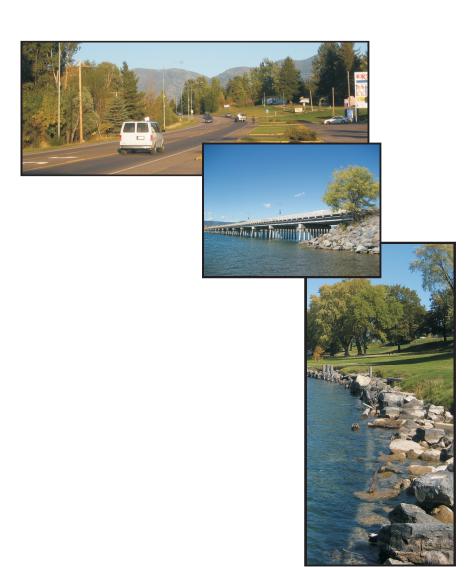
APPENDIX C CORRIDOR STUDY DOCUMENTATION



US 93 Polson Corridor Study

Polson Area Transportation Plan US 93 Polson Corridor Study



PUBLIC PARTICIPATION PLAN

Prepared For:

Montana Department of Transportation Confederated Salish & Kootenai Tribes Lake County City of Polson

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana

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1.0 Introduction

Lake County, City of Polson and the Confederated Salish and Kootenai Tribes (CSKT), in partnership with the Montana Department of Transportation (MDT), has initiated the development of the Polson Area Transportation Plan and US 93 Polson Corridor Study. These two area-wide interrelated transportation planning processes will assist state and local governments and the community at large in guiding transportation infrastructure and implementation over the next 20-year planning horizon. The comprehensive Polson Area Transportation Plan will provide an opportunity for local governments and residents to work together to develop innovative approaches necessary to plan and implement an integrated transportation system that will beneficially serve the community's citizens and visitors well into the future. The US 93 Polson Corridor Study will primarily focus on US 93, the principle arterial through the greater Polson area, and will assist MDT in determining cost-effective ways to address transportation needs including the feasibility of a truck bypass to US 93. The corridor planning process will provide information into any future NEPA/MEPA process, help identify viable improvement options, and provide opportunity for public involvement at all stages.

An initial step of the corridor study and transportation plan processes is to develop a Public Participation Plan that provides for and identifies public involvement activities on existing and future transportation system needs. The purpose of this plan is to ensure a proactive public involvement process that provides opportunities for the public to be involved in all phases of the corridor study and transportation plan process. This is accomplished by providing complete information, timely public notice, opportunities for making comments, and ensuring full access to key decisions.

1.1 Transportation Plan Purpose

The Polson area transportation plan is intended to help guide decisions about the future of the transportation system in the area. The development and implementation of a transportation plan is a tool for managing growth and accommodating development needs. Public participation is a key component in any successful transportation planning process. For this planning study, numerous public participation strategies are being proposed to reach as many people as possible and gather essential information to guide infrastructure improvements. The City of Polson has been one of the fastest growing areas in Montana and it is expected that the City will become a designated urban area based on the 2010 Census. The level of public involvement in transportation issues generally increases with the community's growth. In the Polson area, this population growth has manifested itself in new development and new employment with additional traffic and higher demands on the local transportation system. The transportation plan will provide public outreach opportunities that will:

- Educate the public on the important elements of planning and engineering the community's transportation system,
- Respond to the increasing interest of the general public to participate in planning of the community, and
- Increase the public's investment in the Transportation Plan.

1.2 Corridor Study Purpose

The purpose for a corridor study is to analyze existing data to determine current and future deficiencies and needs within the corridor and identify potential environmental issues and mitigation opportunities. The US 93 Corridor Study is a pre-NEPA/MEPA study that allows flexibility in examining improvement options for the roadway system should any project move forward. Additionally, this study will look at the feasibility of a truck bypass to US 93 as previously examined in the 1996 US 93 – Evaro to Polson Environmental Impact Statement. Public participation is an important component in any successful corridor planning study process. For this study, a number of public involvement strategies are proposed to reach the most people possible and elicit meaningful participation. These opportunities will:

- Educate the public on important element and the process of planning the US 93 corridor near Polson,
- Increase the public's ability to provide input and ask questions throughout the corridor planning study, and
- Present findings and recommendations.

1.3 Corridor Study and Transportation Plan Areas

The termini of the US 93 Corridor Study has been established by the MDT as being along US 93 from (RP) Reference Post 56.5 (US 93/Caffrey Road) to RP 63.0 (0.8 miles beyond the Rocky Point Road intersection). The study area for the Polson Area Transportation Plan includes the city limits of Polson, in addition to a 2-mile radius outside of the city limits. Physical features within the study area include Flathead Lake, Flathead River, and public, private, and tribal property. The study areas for the Polson Area Transportation Plan and the US 93 Polson Corridor Study are shown in Figures 1 and 2, respectively.

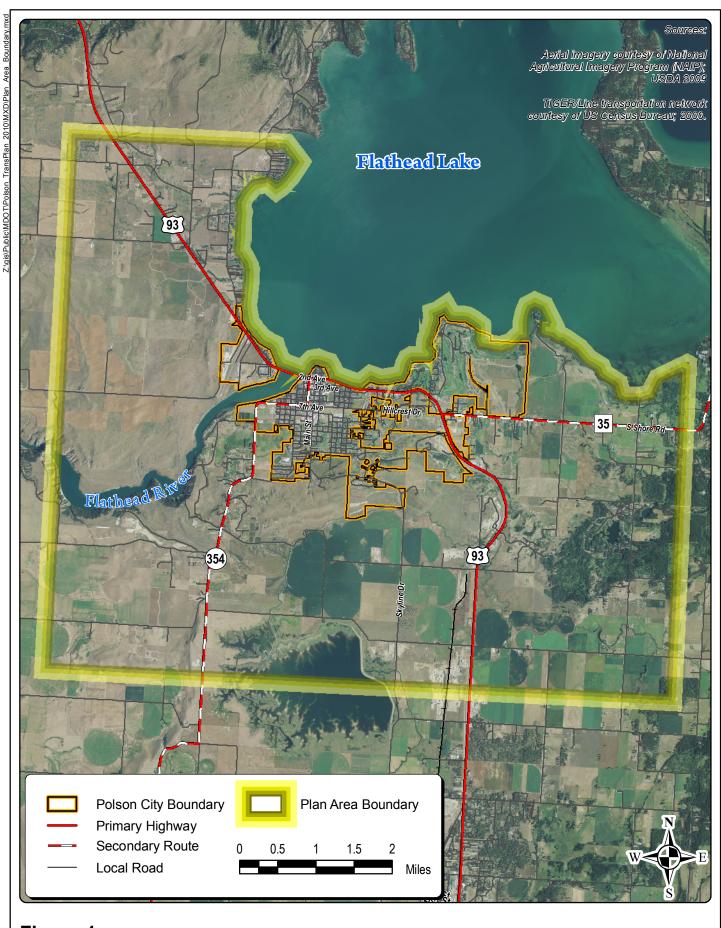
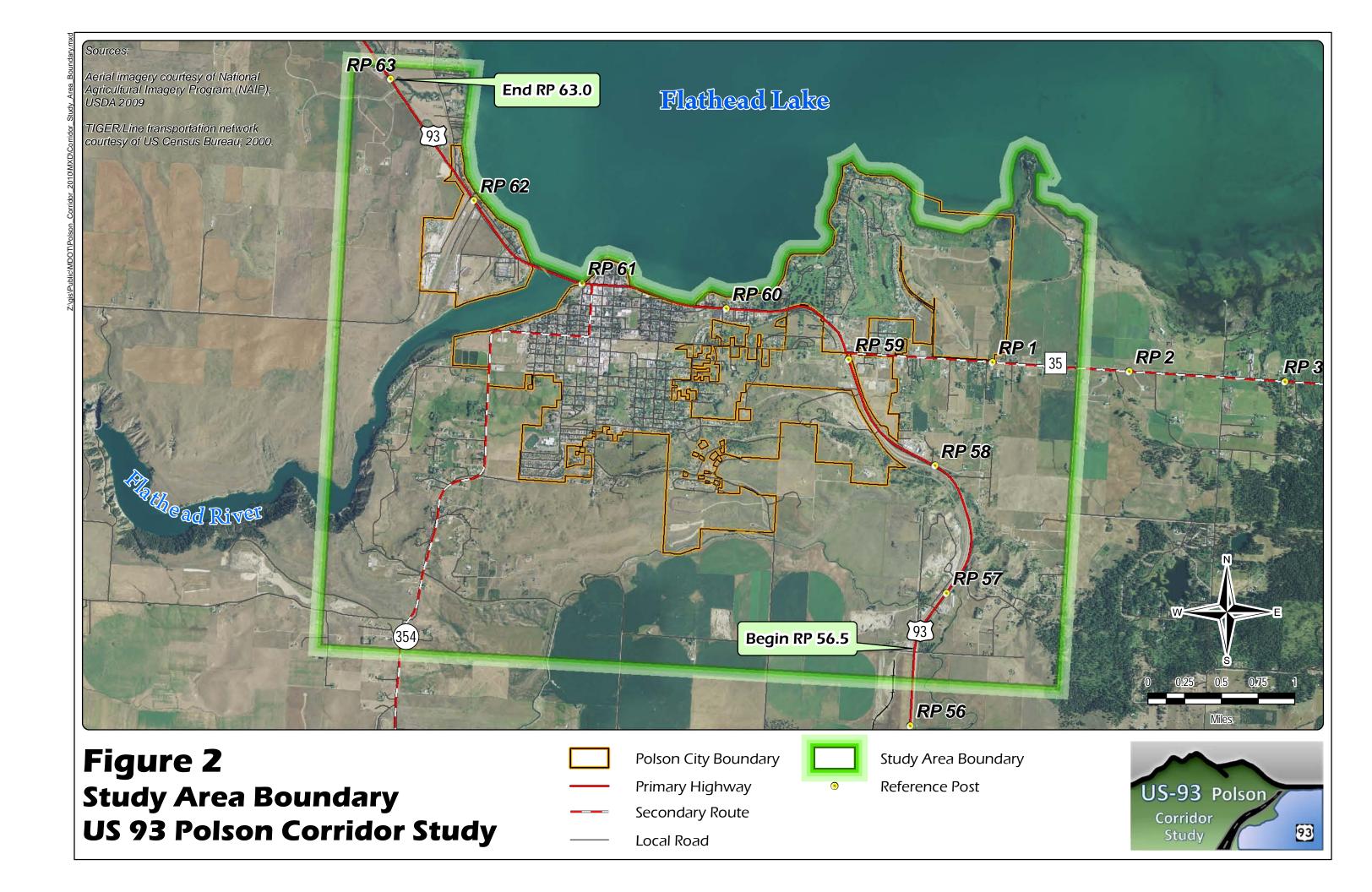


Figure 1
Plan Area Boundary
Polson Area Transportation Plan





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1.4 Goals of Public Involvement & Outreach Effort

The goal of the study partners and the consultant is to have ongoing public involvement for the corridor

study and transportation plan processes. Education and public outreach are an essential part of fulfilling the local entities' responsibility to successfully inform the public about the corridor study and transportation plan processes. All four contracting entities (CSKT, Lake County, the City of Polson and MDT) seek to encourage public involvement and meaningful participation. These public outreach activities will be devoted

Education and public outreach are an essential part of fulfilling the local entities' responsibility to successfully inform the public about the corridor study and transportation planning processes.

to defining relevant issues and presenting preliminary findings of the analysis and studies of the existing transportation and socio-economic systems.

2.0 Public Participation Procedures

The Public Participation Plan describes the public information and input opportunities that will be provided as part of the development of the Polson Area Transportation Plan and US 93 Polson Corridor Study. This plan encourages active participation in identifying and commenting on corridor and transportation issues at every stage of the planning process. Participants in this public participation process include:

- The general public residents of the City of Polson, the Flathead Reservation, and adjacent unincorporated areas (Lake County) affected by the planning efforts;
- Landowners and business owners affected within the study area boundaries;
- The Technical Oversight Committee (TOC) made up of 9 representatives of the study partners, including the Federal Highway Administration (FHWA); and
- Stakeholders and Outreach Groups.

Methods of notifying the public of the planning processes, upcoming meetings, and other information are detailed in this document. The general public will be kept informed of all aspects of the plan and study, and their input will be sought throughout the process. The public and interested parties shall provide input to the Consultant via the methods detailed herein.

