freeway Num	per of Lanes, N	2						
Jpstream Adj Ramp		Ramp Number		1					Downstre Ramp	am Adj
☐ Yes ☐ Or	า			•					l '	
			ane Length, L <sub>A</sub>	1500					□Yes	On
☑ No ☐ Of	f		ane Length L <sub>D</sub>						✓ No	Off
_ 6		Freeway Volui		803						4
<sub>up</sub> = ft		Ramp Volume	11	572					L <sub>down</sub> =	ft
/ <sub>u</sub> = veh/h	•	Freeway Free-	Flow Speed, S <sub>FF</sub>	65.0					V <sub>D</sub> =	veh/h
u veii/i		Ramp Free-Flo	ow Speed, S <sub>FR</sub>	50.0					- D	• • • • • • • • • • • • • • • • • • • •
Conversion t	o pc/h Un	der Base (	Conditions							
(pc/h)	V	PHF	Terrain	%Truck	%Rv	f	-IV	fp	v = V/PHF	x f <sub>HV</sub> x f <sub>D</sub>
	(Veh/hr)							r		
Freeway	803	0.90	Grade	16	0	0.9		1.00		964
Ramp UpStream	572	0.82	Level	23	0	0.8	91	1.00		774
DownStream		+ +				+				
zowiiou daiii		Merge Areas					<u>_</u>	iverge Areas		
Estimation of					Estimat	ion of				
	V <sub>12</sub> = V <sub>F</sub>	(P)						V <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	\D	
_			10.7)		_					2)
EQ =		ation 13-6 or			L <sub>EQ</sub> =			Equation 13-		
P <sub>FM</sub> =			on (Exhibit 13-6)		P <sub>FD</sub> =			using Equatio	n (Exhibit 1	3-7)
' <sub>12</sub> =	964 p				V <sub>12</sub> =			oc/h		
/ <sub>3</sub> or V <sub>av34</sub>	-		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			oc/h (Equation 1	3-14 or 13-1	17)
$V_3 \text{ or } V_{av34} > 2,70$						٠.		☐Yes ☐ No		
Is $V_3$ or $V_{av34} > 1.5$					Is V <sub>3</sub> or V <sub>av</sub>	<sub>/34</sub> > 1.5 *		☐Yes ☐ No		
Yes,V <sub>12a</sub> =			-16, 13-18, or		If Yes,V <sub>12a</sub> =	=		oc/h (Equation	n 13-16, 1	3-18, or
Capacity Che	13-19	)			Capacit			3-19)		
supacity one	Actual		apacity	LOS F?	Dapach	y one	Actual	Car	pacity	LOS F?
	Notaai	<del>†                                     </del>	араску	LOO1:	V <sub>F</sub>	$\dashv$	Motual	Exhibit 13-8		
						\/		Exhibit 13-8		+
$V_{FO}$	1738	Exhibit 13-8		No	$V_{FO} = V_{F}$	- <b>v</b> R		Exhibit 13-	_	_
					$V_R$			10	-	
low Entering	g Merae Ir	ifluence A	rea	•	Flow Er	nterino	Diver	ge Influen	ce Area	
	Actual	1	Desirable	Violation?			ctual	Max Desi		Violation
V <sub>R12</sub>	1738	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8		
	ice Deterr	nination (i				f Serv	ice De	terminatio	n (if not	<i>F</i> )
evel oi serv								.0086 V <sub>12</sub> - 0.		,
		12	А			oc/mi/ln		12	ט=	
D <sub>R</sub> = 5.475 +	/ln)					Exhibit 1				
$D_{R} = 5.475 + 0$ $D_{R} = 9.3 \text{ (pc/mi.)}$	•						13-2)			
$D_R = 5.475 + $ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 4 \text{ (Exhibit)}$	13-2)					7040 ===	aincti-			
$D_R = 5.475 + $ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 0.000 + 0.000$ $D_R = 0.0000$	13-2) mination				Speed L			n		
$D_R = 5.475 + $ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 0.3 \text{ (pc/mi.}$ $D_R = 0.193 \text{ (Exhibit)}$	13-2) <b>mination</b> bit 13-11)				Speed L	Exhibit 13	-12)	n		
$D_R = 5.475 + $ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 0.3 \text{ (pc/mi.}$ $D_R = 0.193 \text{ (Exhibit)}$	13-2) mination				<b>Speed L</b> $D_s = (E_s)^2$	Exhibit 13 nph (Exhib	-12) oit 13-12)	n		
$D_R = 5.475 + $ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 9.3 \text{ (pc/mi.}$ $D_R = 0.193 \text{ (Exi}$ $D_R = 0.193 \text{ (Exi}$ $D_R = 0.6 \text{ mph}$ $D_R = 0.193 \text{ (Exi}$ $D_R = 0.6 \text{ mph}$ $D_R = 0.193 \text{ (Exi}$	13-2) <b>mination</b> bit 13-11)				<b>Speed L</b> $D_s = (E_s)^2$	Exhibit 13	-12) oit 13-12)	n		

Ramp Number of Lanes, N 1  Acceleration Lane Length, $L_A$ No Off Deceleration Lane Length $L_D$ 358  Freeway Volume, $V_F$ 713 $L_{up} = \text{ ft}  \text{Ramp Volume, } V_R  686$ $V_u = \text{ veh/h}  \text{Freeway Free-Flow Speed, } S_{FF}  65.0$ $Ramp Free-Flow Speed, S_{FR}  50.0$ Conversion to pc/h Under Base Conditions  (pc/h) $V_D = V_C  $	Yes On No Off  m = ft
Agency or Company Date Performed         9/9/2014         Junction Jurisdiction           Analysis Time Period         AM Peak         Analysis Year         2035           Project Description           Inputs           Upstream Adj Ramp         Freeway Number of Lanes, N         2         Down Ramp Number of Lanes, N         1         Ramp Number of Lanes, N         1         Ramp Number of Lanes, N         1         Project Description         Project Description         Project Description         Project Description         Project Description         Down Ramp Number of Lanes, N         2         Down Ramp Number of Lanes, N         1         Project Description         Project P	mp  Yes $\bigcirc$ On  No $\bigcirc$ Off  = $t$ $t$ $t$ $t$ $t$ $t$ $t$ $t$
Analysis Time Period         AM Peak         Analysis Year         2035           Project Description         Inputs         Freeway Number of Lanes, N         2           Upstream Adj Ramp         Freeway Number of Lanes, N         1           □ Yes         On         Acceleration Lane Length, L <sub>A</sub> □ Y           ☑ No         Off         Deceleration Lane Length L <sub>D</sub> 358           Freeway Volume, V <sub>F</sub> 713         Lane           L <sub>up</sub> =         ft         Ramp Volume, V <sub>R</sub> 686           V <sub>u</sub> =         veh/h         Freeway Free-Flow Speed, S <sub>FF</sub> 65.0           Ramp Free-Flow Speed, S <sub>FR</sub> 50.0         V <sub>D</sub> =           Conversion to pc/h Under Base Conditions         Conditions           (pc/h)         V <sub>(Veh/hr)</sub> PHF         Terrain         %Truck         %Rv         f <sub>HV</sub> f <sub>p</sub> v = V           Freeway         713         0.85         Grade         7         0         0.891         1.00	mp  Yes $\bigcirc$ On  No $\bigcirc$ Off  = $t$ $t$ $t$ $t$ $t$ $t$ $t$ $t$
Project Description   Inputs	mp  Yes $\bigcirc$ On  No $\bigcirc$ Off  = $t$ $t$ $t$ $t$ $t$ $t$ $t$ $t$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	mp  Yes $\bigcirc$ On  No $\bigcirc$ Off  = $t$ $t$ $t$ $t$ $t$ $t$ $t$ $t$
Ramp Number of Lanes, N 1  Acceleration Lane Length, L <sub>A</sub> Poeceleration Lane Length L <sub>D</sub> 358  Freeway Volume, V <sub>F</sub> 713  L <sub>up</sub> = ft Ramp Volume, V <sub>R</sub> 686  V <sub>u</sub> = veh/h  Ramp Free-Flow Speed, S <sub>FF</sub> 65.0  Ramp Free-Flow Speed, S <sub>FR</sub> 50.0  Conversion to pc/h Under Base Conditions  (pc/h) V <sub>(Veh/hr)</sub> PHF Terrain %Truck %Rv $f_{HV}$ $f_p$ $v = V_{HV}$ Freeway 713 0.85 Grade 7 0 0.891 1.00	mp  Yes $\bigcirc$ On  No $\bigcirc$ Off  = $t$ $t$ $t$ $t$ $t$ $t$ $t$ $t$
	Yes $\square$ On $\square$ Off  No $\square$ Off  = veh/h  V/PHF x f <sub>HV</sub> x f <sub>p</sub> 942
Freeway Volume, $V_F$ 713 $L_{up} = ft$ Ramp Volume, $V_R$ 686 $V_u = veh/h$ Freeway Free-Flow Speed, $S_{FF}$ 65.0 $V_D = conversion to pc/h Under Base Conditions$ $Conversion to pc/h Under Base Conditions$ $Conversion to pc/h Under Base Conditions$ Freeway 713 0.85 Grade 7 0 0.891 1.00	$= ft$ $= veh/h$ $V/PHF x f_{HV} x f_{p}$ $942$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	= veh/h  V/PHF x f <sub>HV</sub> x f <sub>p</sub> 942
Vu =         Ven/n         Ramp Free-Flow Speed, S <sub>FR</sub> 50.0           Conversion to pc/h Under Base Conditions           (pc/h)         V (Veh/hr)         PHF         Terrain         %Truck         %Rv         f <sub>HV</sub> f <sub>p</sub> V = V           Freeway         713         0.85         Grade         7         0         0.891         1.00	V/PHF x f <sub>HV</sub> x f <sub>p</sub> 942
Conversion to pc/h Under Base Conditions           (pc/h)         V (Veh/hr)         PHF         Terrain         %Truck         %Rv         f <sub>HV</sub> f <sub>p</sub> v = V           Freeway         713         0.85         Grade         7         0         0.891         1.00	942
(pc/h)         V (Veh/hr)         PHF         Terrain         %Truck         %Rv         f <sub>HV</sub> f <sub>p</sub> v = V           Freeway         713         0.85         Grade         7         0         0.891         1.00	942
Freeway 713 0.85 Grade 7 0 0.891 1.00	942
Ramp 686 0.79 Level 7 0 0.966 1.00	004
UpStream	
DownStream	
Merge Areas Diverge Areas	
Estimation of v <sub>12</sub> Estimation of v <sub>12</sub>	
$V_{12} = V_F (P_{FM})$ $V_{12} = V_R + (V_F - V_R)P_{FD}$	FD
$L_{EQ}$ = (Equation 13-6 or 13-7) $L_{EQ}$ = (Equation 13-12 or	r 13-13)
$P_{FM}$ = using Equation (Exhibit 13-6) $P_{FD}$ = 1.000 using Equation	on (Exhibit 13-7)
$V_{12}$ = pc/h $V_{12}$ = 942 pc/h	,
$V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) $V_3$ or $V_{av34}$ 0 pc/h (Equation 13	3-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h? $\square$ Yes $\square$ No	,
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ Yes No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ Yes No	
$  f  Yes, V_{12a}  =   f  Ye$	-16, 13-18, or 13-
Capacity Checks Capacity Checks	
Actual Capacity LOS F? Actual Capacity	ity LOS F?
V <sub>F</sub> 942         Exhibit 13-8	4700 No
$V_{FO}$ Exhibit 13-8 $V_{FO} = V_F - V_R$ 48 Exhibit 13-8	4700 No
	2100 No
Flow Entering Merge Influence Area Flow Entering Diverge Influence A	Area
Actual Max Desirable Violation? Actual Max Desirable	Violation?
V <sub>R12</sub> Exhibit 13-8 V <sub>12</sub> 942 Exhibit 13-8 440	400:All No
Level of Service Determination (if not F) Level of Service Determination (if	if not F)
$D_R = 5.475 + 0.00734 \text{ v}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ $D_R = 4.252 + 0.0086 \text{ V}_{12} - 0.009 \text{ L}_A$	L <sub>D</sub>
$D_{R} = (pc/mi/ln)$ $D_{R} = 9.1 (pc/mi/ln)$	
LOS = (Exhibit 13-2)  LOS = A (Exhibit 13-2)	
Speed Determination Speed Determination	
$M_{\rm S}$ = (Exibit 13-11) $D_{\rm S}$ = 0.313 (Exhibit 13-12)	
$S_R$ = mph (Exhibit 13-11) $S_R$ = 57.8 mph (Exhibit 13-12)	
$S_0$ = mph (Exhibit 13-11) $S_0$ = N/A mph (Exhibit 13-12)	
S = mph (Exhibit 13-13) S = 57.8 mph (Exhibit 13-13)	
	rated: 9/9/2014 9:56 Al

0		MPS AND	TOAIM COIL			<u>-                                    </u>			
General Inform				Site Infor					
Analyst	Shan	ne Forsythe		eeway/Dir of Tr	avel (	Gore Hill SB On			
Agency or Company Date Performed	9/9/2	n11		ınction ırisdiction					
analysis Time Period	AM P			nalysis Year	•	2035			
Project Description	7 (1) 1	Can	7.0	iaryolo i cai		2000			
nputs									
Jpstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Downstre	am Adi
pstream Auj Kamp		Ramp Numbe	r of Lanes. N	1				Ramp	aiii Auj
☐ Yes ☐ On		1 '	ane Length, L <sub>Δ</sub>	1500				1 '	
_		1	Lane Length L <sub>D</sub>	1000				□Yes	☐ On
✓ No ☐ Off		1		000				✓ No	Off
un = ft		Freeway Volu		286				L <sub>down</sub> =	ft
<sub>up</sub> = ft		Ramp Volume	11	81				_down	
'u = veh/h		1	-Flow Speed, S <sub>FF</sub>	65.0				V <sub>D</sub> =	veh/h
			ow Speed, S <sub>FR</sub>	50.0					
Conversion to	<u> </u>	der Base	Conditions			•			
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_HV$	fp	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
reeway	286	0.79	Level	20	0	0.909	1.00		398
Ramp	81	0.62	Level	40	0	0.833	1.00	+	157
JpStream		<del>                                      </del>		.,					
DownStream									
		Merge Areas					Diverge Areas		
stimation of	v <sub>12</sub>				Estimati	on of v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )				V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	' <sub>R</sub> )P <sub>FD</sub>	
EQ =		ation 13-6 or	r 13-7)		L <sub>EQ</sub> =	12	(Equation 13		3)
en =			tion (Exhibit 13-6)	ı	P <sub>FD</sub> =		using Equat		
' <sub>12</sub> =	398 p		(EXIIDIC 10 0)		V <sub>12</sub> =		pc/h		.,
12 <sup>7</sup> 3 or V <sub>av34</sub>	•		13-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equation	13 1/1 or 13 1	7)
s V <sub>3</sub> or V <sub>av34</sub> > 2,700	-		13-14 01 13-17)			2,700 pc/h?			1)
						•			
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *			3-16, 13-18, or			$_{4} > 1.5 * V_{12}/2$			3 18 or
Yes,V <sub>12a</sub> =	13-19)		5-10, 13-10, 01		If Yes,V <sub>12a</sub> =		β6/11 (⊑quati 13-19)	OII 13-10, 1	J-10, UI
Capacity Chec	cks				Capacity	/ Checks	,		
	Actual	C	Capacity	LOS F?		Actual	C	apacity	LOS F
					I			R_R	
					$V_{F}$		Exhibit 13	, ,	
VEO	555	Exhibit 13-8		No		- V <sub>R</sub>	Exhibit 13		
$V_{FO}$	555	Exhibit 13-8		No	$V_{FO} = V_F$	- V <sub>R</sub>	_	3-8	
				No	$V_{FO} = V_{F}$ $V_{R}$		Exhibit 13 Exhibit 1 10	3-8	
	Merge In	ofluence A			$V_{FO} = V_{F}$ $V_{R}$	tering Dive	Exhibit 13 Exhibit 1 10 Erge Influe	3-8 3- nce Area	
Flow Entering	Merge In	fluence A	Desirable	Violation?	$V_{FO} = V_F \cdot V_R$ Flow En		Exhibit 13 Exhibit 1 10 Erge Influe Max De	3-8 3- Ince Area	Violation
Flow Entering V <sub>R12</sub>	Merge In Actual 555	Max Exhibit 13-8	Desirable 4600:All		$V_{FO} = V_F$ $V_R$ Flow En	tering Dive	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8	3-8 3- Ince Area esirable	Violation
Flow Entering  V <sub>R12</sub> Level of Servi	Merge In Actual 555 ce Detern	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F$ $V_R$ Flow End $V_{12}$ Level of	tering Dive	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Eterminati	3-8 3- Ince Area esirable on (if not	Violation
V <sub>R12</sub> .evel of Servi	Merge In Actual 555 Ce Detern 0.00734 v R + C	Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F$ $V_R$ Flow End $V_{12}$ Level of	tering Dive	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Eterminati	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering  V <sub>R12</sub> Level of Servi	Merge In Actual 555 Ce Detern 0.00734 v R + C	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	V <sub>FO</sub> = V <sub>F</sub> · V <sub>R</sub> Flow Enter  V <sub>12</sub> Level of	tering Dive	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Eterminati	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering $V_{R12}$ Evel of Servi $D_{R} = 5.475 + 0$ $P_{R} = 0.3 \text{ (pc/mi/lum)}$	Actual 555 CE Detern 0.00734 v <sub>R</sub> + 0	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_{F}$ $V_{R}$ Flow End $V_{12}$ Level of $D_{R} = (prime Prime	Actual  Service Do  D <sub>R</sub> = 4.252 + 6	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Eterminati	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering $V_{R12}$ Evel of Servi $D_{R} = 5.475 + 0$ $R = 0.3 \text{ (pc/mi/li)}$ $OS = A \text{ (Exhibit 1)}$	Merge In Actual 555  Ce Detern 0.00734 v <sub>R</sub> + (cn) 3-2)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F$ $V_R$ Flow Entirely $V_{12}$ Level of $D_R = (percent level of level l$	Actual  Service Do  R = 4.252 + (c/mi/ln)	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	3-8 3- Ince Area esirable on (if not	Violation
V <sub>R12</sub> Level of Servi  D <sub>R</sub> = 5.475 + 0  R <sub>R</sub> = 0.3 (pc/mi/li  OS = A (Exhibit 1	Actual 555 CE Detern 0.00734 v <sub>R</sub> + (cn) 3-2) sination	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_{F}$ $V_{R}$ Flow End $V_{12}$ Level of $D_{R} = (p_{0})$ LOS = (E  Speed D	Actual  Service De  O <sub>R</sub> = 4.252 + ( c/mi/ln)  (xhibit 13-2)	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering $V_{R12}$ Evel of Servi $D_R = 5.475 + 0$ $QS = 0.3 \text{ (pc/mi/lit})$ $QS = A \text{ (Exhibit 1)}$ $QS = 0.178 \text{ (Exib)}$	Merge In Actual 555  Ce Detern  0.00734 v <sub>R</sub> + (cn) 3-2)  nination  it 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_{F}$ $V_{R}$ Flow End $V_{12}$ Level of $D_{R} = (p_{0}$ LOS = (E  Speed D $D_{S} = (E)$	Actual  Actual  Service Do  DR = 4.252 + (  c/mi/ln)  exhibit 13-2)  Actual	Exhibit 13 Exhibit 1 10 Erge Influe Max De Exhibit 13-8 Eterminati 0.0086 V <sub>12</sub> -	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering $V_{R12}$ Level of Servi $D_R = 5.475 + 0$ $R = 0.3 \text{ (pc/mi/li}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$ $COS = A \text{ (Exhibit 1}$	Merge In Actual 555  CE Detern 0.00734 v R + Con 3-2) Innation it 13-11) Exhibit 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_F$ $V_R$ Flow Entropy $V_{12}$ Level of $V_{R} = V_{R}$	Actual  Service De  Comi/In)  Exhibit 13-2)  Determination  Continuo (Exhibit 13-12)  Continuo (Exhibit 13-12)  Continuo (Exhibit 13-12)	Exhibit 13 Exhibit 13 Exhibit 13-8 Exhibit 1	3-8 3- Ince Area esirable on (if not	Violation
Flow Entering $V_{R12}$ Level of Servi $D_R = 5.475 + 0$ $D_R = 0.3 \text{ (pc/mi/li)}$ $D_R = 0.4 \text{ (pc/mi/li)}$ $D_R = 0.4  (pc/mi/li)$	Merge In Actual 555  Ce Detern  0.00734 v <sub>R</sub> + (cn) 3-2)  nination  it 13-11)	nfluence A Max Exhibit 13-8	Desirable 4600:All <b>if not F)</b>	Violation?	$V_{FO} = V_{F}$ $V_{R}$ Flow End $V_{12}$ Level of $D_{R} = (pr)$ $LOS = (E)$ Speed D $D_{S} = (Er)$ $S_{R} = (Er)$ $S_{R} = (Er)$ $S_{R} = (Er)$	Actual  Actual  Service Do  DR = 4.252 + (  c/mi/ln)  exhibit 13-2)  Actual	Exhibit 13 Exhibit 13 Exhibit 13 Exhibit 13 Exhibit 13-8	3-8 3- Ince Area esirable on (if not	Violation

		RAMP	S AND RAN	//P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor						
Analyst Agency or Company	Shar	ne Forsythe	J	reeway/Dir of Trunction		Gore H	ill NB Off			
Date Performed	9/9/2			lurisdiction	,	0005				
Analysis Time Perio Project Description	d AM F	<sup>2</sup> еак	Ρ	Analysis Year	-	2035				
Inputs										
-	_	Freeway Num	nber of Lanes, N	2						
Upstream Adj F	Ramp	Ramp Numbe		1					Downstre Ramp	am Adj
□Yes □	On	· '	Lane Length, L	1					I_ '	_
	_		Lane Length L <sub>D</sub>	202					∐Yes	On
☑ No	Off			323					✓ No	Off
L <sub>up</sub> = +	ft	Freeway Volume		451					L <sub>down</sub> =	ft
⊏up		Ramp Volume		67					down	
V,, = v	eh/h		e-Flow Speed, S <sub>FF</sub>						$V_D =$	veh/h
			low Speed, S <sub>FR</sub>	50.0						
Conversion t	11	der Base	Conditions	1						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{HV}$	$f_p$	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	451	0.96	Level	12	0	0.	943	1.00	4	98
Ramp	67	0.74	Level	42	0		826	1.00		09
UpStream										
DownStream										
		Merge Areas						Diverge Areas		
Estimation o	f v <sub>12</sub>				Estimati	on o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V	R)P <sub>FD</sub>	
L <sub>EQ</sub> =	(Equa	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(1	Equation 13-	12 or 13-13	3)
P <sub>FM</sub> =	using	Equation (I	Exhibit 13-6)		P <sub>FD</sub> =		1.	000 using Eq	uation (Exh	ibit 13-7)
V <sub>12</sub> =	pc/h				V <sub>12</sub> =			98 pc/h	,	•
V <sub>3</sub> or V <sub>av34</sub>	pc/h (	Equation 13	3-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equati	on 13-14 o	r 13-17)
Is $V_3$ or $V_{av34} > 2,70$			,			, > 2,7		Yes ☑ No		- ,
Is $V_3$ or $V_{av34} > 1.5$								☐Yes ☑No		
If Yes,V <sub>12a</sub> =			s-16, 13-18, or		If Yes,V <sub>12a</sub> =			c/h (Equation	า 13-16, 13	-18, or 13-
	13-19)						19			· 
Capacity Che	ecks				Capacity	/ Ch	ecks			
	Actual		Capacity	LOS F?		$\overline{}$	Actual	_	apacity	LOS F?
					V <sub>F</sub>		498	Exhibit 13-		No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	389	Exhibit 13-	8 4700	No
					$V_R$		109	Exhibit 13-	10 2100	No
Flow Enterin	g Merge In	fluence A	\rea		Flow En	terin	g Dive	rge Influer	ice Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desira	ble	Violation?
$V_{R12}$		Exhibit 13-8			V <sub>12</sub>		498	Exhibit 13-8	4400:All	No
Level of Serv	rice Detern	nination (	if not F)		Level of	Ser	/ice De	terminatio	n (if not	F)
D <sub>R</sub> = 5.475 + 0	.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> -	- 0.00627 L <sub>A</sub>		[	$D_R = 4$	.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/lr	۱)				D <sub>R</sub> = 5.6	6 (pc/r	mi/ln)			
LOS = (Exhibit	13-2)						oit 13-2)			
Speed Deteri					Speed D	•		on .		
					<del>                                     </del>		xhibit 13-			
$M_S = (Exibit 1)$					1 -		(Exhibit	•		
	nibit 13-11)					-		-		
	nibit 13-11)				l *	-	(Exhibit	•		
	nibit 13-13)						(Exhibit	·		
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Conomallist		MIS AND	RAMP JUN						
General Infor				Site Infor		0 1	^		
Analyst Agency or Company	Shar	ne Forsythe		eeway/Dir of Tranction	avel	Gore Hill NB	On		
agency or Company  Oate Performed	9/9/2	014		ırisdiction					
nalysis Time Period				nalysis Year		2035			
roject Description				7					
nputs									
pstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Downstre	eam Adi
		Ramp Numbe	r of Lanes, N	1				Ramp	· · · · · · · · · · · · · · · · · · ·
☐ Yes ☐ On		Acceleration L	ane Length, L₄	1500				□Yes	On
☑ No ☐ Off		Deceleration L	ane Length L						_
✓ No ☐ Off		Freeway Volu		1122				✓ No	Off
<sub>up</sub> = ft		Ramp Volume		961				L <sub>down</sub> =	ft
2P		1	Flow Speed, S <sub>FF</sub>	65.0					
u = veh/h		1	• • • • • • • • • • • • • • • • • • • •					$V_D =$	veh/h
Na musa wai a mata	- no/h lln		ow Speed, S <sub>FR</sub>	50.0					
Conversion to	y pc/n Uni		Sonaitions	1	ı	1	1	1	
(pc/h)	v (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PH	$F \times f_{HV} \times f_{p}$
reeway	1122	0.80	Grade	10	0	0.952	1.00		1473
Ramp	961	0.74	Level	9	0	0.957	1.00		1357
JpStream									
DownStream									
		Merge Areas			F-4:	<b></b>	Diverge Are	as	
stimation of	V <sub>12</sub>				Estimat				
	$V_{12} = V_{F}$	(P <sub>FM</sub> )				V.	$_{12} = V_{R} + (V_{F} -$	$V_R)P_{FD}$	
EQ =	(Equ	ation 13-6 or	13-7)		L <sub>EQ</sub> =		(Equation	13-12 or 13-	13)
<sub>FM</sub> =	1.000	using Equat	ion (Exhibit 13-6)		P <sub>FD</sub> =		using Equ	ation (Exhibit 1	13-7)
12 =	1473	pc/h			V <sub>12</sub> =		pc/h		
or V <sub>av34</sub>	0 pc/	h (Equation	13-14 or 13-17)	)	V <sub>3</sub> or V <sub>av34</sub>		pc/h (Equati	on 13-14 or 13-	17)
s V <sub>3</sub> or V <sub>av34</sub> > 2,70	-		,			<sub>34</sub> > 2,700 pc	/h? ☐ Yes ☐		,
s V <sub>3</sub> or V <sub>av34</sub> > 1.5 *							/2		
Yes,V <sub>12a</sub> =			3-16, 13-18, or		If Yes,V <sub>12a</sub> =			ation 13-16, 1	13-18, or
	13-19)	)					13-19)		
Capacity Che		1 0	.,	1 100 50	Capacit	y Checks		0 "	1
	Actual		apacity	LOS F?	\ \	Ac	etual	Capacity	LOS F
					V <sub>F</sub>		Exhibit		
$V_{FO}$	2830	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>	Exhibit		
					V <sub>R</sub>		Exhibit 10		
low Entering	Merge In	fluence A	rea		Flow En	terina D	iverge Influ		<u> </u>
TOW Emering	Actual	1	Desirable	Violation?		Actual		Desirable	Violation
V <sub>R12</sub>	2830	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13	1	
evel of Serv	ce Detern	nination (	if not F)	<u> </u>		Service	Determina		t F)
		0.0078 V <sub>12</sub> - 0.0					+ 0.0086 V <sub>12</sub>	<u> </u>	,
$_{R} = 17.5 \text{ (pc/m)}$		0.0070 v <sub>12</sub> 0.0	7002. LA			oc/mi/ln)	0.0000 112	о.ооо 2 <sub>D</sub>	
	-						)\		
OS = B (Exhibit	<u> </u>					Exhibit 13-2	-		
Speed Detern						Determin	ation		
$I_{\rm S} = 0.237  (Exit)$	oit 13-11)				,	xhibit 13-12)			
`					S <sub>R</sub> = m	ph (Exhibit 13	3-12)		
	Exhibit 13-11)						-		
R= 59.5 mph (	Exhibit 13-11) Exhibit 13-11)					ph (Exhibit 1	-		
R= 59.5 mph ( 0= N/A mph (B	-				S <sub>0</sub> = m		3-12)		