2.1 Study Contacts

Contact information for CSKT, Lake County, City of Polson, MDT and the Consultant will be provided to the public. Telephone numbers and email addresses of plan and study contacts will be published in information that is released and is also included here.

City of Polson, 106 1st Street East, Polson, MT 59860; (406) 249-5637; Contact – Todd Crossett, polsonmanager@centurytel.net

Lake County, 106 Fourth Avenue East, Polson, MT 59860; (406) 883-7204; Contact – Bill Barron, lakecommissioners@lakemt.gov

CSKT, 36100 Second Street East (PO Box 278), Pablo, MT 59855; Contact – Joe Hovenkotter, jhovenkotter@cskt.org

Montana Department of Transportation (MDT), Statewide and Urban Planning, 2960 Prospect Avenue (PO Box 201001), Helena, MT 59620-1001; (406) 444-9193; Contact – Sheila Ludlow, sludlow@mt.gov

Montana Department of Transportation (MDT), Missoula District Office, 2100 W Broadway (PO Box 7039), Missoula, MT 59807-7039; (406) 523-5830; Contact – Shane Stack, sstack@mt.gov

Camp Dresser & McKee, Inc. (CDM), 50 West 14th Street, Suite 200, Helena, MT 59601 (406) 441-1400; CDM Project Manager – Jeff Key, P.E., <u>KeyJA@cdm.com</u>

2.2 Publications

Meeting announcements will be developed by CDM and advertised by MDT at least three weeks prior to meetings. The ads will announce the meeting location, time, and date, the format and purpose of the meeting, and the locations where documents may be reviewed (if applicable). The following print newspapers may carry the display ads.

Char-Koosta News – print and online http://www.charkoosta.com

Lake County Leader- print and online http://leaderadvertiser.com

The Valley Journal—print and online http://www.valleyjournal.net

The Missoulian – print and online http://missoulian.com

Daily Inter Lake—print and online http://www.dailyinterlake.com

Flathead Beacon – print and online http://www.flatheadbeacon.com

Also, three newsletters for each study will be made available one month prior to each formal public meeting. Newsletters will describe work in progress, results achieved, preliminary recommendations, and other related topics. Each newsletter will be saved as a PDF and delivered to CSKT, Lake County, the City of Polson, MDT and select stakeholders for their use in posting to their individual internet sites.

2.3 Radio and Television

Meetings may also be announced on local radio and television stations. Input from the TOC will identify

the most popular radio and television stations on which announcements will be made.

Frequency	Call Sign	Format	Home Community	Licensee
600 AM	KGEZ		Kalispell, MT	Skyline Broadcasters, Inc.
750 AM	KERR		Polson, MT	Anderson Radio Broadcasting, Inc.
1180 AM	KOFI		Kalispell, MT	Kofi, Inc.
1240 AM	KSAM		Whitefish, MT	Bee Broadcasting, Inc.
88.7 FM	KLKM	Christian	Kalispell, MT	Educational Media Foundation
89.1 FM	KUFM	National Public Radio	Missoula, MT	The University Of Montana
91.5 FM	KPLG		Plains, MT	Hi-line Radio Fellowship, Inc.
92.3 FM	KQRK		Ronan, MT	Anderson Radio Broadcasting, Inc.
93.3 FM	KGGL		Missoula, MT	Fisher Radio Regional Group, Inc.
94.9 FM	KYSS-FM	Country	Missoula, MT	Capstar Tx Limited Partnership
95.9 FM	KHNK		Columbia Falls, MT	Bee Broadcasting, Inc.
96.3 FM	KBAZ	New Rock	Hamilton, MT	Capstar Tx Limited Partnership
97.1 FM	KALS		Kalispell, MT	Kalispell Christian Radio Fellowship, Inc.
98.5 FM	KBBZ		Kalispell, MT	Bee Broadcasting, Inc.
100.7 FM	KIBG		Wallace, ID	Anderson Radio Broadcasting, Inc.
103.9 FM	KZMN		Kalispell, MT	Kofi, Inc.
105.1 FM	KWOL-FM		Whitefish, MT	Cathleen R. Bee Dba Rose Communications
106.3 FM	KDBR		Kalispell, MT	Bee Broadcasting, Inc.
106.7 FM	KBQQ		Pinesdale, MT	Fisher Radio Regional Group Inc.

Source: The Center for Public Integrity - Radio stations that reach ZIP code 59860, Polson, MT. http://projects.publicintegrity.org/telecom/search/default.aspx?zip=59860

Channel	Call Sign	License Type	Network	Home Community	Licensee
3	K03DJ	Translator (VHF)		Polson, MT	Blacktail Tv Tax District
6	K06EL	Translator (VHF)		Ferndale, Etc., MT	Swan Hill Tv, Inc.
8	KPAX-TV	Commercial (VHF)	CBS	Missoula, MT	Kpax Communications, Inc.
9	KCFW-TV	Commercial (VHF)	NBC	Kalispell, MT	Bluestone License Holdings Inc.
10	K10LP	Translator (VHF)		Polson, MT	Blacktail Tv Tax District
11	K11HO	Translator (VHF)		Polson, MT	Polson Tv Improvement Association
11	KUFM-TV	Educational (VHF)	PBS	Missoula, MT	The University Of Montana
13	KECI-TV	Commercial (VHF)	NBC	Missoula, MT	Bluestone License Holdings Inc.
14	K14LT	Translator (UHF)		Polson, MT	Blacktail Tv Tax District
15	K15GP	Translator (UHF)		Kalispell, MT	Blacktail Tv Tax District
16	K16GJ	Translator (UHF)		Polson, MT	Polson Tv Improvement Association
17	KMMF	Commercial (UHF)	FOX	Missoula, MT	Montana License Sub, Inc.
20	K20CP	Translator (UHF)		Elmo, MT	Salish Kootenai College
23	KTMF	Commercial (UHF)	ABC	Missoula, MT	Mmm License Llc
25	KSKC-CA	Class A (UHF)		Pablo/ronan, MT	Salish Kootenai College
26	K26DD	Translator (UHF)		Kalispell, MT	Trinity Broadcasting Network
30	K30II	Translator (UHF)		Polson, MT	Blacktail Tv Tax District
41	K41IW	Translator (UHF)		Polson, MT	Blacktail Tv Tax District
44	K44FR	Translator (UHF)		Blacktail, Etc., MT	Blacktail Tv Tax District
51	K51HT	Translator (UHF)		Kalispell, MT	Blacktail Tv Tax District

Source: The Center for Public Integrity - Television stations that reach ZIP code 59860, Polson, MT. http://projects.publicintegrity.org/telecom/search/default.aspx?zip=59860

2.4 Stakeholder Contact List

A stakeholder contact list will be produced that will include individuals, businesses, or groups identified by the CSKT, Lake County, City of Polson, and MDT. The intent of developing the stakeholder list is to identify those individuals and groups to actively seek out and engage in all phases of the study and plan processes. Individuals who attend public meetings will also be added to the stakeholder list. The following groups or businesses (at a minimum) will be included in the initial list, providing that addresses and/or emails are obtainable from each respective group for these purposes:

- CSKT Tribal Council
- City of Polson
- Lake County Commissioners
- Lake County Planner
- Polson Chamber of Commerce
- Polson Airport
- Polson K-12 School District
- Downtown Business Owners Association
- US 93 User's Group
- Water User's Group (Flathead Lake and Flathead River)
- Office of Emergency Management
- Montana Fish, Wildlife, and Parks
- County Fire Departments and Emergency Medical Personnel
- County Sheriff and Montana State Highway Patrol
- Montana Truckers Association (MTA)
- Interested Landowners
- Employers:
 - KwaTaqNuk Resort
 - St. Joseph Medical Center
 - Businesses along US 93

2.5 Document Availability

All study deliverables and working draft technical memorandums will be available in hard copy format at the offices of the CSKT, Lake County, City of Polson, and the MDT. These are the "formal" locations at which materials will be available. In addition, when the Public Draft and Final Draft of the Polson Area Transportation Plan and US 93 Polson Corridor Study are made available in the Spring of 2011, hard copies will also be located at the Polson City Library.

Document Availability Locations:

- CSKT Land Use Planning Department, 42487 Complex Boulevard, Pablo, MT
- Lake County Planning Department, 106 4th Avenue East, Polson, MT
- Polson City Hall, 106 1st Street East, Polson, MT
- MDT District 1 Office, 2100 W Broadway, Missoula, MT
- MDT District Office, 85 5th Avenue East North, Kalispell, MT
- MDT Statewide and Urban Planning Section Office, 2960 Prospect Avenue, Helena, MT
- Polson City Library, 2 1st Avenue East, Polson, MT (Public Draft and Final Draft Reports Only)

Electronic copies of study deliverables will be posted on the study websites at the addresses shown below within 7 days of receiving approval to do so by the study partners.

http://www.mdt.mt.gov/pubinvolve/polsoncorridorstudy/

http://www.mdt.mt.gov/pubinvolve/polsontransplan/

The following Americans with Disabilities Act (ADA)-required statement will be included on all published materials:

The CSKT, Lake County, City of Polson, MDT, and CDM attempt to provide accommodations for any known disability that may interfere with a person participating in any service, program, or activity associated with this project. Alternative accessible formats of this information will be provided upon request. For further information, call (406) 441-1400 or TTY (800) 335-7592, or by calling Montana Relay at 711. Accommodation requests must be made at least 48 hours prior to the scheduled activity and/or meeting.

2.6 Meetings

2.6.1 Technical Oversight Committee Meetings

Technical Oversight Committee (TOC) meetings will be scheduled every month for the duration of the twelve-month corridor study and transportation plan period. Individuals included in the meetings will be the Consultant, CSKT, Lake County, City of Polson, FHWA, MDT personnel, and others as needed. The meetings are intended to track progress and address study development issues and questions. The meetings are considered an important aspect for the exchange of information and ideas during the development of these studies. Throughout these meetings, issues, problems, and possible solutions will be identified and discussed.

There will be two study status meetings and one public hearing each with the CSKT Tribal Council, Lake County Commission, and the Polson City Council, as necessary, to ensure that goals, objectives, and decisions are acceptable to elected officials.

2.6.2 Resource Agency Meeting/Involvement

After the first formal public meeting has been held on the study, a meeting will be scheduled and held with the Resource Agencies. The meeting will be organized by MDT and facilitated by CDM with assistance from the study partners as necessary.

2.6.3 Public Meetings

Three formal public opportunities will be held throughout the duration of the Corridor Study and Transportation Plan. The <u>first public meeting</u> will be a combined transportation plan/corridor study meeting to discuss and identify the issues and visioning that will help define community perceptions and goals, as well as identifying issues that should be addressed as part of the transportation planning effort. This initial effort would consist of a 2- or 3-hour workshop that would be very interactive. The purpose would be for CDM to define the transportation plan and corridor study processes, and then engage the community appropriately.

The <u>second public meeting</u> will also be a combined transportation plan/corridor study meeting that will occur after initial field studies have been completed and the transportation-related problems are defined. The purpose of this gathering with regard to the Transportation Plan will be to review the identified problems with the public to assure that all of the major transportation problems have been included in the analysis. Potential Recommended Improvement Options relative to the Corridor Study will also be presented. An informal open house would be held where attendees could visit with study personnel at several displays, followed by a formal presentation by the Consultant with questions and answers.

The <u>third set of public meetings</u> will be different in that the Corridor Study and Transportation Plan will each have their own meeting. <u>The third public meeting for the Corridor Study</u> (expected to occur first) will be held in order to present the Draft Corridor Study Report and its findings. <u>The third public meeting for the Transportation Plan</u> will be held to present the preliminary recommendations and findings. Individual work stations will be set up for participants to move about to their areas of interest

and review and comment on the preliminary findings. It is hoped that participants can become fully engaged through this mechanism and alleviate many of the "confrontational" situations that can occur in large, traditional public forums. The purpose of this venue will be to present the types of recommended improvements and receive initial feedback from the community.

2.6.4 Public Hearings

Three public hearings will be held after the draft Polson Area Transportation Plan and US 93 Polson Corridor Study documents have been published. These public hearings will be held separately with the CSKT Tribal Council, the Lake County Commission, and the Polson City Council. These hearings will be designed to obtain official comments from the public prior to final approval of the document(s) and production of the final report(s).