		RAMP	S AND RAI	MP JUNCTION	ONS WO	ORKS	HEET			
General Infor	mation			Site Infor						
Analyst Agency or Company Date Performed	Shan	e Forsythe	J	Freeway/Dir of Tra lunction lurisdiction		Gore H	ill SB Off			
Analysis Time Period				Analysis Year		2035				
Project Description				.,						
Inputs										
Upstream Adj R	lamp	Freeway Num Ramp Numbe	nber of Lanes, N	2 1					Downstrea Ramp	m Adj
□Yes	On		Lane Length, L <sub>A</sub>						Yes	On
☑ No	Off		Lane Length L <sub>D</sub>	358					✓No	Off
L <sub>up</sub> = f	t	Freeway Volu Ramp Volume	•	981 644					L <sub>down</sub> =	ft
V <sub>u</sub> = v	eh/h		e-Flow Speed, S						V <sub>D</sub> =	veh/h
Conversion t	o no/h Un		low Speed, S <sub>FR</sub>	50.0						
Conversion t	o pc/n one I ∨			1 0/7 1	2/5		, 1	,	) ((D)   E	
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	_	f <sub>HV</sub>		v = V/PHF	
Freeway Ramp	981 644	0.93 0.80	Grade	10	0		870 926	1.00	12 <sup>-</sup>	
UpStream	044	0.00	Level	10	-	<del>  0.</del>	920	1.00	00	1
DownStream						$\top$				
		Merge Areas		<u>'</u>				iverge Areas		
Estimation of	f v <sub>12</sub>				Estimat	tion o	f v <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>EM</sub> )					V <sub>12</sub> =	V <sub>R</sub> + (V <sub>F</sub> - V <sub>F</sub>	)P <sub>ED</sub>	
L <sub>EQ</sub> =		tion 13-6 or	13-7)		L <sub>EQ</sub> =			Equation 13-1		)
P <sub>FM</sub> =		Equation (I			P <sub>FD</sub> =			000 using Equ		
V <sub>12</sub> =	pc/h	,	,		V <sub>12</sub> =			13 pc/h		,
V <sub>3</sub> or V <sub>av34</sub>	•	Fauation 13	s-14 or 13-17)		V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equatio	n 13-14 or	13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,70			,			> 2.7		Yes ☑ No		,
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5								Yes ☑ No		
If Yes,V <sub>12a</sub> =		Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub>			c/h (Equation	13-16, 13-	18, or 13-
Capacity Che	ecks				Capacit	ty Ch	ecks	,		
	Actual		Capacity	LOS F?			Actual	Ca	pacity	LOS F?
					V <sub>F</sub>		1213	Exhibit 13-8	4700	No
$V_{FO}$		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	346	Exhibit 13-8	4700	No
					V <sub>R</sub>		867	Exhibit 13-10	2100	No
Flow Entering	g Merge In	fluence A	\rea	-	Flow Er	nterin	g Diver	ge Influen	ce Area	•
	Actual	ī	Desirable	Violation?			Actual	Max Desirab		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		1213	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	if not F)		Level o	f Serv	vice De	terminatio	n (if not l	)
D <sub>R</sub> = 5.475 + 0.								0086 V <sub>12</sub> - 0.0		
D <sub>R</sub> = (pc/mi/ln	)	_			D <sub>R</sub> = 1	1.5 (pc	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = B	(Exhil	oit 13-2)			
Speed Deterr	nination				Speed	-		n		
M <sub>S</sub> = (Exibit 1					<del></del>		xhibit 13-			
-	nibit 13-11)				S <sub>R</sub> = 5	7.8 mph	(Exhibit	13-12)		
	nibit 13-11)				$S_0 = N$	I/A mph	(Exhibit 1	13-12)		
	nibit 13-13)				S = 5	7.8 mph	(Exhibit	13-13)		
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	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Info				Site Infor		<del>-</del>				
Analyst Agency or Company	1	e Forsythe	Jı	reeway/Dir of Tra	avel	Gore Hill S	B On			
Date Performed Analysis Time Perio	9/9/2 d PM P			urisdiction		2035				
Project Description	u PIVI P	reak	^	nalysis Year		2033				
Inputs										
Upstream Adj Ramp		Freeway Num	ber of Lanes, N	2				Do	wnetro	am Adj
opstream Auj Kamp	)	Ramp Numbe	r of Lanes, N	1				Rai		ani Auj
☐ Yes ☐ O	n	1	.ane Length, L₄	1500					' Yes	On
□N- □o	cc		Lane Length L <sub>D</sub>							
✓ No ☐ Of	II	Freeway Volu		444				<b>✓</b>	No	Off
L <sub>up</sub> = ft		Ramp Volume		83				L <sub>dow</sub>	vn =	ft
		1	-Flow Speed, S <sub>FF</sub>							
$V_{\rm u} = {\rm veh/h}$	า		ow Speed, S <sub>FR</sub>	50.0				$V_{D}$	=	veh/h
Conversion t	to nc/h Und	-	. 117	00.0						
	V			0/ T-:-alc	0/ D	f	- 1	l,_	V/DUE	vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>		· -		x f <sub>HV</sub> x f <sub>p</sub>
Freeway	444	0.89	Level	6	0	0.971	1.0			514
Ramp	83	0.65	Level	41	0	0.830	1.0	0		153
UpStream DownStream		<del>                                     </del>				+				
Downoucam		Merge Areas		1			Diverge	Areas		
Estimation o					Estimat	tion of v				
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>54</sub> )					$V_{12} = V_R + (V_R)$	/ V_)P_,		
- <sub>EQ</sub> =		ation 13-6 o	r 13-7)		L <sub>EQ</sub> =			on 13-12 (	_	3)
-EQ P <sub>FM</sub> =			tion (Exhibit 13-6	)	P <sub>FD</sub> =			Equation (E		
<sub>12</sub> =	514 p		IOII (EXIIIDIL 13-0	7	V <sub>12</sub> =		pc/h	.quation (L	-AIIIDIC IC	, , ,
*12 V <sub>3</sub> or V <sub>av34</sub>	•		13-14 or 13-17	`	V <sub>3</sub> or V <sub>av34</sub>		•	uation 13-14	1 or 13 1	7\
v <sub>3</sub> or v <sub>av34</sub> Is V <sub>3</sub> or V <sub>av34</sub> > 2,70	-		13-14-01-13-17	)		> 2 700 n	c/h? Yes		101 13-1	')
Is $V_3$ or $V_{av34} > 2,74$ Is $V_3$ or $V_{av34} > 1.5$							$\frac{1}{2}$ Yes			
			3-16, 13-18, or					⊔ No quation 13	3-16. 1:	3-18. or
f Yes,V <sub>12a</sub> =	13-19)	(Equation 10			If Yes,V <sub>12a</sub> :	=	13-19)	qualion re		, 0.
Capacity Che	ecks				Capacit					
	Actual	C	Capacity	LOS F?		, ,	Actual	Capacit	у	LOS F?
					V <sub>F</sub>		Ext	nibit 13-8		
$V_{FO}$	667	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V <sub>R</sub>		nibit 13-8		
					V <sub>R</sub>		Ex	nibit 13- 10		
Flow Enterin	a Merae In	fluence A	lroa		Flow Fr	ntorina l	Diverge In		Aroa	
TOW LINEINI	Actual	ı ·	Desirable	Violation?	, IOW EI	Actu		lax Desirable		Violation <sup>4</sup>
V <sub>R12</sub>	667	Exhibit 13-8	4600:All	No	V <sub>12</sub>	7.010	Exhibi		-	
Level of Serv				1		f Service	e Determi		if not	F)
	+ 0.00734 v <sub>R</sub> + 0				1		2 + 0.0086			• /
$D_{R} = 1.2 \text{ (pc/mi)}$		12 0.0	A			pc/mi/ln)	2.0000	12 5.550	ט=	
$_{R}$ 1.2 (pc/11) $_{L}$ OS = A (Exhibit	*					Exhibit 13	-2)			
Speed Deteri						Determi				
•					<del> </del>					
	ibit 13-11)					Exhibit 13-12	•			
	(Exhibit 13-11)				1.5	nph (Exhibit	•			
	(Exhibit 13-11)				ľ	nph (Exhibit	•			
<u>.</u>	(Exhibit 13-13)					nph (Exhibit				
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Vistro File: F:\...\I-15 Corridor.vistropdb

Report File: F:\...\Future\_LOS\_Report\_AM.pdf

Scenario 3: Future AM Scenario 8/19/2014

8/19/2014

# **Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Tri Hill and Frontage Airport Rd	Two-way stop	HCM2010	NEBL	0.514	27.3	D
2	I-15 NB and Airport Rd	Two-way stop	HCM2010	NEBT	0.000	44.2	Е
3	I-15 SB On and Airport RD	Two-way stop	HCM2010	NWBL	0.133	10.4	В
4	I-15 SB Off and Airport RD Frontage	Two-way stop	HCM2010	SWBL	0.947	121.8	F
5	14th St SW and I-315 EB	Signalized	HCM2010	SBL	0.218	13.3	В
6	14th St SW and I-315 WB	Signalized	HCM2010	EBR	0.295	22.2	С
7	Fox Farm and I-315	Signalized	HCM2010	NEBL	0.760	39.0	D
8	Central Ave and I15 SB	Two-way stop	HCM2010	SBL	1.188	178.9	F
9	Central Ave and I-15 NB	Two-way stop	HCM2010	NBL	0.274	113.1	F
10	Central Ave and Vaughn Rd	Two-way stop	HCM2010	SBL	1.518	406.0	F
11	Vaughn Rd and I-15 SB	Two-way stop	HCM2010	SBL	0.361	11.0	В
12	Vaughn Rd and I-15 NB	Two-way stop	HCM2010	EBL	0.000	7.3	Α

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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# Intersection Level Of Service Report #1: Tri Hill and Frontage Airport Rd