The comments made during the hearings will be transcribed by CDM staff and entered as part of the public record of the planning process. The comments will be reviewed and responses will be provided in the final documents as an appendix.

2.6.5 Other Meetings

Up to ten other meetings may be conducted over the 12-month schedule. While the Consultant is in the Polson community, meetings with neighborhood groups, special interest groups, additional Council meetings, interested landowners, and others may be needed or requested. Coordination and approval by the study partners will be obtained prior to the meetings.

Summary of Proposed Meetings:

CSKT Tribal Council	Two Study Status Meetings & One Public Hearing
Lake County Commission	Two Study Status Meetings & One Public Hearing
Polson City Council	Two Study Status Meetings & One Public Hearing
1 st Public Meeting	One Open House with Formal Presentation (Visioning & Issues)
Resource Agency Meeting	Corridor Workshop (US 93 Polson Corridor Study only)
2 nd Public Meeting	One Open House with Formal Presentation
3 rd Public Meeting	Presentation of Corridor Study Report (US 93 Polson Corridor Study only)
3 rd Public Meeting	Preliminary Recommendations (Polson Area Transportation Plan only)

Other Meetings, up to ten total (as needed or requested)

2.6.6 Public Outreach Events

Community events will provide valuable public outreach opportunities. Presence at the Farmers' Market

is anticipated as a possible opportunity to interact with and engage the public on the planning study processes.

 Farmers' Market; Fridays 9 AM – 1 PM, May to October; Contact – J.E. Donald Blais; (406) 883-3595.

2.6 Consideration for Traditionally Underserved Populations

The TOC and Consultant recognize that additional efforts must be made to involve traditionally underserved segments of the population in the public process for the study and plan, including the disabled, racial and ethnic minorities, and low-income residents. Including these groups leads to planning that reflects the needs of everyone. The following steps will help with these efforts:

Plan Meeting Locations Carefully

Public meetings will be held in locations that are accessible and compliant with the Americans
with Disabilities Act (ADA). If a targeted population is located in a certain geographic part of the
City or County, then the meeting location should be in that area for convenience.

Seek Help from Community Leaders and Organizations

 To facilitate involvement of traditionally underserved populations, community leaders and organizations that represent these groups will be consulted about how to most effectively reach their members.

Be Sensitive to Diverse Audiences

At public meetings, study partner staff and the Consultant will attempt to communicate as
effectively as possible. Technical jargon will be avoided and appropriate dress and conduct will
be adhered to.

2.7 Study and Plan Schedule

Adherence to the study and plan schedule is important to stay on track and keep all participating parties engaged. The study schedules for the Polson Area Transportation Plan and US 93 Polson Corridor Study are attached as Figures 2-1 and 2-2, respectively. It is CDM's intent to adhere to these schedules.

3.0 Overall Study and Plan Communication

3.1 Summary

The Polson Area Transportation Plan and US 93Polson Corridor Study Public Participation Plan establish guidelines and procedures for encouraging public participation. The following communication strategies and techniques may be used in their entirety (or partially) to distribute the information to the community at large and seek a higher level of engagement. The TOC and the Consultant will utilize as many of these techniques as possible that best suit the planning study processes.

- All relevant deliverables and associated materials will be posted on the study and plan websites at the following addresses:
 - o http://www.mdt.mt.gov/pubinvolve/polsoncorridorstudy/
 - o http://www.mdt.mt.gov/pubinvolve/polsontransplan/
- Public service announcements and interviews on radio and television may be conducted to explain the subject matter and promote participation.
- Articles and press releases for the newspaper or other widely circulated publications will be developed.
- Informal presentations will be made at regional sites, open houses, round tables, or other community forums to receive input from the affected community.
- Formal presentations will be made to various service clubs and civic and professional groups.
- Select mailings, as requested by interested parties, will be provided to individuals or groups that have expressed interest or made comments at meetings.
- Technical memorandums (working drafts) will be provided to the CSKT, Lake County, City of Polson, and the MDT for posting to their respective internet sites, and also distributed to the TOC, to provide a better understanding of proposed transportation issues and recommendations and, in return, to provide the four study partner with feedback and an opportunity for continual comment. Hard copies of all materials will be made available at the following locations:
 - CSKT Land Use Planning Department, 42487 Complex Boulevard, Pablo, MT
 - o Polson City Hall, 106 1st Street East, Polson, MT
 - o Lake County Planning Department, 106 4th Avenue East, Polson, MT
 - o MDT District 1 Office, 2100 W Broadway, Missoula, MT

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- o MDT District 1 Office, 85 5th Avenue East North, Kalispell, MT
- MDT Statewide and Urban Planning Section Office, 2960 Prospect Avenue,
 Helena, MT
- Special presentations will be made, upon request, to community groups and organizations.
- Fact sheets may be used to explain transportation related issues.
- Special issues "technical memorandums" will be announced or reported at meetings and/or via email on relevant transportation issues.

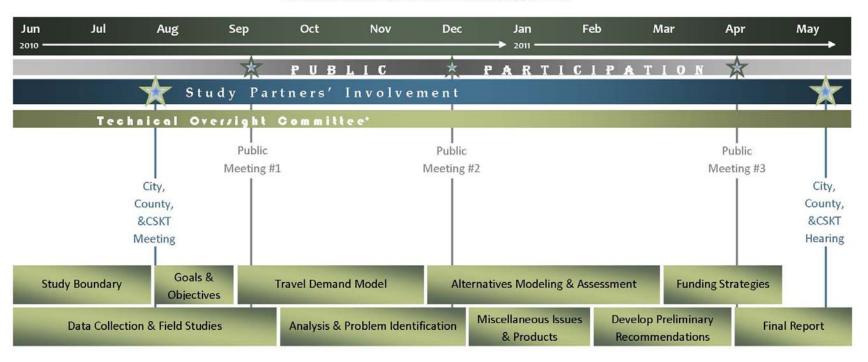
Responses to questions and comments from the public concerning the public participation plan, working draft technical memorandums, the draft and public draft Polson Area Transportation Plan / US 93 Polson Corridor Study documents, and other work products will be made via written response in an Appendix to the actual documents. In some circumstances, the TOC and/or the Consultant will respond directly to an individual or group by letter or telephone call, or by way of a periodic newsletter.

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Figure 2-1 (Polson Area Transportation Plan Schedule)

Polson Area Transportation Plan Schedule

Note: Task durations and public involvement dates are approximated.

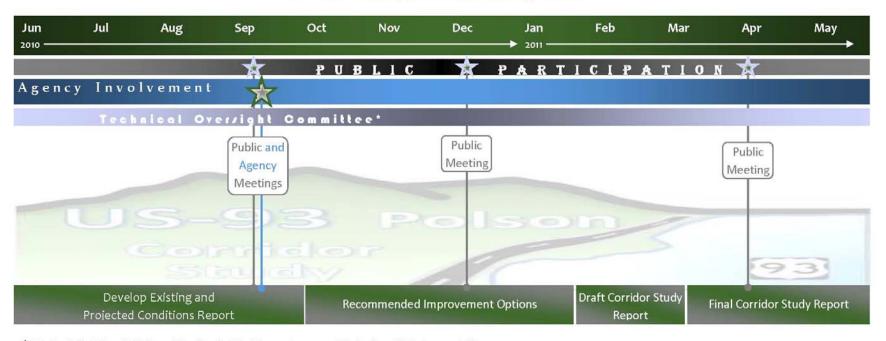


^{*} The Technical Oversight Committee is scheduled to meet on a monthly basis until Transportation Plan completion.

Figure 2-2 (US 93 Polson Corridor Study Schedule)

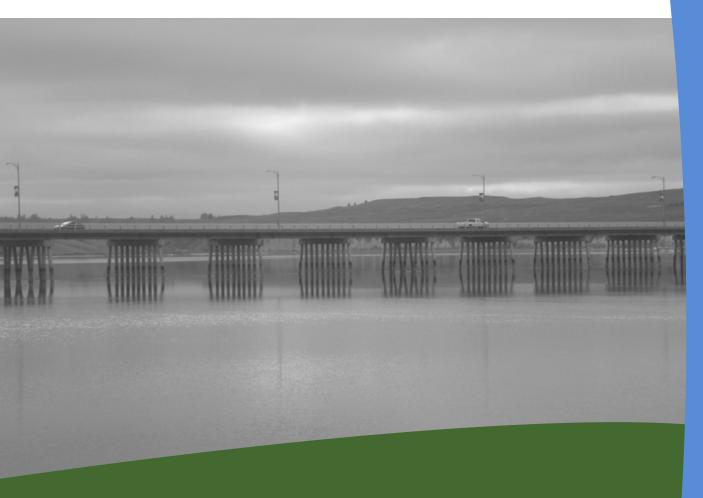
US 93 Polson Corridor Study Schedule

Note: Task durations and public involvement dates are approximated.



^{*} The Technical Overright Committee is scheduled to meet on a monthly basis until study completion.

US 93 Polson Corridor Study



CORRIDOR SETTING DOCUMENT

Prepared For:

Montana Department of Transportation Confederated Salish & Kootenai Tribes

Lake County

City of Polson

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana

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1.0 Overview of Corridor Setting Document

The US 93 Polson Corridor Study near Polson, Montana in Lake County begins around Reference Post (RP) 56.5 and extends approximately 6.5 miles north to around RP 63.0. The US 93 Polson Corridor Study area boundary has been developed to identify corridor concerns and assess the feasibility of an alternate route to US 93 through the Polson community. The option of an alternate route to US 93 was brought forward in the 1996 US 93-Evaro to Polson Environmental Impact Statement (EIS).

The Corridor Study will look at improvement options, in terms of both short-range and long-range improvements, that will address the needs of the corridor, while also considering cost, feasibility and environmental impacts within the corridor. A figure showing the corridor study area is included herein as Figure 1-1.

This corridor setting document describes the existing corridor in preparation for future detailed analysis of technical conditions and environmental resources. This document is intended to be the "blueprint" for further investigation that will be made via the Existing and Projected Conditions Report. The Existing and Projected Conditions Report will provide for greater detail for all the items listed in this Corridor Setting Document.

2.0 Description of Corridor

The description of the corridor as contained in this section focuses on the existing roadway aspects of the corridor study area.

2.1 Roadway Aspects

Functional Classification

US 93 is part of the National Highway System (NHS). US 93 is classified as (NHS) Rural Principal Arterial – Non-Interstate System. Arterials provide the highest level of mobility, at the highest speed, for long interrupted travel. The rural arterial network provides interstate and inter-county service. US 93 is a major north/south highway providing a vital regional link between Idaho and Canada. It also provides an important link between Missoula, Kalispell, and surrounding communities.

Right-of-Way and Jurisdictions

US 93 is located primarily along private property, with the State of Montana maintaining the right-of-way along each side of the existing highway. Montana Rail Link has land ownership of three small parcels interspersed within the corridor study area. The Confederated Salish and Kootenai Tribes (CSKT) has jurisdiction as authority of the

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Flathead River. The Federal Aviation Administration (FAA) has jurisdiction of the Polson Airport.

Geometrics

The existing physical and geometric design criteria for US 93 will be evaluated for the study area boundary to identify areas that do not meet current MDT design standards. The Existing and Projected Conditions Report will investigate as-built drawings and identify specifications on lane width, passing percentage, and guardrail sites and identify whether the current conditions meet current MDT design standards. Whether or not bridge structures meet the specific design criteria for spanning a major river will be further identified in the Existing and Projected Conditions Report.

Traffic Data

The following table shows traffic data for US 93 through the study area corridor. As shown in the following table, the average annual daily traffic was at its highest in 2004 and has decreased from 2007 to 2009.

	Average Annual Daily Traffic										
Location	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
US 93, RP 58.5 (.5 mi S of MT 35)	9,080	9,510	9,280	9,910	10,210	10,780	10,780	10,760	10,230	9,740	9,600
US 93, RP 59.5 (.5 mi N of MT 35)	11,430	9,860	12,610	12,410	13,590	14,690	14,690	14,660	13,440	12,590	11,760
US 93, E of 8th St E in Polson	12,670	14,400	11,850	11,870	12,920	13,760	13,760	13,730	13,030	10,940	11,290
US 93, between 5 th East & 2 nd East in Polson	10,580	13,950	11,150	11,500	12,240	12,900	12,190	12,170	12,550	10,440	10,600
US 93 (2 nd Avenue), between Main & 1 st St East in Polson	10,150	10,970	10,570	10,890	11,570	12,190	8,010	7,990	11,120	8,790	8,140
US 93, either end of Flathead River Bridge in Polson	6,380	7,730	6,890	7,980	7,830	8,010	12,900	12,870	8,910	6,810	6,850
Weighted Average	9,862	11,638	10,397	10,809	11,424	12,058	12,610	12,586	11,766	9,943	9,884

Source: MDT Traffic Data and Collection Analysis

Safety

Comprehensive crash and safety data will be obtained from MDT State Highway Traffic Office and examined to evaluate Polson crash data compared to other incorporated cities in Montana. The data will determine safety issues, concerns, and locations within the study area boundary.