Control Type:Two-way stopDelay (sec / veh):27.3Analysis Method:HCM2010Level Of Service:DAnalysis Period:15 minutesVolume to Capacity (v/c):0.514

### Intersection Setup

Name							
Approach	Northea	stbound	Northwe	estbound	Southeastbound		
Lane Configuration	1	r	+	ıİ	F		
Turning Movement	Left	Right	ght Left Thru		Thru	Right	
Lane Width [ft]	12.00 12.00		12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	.00	30.00		30.00		
Grade [%]	0.	00	0.00		0.00		
Crosswalk	ye	es	у	es	yes		

Name						
Base Volume Input [veh/h]	83	19	9	189	97	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.70	31.10	22.20	28.60	25.70	5.70
Growth Rate	1.70	1.70	1.70	1.70	1.70	1.70
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	32	15	321	165	150
Peak Hour Factor	0.7410	0.4750	0.5630	0.8750	0.9330	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	17	7	92	44	49
Total Analysis Volume [veh/h]	190	67	27	367	177	198
Pedestrian Volume [ped/h]		0	0		0	
Bicycle Volume [bicycles/h]		0	0		0	

8/19/2014



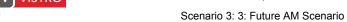
# Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

# Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.10	0.02	0.00	0.00	0.00	
d_M, Delay for Movement [s/veh]	27.25	22.66	8.42	0.00	0.00	0.00	
Movement LOS	D	С	Α	A	Α	А	
95th-Percentile Queue Length [veh]	3.94	3.94	0.08	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	98.56	98.56	1.92	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]	26	.06	0.	58	0.00		
Approach LOS	[	D A				4	
d_I, Intersection Delay [s/veh]	6.75						
Intersection LOS	D						

Version 2.00-10



# Intersection Level Of Service Report #2: I-15 NB and Airport Rd

8/19/2014

Control Type:Two-way stopDelay (sec / veh):44.2Analysis Method:HCM2010Level Of Service:EAnalysis Period:15 minutesVolume to Capacity (v/c):0.000

### Intersection Setup

Name												
Approach	Northeastbound		Sou	Southwestbound		Northwestbound			Southeastbound		und	
Lane Configuration	+					F			4			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00		30.00			30.00			
Grade [%]	0.00		0.00		0.00			0.00				
Crosswalk		yes			yes		yes			yes		

Name												
Base Volume Input [veh/h]	4	0	13	0	0	0	0	49	222	79	173	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	46.20	2.00	2.00	2.00	2.00	38.80	26.60	12.70	10.90	2.00
Growth Rate	1.90	1.90	1.90	1.00	1.00	1.00	1.00	1.90	1.90	1.90	1.90	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	0	25	0	0	0	0	93	422	150	329	0
Peak Hour Factor	0.5000	1.0000	0.8130	1.0000	1.0000	1.0000	1.0000	0.7210	0.8670	0.7050	0.9010	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	8	0	0	0	0	32	122	53	91	0
Total Analysis Volume [veh/h]	16	0	31	0	0	0	0	129	487	213	365	0
Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

# Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

# Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00
d_M, Delay for Movement [s/veh]	34.72	44.22	13.81	0.00	0.00	0.00	0.00	0.00	0.00	10.13	0.00	0.00
Movement LOS	D	E	В					Α	Α	В	Α	
95th-Percentile Queue Length [veh]	0.61	0.61	0.61	0.00	0.00	0.00	0.00	0.00	0.00	4.65	4.65	0.00
95th-Percentile Queue Length [ft]	15.29	15.29	15.29	0.00	0.00	0.00	0.00	0.00	0.00	116.18	116.18	0.00
d_A, Approach Delay [s/veh]		20.93		0.00				0.00			3.73	
Approach LOS		С		A A						Α		
d_I, Intersection Delay [s/veh]	2.53											
Intersection LOS						E						

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8/19/2014 Scenario 3: 3: Future AM Scenario

### Intersection Level Of Service Report #3: I-15 SB On and Airport RD

Control Type: Two-way stop Delay (sec / veh): 10.4 Analysis Method: HCM2010 Level Of Service: В Analysis Period: 15 minutes Volume to Capacity (v/c): 0.133

### Intersection Setup

Crosswalk	У	res .	y	yes		es	
Grade [%]	0	.00	0.00		0.00		
Speed [mph]	30	0.00	30.00		30.00		
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Configuration			•	1	<b> </b>		
Approach	Northea	astbound	Northwe	estbound	Southeastbound		
Name							

Name							
Base Volume Input [veh/h]	0	0	32	23	251	6	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	2.00	2.00	43.80	21.70	14.00	16.70	
Growth Rate	1.00	1.00	2.12	2.12	2.12	2.12	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	0	0	68	49	532	13	
Peak Hour Factor	1.0000	1.0000	0.6670	0.6390	0.8720	0.3750	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	0	0	25	19	153	9	
Total Analysis Volume [veh/h]	0	0	102	77	610	35	
Pedestrian Volume [ped/h]		0	0		0		
Bicycle Volume [bicycles/h]		0		0	0		

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# Scenario 3: 3: Future AM Scenario

# Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

# Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.39	0.00	0.00	0.00
Movement LOS			В	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.90	0.90	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	22.46	22.46	0.00	0.00
d_A, Approach Delay [s/veh]	0.	.00	5	.92	0.	00
Approach LOS		A		A		A
d_I, Intersection Delay [s/veh]			1	.29		
Intersection LOS				В		

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# Scenario 3: 3: Future AM Scenario

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# Intersection Level Of Service Report #4: I-15 SB Off and Airport RD Frontage

Control Type:Two-way stopDelay (sec / veh):121.8Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):0.947

### Intersection Setup

Name													
Approach	No	rtheastboo	und	Sou	uthwestbo	und	Noi	thwestbo	und	Sou	Southeastbound		
Lane Configuration		т			44			4			H		
Turning Movement	Left				Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00	100.00	100.00 100.00 100.00			
Speed [mph]		30.00			30.00			30.00		30.00			
Grade [%]	0.00				0.00			0.00		0.00			
Crosswalk		yes			yes			yes		yes			

•												
Name												
Base Volume Input [veh/h]	5	0	44	159	54	96	8	12	0	0	40	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	11.30	10.10	7.40	3.10	12.50	8.30	2.00	2.00	2.50	0.00
Growth Rate	2.22	1.00	2.22	2.22	2.22	2.22	2.22	2.22	1.00	1.00	2.22	2.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	0	98	353	120	213	18	27	0	0	89	9
Peak Hour Factor	0.4170	1.0000	0.5240	0.8110	0.9000	0.7060	0.4000	0.7500	1.0000	1.0000	0.7690	0.5000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	0	47	109	33	75	11	9	0	0	29	5
Total Analysis Volume [veh/h]	26	0	187	435	133	302	45	36	0	0	116	18
Pedestrian Volume [ped/h]		0			0	-		0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

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9 Scenario 3: 3: Future AM Scenario

# Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no		
Number of Storage Spaces in Median	0	0	0	0

# Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.21	0.95	0.22	0.29	0.03	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	16.59	0.00	10.80	121.78	119.80	9.92	7.68	0.00	0.00	0.00	0.00	0.00
Movement LOS	С		В	F	F	Α	Α	Α			Α	Α
95th-Percentile Queue Length [veh]	1.14	0.00	1.14	20.41	20.41	1.22	0.19	0.19	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	28.44	0.00	28.44	510.19	510.19	30.56	4.64	4.64	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		11.50			82.65			4.27			0.00	
Approach LOS		В			F			Α			Α	
d_I, Intersection Delay [s/veh]						57	.55					
Intersection LOS					F							

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### Scenario 3: 3: Future AM Scenario

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### Intersection Level Of Service Report #5: 14th St SW and I-315 EB

Control Type:SignalizedDelay (sec / veh):13.3Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.218

### Intersection Setup

Name													
Approach	١	Northboun	d	S	outhboun	d	ı	Eastbound	d t	Westbound			
Lane Configuration		Teft Thru Right			٦١٢			٦١٢		710			
Turning Movement	Left				Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00	100.00	0 100.00 100.00 100.0			
Speed [mph]		30.00			30.00			30.00		30.00			
Grade [%]	0.00				0.00			0.00		0.00			
Crosswalk		yes			yes		yes			yes			

Name						•					•	
Base Volume Input [veh/h]	7	66	286	142	91	60	44	69	3	20	30	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.30	1.50	1.70	3.50	4.40	5.00	0.00	4.30	0.00	10.00	3.30	0.00
Growth Rate	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	82	355	176	113	74	55	86	4	25	37	6
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	25	107	53	34	22	17	26	1	8	11	2
Total Analysis Volume [veh/h]	11	99	428	212	136	89	66	104	5	30	45	7
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

# Intersection Settings

G		
Located in CBD	no	
Signal Coordination Group	-	
Cycle Length [s]	60	
Coordination Type	Time of Day Pattern Coordinated	
Actuation Type	Semi-actuated	
Offset [s]	0.0	
Offset Reference	LeadGreen	
Permissive Mode	SingleBand	
Lost time [s]	0.00	

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# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	2	3	0	6	7	7	4	0	3	8	0
Lead / Lag	-	-	-	-	_	-	Lead	-	-	Lead	-	_
Minimum Green [s]	0	5	15	0	5	15	15	5	0	15	15	0
Maximum Green [s]	0	50	20	0	50	20	20	60	0	20	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	22	18	0	22	18	18	20	0	18	20	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	5	0	5	0	0	5	0	5	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	10	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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# Scenario 3: 3: Future AM Scenario

# **Lane Group Calculations**

Lane Group	L	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	5.00	5.00	5.00	4.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	17	17	37	17	17	36	29	12	12	29	11	11
g / C, Green / Cycle	0.28	0.28	0.62	0.28	0.28	0.60	0.49	0.21	0.21	0.49	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.27	0.17	0.07	0.06	0.04	0.06	0.00	0.02	0.02	0.00
s, saturation flow rate [veh/h]	1114	1872	1588	1272	1820	1538	1616	1822	1615	1422	1839	1615
c, Capacity [veh/h]	334	530	979	387	515	920	948	376	333	816	346	304
d1, Uniform Delay [s]	19.78	16.28	6.04	22.47	16.66	5.14	8.16	20.04	18.95	8.07	20.26	19.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.17	0.31	1.21	0.27	0.05	0.03	0.39	0.02	0.02	0.17	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

# Lane Group Results

X, volume / capacity	0.03	0.19	0.44	0.55	0.26	0.10	0.07	0.28	0.01	0.04	0.13	0.02
d, Delay for Lane Group [s/veh]	19.82	16.44	6.35	23.68	16.93	5.19	8.20	20.43	18.97	8.08	20.43	19.88
Lane Group LOS	В	В	Α	С	В	Α	Α	С	В	Α	С	В
Critical Lane Group	no	no	yes	no	no	no	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.12	0.97	2.14	2.75	1.37	0.37	0.40	1.18	0.05	0.18	0.51	0.08
50th-Percentile Queue Length [ft]	3.03	24.30	53.51	68.66	34.27	9.31	9.90	29.58	1.34	4.43	12.70	1.94
95th-Percentile Queue Length [veh]	0.22	1.75	3.85	4.94	2.47	0.67	0.71	2.13	0.10	0.32	0.91	0.14
95th-Percentile Queue Length [ft]	5.46	43.75	96.31	123.59	61.69	16.75	17.82	53.25	2.41	7.97	22.86	3.49



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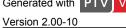
# Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.82	16.44	6.35	23.68	16.93	5.19	8.20	20.43	18.97	8.08	20.43	19.88
Movement LOS	В	В	Α	С	В	Α	Α	С	В	Α	С	В
d_A, Approach Delay [s/veh]		8.48			17.81			15.78			15.87	
Approach LOS		Α			В			В			В	
d_I, Intersection Delay [s/veh]			13.32									
Intersection LOS						E	3					
Intersection V/C	0.218											

# Sequence

Ring 1	2	7	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	_	-	-	-	-	-	-	-	-	-





# Scenario 3: 3: Future AM Scenario Intersection Level Of Service Report #6: 14th St SW and I-315 WB

8/19/2014

Control Type:SignalizedDelay (sec / veh):22.2Analysis Method:HCM2010Level Of Service:CAnalysis Period:15 minutesVolume to Capacity (v/c):0.295

### Intersection Setup

Name												
Approach	١	orthboun	d	S	Southboun	d	E	Eastbound	d t	V	Vestbound	t
Lane Configuration		nir			٦F			+		- dr		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]		0.00		0.00				0.00		0.00		
Crosswalk		yes		yes			yes			yes		

Name													
Base Volume Input [veh/h]	11	17	90	26	136	0	0	7	15	162	16	38	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	9.10	0.00	4.40	7.70	1.50	0.00	0.00	0.00	0.00	2.50	0.00	0.00	
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	13	20	104	30	158	0	0	8	17	188	19	44	
Peak Hour Factor	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	0.8040	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	4	6	32	9	49	0	0	2	5	58	6	14	
Total Analysis Volume [veh/h]	16	25	129	37	197	0	0	10	21	234	24	55	
Presence of On-Street Parking	no		no	no		no	no		no	no		no	
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrian Volume [ped/h]	0		0				0		0				
Bicycle Volume [bicycles/h]		0			0			0			0		

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# Scenario 3: 3: Future AM Scenario

# Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	1	2	0	1	0	0	3	0	0	2	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	5	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	35	40	0	35	0	0	25	0	0	40	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	25	19	0	25	0	0	16	0	0	19	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	7	0	9	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	11	7	0	11	0	0	0	0	0	7	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		no	no		no			no			no	
Maximum Recall		no	no		no			no			no	
Pedestrian Recall		no	no		no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Scenario 3: 3: Future AM Scenario

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# **Lane Group Calculations**

Lane Group	L	С	R	L	С	С	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	13	13	30	13	13	2	12	12
g / C, Green / Cycle	0.21	0.21	0.49	0.21	0.21	0.03	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.02	0.01	0.09	0.03	0.12	0.02	0.16	0.04
s, saturation flow rate [veh/h]	994	1710	1392	1176	1685	1527	1636	1454
c, Capacity [veh/h]	183	356	686	305	350	52	329	292
d1, Uniform Delay [s]	26.76	19.09	8.52	21.98	21.31	28.58	22.73	19.90
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.08	0.13	0.18	1.41	10.57	4.12	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

# Lane Group Results

X, volume / capacity	0.09	0.07	0.19	0.12	0.56	0.60	0.78	0.19
d, Delay for Lane Group [s/veh]	26.96	19.18	8.65	22.16	22.72	39.15	26.86	20.21
Lane Group LOS	С	В	А	С	С	D	С	С
Critical Lane Group	no	no	no	no	yes	yes	yes	no
50th-Percentile Queue Length [veh]	0.22	0.27	0.82	0.44	2.44	0.57	3.57	0.62
50th-Percentile Queue Length [ft]	5.43	6.74	20.40	11.02	60.90	14.26	89.30	15.53
95th-Percentile Queue Length [veh]	0.39	0.49	1.47	0.79	4.38	1.03	6.43	1.12
95th-Percentile Queue Length [ft]	9.77	12.13	36.71	19.83	109.62	25.67	160.74	27.96



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# Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.96	19.18	8.65	22.16	22.72	22.72	39.15	39.15	39.15	26.86	26.86	20.21
Movement LOS	С	В	Α	С	С	С	D	D	D	С	С	С
d_A, Approach Delay [s/veh]		11.92			22.63			39.15			25.69	
Approach LOS		В			С			D			С	
d_I, Intersection Delay [s/veh]						22	.16					
Intersection LOS						(	)					
Intersection V/C						0.2	95					

# Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	_	-	-	-	-	-	-	-	-	-



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# Scenario 3: 3: Future AM Scenario Intersection Level Of Service Report #7: Fox Farm and I-315

Control Type:SignalizedDelay (sec / veh):39.0Analysis Method:HCM2010Level Of Service:DAnalysis Period:15 minutesVolume to Capacity (v/c):0.760

### Intersection Setup

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Name													
Approach	١	Northbound			outhboun	d	No	rtheastboo	und	Sou	Southwestbound		
Lane Configuration		117			<u>1  (</u>			Шь		١١١١٢			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00	100.00	100.00 100.00 100.00			
Speed [mph]		30.00			30.00			30.00			30.00		
Grade [%]		0.00		0.00				0.00		0.00			
Crosswalk		yes		yes				yes		yes			

Name													
Base Volume Input [veh/h]	50	219	437	172	90	121	161	732	45	101	335	136	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	2.00	0.90	0.70	1.80	2.20	4.10	6.20	5.20	2.20	4.00	6.00	3.70	
Growth Rate	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	59	256	511	201	105	142	188	856	53	118	392	159	
Peak Hour Factor	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	18	80	160	63	33	44	59	268	17	37	123	50	
Total Analysis Volume [veh/h]	74	321	640	252	132	178	236	1073	66	148	491	199	
Presence of On-Street Parking	no		no	no		no	no		no	no		no	
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrian Volume [ped/h]	0		0				0		0				
Bicycle Volume [bicycles/h]		0			0			0			0		

# Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

# Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	1	8	0	3	6	6	4	0	8	2	5
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	5	0	5	5	5	5	0	5	5	0
Maximum Green [s]	0	60	60	0	60	60	60	60	0	60	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	20	41	0	33	67	67	46	0	41	20	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Scenario 3: 3: Future AM Scenario

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# **Lane Group Calculations**

Lane Group	С	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00	3.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	31	31	97	25	25	52	22	47	47	31	56	56
g / C, Green / Cycle	0.22	0.22	0.69	0.18	0.18	0.37	0.16	0.34	0.34	0.22	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.40	0.14	0.04	0.11	0.14	0.31	0.04	0.04	0.14	0.13
s, saturation flow rate [veh/h]	1793	1714	1604	1778	3540	1551	1704	3439	1580	3379	3413	1557
c, Capacity [veh/h]	405	387	1160	365	727	618	268	1167	536	750	1378	629
d1, Uniform Delay [s]	43.76	51.63	8.93	51.50	45.91	28.61	57.70	44.43	31.90	44.32	29.06	28.52
k, delay calibration	0.11	0.11	0.41	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	4.62	1.56	2.33	0.12	0.25	9.13	3.49	0.10	0.13	0.16	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

# Lane Group Results

X, volume / capacity	0.18	0.83	0.55	0.69	0.18	0.29	0.88	0.92	0.12	0.20	0.36	0.32
d, Delay for Lane Group [s/veh]	43.98	56.25	10.49	53.83	46.03	28.87	66.82	47.91	32.00	44.45	29.22	28.81
Lane Group LOS	D	E	В	D	D	С	E	D	С	D	С	С
Critical Lane Group	no	no	yes	yes	no	no	no	yes	no	no	no	no
50th-Percentile Queue Length [veh]	2.13	11.29	10.10	9.13	2.00	4.36	8.87	18.35	1.59	2.14	5.88	4.71
50th-Percentile Queue Length [ft]	53.34	282.26	252.44	228.16	49.99	109.09	221.67	458.87	39.66	53.49	147.02	117.63
95th-Percentile Queue Length [veh]	3.84	16.80	15.31	14.08	3.60	7.79	13.75	25.38	2.86	3.85	9.86	8.26
95th-Percentile Queue Length [ft]	96.01	420.02	382.72	352.03	89.98	194.73	343.76	634.52	71.39	96.29	246.44	206.56



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# Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.98	56.25	10.49	53.83	46.03	28.87	66.82	47.91	32.00	44.45	29.22	28.81
Movement LOS	D	E	В	D	D D C			D	С	D	С	
d_A, Approach Delay [s/veh]		27.07			44.09			50.39		31.81		
Approach LOS		С			D			D				
d_I, Intersection Delay [s/veh]						39	.04					
Intersection LOS	D											
Intersection V/C	0.760											

# Sequence

Ring 1	1	3	8	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	6	2	-	-	-	-	-	-	-	-	-	-	•	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	_	-	-	-	-	-	-	-	-	-





8/19/2014 Scenario 3: 3: Future AM Scenario

### Intersection Level Of Service Report #8: Central Ave and I15 SB

Control Type: Two-way stop Delay (sec / veh): 178.9 Analysis Method: HCM2010 Level Of Service: F Analysis Period: 15 minutes Volume to Capacity (v/c): 1.188

### Intersection Setup

Name												
Approach	S	outhboun	ıd	1	Eastbound	d	١	Vestboun	d	Nor	rthwestboo	und
Lane Configuration		eft Thru Right			٦ſ			111				
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]	0.00			0.00				0.00		0.00		
Crosswalk		yes		yes				yes		yes		

•												
Name												
Base Volume Input [veh/h]	130	0	6	0	191	39	123	88	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.30	0.00	0.00	2.00	3.10	0.00	6.50	11.30	2.00	2.00	2.00	2.00
Growth Rate	1.41	1.41	1.41	1.00	1.41	1.41	1.41	1.41	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	183	0	8	0	269	55	173	124	0	0	0	0
Peak Hour Factor	0.8550	1.0000	0.7500	1.0000	0.6920	0.7500	0.7690	0.8150	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	0	3	0	97	18	56	38	0	0	0	0
Total Analysis Volume [veh/h]	214	0	11	0	389	73	225	152	0	0	0	0
Pedestrian Volume [ped/h]		0	-		0	-		0	-	0		
Bicycle Volume [bicycles/h]		0			0			0			0	

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# 23 Scenario 3: 3: Future AM Scenario

# Intersection Settings

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Priority Scheme	Stop	Free	Free	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

# Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.19	0.00	0.01	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00		
d_M, Delay for Movement [s/veh]	178.88	176.96	9.05	0.00	0.00	0.00	8.91	0.00	0.00	0.00	0.00	0.00		
Movement LOS	F	F	Α		Α	Α	Α	Α						
95th-Percentile Queue Length [veh]	11.32	11.32	0.04	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00		
95th-Percentile Queue Length [ft]	282.97	282.97	0.93	0.00	0.00	0.00	18.22	0.00	0.00	0.00	0.00	0.00		
d_A, Approach Delay [s/veh]		170.57			0.00			5.32			0.00			
Approach LOS		F			Α			Α			А			
d_I, Intersection Delay [s/veh]						37	.95							
Intersection LOS						ı	F							

# Scenario 3: 3: Future AM Scenario

### Intersection Level Of Service Report #9: Central Ave and I-15 NB

Control Type:Two-way stopDelay (sec / veh):113.1Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):0.274

### Intersection Setup

Name												
Approach	١	lorthboun	d		Eastbound	d	\	Vestboun	d	Sou	utheastbo	und
Lane Configuration		Ť			1			Πr				
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]	0.00			0.00				0.00		0.00		
Crosswalk		yes		yes				yes		yes		

Name												
Base Volume Input [veh/h]	15	0	177	6	305	0	0	202	44	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	10.80	16.70	2.00	2.00	2.00	11.40	13.60	2.00	2.00	2.00
Growth Rate	1.64	1.64	1.64	1.64	1.64	1.00	1.00	1.64	1.64	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	0	290	10	500	0	0	331	72	0	0	0
Peak Hour Factor	0.5360	1.0000	0.8510	0.7500	0.7190	1.0000	1.0000	0.8420	0.7330	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	0	85	3	174	0	0	98	25	0	0	0
Total Analysis Volume [veh/h]	47	0	341	13	695	0	0	393	98	0	0	0
Pedestrian Volume [ped/h]	0			0				0	•	0		
Bicycle Volume [bicycles/h]		0		0				0		0		

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## Scenario 3: 3: Future AM Scenario

## Intersection Settings

Version 2.00-10

Priority Scheme	Stop	Free	Free	Stop
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.00	0.80	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	113.09	109.47	100.54	8.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	F	Α	Α			Α	А			
95th-Percentile Queue Length [veh]	13.79	13.79	13.79	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	344.63	344.63	344.63	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		102.06			0.15		0.00			0.00		
Approach LOS		F			Α			Α			А	
d_I, Intersection Delay [s/veh]		25.02										
Intersection LOS						F	=					

8/19/2014 Scenario 3: 3: Future AM Scenario

#### Intersection Level Of Service Report #10: Central Ave and Vaughn Rd

Control Type: Two-way stop Delay (sec / veh): 406.0 Analysis Method: HCM2010 Level Of Service: F Analysis Period: 15 minutes Volume to Capacity (v/c): 1.518

#### Intersection Setup

Version 2.00-10

Crosswalk	y	es	у	es	yes		
Grade [%]	0.	0.00 0.00		00	0.00		
Speed [mph]	30	.00	30	30.00		0.00	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Configuration	٦	Ψ.		٦İ		<b>         </b>	
Approach	South	Southbound		Eastbound		bound	
Name							

#### Volumes

Name							
Base Volume Input [veh/h]	77	60	71	410	184	65	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	9.10	6.70	7.00	5.10	11.40	6.20	
Growth Rate	1.63	1.63	1.63	1.63	1.63	1.63	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	126	98	116	668	300	106	
Peak Hour Factor	0.7700	0.7890	0.8450	0.8010	0.8520	0.7740	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	41	31	34	208	88	34	
Total Analysis Volume [veh/h]	164	124	137	834	352	137	
Pedestrian Volume [ped/h]		0		0		0	
Bicycle Volume [bicycles/h]		0	0		0		

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27 Scenario 3: 3: Future AM Scenario

## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.52	0.20	0.13	0.01	0.00	0.00	
d_M, Delay for Movement [s/veh]	405.95	378.42	8.95	0.00	0.00	0.00	
Movement LOS	F	F	А	Α	Α	А	
95th-Percentile Queue Length [veh]	20.34	20.34	0.45	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	508.50	508.50	11.23	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]	394	1.10	1.	26	0.00		
Approach LOS	F	=	,	4	Į.	4	
d_I, Intersection Delay [s/veh]		65.63					
Intersection LOS		F					

Scenario 3: 3: Future AM Scenario

# Intersection Level Of Service Report #11: Vaughn Rd and I-15 SB

Control Type:Two-way stopDelay (sec / veh):11.0Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.361