Roadway Considerations

The existing physical and geometric design criteria for US 93 will be evaluated within the study area boundary to identify areas that do not meet the current MDT design standards.

Horizontal Alignment

The horizontal alignment of US 93 will have a major influence on traffic flow and safety.

Vertical Alignment

The vertical alignment is a measure of elevation change of a roadway. The length and steepness of grades directly affects the operational characteristics of the roadway. The MDT Road Design Manual lists recommendations for maximum grades on principal arterials according to the type of terrain in the area.

Roadside Safety (Clear Zone)

Clear zone considerations will be evaluated.

Pavement Width

The existing pavement width and typical section will be evaluated.

Geotechnical

A geotechnical investigation report will not be developed for this corridor study. Existing as-built drawings indicate the study area has no substantial geotechnical issues.

Drainage

There are several irrigation ditches and canals located throughout the study area. There do not appear to be any hydraulics issues within the corridor study area.

Bridge Structures

Throughout the corridor there are four bridges. These are located as follows:

AUGUST 10, 2010

RP 57.1, Structure No. P00005057+00641 (Pablo Feeder Canal)

RP 57.8, Structure No. P00005057+07611 (Wildlife Underpass)

RP 57.8, Structure No. P00005057+07612 (Wildlife Underpass)

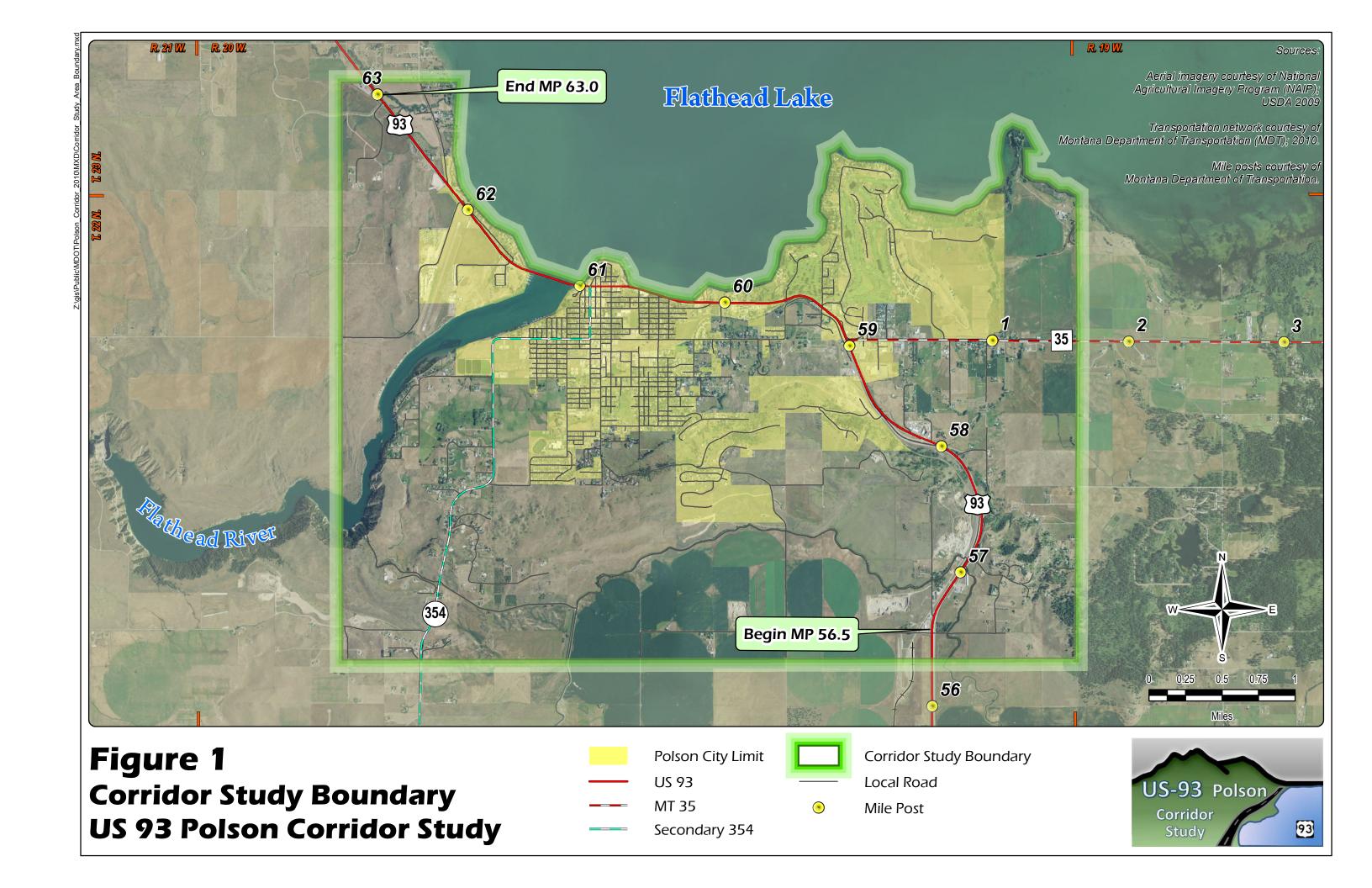
RP 61.2, Structure No. P00005061+01811 (Flathead River Bridge)

Railroad

The presence of Montana Rail Link within the corridor is a key factor in developing improvement options. Guidelines have been established in accordance with construction and development near railroad facilities. These will be evaluated as improvement options are evaluated.

Utilities

Utilities existing throughout the corridor will be addressed in developing improvement options.



2.2 Environmental Setting

The study area environmental setting is an important aspect of this pre-NEPA/MEPA Corridor Study. The following items represent a preliminary list of potential environmental resources that will be further evaluated in the Existing and Projected Conditions Report.

Land Use and Ownership

The corridor study area boundary has a predominant land use of rangeland, agriculture, and urban land. Land ownership within the study area is predominately private with scattered tracts of tribal, state, and federal land.

Development

Future development is important to the corridor and improvement options that may be proposed. The zoning districts for the Polson City/County Planning Area were just updated in 2009. Zoning for lands located outside the Polson City Limits vary from rural residential to productive lands to highway commercial. Within the unincorporated areas of the Study Area Boundary, there are likely to be planned and or undeveloped, platted subdivisions to consider.

Surface Waters

Polson is situated along the southern shore of Flathead Lake, the largest natural, freshwater lake in the western United States. Along the west side of the Mission Valley, the Flathead River flows from the south end of Flathead Lake to the confluence with the Clark Fork River. Approximately two miles south of Polson is the Pablo Reservoir/Pablo National Wildlife Refuge, a lake with wetlands providing habitat for birds and other wildlife. In addition, several irrigation canals are present within, and south of Polson.

Recreation

An abundance of recreational activities exist within the study area, predominantly due to the presence of the Flathead Lake.

Tribal Concerns

There are tribal concerns and resource issues (cultural, historical, economic and environmental) known within the study area. Archeological sites might be present along the Flathead River and elsewhere within the Study Area Boundary.

Page 6

General Vegetation

The study area is largely comprised of a short grassland prairie ecosystem with inclusions of willow, cottonwood, ponderosa pine, and mountain mahogany. The grasslands support livestock grazing, and have been tilled for small grain and hay production.

Wildlife

The Pablo Reservoir / Pablo National Wildlife Refuge is located approximately two miles south of Polson. A lake and wetlands within this wildlife refuge provide habitat for birds and other wildlife. If an improvement option is forwarded during the project development process, a complete biological survey of the study area will be conducted in accordance with accepted.

Sensitive Species

Species of Special Concern

A search of the Montana Natural Heritage Program species of special concern database revealed two mammal species (gray wolf and Townsend's big eared bat), five bird species (common loon, bald eagle, long-billed curlew, grasshopper sparrow, and bobolink), one fish species (bull trout), and three plant species (sweet flag, lake bank sedge, and scribner's panic grass) within or overlapping the study area.

<u>Threatened and Endangered Species</u>

The federal list of endangered and threatened species is maintained by the USFWS. According to the USFWS, Lake County has been documented to possess two threatened animal species (Grizzly Bear and Canada Lynx) and two threatened plant species (spalding's campion and water howellia).

Aquatic Resources

Fish species abundantly/commonly occurring in the Flathead River and within the study area are the largescale sucker, northern pike, northern pike minnow, peamouth, redside shiner, and westslope cutthroat trout. Species occurring rarely within this river stretch are the brown trout, largemouth bass, rainbow trout, slimy sculpin, and yellow perch (MFISH, 2010).

Wetlands

The study area crosses the Flathead River, sits adjacent to Flathead Lake, and contains several other drainages and irrigation ditches. Scattered locations of freshwater emergent wetlands exist throughout the study area.

Air Quality

The Study area is located within a designated non-attainment area for particulate matter with an aerodynamic diameter of 10 microns or less (PM10). Any improvement options forwarded from corridor study into project development will need to be evaluated to determine if the project is regionally significant according to the Federal Highway Administration letter of July 17, 2008.

Historic Properties

Historic properties are properties included in the National Register of Historic Places (NRHP). There are seven registered historic places in Lake County; at least one of those is located within the study area. The Montana State Historic Preservation Office (SHPO) revealed 62 previously recorded historic properties within the Study area. Most of these historic properties are residences located within the City of Polson.

Noise

If an improvement option is forwarded into project development, a noise study would be required to determine where noise-sensitive land uses are located, what existing noise levels those areas are experiencing, and to estimate what future noise levels will be as a result of the project. If the project was expected to change traffic volumes on other routes, then off-project routes should also be studied for noise impacts. In areas of residential development, noise impacts (existing or predicted) may need to be mitigated.

Farmlands

Prime farmland, as well as farmland of statewide and local importance, exists within the Study area. Due to the large capacity of prime farmland within the corridor, there is potential for farmlands to be impacted as improvement options further develop.

Irrigation

The study area contains a portion of the Flathead Irrigation District. There is an estimated 1,300 miles of canals and lateral ditches in the entire distribution system.

Section 4(f) and 6(f)

There are twenty-two potential Section 4(f) sites. It should be noted there may be additional Section 4(f) sites located within the study area after a cultural resource

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survey has been completed. According to Montana Department of Fish, Wildlife, and Parks Land and Water Conservation Fund list, there are eight Section 6(f) properties within the study area.

Floodplain

Based on a review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for Lake County, a delineated 100-year floodplain (Zone A) is located along the Flathead River and Flathead Lake throughout the study area.

Hazardous Waste

The NRIS database has layers for tank sites and leaking tank sites which probably would be the most likely issue to come up regarding contamination within the study area.

Geology and Soils

According to NRIS, the soil conditions within the study area boundary are consistent with the primary land use of grassland, crop, and pasture lands.

Noxious Weeds

The following noxious weeds have been identified as present in Lake County: Leafy Spurge, Spotted Knapweed, Russian Knapweed, Dalmatian Toadflax, and Sulphur Cinqueful. Spotted Knapweed is known to be present within the Study area. The Study area will need to be surveyed for noxious weeds during the project development process.

3.0 Conclusion

Preliminary review of the existing conditions and corridor settings lead to a number of factors and issues that will be further identified and addressed in the Existing and Projected Conditions Report. The highway geometrics will be analyzed and confirmed whether current MDT design standards are met or if standards need to be updated with future improvement options. Safety issues and concerns will be addressed in future improvement options in order to increase traffic safety. Environmental concerns and issues will be explained in greater detail in the Existing and Projected Conditions Report in order to minimize environmental impacts with projected improvement options.

4.0 References

Code of Federal Regulations (CFR). 23 CFR Section 450.

Montana Department of Transportation. <u>Draft Environmental Scan Polson Corridor Planning</u> *Study*. Montana, 2010.

Montana Department of Transportation. 2000 Montana State Rail Plan Update. Montana, 2000.

Montana Fisheries Information System. 2010 http://fwp.mt.gov/fishing/mFish/

National Register of Historic Places. 2010 http://www.nationalregisterofhistoricplaces.com/

US 93 Polson Corridor Study



Existing Conditions of US 93

Prepared For:

Montana Department of Transportation Confederated Salish & Kootenai Tribes Lake County City of Polson

Prepared By:

Camp Dresser & McKee Inc.



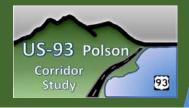


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Chapter 2 Existing and Projected Conditions

This chapter documents the existing technical and environmental features along the existing US 93 corridor. The Technical Oversight Committee established the existing 6.5 mile study corridor along US 93. In addition to the existing US 93 corridor, the Committee determined the corridor study area which encompasses a full representation of the environment and physical surroundings of the study area. Even though several routes and alignments exist outside the existing US 93 corridor, there is a lack of detail and as-built drawings available for such alignments. The focus of this chapter consists of the existing technical features along the US 93 corridor.

2.1 Existing Roadway Users and Traffic Volumes

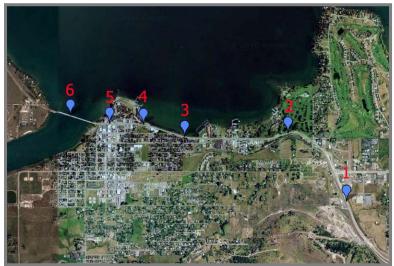
Montana Highway 35 (MT 35) intersects US 93 near RP 59.0 at South Shore Road and is primarily used by local traffic, commercial trucks, and recreational vehicles. Secondary Route 354 (S 354) intersects US 93 east of the Flathead River Bridge and is primarily used by local traffic, commuters, and commercial trucks. During the non-winter months, an increase in roadway users and traffic volumes is primarily due to recreation and tourism in the area.

The "weighted" Average Annual Daily Traffic (AADT) for US 93 through the study area for 2009 was 9,884, which has decreased since a peak of 12,610 in 2005. In 2009, the percentage of truck traffic through the corridor reached 10.9%. Table 2.1 shows the most recent 10-year traffic volumes for the corridor study area.

Tabl	Table 2.1 Average Annual Daily Traffic												
No.	Length (miles)	Location	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	0.332	US 93, RP 58.5 (.5 mile S of MT 35)	9,080	9,510	9,280	9,910	10,210	10,780	10,780	10,760	10,230	9,740	9,600
2	0.953	US 93, RP 59.5 (.5 mile N of MT 35)	11,430	9,860	12,610	12,410	13,590	14,690	14,690	14,660	13,440	12,590	11,760
3	0.400	US 93, East of 8 th Street East in Polson	12,670	14,400	11,850	11,870	12,920	13,760	13,760	13,730	13,030	10,940	11,290
4	2.766	US 93, between 5 th East and 2 nd East in Polson	10,580	13,950	11,150	11,500	12,240	12,900	12,190	12,170	12,550	10,440	10,600
5	0.226	US 93 (2 nd Avenue), between Main & 1 st Street East in Polson	10,150	10,970	10,570	10,890	11,570	12,190	8,010	7,990	11,120	8,790	8,140
6	1.266	US 93, either end of Flathead River Bridge in Polson	6,380	7,730	6,890	7,980	7,830	8,010	12,900	12,870	8,910	6,810	6,850
		Weighted Average	9,862	11,638	10,397	10,809	11,424	12,058	12,610	12,586	11,766	9,943	9,884

Source: MDT Traffic and Data Collection Analysis

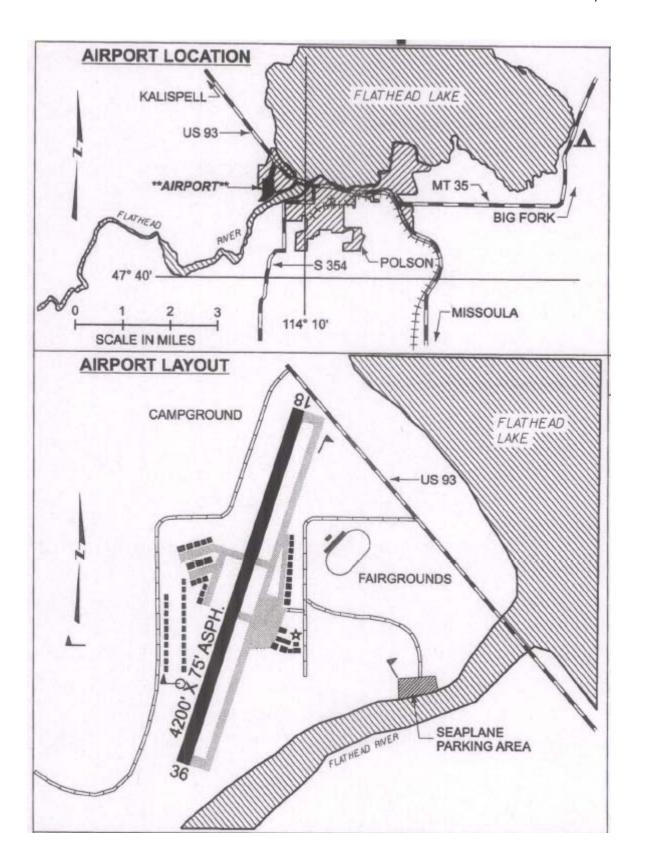
The following graphic shows the locations of the MDT Traffic Count stations shown in the table above.



MDT Statewide Traffic Count Site Location Map

2.2 Right-of-Way and Jurisdictions

The existing US 93 corridor is located primarily along private property. The State of Montana maintains the right-of-way on each side of the highway. Three small sections of MDT land are within the study area boundary, and the level of impact is undetermined at this point. Montana Rail Link (MRL) infrastructure and right-of-way is located within the corridor study area. Montana Rail Link also has land ownership interspersed throughout the study area, primarily along 7th Avenue. If any improvement options are identified along 7th Avenue this will need to be addressed. The Flathead River flows along the west side of the study area and passes under US 93 at MP 61. CSKT has jurisdiction as authority of the Flathead River. The Polson Airport is located inside the study area boundary and west of the Flathead River and includes a seaplane landing area. The Federal Aviation Administration (FAA) has jurisdiction of the Polson Airport. The graphic below shows the location and layout of the Polson Airport. If improvement options are considered near the Polson Airport, appropriate coordination will be determined.



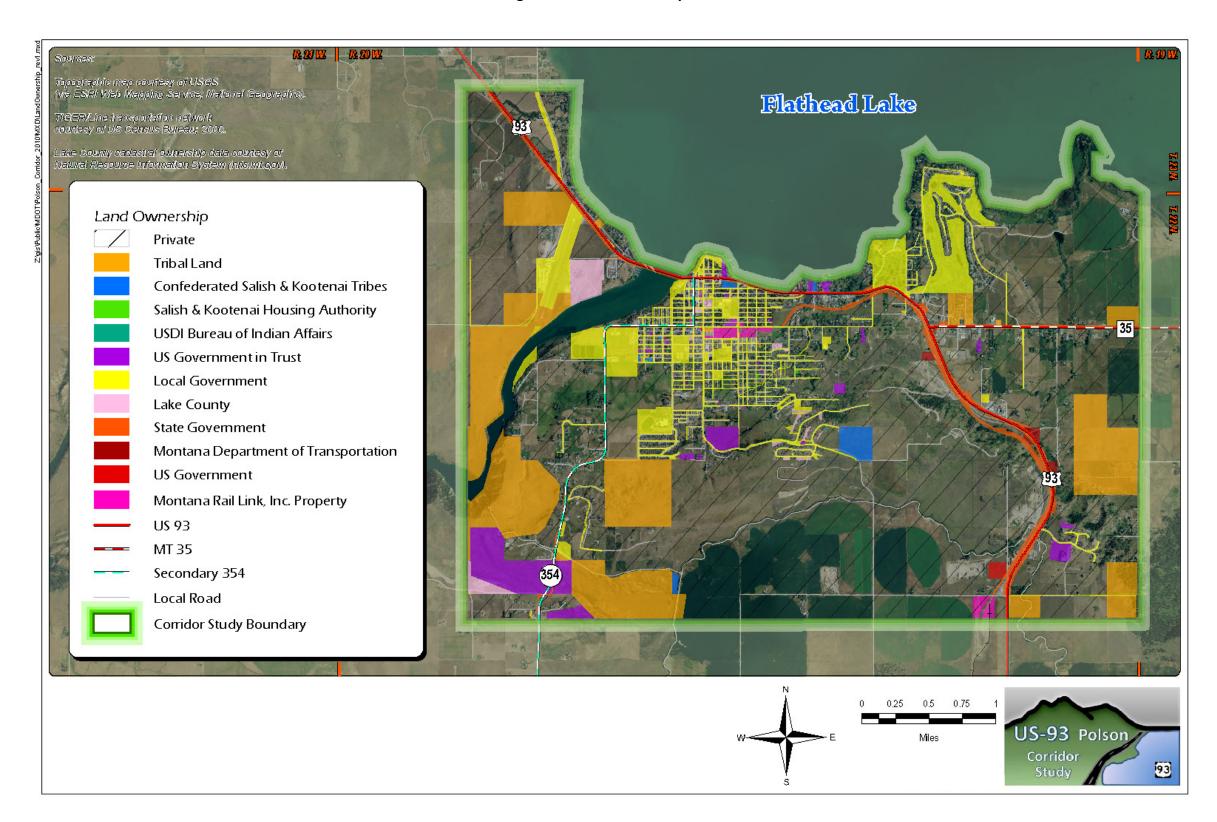
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Resource agency coordination with the US Army Corps of Engineers (USACE), US Environmental Protection Agency (EPA), Montana Fish, Wildlife, and Parks (FWP), Montana Department of Environmental Quality (DEQ), Tribal Preservation Office, CSKT, Lake County, City of Polson, MDT, and FHWA was conducted on September 30, 2010. The proactive coordination with the resource agencies is essential to ensure agency guidelines and requirements are considered as improvement options develop. Regulatory areas that will be considered and further addressed include wildlife habitat, permitting, wetlands, and mapping considerations. Figure 2-1 shows the land ownership within the study area.

US 93 Polson Corridor Planning Study

Existing Conditions of US 93

Figure 2-1 Land Ownership



2.3 Physical Characteristics

US 93 is a major north/south highway providing a vital regional link between Idaho and Canada, and is functionally classified as a Rural Principal Arterial on the NHS Non-Interstate System. This corridor also provides an important link between Missoula, Kalispell, and surrounding communities. At the south end of the corridor (RP 58.5), US 93 functions as a four-lane divided highway which transitions to a four-lane undivided highway with interspersed turning lanes. Just north of the junction of US 93 and MT 35, the four-lane segment of US 93 transitions to a two-lane roadway with interspersed turning lanes. The posted speed limit along the US 93 corridor varies from 25 mph to 70 mph. The graphic below shows the posted speed limits through the US 93 corridor.



Posted speed limits

The US 93 facility enters the corridor study area at the southeastern section at RP 56.5 and traverses northward on primarily level terrain comprised of farm and agricultural lands. Continuing northward, US 93 curves slightly eastward crossing the Pablo Feeder Canal and around a bluff before continuing to the northwest to the southern bank of the Flathead Lake, where it continues westward through the City of Polson. Once across the Flathead River, the facility curves to the northwest exiting the corridor study area boundary at RP 63.0.

Work was recently completed on US 93 from Minesinger Trail to MT 35. The following reconstruction activities were completed:

- Construction of a 4-lane roadway
- Construction of an overlook of Flathead Lake form the top of Polson Hill
- One wildlife crossing structure
- Two bike and pedestrian paths
 - o US 93/MT 35 junction east to Turtle Lake Road
 - o Top of Polson Hill to ½ mile north of Caffrey Road
- Installations of sidewalks along Haack Road and Anchor Way Frontage Road
- Installation of traffic signal at the junction of US 93 and MT 35
- Two southbound, left-turn lanes and one northbound, right-turn lane
- Turn bays at Walmart intersection, Frontage Road, and Ford/Caffrey Road intersection

2.4 Design Standards

Table 2.2 lists the design standards for rural and urban principal arterials according to MDT design criteria. The design speed for this corridor ranges from 45 mph to 70 mph. Although the segment of US 93 through the city of Polson is not classified as an urban principal arterial, MDT design standards will apply if improvement options are further developed from the study.