#### Intersection Setup

Name						
Approach	South	nbound	East	bound	West	bound
Lane Configuration	-	т				
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30	0.00	30	30.00		0.00
Grade [%]	0	0.00		0.00		.00
Crosswalk	у	res	yes		yes	

#### **Volumes**

Name						
Base Volume Input [veh/h]	219	1	0	27	12	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.60	0.00	2.00	11.10	8.30	2.00
Growth Rate	1.36	1.36	1.00	1.36	1.36	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	298	1	0	37	16	0
Peak Hour Factor	0.8830	0.2500	1.0000	0.8440	0.7500	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	84	1	0	11	5	0
Total Analysis Volume [veh/h]	337	4	0	44	21	0
Pedestrian Volume [ped/h]		0	0		0	
Bicycle Volume [bicycles/h]	(	0 0		0		

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## Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.36	0.00	0.00	0.00	0.00	0.00			
d_M, Delay for Movement [s/veh]	11.04	10.58	0.00	0.00	0.00	0.00			
Movement LOS	В	В		A	A				
95th-Percentile Queue Length [veh]	1.68	1.68	0.00	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	42.07	42.07	0.00	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	11.	.04	0	.00	0.	00			
Approach LOS	E	3		A	,	A			
d_I, Intersection Delay [s/veh]		9.27							
Intersection LOS				В	В				

8/19/2014 Scenario 3: 3: Future AM Scenario

#### Intersection Level Of Service Report #12: Vaughn Rd and I-15 NB

Control Type: Two-way stop Delay (sec / veh): 7.3 Analysis Method: HCM2010 Level Of Service: Α Analysis Period: 15 minutes Volume to Capacity (v/c): 0.000

#### Intersection Setup

Name						
Approach	East	Eastbound Wes		Westbound		astbound
Lane Configuration	4 Ir					
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30	.00	30	30.00		0.00
Grade [%]	0.	0.00 0.00		0.00		
Crosswalk	y	es	yes		yes	

#### Volumes

Name						
Base Volume Input [veh/h]	0	237	19	76	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	5.30	14.50	2.00	2.00
Growth Rate	1.37	1.37	1.37	1.37	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	325	26	104	0	0
Peak Hour Factor	1.0000	0.8590	0.5940	0.8260	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	95	11	31	0	0
Total Analysis Volume [veh/h]	0	378	44	126	0	0
Pedestrian Volume [ped/h]		0	0		0	
Bicycle Volume [bicycles/h]		0	0		0	



Generated with PTV VISTRO 31 8/19/2014

## Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

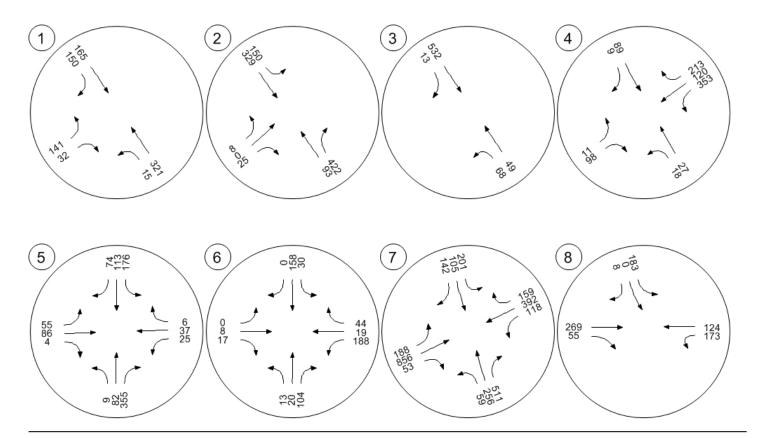
## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00			
d_M, Delay for Movement [s/veh]	7.28	0.00	0.00	0.00	0.00	0.00			
Movement LOS	Α	A	А	A					
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	0.	00	C	0.00	0.00				
Approach LOS	,	A		A	F	4			
d_I, Intersection Delay [s/veh]	0.00								
Intersection LOS	A								

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# Traffic Volume - Future Total Volume

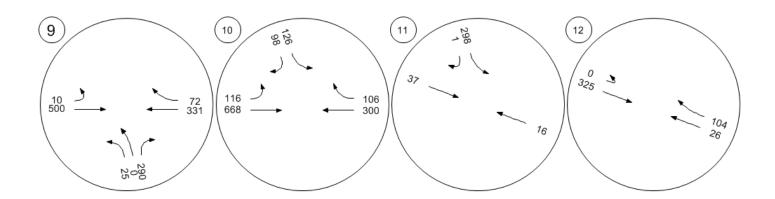




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# Traffic Volume - Future Total Volume

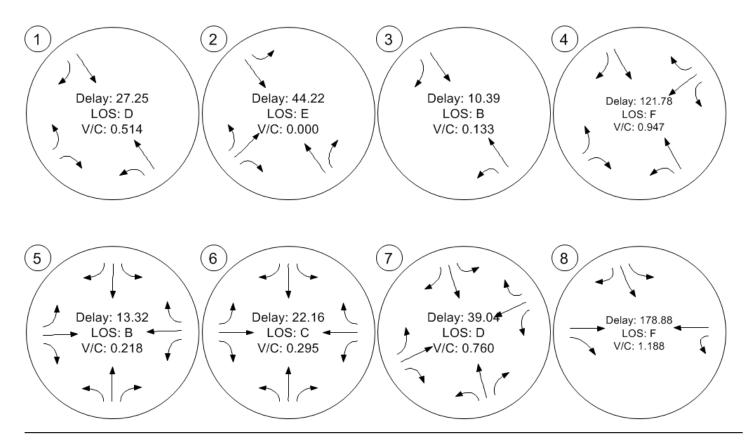




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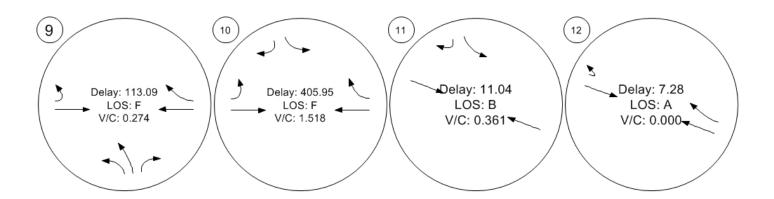
#### **Traffic Conditions**





# Traffic Conditions





I-15 Corridor Study

Vistro File: F:\...\I-15 Corridor.vistropdb

Scenario 4: Future PM Scenario Report File: F:\...\Future\_LOS\_Report\_PM.pdf 9/15/2014

## **Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Tri Hill and Frontage Airport Rd	Two-way stop	HCM2010	NEBL	0.713	43.7	Е
2	I-15 NB and Airport Rd	Two-way stop	HCM2010	NEBR	0.159	10,000.0	F
3	I-15 SB On and Airport RD	Two-way stop	HCM2010	NWBL	0.305	23.5	С
4	I-15 SB Off and Airport RD Frontage	Two-way stop	HCM2010	SWBL	7.378	3,138.9	F
5	14th St SW and I-315 EB	Signalized	HCM2010	NBL	0.457	12.4	В
6	14th St SW and I-315 WB	Signalized	HCM2010	EBR	0.621	19.6	В
7	Fox Farm and I-315	Signalized	HCM2010	NBT	0.891	35.6	D
8	Central Ave and I15 SB	Two-way stop	HCM2010	SBL	1.339	314.9	F
9	Central Ave and I-15 NB	Two-way stop	HCM2010	NBL	1.211	445.2	F
10	Central Ave and Vaughn Rd	Two-way stop	HCM2010	SBL	3.231	1,422.7	F
11	Vaughn Rd and I-15 SB	Two-way stop	HCM2010	SBL	0.254	11.0	В
12	Vaughn Rd and I-15 NB	Two-way stop	HCM2010	EBL	0.000	7.4	Α

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

# Intersection Level Of Service Report #1: Tri Hill and Frontage Airport Rd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 43.7
Level Of Service: E
Volume to Capacity (v/c): 0.713

#### Intersection Setup

Name							
Approach	Northea	stbound	Northwe	estbound	Southeastbound		
Lane Configuration	1	r	+	ıİ	F		
Turning Movement	Left	Right	Left Thru		Thru	Right	
Lane Width [ft]	12.00 12.00		12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30.00		30.00		30.00		
Grade [%]	0.00		0.00		0.00		
Crosswalk	ye	es	у	yes		es	

#### Volumes

Name							
Base Volume Input [veh/h]	75	7	9	160	207	70	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	2.70	0.00	22.20	33.80	18.90	15.80	
Growth Rate	1.70	1.70	1.70	1.70	1.70	1.70	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [ve	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	128	12	15	272	352	119	
Peak Hour Factor	0.5680	0.4380	0.7500	0.8000	0.8480	0.8330	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	56	7	5	85	104	36	
Total Analysis Volume [veh/h]	225	27	20	340	415	143	
Pedestrian Volume [ped/h]	0			0	ō		
Bicycle Volume [bicycles/h]		0		0	0		

## Intersection Settings

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Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.71	0.05	0.02	0.00	0.00	0.00				
d_M, Delay for Movement [s/veh]	43.71 38.46		9.00	0.00	0.00	0.00				
Movement LOS	E E		Α	A	Α	A				
95th-Percentile Queue Length [veh]	5.93	5.93	0.07	0.00	0.00	0.00				
95th-Percentile Queue Length [ft]	148.33 148.33		1.67	0.00	0.00	0.00				
d_A, Approach Delay [s/veh]	43	.15	0.	50	0.0	00				
Approach LOS	E	<b>=</b>	,	4	A	4				
d_I, Intersection Delay [s/veh]		9.45								
Intersection LOS	E									



# Intersection Level Of Service Report #2: I-15 NB and Airport Rd

Control Type:Two-way stopDelay (sec / veh):10,000.0Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):0.159

#### Intersection Setup

Name												
Approach	No	Northeastbound			ıthwestbo	und	Northwestbound			Southeastbound		
Lane Configuration	+						F			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]	0.00			0.00		0.00			0.00			
Crosswalk		yes			yes		yes			yes		

#### Volumes

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Name												
Base Volume Input [veh/h]	2	2	31	0	0	0	0	47	197	307	236	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	47.40	2.00	2.00	2.00	2.00	40.40	20.80	0.70	17.40	2.00
Growth Rate	1.90	1.90	1.90	1.00	1.00	1.00	1.00	1.90	1.90	1.90	1.90	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	4	59	0	0	0	0	89	374	583	448	0
Peak Hour Factor	0.5000	0.5000	0.7750	1.0000	1.0000	1.0000	1.0000	0.6910	0.8210	0.6910	0.8680	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	19	0	0	0	0	32	114	211	129	0
Total Analysis Volume [veh/h]	8	8	76	0	0	0	0	129	456	844	516	0
Pedestrian Volume [ped/h]	0		0		0			0				
Bicycle Volume [bicycles/h]		0			0			0	•		0	•

## Intersection Settings

Robert Peccia And Associates

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.01	0.00
d_M, Delay for Movement [s/veh]	10000.0	10000.0	10000.0	0.00	0.00	0.00	0.00	0.00	0.00	24.83	0.00	0.00
Movement LOS	F	F	F					Α	Α	С	Α	
95th-Percentile Queue Length [veh]	13.97	13.97	13.97	0.00	0.00	0.00	0.00	0.00	0.00	54.79	54.79	0.00
95th-Percentile Queue Length [ft]	349.24	349.24	349.24	0.00	0.00	0.00	0.00	0.00	0.00	1369.74	1369.74	0.00
d_A, Approach Delay [s/veh]		10000.00	0.00				0.00			15.41		
Approach LOS		F		A A F								
d_I, Intersection Delay [s/veh]	461.93											
Intersection LOS		F										

#### Intersection Level Of Service Report #3: I-15 SB On and Airport RD

Control Type:Two-way stopDelay (sec / veh):23.5Analysis Method:HCM2010Level Of Service:CAnalysis Period:15 minutesVolume to Capacity (v/c):0.305

#### Intersection Setup

Name							
Approach	Northeastbound		Northwe	estbound	Southeastbound		
Lane Configuration		1		1	F		
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00 12.00		12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00 100.00		100.00	
Speed [mph]	30	30.00		30.00		0.00	
Grade [%]	0.00		0.00		0.00		
Crosswalk	у	es	yes		yes		

#### Volumes

Robert Peccia And Associates

Name						
Base Volume Input [veh/h]	0	0	25	21	542	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	64.00	19.10	7.30	0.00
Growth Rate	1.00	1.00	2.12	2.12	2.12	2.12
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [v	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	53	45	1149	30
Peak Hour Factor	1.0000	1.0000	0.6250	0.7500	0.7450	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	21	15	386	11
Total Analysis Volume [veh/h]	0	0	85	60	1542	43
Pedestrian Volume [ped/h]	(	0		0		0
Bicycle Volume [bicycles/h]		0		0		0