Table	2.2 Design Stan	dards for U	S 93				
	Design Element			Design Criteria			
sl	Functional Classificiation	ı	Rural Principal Arterial		Urbar	n Principal Arterial	
ntro					2-Lane, Curbed	2-Lane, Uncurbed	
0) ر	Design Forecast year		20	30		2030	
Design Controls	*Design Speed	Level Rolling	70 r 60 r		40 - 45 mph	40 - 50 mph	
	Level of Service	g		3	Desirable:	B Minimum: C	
	*Travel Lane Width		1.	2'		12'	
Roadway Elements	*Shoulder Width	Outside Inside	Vai	ries		Varies N/A	
y Ele	0 01	*Travel Lane	29	%	2% Typical	2%	
Jw a	Cross Slope	Shoulder	29	%	2% Typical	2%	
Road	Median Width		Varies		N/A		
	TWLTL Width		N/A		16'		
		Inslope	6:1 (Width: 10')		N/A	Desirable: 6:1 Minimum: 4:1	
ns	Ditch	Width	10' Minimum		N/A	10' Minimum	
Earth Cut Sections		Slope	20:1 towards back slope		N/A	20:1 towards back slope	
t Se		0' - 5'	5:1		5:1		
Cu	Back Slope; Cut Depth	5' - 10'	4:1		Level/Rolling: 4:1 Mountainous: 3:1		
arth	at Slope Stake	10' - 15'	3:		Level/Rolling: 3:1 Mountainous: 2:1		
Ш	'	15' - 20'	2:	:1	Level/Rolling: 2:1 Mountainous: 1.5:1		
		> 20'	1.5	5:1	1.5:1		
lop		0' - 10'	6:	:1	6:1	6:1	
S III S	Fill Height at Slope	10' - 20'	4:	:1	4:1	4:1	
Earth Fill Slope	Stake	20' - 30'	3:	:1	3:1	3:1	
Ear		> 30'	2:	:1	2:1	2:1	
	DESIGN SPEED		60 mph	70 mph	40 mph	45 mph	
	*Stopping Sight Distance	e	570'	730'	305'	360'	
nts	Passing Sight Distance		2135'	2480'	N/A	N/A	
mel	*Minimum Radius		1200'	1810'	533'	711'	
Alignment Elements	*Superelevation Rate		e _{max} =	8.0%		$e_{max} = 4.0\%$	
ıent	*Vertical Curvature (K	Crest	151	247	44	61	
gnr	value)	Sag	136	181	64	79	
Ali	*Maximum Grade	Level	3°	%	6%	6%	
	Waxiiiidiii Olade	Rolling	4	%	7%	7%	
	Minimum Vertical Clears		17		17.0'		

Source: Montana Department of Transportation Road Design Manual Chapter 12, Figure 12-3 "Geometric

Design Criteria for Rural and Urban Principal Arterials"

^{*}Controlling design criteria (see Section 8.8 of the MDT Road Design Manual)

2.5 Roadway Geometrics

The MDT Road Design Manual specifies general design principles and controls which determine the overall operational characteristics of the roadway and enhance the aesthetic appearance of the highway. The physical and geometric design elements of the US 93 facility were evaluated to identify areas that do not meet current MDT design standards as shown in Table 2.2. The analysis was necessary to identify areas with substandard geometric design that may contribute to safety concerns.

Available information including as-built construction drawings and the 2009 Montana Road Log were utilized to conduct this analysis. Table 2.3 summarizes the findings of the roadway geometrics of US 93 through the study area and is further discussed in the sections below.

Table 2.3 Summary of US 93 Roadway Geometrics					
Design Characteristic	Summary				
Horizontal Alignment Meets current design standards for design speeds of 45 mph and 60 mph					
Vertical Alignment	Grades of 5.5% to 5.9% exceed 4% maximum				
vertical Alignment	Sag k-values of 128.81 and 130.15 are less 136 minimum				
Roadside Clear Zone	Improvement options should be designed to current design standards				
Surface Width	Surface widths of 28' and 38' are less than 40' recommended width*				

^{*} A formal capacity analysis may indicate a four-lane or wider facility is needed to provide LOS B in the design year, indicating a potential surface width of 68' or more.

2.5.1 Horizontal Alignment

The horizontal alignment of US 93 has a major influence on traffic operation and safety and is comprised of elements that include curvature, superelevation, and sight distance. These parameters are directly related to the design speed. The horizontal alignment along US 93 meets current MDT design standards for design speeds ranging from 45 mph to 70 mph. The graphic below shows the range of design speeds through the existing US 93 corridor.



Design speeds

2.5.2 Vertical Alignment

The vertical alignment is a measure of elevation change of a roadway. The length and steepness of grades directly affects the operational characteristics of the roadway. The MDT Road Design Manual lists recommendations for maximum grades on rural and urban principal arterials according to the type of terrain in the area. Table 2.4 shows the maximum grade recommendations according to terrain.

Table 2.4 Maximum Grade						
Terrain	Maximum					
Level - Rural	3%					
Rolling - Rural	4%					
Level - Urban	6%					
Rolling - Urban	7%					

The grade and terrain throughout the corridor study area varies from level to rolling and from rural to urban. The vertical alignment of US 93 does not meet current design standards at five locations. These include:

- 1. From RP 57.2 to 57.8, the northbound grade goes from 5.9% to 5.7%, respectively. The nearly 6% grade exceeds the maximum allowable grade of 4% for a 60 mph rural design speed in rolling terrain. A design exception was approved for this grade in April 2004.
- 2. From RP 57.2 to 57.7, the southbound grade is 5.5% which exceeds the maximum grade of 4% recommended for a 60 mph rural design speed in rolling terrain. A design exception was approved for this grade in April 2004.
- 3. At RP 57.7, the vertical sag curve k-value of 130.15 does not meet the minimum k-value of 136. A design exception was approved for this grade in April 2004.
- 4. At RP 62.5, the grade of 4.8% exceeds the maximum grade of 4% recommended for a 60 mph rural design speed in rolling terrain.
- 5. At RP 62.5, the vertical sag curve k-value of 128.81 does not meet the minimum k-value of 136.

2.5.3 Roadside Safety (Clear Zone)

The roadside clear zone, starting at the edge of the traveled way, is the total roadside border area available for safe use by errant vehicles. The area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a recovery area. The desired width varies depending on traffic volumes, speeds, and roadside geometry. Clear zones are evaluated individually and based on the roadside cross section. In an urban section, the clear zone is not reduced due to the presence of curb and gutter. The urban section through Polson has substantial development such as landscaping features, signs,

mailboxes, signals, utilities, and luminaries, and it may be impractical to protect or remove the obstacles within the clear zone. Current MDT standards establish clear zone guidelines in rural and urban sections.

As improvement options develop, roadside clear zones should be designed, to the extent practicable, to meet current MDT urban and rural design standards.

2.6 Surface Width

The 2009 Montana Road Log prepared by MDT contains the most current highway statistics. According to MDT NHS Route Segment Plan Map, the recommended surface width of US 93 is 40 feet or greater. However, the Route Segment Plan no longer defines a standard roadway width. The MDT Road Width Committee would determine the appropriate width during future project development. Table 2.5 below shows the existing roadway surface width and surface thickness through the corridor study area. Due to the presence of turning lanes, which are not included in the Road Log, the total surface width may be greater than the sum of lane widths and shoulder widths.

Table 2.5 Existing Roadway Surface Width							
Location	١	Width (feet)	Thickness (inches)		Travel	
Reference Post (RP)	Surface Lane		Shoulder	Surface	Base	Lanes	
RP 56.500 - 57.362	71	12	8	8.9	12.0	4	
RP 57.362 - 57.865	71	12	8	10.7	12.0	4	
RP 57.865 - 57.917	71	12	8	8.9	12.0	4	
RP 57.917 - 58.361	71	12	8	5.9	6.9	4	
RP 58.361 - 58.504	71	12	8	8.9	12.0	4	
RP 58.504 - 58.912	71	12	8	10.7	12.0	4	
RP 58.912 - 59.174	55	12	3	9.1	16.7	4	
RP 59.174 - 59.511	39	12	7	4.8	24.0	2	
RP 59.511 - 60.114	40	12	8	4.8	24.0	2	
RP 60.114 - 60.724	39	12	7	4.8	24.0	2	
RP 60.724 - 60.839	59	12	8	5.8	24.0	2	
RP 60.839 - 61.113	38	12	7	5.8	24.0	2	
RP 61.113 - 63.000	28	12	2	6.0	26.0	2	

Source: 2009 Montana Road Log (page 42)

The Route Segment Plan does not extend into urban areas, due to certain constraints. Therefore, the section from RP 60.839 to 63.000 does not meet the current recommended surface width of 40 feet or greater. Along with the range of surface widths, the US 93 corridor has varying traffic flows, which can be seen in the posted speed limit graphic on page 6.

2.7 Geotechnical

A detailed geotechnical investigation report will not be developed for this corridor study. The US 93 Minesinger Trail – MT 35 project covers RP 55.5 to approximately 58.7. As-built drawings show the study area has no substantial geotechnical issues.

The Polson-East Geotechnical report noted subgrade materials generally consisting of glacial moraine sand and gravel with intermittent zones of low-plasticity fine-grained material. Frost susceptibility is a major concern during intermittent periods of moisture infiltration and freezing temperatures; particularly in cut areas with concentrated runoff.

Neither the drilling logs for the US 93 Minesinger Trail-MT 35 project nor the drilling logs for the Polson-East project indicate that bedrock was encountered. The study area is located in a moderate seismic risk area. Seismicity will need to be considered for any bridge foundation design. Polson is located within the Intermountain Seismic Belt, which appears to be predominately classified as a zone 3 on the Uniform Building Code seismic risk scale of 0 (low risk) to 4(high risk). Seismic zones reflect the variation in seismic risk across the country and are used to permit different requirements for methods of analysis, minimum support lengths, column design details, and foundation and abutment design procedures.

2.8 Drainage

The corridor study area is located within the Lower Flathead sub basin. Flathead Lake is the major body of water, with the Flathead River providing as a tributary to the Clark Fork River. The drainage has several unnamed streams contribute to the Lower Flathead and Flathead Lake. Storm water drainage is in place for the city of Polson. Several irrigation ditches and canals exist within the corridor, and consideration will be given to drainage as a improvement options develop.

2.9 Hydraulic Structures

Table 2.6 shows the hydraulic structures throughout the corridor. A full hydraulic analysis would be recommended if an improvement option is implemented within the study area. Based on a lack of historical flooding occurrences, it is presumed irrigation ditches, culverts, and bridges are hydraulically adequately sized.