## Intersection Settings

Robert Peccia And Associates

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.30	0.00	0.02	0.00			
d_M, Delay for Movement [s/veh]	0.00	0.00	23.48	0.00	0.00	0.00			
Movement LOS			С	A	A	A			
95th-Percentile Queue Length [veh]	0.00	0.00	2.79	2.79	0.00	0.00			
95th-Percentile Queue Length [ft]	0.00	0.00	69.68	69.68	0.00	0.00			
d_A, Approach Delay [s/veh]	0.	00	10	3.76	0.	00			
Approach LOS	,	A		В	,	4			
d_I, Intersection Delay [s/veh]			1.15						
Intersection LOS	С								



# Intersection Level Of Service Report #4: I-15 SB Off and Airport RD Frontage

Control Type:Two-way stopDelay (sec / veh):3,138.9Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):7.378

#### Intersection Setup

Name													
Approach	No	rtheastboo	und	Sou	ıthwestbo	und	No	rthwestbo	und	Sou	Southeastbound		
Lane Configuration	Ψ.				46			4		+			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00		30.00			30.00			
Grade [%]	0.00				0.00			0.00			0.00		
Crosswalk		yes		yes				yes		yes			

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	0	0	55	217	26	47	8	15	0	0	286	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	1.80	18.90	11.50	2.10	37.50	6.70	2.00	2.00	1.00	0.00
Growth Rate	2.22	1.00	2.22	2.22	2.22	2.22	2.22	2.22	1.00	1.00	2.22	2.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	122	482	58	104	18	33	0	0	635	2
Peak Hour Factor	1.0000	1.0000	0.7240	0.8350	0.7220	0.6910	0.6670	0.7500	1.0000	1.0000	0.6810	0.2500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	42	144	20	38	7	11	0	0	233	2
Total Analysis Volume [veh/h]	0	0	169	577	80	151	27	44	0	0	932	8
Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Robert Peccia And Associates

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no		
Number of Storage Spaces in Median	0	0	0	0

## Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.53	7.38	0.38	0.15	0.04	0.00	0.00	0.00	0.01	0.00	
d_M, Delay for Movement [s/veh]	47.75	0.00	27.94	3138.95	3109.90	9.11	11.25	0.00	0.00	0.00	0.00	0.00	
Movement LOS	Е		D	F	F	Α	В	Α			Α	Α	
95th-Percentile Queue Length [veh]	2.88	0.00	2.88	74.83	74.83	0.52	0.40	0.40	0.00	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	72.12	0.00	72.12	1870.70	1870.70	12.88	9.95	9.95	0.00	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]		27.94			2551.16			4.28			0.00		
Approach LOS		D			F			Α		А			
d_I, Intersection Delay [s/veh]		1039.42											
Intersection LOS	F												

#### Intersection Level Of Service Report #5: 14th St SW and I-315 EB

Control Type:SignalizedDelay (sec / veh):12.4Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.457

#### Intersection Setup

Name													
Approach	١	Northbound			outhboun	d	I	Eastbound	d	٧	Westbound		
Lane Configuration	חור				Пr			٦١٢		ПİГ			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00			30.00		30.00			
Grade [%]	0.00			0.00				0.00		0.00			
Crosswalk		yes			yes			yes		yes			

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	13	82	260	95	396	262	107	168	10	102	50	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.40	1.20	4.30	1.30	0.40	0.90	0.00	0.00	1.00	0.00	12.90
Growth Rate	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	102	322	118	491	325	133	208	12	126	62	38
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	27	86	31	131	87	35	55	3	34	17	10
Total Analysis Volume [veh/h]	17	109	343	126	523	346	142	222	13	134	66	41
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

## Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	2	3	0	6	7	7	4	0	3	8	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	15	0	5	15	15	5	0	15	15	0
Maximum Green [s]	0	50	20	0	50	20	20	45	0	20	45	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	22	18	0	22	18	18	20	0	18	20	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	5	0	5	0	0	5	0	5	5	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	10	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## **Lane Group Calculations**

Lane Group	L	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00	4.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	21	21	41	21	21	41	33	15	15	33	15	15
g / C, Green / Cycle	0.35	0.35	0.68	0.35	0.35	0.68	0.55	0.25	0.25	0.55	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.06	0.21	0.10	0.28	0.22	0.09	0.12	0.01	0.09	0.03	0.03
s, saturation flow rate [veh/h]	893	1855	1596	1251	1876	1609	1564	1900	1615	1472	1900	1430
c, Capacity [veh/h]	183	647	1089	469	654	1097	998	466	396	872	466	351
d1, Uniform Delay [s]	26.40	13.51	3.86	17.33	17.64	3.86	6.75	19.34	17.22	7.01	17.69	17.58
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.20	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	0.12	0.16	0.30	2.31	0.30	0.06	0.75	0.03	0.08	0.14	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

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X, volume / capacity	0.09	0.17	0.32	0.27	0.80	0.32	0.14	0.48	0.03	0.15	0.14	0.12
d, Delay for Lane Group [s/veh]	26.62	13.63	4.03	17.63	19.95	4.16	6.82	20.09	17.25	7.09	17.83	17.73
Lane Group LOS	С	В	Α	В	В	Α	Α	С	В	Α	В	В
Critical Lane Group	no	no	no	no	yes	yes	no	yes	no	no	no	no
50th-Percentile Queue Length [veh]	0.23	0.94	1.10	1.32	6.19	1.15	0.74	2.53	0.13	0.70	0.68	0.42
50th-Percentile Queue Length [ft]	5.73	23.57	27.43	32.90	154.65	28.69	18.54	63.35	3.27	17.48	17.01	10.58
95th-Percentile Queue Length [veh]	0.41	1.70	1.97	2.37	10.26	2.07	1.33	4.56	0.24	1.26	1.22	0.76
95th-Percentile Queue Length [ft]	10.31	42.42	49.37	59.22	256.62	51.65	33.37	114.02	5.88	31.46	30.62	19.05

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.62	13.63	4.03	17.63	19.95	4.16	6.82	20.09	17.25	7.09	17.83	17.73
Movement LOS	С	В	Α	В	В	Α	Α	С	В	Α	В	В
d_A, Approach Delay [s/veh]		7.08			14.16			15.00			11.84	
Approach LOS		Α			В			В			В	
d_I, Intersection Delay [s/veh]						12	.45					
Intersection LOS	В											
Intersection V/C	0.457											

## Sequence

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Ring 1	2	7	4	ı	-	-	-	-	-	-	-	ı	-	-	-	ı
Ring 2	6	3	8	-	_	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	_	-	-	_	-	-	_	-	-	-	-	-	-	-	



#### Intersection Level Of Service Report #6: 14th St SW and I-315 WB

Control Type:SignalizedDelay (sec / veh):19.6Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.621

#### Intersection Setup

Name												
Approach	١	lorthboun	d	S	outhboun	d	ı	Eastbound	d	V	Vestbound	d
Lane Configuration		٦١٢			٦ŀ			+			4	
Turning Movement	Left	Left Thru Right			Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]	0.00				0.00			0.00			0.00	
Crosswalk		yes			yes			yes			yes	

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	5	76	146	22	131	2	3	5	19	638	12	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	40.00	6.60	0.70	0.00	2.30	0.00	0.00	0.00	15.80	1.80	8.30	4.20
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	88	169	26	152	2	3	6	22	740	14	165
Peak Hour Factor	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880	0.9880
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	22	43	7	38	1	1	2	6	187	4	42
Total Analysis Volume [veh/h]	6	89	171	26	154	2	3	6	22	749	14	167
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	n Volume [ped/h]				0	-		0			0	-
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

## Phasing & Timing

Robert Peccia And Associates

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	1	2	0	1	0	0	3	0	0	2	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	5	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	35	40	0	35	0	0	25	0	0	40	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	25	19	0	25	0	0	16	0	0	19	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	7	0	9	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	11	7	0	11	0	0	0	0	0	7	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		no	no		no			no			no	
Maximum Recall		no	no		no			no			no	
Pedestrian Recall		no	no		no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## **Lane Group Calculations**

Lane Group	L	С	R	L	С	С	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	11	11	49	11	11	2	33	33
g / C, Green / Cycle	0.18	0.18	0.81	0.18	0.18	0.03	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.01	0.06	0.12	0.02	0.09	0.02	0.51	0.12
s, saturation flow rate [veh/h]	804	1604	1443	1196	1668	1513	1505	1395
c, Capacity [veh/h]	167	290	1168	234	301	51	820	760
d1, Uniform Delay [s]	26.79	21.32	1.24	25.10	22.21	28.59	12.61	7.06
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.27	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.59	0.06	0.21	1.37	11.05	11.60	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

Robert Peccia And Associates

X, volume / capacity	0.04	0.31	0.15	0.11	0.52	0.61	0.93	0.22
d, Delay for Lane Group [s/veh]	26.88	21.91	1.30	25.31	23.59	39.64	24.21	7.20
Lane Group LOS	С	С	Α	С	С	D	С	Α
Critical Lane Group	no	no	no	no	yes	yes	yes	no
50th-Percentile Queue Length [veh]	0.08	1.06	0.08	0.34	1.97	0.58	9.92	0.92
50th-Percentile Queue Length [ft]	2.04	26.57	1.93	8.44	49.22	14.38	247.97	23.06
95th-Percentile Queue Length [veh]	0.15	1.91	0.14	0.61	3.54	1.04	15.08	1.66
95th-Percentile Queue Length [ft]	3.67	47.82	3.47	15.19	88.60	25.89	377.09	41.51

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.88	21.91	1.30	25.31	23.59	23.59	39.64	39.64	39.64	24.21	24.21	7.20
Movement LOS	С	С	Α	С	С	С	D	D	D	С	С	Α
d_A, Approach Delay [s/veh]		8.77			23.83			39.64			21.15	
Approach LOS		Α			С			D			С	
d_I, Intersection Delay [s/veh]						19	.57					
Intersection LOS	В											
Intersection V/C	0.621											

## Sequence

Robert Peccia And Associates

	-																
I	Ring 1	1	2	3	ı	ı	-	-	-	-	-	-	ı	ı	-	-	ı
	Ring 2		-	-	-	-	-	_	-	-	-	-	-	-	-	-	-
I	Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ī	Ring 4	-	-	-	-	_	_	_	_	-	_	-	-	-	-	-	_



35.6

D

0.891

#### Intersection Level Of Service Report #7: Fox Farm and I-315

Control Type:SignalizedDelay (sec / veh):Analysis Method:HCM2010Level Of Service:Analysis Period:15 minutesVolume to Capacity (v/c):

#### Intersection Setup

Name												
Approach	١	Northboun	d	S	outhboun	d	No	rtheastbo	und	Sou	ıthwestbo	und
Lane Configuration		117			۱۱۱۲			Шь		•	ıIIIr	
Turning Movement	Left Thru Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]	0.00				0.00			0.00			0.00	
Crosswalk	yes				yes			yes			yes	

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	71	155	227	153	274	325	242	706	103	486	874	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.80	1.90	0.40	1.30	0.70	2.10	2.50	3.60	2.90	0.40	3.90	1.60
Growth Rate	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	181	266	179	321	380	283	826	121	569	1023	293
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	49	72	49	87	103	77	224	33	155	278	80
Total Analysis Volume [veh/h]	90	197	289	195	349	413	308	898	132	618	1112	318
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate	/ 0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]		0			0	-		0			0	-
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

## Phasing & Timing

Robert Peccia And Associates

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	1	8	0	3	6	6	4	0	8	2	5
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	5	0	5	5	5	5	0	5	5	0
Maximum Green [s]	0	60	60	0	60	60	60	60	0	60	60	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	26	0	20	23	23	39	0	26	42	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	0.0	1.0	3.0	0.0
Minimum Recall		no	no		no	no	no	no		no	no	
Maximum Recall		no	no		no	no	no	no		no	no	
Pedestrian Recall		no	no		no	no	no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## **Lane Group Calculations**

Lane Group	С	С	R	L	С	R	L	С	R	L	С	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	3.00	3.00	5.00	5.00	3.00	5.00	5.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	0.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	18	18	82	28	28	61	28	47	47	27	47	47
g / C, Green / Cycle	0.15	0.15	0.68	0.24	0.24	0.51	0.23	0.40	0.40	0.23	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	0.20	0.12	0.11	0.29	0.19	0.29	0.09	0.20	0.35	0.22
s, saturation flow rate [veh/h]	1604	1527	1448	1608	3233	1424	1589	3143	1413	3150	3134	1431
c, Capacity [veh/h]	243	231	985	380	764	729	371	1245	559	719	1224	559
d1, Uniform Delay [s]	46.00	49.37	7.66	39.82	39.22	20.15	43.70	30.64	24.14	44.46	34.54	28.65
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.15	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	7.18	0.16	1.07	0.43	0.96	4.79	0.80	0.21	3.15	2.94	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Lane Group Results