Table 2.6 Hydra	ulic Structu	ures		
Approximate Location Reference Post (RP)	Size	Length	Remarks	As-Built Project
RP 56.68	24"	190'	Drain	
RP 56.88	18"	110'	Approach LT	
RP 56.88	18"	118'	Approach RT	
RP 57.1	22' x 5' Box	140'	Pablo Feeder Canal	
RP 57.28	18"	50'	Approach RT	
RP 57.76 - 57.82	36"	360'	Irrigation Right	
RP 56.48	18"	103'	Storm Drain	
RP 56.56	18"	87'	Storm Drain	_
RP 56.72	18"	105'	Storm Drain	SU
RP 56.78	18"	103'	Storm Drain	93 - Minesinger Trail to MT 35 (2005)
RP 56.90	18"	79'	Storm Drain	
RP 57.51	18"	87'	Storm Drain	line
RP 57.51 - 57.60	18"	487'	Storm Drain	esir
RP 57.60	18"	89'	Storm Drain	ge
RP 57.60 - 57.70	24"	490'	Storm Drain	Ţ
RP 57.68 - 57.70	18"	121'	Storm Drain	<u>a</u>
RP 57.70 - 57.74	24"	235'	Storm Drain	
RP 57.74	12"	7'	Storm Drain	Š
RP 57.74 - 57.74	24"	113'	Storm Drain	
RP 57.74 - 57.74	24"	39'	Storm Drain	35
RP 57.79	12"	7'	Storm Drain	(20
RP 57.79 - 57.83	18"	228'	Storm Drain	05
RP 57.81	18"	295'	Storm Drain	
RP 57.83	12"	7'	Storm Drain	
RP 57.83	18"	115'	Storm Drain	
RP 57.83 - 57.89	18"	292'	Storm Drain	
RP 57.89	12"	7'	Storm Drain	
RP 57.89 - 57.94	18"	292'	Storm Drain	
RP 57.94	12"	7'	Storm Drain	
RP 57.94 - 58.03	18"	446'	Storm Drain	

Table 2.6 Hydra	ulic Struct	ures		
Approximate Location Reference Post (RP)	Size	Length	Remarks	As-Built Project
RP 58.08 - 58.08	18"	118'	Storm Drain	
RP 58.08 - 58.11	24"	157'	Storm Drain	
RP 58.11	30"	149'	Storm Drain	
RP 58.11 - 58.14	24"	138'	Storm Drain	
RP 58.14	24"	113'	Storm Drain	
RP 58.22 - 58.27	18"	351'	Storm Drain	
RP 58.27 - 58.33	18"	330'	Storm Drain	
RP 58.33 - 58.37	18"	208'	Storm Drain	
RP 58.37	18"	46'	Storm Drain	
RP 58.37 - 58.45	18"	428'	Storm Drain	
RP 58.39	18"	103'	Storm Drain	
RP 58.45 - 58.46	18"	49'	Storm Drain	
RP 58.57	18"	80'	Storm Drain	
RP 58.69	18"	64'	Storm Drain	
RP 58.71 - 58.72	24"	34'	Storm Drain	
RP 58.71 - 58.74	24"	166'	Storm Drain	
RP 58.72 - 58.74	24"	133'	Storm Drain	Po
RP 58.74	24"	69'	Storm Drain	Polson-East (2004)
RP 58.74	30"	41'	Storm Drain	규
RP 58.74 - 58.82	24"	379'	Storm Drain	as
RP 58.82	12"	67'	Storm Drain	
RP 58.82	18"	28'	Storm Drain	200
RP 58.82 - 58.87	24"	302'	Storm Drain	4)
RP 58.87	12"	67'	Storm Drain	
RP 58.87	24"	94'	Storm Drain	
RP 58.87 - 58.94	24"	351'	Storm Drain	
RP 58.94	12"	107'	Storm Drain	
RP 58.94	18"	31'	Storm Drain	
RP 58.94 - 58.98	24"	185'	Storm Drain	
RP 58.97 - 58.98	24"	97'	Storm Drain	
RP 58.98	24"	33'	Storm Drain	
RP 58.98 - 59.02	30"	223'	Storm Drain	
RP 59.02	30"	92'	Storm Drain	
RP 59.02 - 59.04	24"	107'	Storm Drain	
RP 59.10	18"	105'	Storm Drain	
RP 59.10 - 59.14	18"	172'	Storm Drain	
RP 59.18	18"	72'	Storm Drain	
RP 59.18 - 59.22	18"	220'	Storm Drain	
RP 59.22	12"	71'	Storm Drain	

Table 2.6 Hydraulic Structures						
Approximate Location Reference Post (RP)	Size	Length	Remarks	As-Built Project		
RP 59.11	24"	76'	Drain			
RP 59.26	18"	108'	Irrigation			
RP 59.28	15"	28'	Irrigation Approach RT			
RP 59.33	15"	60'	Approach RT			
RP 59.38	24"	80'	Drain			
RP 59.40	3-36"	110', 676', 430'	Irrigation			
RP 59.57	15"	30'	Irrigation			
RP 59.66	24"	76'	Drain			
RP 59.67	18"	130'	Drain			
RP 59.73 - 60.06	15"	1,750'	Drain			
RP 59.84	18"	40'	Approach LT	Pa		
RP 59.90	18"	40'	Approach LT	Pablo-Kalispell (1958 & 1966)		
RP 59.97	30"	94'	Drain) ,		
RP 59.99	18"	40'	Approach LT	alis		
RP 60.05	18"	50'	Approach LT	pe		
RP 60.09	15"	40'	Irrigation Approach LT	(:		
RP 60.10	18"	56'	Irrigation	195		
RP 60.11	24"	96'	Irrigation	8		
RP 60.20 - 60.23	15"	178'	Drain	& 1		
RP 60.23	18"	40'	Approach LT	96		
RP 60.23 - 60.24	15"	42'	Drain	6)		
RP 60.24	24"	86'	Drain			
RP 60.26	24"	86'	Drain			
RP 60.47	24"	88'	Drain			
RP 60.50	24"	86'	Drain			
RP 60.52	24"	72'	Drain			
RP 60.61	12"	100'	Drain			
RP 60.62	24"	70'	Drain			
RP 61.07	15"	18'	Drain thru Embankment RT			
RP 61.50	18"	50'	Approach LT			
RP 61.53	24"	56'	Approach RT			

Table 2.6 Hydraulic Structures						
Approximate Location Reference Post (RP)	Size	Length	Remarks	As-Built Project		
RP 61.39	18"	40'	Approach LT			
RP 61.39	15"	26'	Approach RT			
RP 61.43	15"	110'	Approach RT			
RP 61.50	24"	76'	Drain			
RP 61.60	24"	126'	Drain	_		
RP 61.81	15"	32'	Farm Entrance RT	Polson-North (1955)		
RP 61.82	15"	40'	Farm Entrance RT	sor		
RP 61.83	24"	58'	Drain	N-		
RP 61.89	15"	34'	Approach RT	ort		
RP 62.13	15"	38'	Approach RT	h (
RP 62.15		74'	Stockpass	19		
RP 62.35	15"	40'	Farm Entrance LT	55)		
RP 62.36	12"	84'	Irrigation			
RP 62.58	15"	64'	Farm Entrance LT & RT			
RP 62.74	15"	30'	Farm Entrance RT			
RP 62.78	36"	68'	Drain			
RP 62.88	15"	36'	Approach LT			

2.10 Bridge Crossings

Four bridge crossings are located along the corridor. They include the Flathead River Bridge, the Pablo Feeder Canal Bridge, and two Wildlife Underpass Bridges. The Pablo Feeder Canal Bridge and two Wildlife Underpass Bridges were assessed in 2009, and the Flathead River Bridge was assessed in 2010. The assessments determined the Sufficiency Rating (SR) for each structure.

The Sufficiency Rating formula is a method of evaluating highway bridge data to obtain a numeric value indicating the sufficiency of the bridge to remain in service. The result of this method is the percentage in which 100 is an entirely sufficient bridge and 0 is an entirely deficient bridge. In order to receive funding through the Highway Bridge Replacement and Rehabilitation Program (HBRRP), structures must be *Structurally Deficient* or *Functionally Obsolete* and have an SR of 80% or below. Structures with an SR of 0 to 49.9% are eligible for replacement, and structures 50 to 80 are eligible for rehabilitation unless otherwise approved by the FHWA. The following criteria determine whether or not a structure is structurally deficient or functionally obsolete:

1. Structurally Deficient. A condition of 4 or less for any of the following:

Deck Rating

Superstructure Rating

Substructure Rating

Or, an appraisal of 2 or less for the following:

Structure Rating

Waterway Adequacy

2. Functionally Obsolete. An appraisal of **3 or less** for the following:

Deck Geometry

Under Clearance

Approach Roadway Alignment

Or, an appraisal of 3 for the following:

Structure Rating

Waterway Adequacy

All four structures are not structurally deficient and not functionally obsolete at the present time. Table 2.7 shows the sufficiency ratings of the four bridge crossings.

Table 2.7 Bridge Sufficiency Rating (SR)							
Structurally Deficiency SR Criteria		Flathead	Pablo	Wildlife	Wildlife		
Structurally Deficiency SK Criteria		River	Feeder Canal	Underpass	Underpass		
Deck Rating	≤4	7	-	-	-		
Superstructure Rating	≤4	7	-	-	-		
Substructure Rating	≤4	7	-	-	-		
Structure Rating	≤2	7	8	7	7		
Waterway Adequacy	≤2	8	9	-	-		
Functionally Obsolete SR Criteria							
Structure Rating	≠3	7	8	7	7		
Deck Geometry	≤3	4	9	5	5		
Under Clearance	≤3	-	-	-	-		
Waterway Adequacy	≠3	8	9	-	-		
Approach Roadway Alignment	≤3	8	8	8	8		
Dosign Lo	adina	5 MS 18	5 MS 18	5 MS 18	5 MS 18		
Design Loading		(HS 20)	(HS 20)	(HS 20)	(HS 20)		
Sufficiency R	66.9	84.9	83.2	83.2			
Structure S	tatus	Not Deficient	Not Deficient	Not Deficient	Not Deficient		

2.10.1 Flathead River Bridge

The Flathead River Bridge is a two lane structure located at RP 61.2. Constructed in 1966 on a horizontal tangent, the bridge is 1,562 feet long and 30 feet wide with a concrete cast-in-place deck and 25 spans.

Based on the above ratings, the Flathead River Bridge is categorized as **not structurally deficient** and **not functionally obsolete**. In 2009, the Flathead River Bridge underwent a bridge deck rehabilitation project.

2.10.2 Pablo Feeder Canal Bridge

The Pablo Feeder Canal Bridge is a concrete box culvert located at RP 57.1. Constructed in 2006 on a horizontal tangent, the culvert spans the four-lane divided roadway of US 93 in addition to the two-lane frontage roads on both the east and west sides of US 93 for a total of 8 lanes of traffic. This culvert is 140 feet long and is 22 feet wide situated at a 33-degree skew. To address the moderate potential of strong ground motion in Seismic 3 areas, the appropriate National Earthquake Hazards Reduction Program seismic design parameters were included for a soil profile Type II.

Based on the above ratings, the Pablo Feeder Canal Bridge is categorized as **not structurally deficient** and **not functionally obsolete**.

2.10.3 Wildlife Underpass Bridge

The Wildlife Underpass Bridge (Structure No. P00005057+07611) is a two lane structure located at RP 57.8. Constructed in 2006 on a horizontal curve, the steel culvert bridge is 25 feet long and 36 feet wide. The Wildlife Underpass Bridge is *not structurally deficient* and *not functionally obsolete*.

2.11 Crash Analysis

Safety issues are a concern along US 93 through the study area. In 2010, the MDT Traffic and Safety Bureau conducted a crash analysis along US 93 from RP 55.0 to RP 65.0 through the Polson area. Due to the recent reconstruction of the segment south of Polson, the latest three-year crash data was provided from July 1, 2007 to June 30, 2010. The segments of US south of MT 35 and north of Irvine Flats Road exhibit more rural than the urban section through town; therefore the study area was divided into three segments. The analysis compared the study area with the average crash rates on Non-Interstate National Highway System (NINHS) routes statewide. The results are shown in Table 2.8.

Table 2.8 US 93 Crash Statistics (RP 55.0 - 65.0) (from July 1, 2000 - June 30, 2010)								
		Study Area		NINHS	NINHS			
Statewide Average	South of MT 35	MT 35 to Irvine Flats Road	North of Irvine Flats Road	Rural Routes ¹	Urban Routes ²			
All Vehicles Crash Rate	1.58	2.33	1.32	1.07	5.06			
All Vehicles Severity Index	1.95	1.57	1.86	2.14	1.67			
All Vehicles Severity Rate	3.08	3.66	2.46	2.29	8.48			
Commercial Vehicles Crash Rate	2.63	4.44	1.05	0.90				
Commercial Vehicles Severity Index	1.88	1.22	1.00	2.34				
Commercial Vehicles Severity Rate	4.94	5.42	1.05	2.11				
Commercial Vehicle Crashes	8	18	4					
All Vehicle Crashes	73	256	79					

^{*}Segment reconstructed, completed in 2006. Data from 3-Year Time Period July 1, 2007 - June 30, 2010 Denotes segment of "urban" character of US 93.

Source: MDT Traffic and Safety Bureau, 2010.

The crash rate within the US 93 Polson Corridor is higher than the average comparable rural routes throughout the state of Montana. The "urban" section from MT 35 to Irvine Flats Road is higher than the NINHS rural routes, but less than the NINHS urban routes. Currently, the section from MT 35 to Irvine Flats Road is not functionally classified as an urban section. It is possible the 2010 Census may determine an urban classification for Polson. In the case of a rural to urban reclassification, the crash rate for the urban section would be less than the statewide average.

Table 2.9 shows the total number of crashes, with a breakdown of crashes by severity, for every quarter mile through the existing corridor study area boundary.