Robert Peccia And Associates

X, volume / capacity	0.40	0.82	0.29	0.51	0.46	0.57	0.83	0.72	0.24	0.86	0.91	0.57
d, Delay for Lane Group [s/veh]	47.07	56.55	7.83	40.89	39.65	21.11	48.50	31.44	24.35	47.61	37.48	29.57
Lane Group LOS	D	Е	Α	D	D	С	D	С	С	D	D	С
Critical Lane Group	no	yes	no	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.70	5.98	2.86	5.12	4.46	7.98	9.16	10.99	2.55	9.09	15.51	7.26
50th-Percentile Queue Length [ft]	67.38	149.57	71.39	127.98	111.45	199.62	228.90	274.66	63.65	227.31	387.83	181.61
95th-Percentile Queue Length [veh]	4.85	9.99	5.14	8.83	7.92	12.62	14.12	16.42	4.58	14.04	21.97	11.68
95th-Percentile Queue Length [ft]	121.29	249.86	128.51	220.75	198.02	315.47	352.97	410.56	114.57	350.95	549.31	292.12

## Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.07	56.22	7.83	40.89	39.65	21.11	48.50	31.44	24.35	47.61	37.48	29.57
Movement LOS	D	E	Α	D	D	С	D	С	С	D	D	С
d_A, Approach Delay [s/veh]		30.51			31.90			34.67			39.31	
Approach LOS		С			С			С				
d_I, Intersection Delay [s/veh]						35	.58					
Intersection LOS						[	)					
Intersection V/C						3.0	391					

## Sequence

Robert Peccia And Associates

F	Ring 1	1	3	8	4	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 2		-	6	2	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



314.9

F

1.339

#### Intersection Level Of Service Report #8: Central Ave and I15 SB

Control Type: Two-way stop Delay (sec / veh):

Analysis Method: HCM2010 Level Of Service:

Analysis Period: 15 minutes Volume to Capacity (v/c):

#### Intersection Setup

Name												
Approach	S	Southboun	d	1	Eastbound	d	\	Vestboun	d	Nor	rthwestbo	und
Lane Configuration		left Thru Right			17			1				
Turning Movement	Left	Left Thru Right			Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]	0.00				0.00		0.00			0.00		
Crosswalk	yes			yes		yes			yes			

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	66	0	6	0	166	30	230	299	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	2.00	0.60	0.00	6.50	1.00	2.00	2.00	2.00	2.00
Growth Rate	1.41	1.41	1.41	1.00	1.41	1.41	1.41	1.41	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	0	8	0	234	42	324	422	0	0	0	0
Peak Hour Factor	0.9170	1.0000	0.7500	1.0000	0.8470	0.8330	0.8980	0.8690	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	3	0	69	13	90	121	0	0	0	0
Total Analysis Volume [veh/h]	101	0	11	0	276	50	361	486	0	0	0	0
Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

Robert Peccia And Associates

Priority Scheme	Stop	Free	Free	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.34	0.00	0.02	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	314.89	307.18	11.27	0.00	0.00	0.00	8.99	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	В		Α	Α	Α	Α				
95th-Percentile Queue Length [veh]	7.96	7.96	0.06	0.00	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	198.90	198.90	1.44	0.00	0.00	0.00	29.75	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]		285.07			0.00			3.83			0.00	
Approach LOS		F			Α			Α			А	
d_I, Intersection Delay [s/veh]						27	.37					
Intersection LOS						·	=					



#### Intersection Level Of Service Report #9: Central Ave and I-15 NB

Control Type:Two-way stopDelay (sec / veh):445.2Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):1.211

#### Intersection Setup

Name												
Approach	١	Northboun	d	1	Eastbound	i	\	Vestboun	d	Sou	utheastbo	und
Lane Configuration		ት			1			IIr				
Turning Movement	Left	Left Thru Right			Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00 100.00 100.00			100.00 100.00 100.00			100.00	100.00
Speed [mph]		30.00			30.00		30.00			30.00		
Grade [%]	0.00				0.00		0.00			0.00		
Crosswalk	yes			yes			yes			yes		

#### Volumes

Robert Peccia And Associates

Name												
Base Volume Input [veh/h]	57	0	170	5	249	0	0	471	113	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.80	0.00	7.00	0.00	2.00	2.00	2.00	4.60	0.90	2.00	2.00	2.00
Growth Rate	1.64	1.64	1.64	1.64	1.64	1.00	1.00	1.64	1.64	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	0	279	8	408	0	0	772	185	0	0	0
Peak Hour Factor	0.7130	1.0000	0.7590	0.4170	0.8650	1.0000	1.0000	0.9350	0.8310	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	0	92	5	118	0	0	206	56	0	0	0
Total Analysis Volume [veh/h]	130	0	368	19	472	0	0	826	223	0	0	0
Pedestrian Volume [ped/h]		0			0		0			0		
Bicycle Volume [bicycles/h]		0			0			0			0	

## Intersection Settings

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Priority Scheme	Stop	Free	Free	Stop
Flared Lane	no			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no			
Number of Storage Spaces in Median	0	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.21	0.00	0.63	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
d_M, Delay for Movement [s/veh]	445.19	435.47	417.85	9.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Movement LOS	F	F	F	Α	Α			Α	Α				
95th-Percentile Queue Length [veh]	33.98	33.98	33.98	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95th-Percentile Queue Length [ft]	849.39	849.39	849.39	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
d_A, Approach Delay [s/veh]		424.99			0.37			0.00		0.00			
Approach LOS		F			Α			Α			А		
d_I, Intersection Delay [s/veh]	103.94												
Intersection LOS		F											



# Intersection Level Of Service Report #10: Central Ave and Vaughn Rd

Control Type:Two-way stopDelay (sec / veh):1,422.7Analysis Method:HCM2010Level Of Service:FAnalysis Period:15 minutesVolume to Capacity (v/c):3.231

#### Intersection Setup

Crosswalk	y	es	yes		yes		
Grade [%]	0.00		0.00		0.00		
Speed [mph]	30	.00	30	30.00		0.00	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Configuration	₩.		٦	Ī	IF.		
Approach	South	Southbound		ound	Westbound		
Name							

#### Volumes

Robert Peccia And Associates

Name							
Base Volume Input [veh/h]	68	121	66	361	462	76	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	2.90	1.60	1.50	4.00	3.40	2.60	
Growth Rate	1.63	1.63	1.63	1.63	1.63	1.63	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [v	e 0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	111	197	108	588	753	124	
Peak Hour Factor	0.6540	0.9450	0.7500	0.7910	0.8680	0.7310	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	42	52	36	186	217	42	
Total Analysis Volume [veh/h]	170	208	144	743	868	170	
Pedestrian Volume [ped/h]	Ö			0	0		
Bicycle Volume [bicycles/h]		0		0	0		

## Intersection Settings

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Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	3.23	0.66	0.21	0.01	0.01	0.00			
d_M, Delay for Movement [s/veh]	1422.75	1365.77	11.82	0.00	0.00	0.00			
Movement LOS	F	F	В	A	А	A			
95th-Percentile Queue Length [veh]	38.77	38.77	0.81	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	969.13	969.13	20.22	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	139	1.39	1.	92	0.00				
Approach LOS	F	=	,	4	A				
d_I, Intersection Delay [s/veh]	229.11								
Intersection LOS	F								

# Intersection Level Of Service Report #11: Vaughn Rd and I-15 SB

Control Type:Two-way stopDelay (sec / veh):11.0Analysis Method:HCM2010Level Of Service:BAnalysis Period:15 minutesVolume to Capacity (v/c):0.254

#### Intersection Setup

Name							
Approach	South	Southbound		bound	Westbound		
Lane Configuration	Ψ.		1			1	
Turning Movement	Left	Right	Left	Thru	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]	30	0.00	30	30.00		0.00	
Grade [%]	0.00		0.00		0.00		
Crosswalk	у	yes		yes		res	

#### Volumes

Robert Peccia And Associates

Name							
Base Volume Input [veh/h]	143	1	0	53	50	0	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Heavy Vehicles Percentage [%]	7.00	0.00	2.00	7.60	4.00	2.00	
Growth Rate	1.36	1.36	1.00	1.36	1.36	1.00	
In-Process Volume [veh/h]	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	0	0	0	0	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	
Existing Site Adjustment Volume [ve	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	194	1	0	72	68	0	
Peak Hour Factor	0.9410	0.2500	1.0000	0.7790	0.8930	1.0000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Total 15-Minute Volume [veh/h]	52	1	0	23	19	0	
Total Analysis Volume [veh/h]	206	4	0	92	76	0	
Pedestrian Volume [ped/h]		0		0	Ö		
Bicycle Volume [bicycles/h]		0	(	0	0		

## Intersection Settings

Robert Peccia And Associates

Priority Scheme	Stop	Free	Free
Flared Lane	no		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no		
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.25	0.00	0.00	0.00	0.00	0.00			
d_M, Delay for Movement [s/veh]	10.97	10.17	0.00	0.00	0.00	0.00			
Movement LOS	В	В		A	Α				
95th-Percentile Queue Length [veh]	1.03	1.03	0.00	0.00	0.00	0.00			
95th-Percentile Queue Length [ft]	25.74	25.74	0.00	0.00	0.00	0.00			
d_A, Approach Delay [s/veh]	10	.96	0.00		0.00				
Approach LOS	E	3	,	4	A				
d_I, Intersection Delay [s/veh]	6.09								
Intersection LOS	В								

# Intersection Level Of Service Report #12: Vaughn Rd and I-15 NB

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 7.4
Level Of Service: A
Volume to Capacity (v/c): 0.000

#### Intersection Setup

Name								
Approach	Eastbound		Wes	Westbound		astbound		
Lane Configuration	1		1	ſ				
Turning Movement	Left	Thru	Thru	Right	Left	Right		
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00		
No. of Lanes in Pocket	0	0	0	0	0	0		
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00		
Speed [mph]	30	.00	30	30.00		30.00		
Grade [%]	0.00		0.00		0.00			
Crosswalk	ye	es	У	yes		yes		

#### Volumes

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Name						
Base Volume Input [veh/h]	0	165	55	334	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	6.10	1.80	4.80	2.00	2.00
Growth Rate	1.37	1.37	1.37	1.37	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [ve	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	226	75	458	0	0
Peak Hour Factor	1.0000	0.7500	0.8090	0.9180	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	75	23	125	0	0
Total Analysis Volume [veh/h]	0	301	93	499	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

## Intersection Settings

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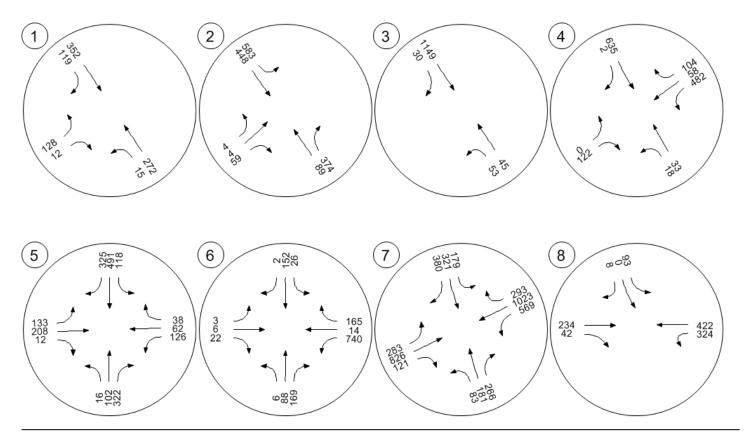
Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			
Number of Storage Spaces in Median	0	0	0

#### Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00		
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	0.00	0.00	0.00		
Movement LOS	Α	A	Α	A				
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00		
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00		
d_A, Approach Delay [s/veh]	0.00		0.00		0.00			
Approach LOS	A		A		А			
d_I, Intersection Delay [s/veh]	0.00							
Intersection LOS	A							

# Traffic Volume - Future Total Volume



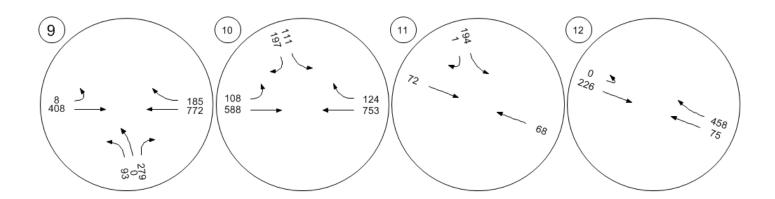


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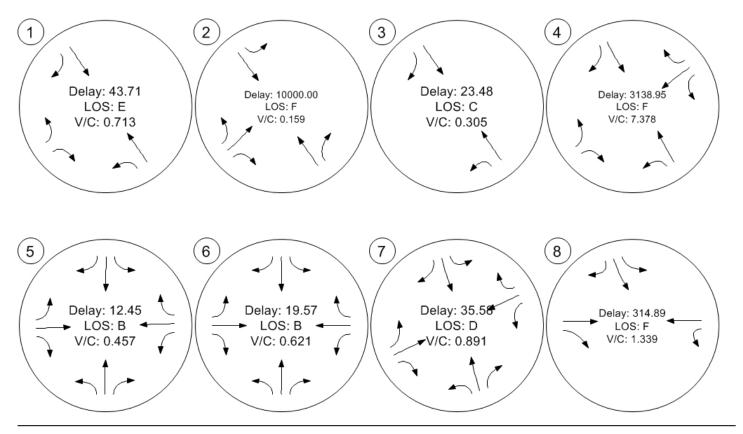
# Traffic Volume - Future Total Volume





#### **Traffic Conditions**





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