Table 2.9 Crash Data per Quarter-Mile								
Reference Post Location	# Crashes	No Injury	Injury	Fatal Injury				
56.50 - 56.74	31	13	16	2				
56.75 - 56.99	12	10	2					
57.00 - 57.24	11	7	4					
57.25 - 57.49	7	6	1					
57.50 - 57.74	14	10	4					
57.75 - 57.99	9	6	3					
58.00 - 58.24	11	9	2					
58.25 - 58.49	5	5						
58.50 - 58.74	14	11	3					
58.75 - 58.99	20	12	8					
59.00 - 59.24	81	56	25					
59.25 - 59.49	16	11	5					

^{1.} NINHS Route averages outside the city limits from 2005 through 2009.

^{2.} NINHS Route averages within city limits from 2004 through 2008.

59.50	-	59.74	14	10	4	
59.75	-	59.99	11	9	2	
60.00	-	60.24	31	24	7	
60.25	-	60.49	32	26	6	
60.50	-	60.74	27	18	9	
60.75	-	60.99	95	77	18	
61.00	-	61.24	11	10	1	
61.25	-	61.49	3	1	2	
61.50	-	61.74	7	6	1	
61.75	-	61.99	8	5	3	
62.00	-	62.24	17	12	5	
62.25	-	62.49	10	7	3	
62.50	-	62.74	6	4	2	
62.75	-	62.99	2	1	1	
Corric	dor	Total	505	366	137	2

2.12 Railroad

Montana Rail Link (MRL), which ends just within the southern boundary of the corridor study area, is a factor in developing improvement options. Guidelines have been established defining construction requirements and development standards near railroad facilities. MRL also has land ownership interspersed throughout the study area, primarily along 7th Avenue. If any improvement options are identified along 7th Avenue this will need to be addressed. As improvement options develop, consideration will be made to comply with specified railroad requirements.

2.13 Utilities

Several utilities exist throughout the corridor, primarily along US 93 corridor. Utilities include power (overhead and underground), telephone, water, sewer, gas, and fiber optics. As improvement options develop, it will be important to recognize the impact options may or may not have on the utilities within the corridor. Utility adjustments and/or relocations may delay projects if they are not identified in the project development process. Consideration will be given to utilities as improvement options develop.

2.14 Access Points

There are 115 access points along US 93 (58 north/east and 73 south/west) from RP 56.5 (Caffrey/Ford Road) to RP 63.0. Access control is implemented along existing US 93 from the study area boundary north to MT 35. All approaches and access points will be considered as the study develops. Table 2.10 contains a listing of approaches by approximate half-mile increments.

Table 2.10 Access Points along US 93						
D-1	North/East of US 93		South/West of US 93		Total	
Reference Post (RP)	No.	Density	No.	Density	No.	Density
	Accesses	(access/mi)	Accesses	(access/mi)	Accesses	(access/mi)
56.5 to 57.0	2	4	2	4	4	8
57.0 to 57.5	1	2	0	0	1	2
57.5 to 58.0	0	0	1	2	1	2
58.0 to 58.5	1	2	1	2	2	4
58.5 to 59.0	1	2	1	2	2	4
59.0 to 59.5	8	16	4	8	12	24
59.5 to 60.0	16	32	11	22	27	54
60.0 to 60.5	8	16	20	40	28	56
60.5 to 61.0	13	26	23	46	36	72
61.0 to 61.5	2	4	3	6	5	10
61.5 to 62.0	3	6	4	8	7	14
62.0 to 62.5	2	4	1	2	3	6
62.5 to 63.0	1	2	2	4	3	6

Over the 3 mile section, the average density is 20 accesses per mile.

US 93 Polson Corridor Study



Needs and Objectives

Prepared For:

City of Polson

Lake County

Confederated Salish & Kootenai Tribes

Montana Department of Transportation

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana

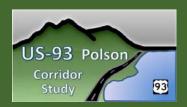


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Chapter 4 Needs and Objectives

US 93 is a major north/south highway providing a vital regional link between Idaho and Canada, and is functionally classified as a Rural Principal Arterial on the NHS Non-Interstate System. This corridor also provides an important link between Missoula, Kalispell, and surrounding communities. In the corridor study area, US 93 sees a diverse mix of traffic - including trucks, recreational vehicles, passenger vehicles and non-motorized uses. During the peak summer tourism season traffic volumes elevate in numbers causing congestion and poor levels of service on the roadway and adjacent intersections. The needs and objectives listed below addresses both MDT's concerns to enhance traffic flow and the local government's desire to enhance livability and connectivity within their community.

Note the needs or objectives followed by an asterisk implies a variation on the needs or objectives contained in the 1995 FEIS fully referenced in Section 4.2 References at the end of this chapter.

4.1 Needs and Objectives:

4.1.1 Need Number 1: System Linkage and Function

Preserve functionality of US 93 as a principal arterial.

Objectives

- Maintain connections of Polson with other Montana communities.
- Maintain connections to other major highways in the corridor.

4.1.2 Need Number 2: Transportation Demand and Operations

Accommodate existing and future transportation demand on US 93 through the planning horizon of the year 2030.

Objectives

- Maintain a level of service (LOS) B or better for roadway segments along US 93 (rural principal arterial), to the extent practicable. *
- Maintain a level of service (LOS) C or better for roadway segments along US 93 (urban principal arterial), to the extent practicable. *
- Acknowledge the increase in non-motorized transportation uses and provide for appropriate infrastructure, to the extent practicable.

Page 2

4.1.3 Need Number 3: Roadway Geometrics

Provide a facility that accommodates the diversity of vehicle types.

Objectives

- Provide appropriate lane configuration(s) to accommodate the vehicle demand expected under existing and future conditions, to the extent practicable.
- Provide for unique turning movements and grade requirements for specialized vehicles such as semi-trucks and recreational vehicles, to the extent practicable.
- Improve the road and bridge surfacing widths to meet current MDT design criteria, to the extent practicable.
- Provide modifications to the roadway horizontal alignment and vertical alignment to meet current MDT design criteria, to the extent practicable.

4.1.4 Need Number 4: Safety

Improve the safety of US 93. *

Objectives

- Provide adequate clear zones along US 93 by identifying and removing obstacles, upgrading shoulder widths, and providing urban roadway features in accordance with MDT design criteria, to the extent practicable.
- Manage public access points and private approaches by providing appropriate features commensurate with the types and volumes of traffic encountered at each approach, and/or by consolidating or closing approaches, to the extent practicable.

4.1.5 Need Number 5: Livability and Connectivity

Reduce conflicts by enhancing connectivity and minimizing impacts within the US 93 corridor.

Objectives

- Minimize impacts to existing neighborhoods. *
- Minimize impacts to environmental, sensitive and recreational resources, including trails. *
- Be responsive to land use plans and future transportation needs. *

4.1.6 Need Number 6: Truck Traffic

Minimize the impacts of US 93 thru truck traffic.

Objectives

- Provide appropriate signage to direct thru truck traffic.
- Minimize the number of vertical grade changes for thru truck traffic.
- Provide acceptable travel times with minimal delay for thru truck traffic.

4.1.7 Other

The following are potential objectives that do not correlate to any of the five needs described above.

- Be responsive to long-term maintenance requirements. *
- Limit construction disruption as much as possible. *
- Community preference.

4.2 References

Carter Burgess/WGM Group Inc., F 5-1(9)6, U.S. Highway 93 Evaro – Polson Final Environmental Impact Statement and Section 4(f) Evaluation, June, 1996

Carter Burgess/WGM Group Inc., *US Highway 93 – Polson, Traffic Operations and Environmental Study,* March, 1995

Northwest Environmental Training Center, Writing the Perfect EA/FONSI or EIS Training Course Publication, September 3-4, 2008

US 93 Polson Corridor Study



Alignment Identification

Prepared For:

City of Polson

Lake County

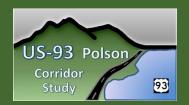
Confederated Salish & Kootenai Tribes

Montana Department of Transportation

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana



May 17, 2011

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Alignment Identification

1.1 Introduction

This Technical Memorandum presents the process used to develop potential alternate alignments to US Highway 93 for potential forwarding into the screening analysis. The identification of potential alternate alignments was based on analysis results of the Quantm Alignment Planning System (i.e. Quantm) route optimization software, as well as the assessment of potential alignments contained in the 1995 US 93-Evaro to Polson Environmental Impact Statement (EIS). General corridors were identified based on input from local government, the community, and resource agencies (e.g., U.S. Army Corps of Engineers, Montana Fish Wildlife and Parks, etc.). The general corridors identified within this Technical Memorandum will be included in the Corridor Study Report document, and were forwarded to the first level screening process.

The identification of alternate alignments is necessary to determine what alignments are most relevant to carry forward into the screening process and determine whether a single, feasible alternate alignment is possible. Since an EIS was previously prepared for US Highway 93 in the Polson area with no conclusion on this section of US 93, it was necessary to evaluate the EIS alignments in this identification process. Additionally, because the Quantm route optimization software was available to the study team, it was decided that any new routes generated by Quantm should also be explored.

1.2 Design Criteria

In order to generate new alignments, minimum geometric design criteria for the roadway must be known. Since the corridor study area incorporates both urban and rural land, MDT's Road Design Manual criteria for rural principal arterials and urban principal arterials were utilized. Table 1 lists the minimum geometric design criteria used for alignment identification. Note that within the study area, portions of the roadway (whether existing or proposed) falling within the Polson city limits were categorized as "urban", while portions outside of the Polson city limits were categorized as "rural".

May 17, 2011

Table 1 Rural Principal and Urban Principal Arterial Design Criteria

Design Element			Design Criteria				
					Urban Principal Arterial		
Design Controls	Functional Classification		Rural Principal Arterial		2-Lane, Curbed	2-Lane, Uncurbed	
	Design Forecast year		2030		2030		
	*Dasies Coased	Level	70 n	nph	40 - 45 mph	40 E0 mph	
	*Design Speed	Rolling	60 mph		40 - 45 IIIpii	40 - 50 mph	
	Level of Service		В		Desirable: B Minimum: C		
	*Travel Lane Width		12'		12'		
ants	*Shoulder Width	Outside	Varies		Varies		
Roadway Elements		Inside			N/A		
l ⊨	Cross Slope	*Travel Lane	2%		2% Typical	2%	
gypt	Cross Slope	Shoulder	2%		2% Typical	2%	
Rog	Median Width		Varies		N/A		
	TWLTL Width		N/A		16'		
	Ditch	Inslope	6:1 (Width: 10')		N/A	Desirable: 6:1 Minimum: 4:1	
S		Width	10' Minimum		N/A	10' Minimum	
Earth Cut Sections		Slope	20:1 towards back slope		N/A	20:1 towards back slope	
Sec	Back Slope; Cut Depth at Slope Stake	0' - 5'	5:1		5:1		
Ö		5' - 10'	4:1		Level/Rolling: 4:1 Mountainous: 3:1		
art		10' - 15'	3:1		Level/Rolling	g: 3:1 Mountainous: 2:1	
		15' - 20'	2:1		Level/Rolling: 2:1 Mountainous: 1.5:1		
		> 20'	1.5:1		1.5:1		
bes	Fill Height at Slope Stake	0' - 10'	6:1		6:1	6:1	
l Slo		10' - 20'	4:1		4:1	4:1	
E L		20' - 30'	3:1		3:1	3:1	
Earth Fill Slopes		> 30'	2:	1	2:1	2:1	
	DESIGN SPEED		60 mph	70 mph	40 mph	45 mph	
	*Stopping Sight Dista	ince	570'	730'	305'	360'	
Ş	Passing Sight Distance		2135'	2480'	N/A	N/A	
*Minimum Radius			1200'	1810'	533'	711'	
Alignment Elements	*Superelevation Rate		e _{max} = 8.0%		e _{max} = 4.0%		
	*Vertical Curvature (K-value)	Crest	151	247	44	61	
		Sag	136	181	64	79	
₹	*Maximum C	Level	3%		6%	6%	
	*Maximum Grade	Rolling	4%		7%	7%	
	Minimum Vertical Clearance		17.0'		17.0'		

Source: Montana Department of Transportation Road Design Manual Chapter 12, Figure 12-3 "Geometric Design Criteria for Rural and Urban Principal Arterials"

^{*}Controlling design criteria (see Section 8.8 of the MDT Road Design Manual)

In some cases, minimum design criteria cannot be achieved. In these circumstances, design exceptions need to be sought and accepted by MDT's roadway design staff. For alignment identification purposes, the need for design exceptions is not explicitly addressed in this Technical Memorandum. Of particular note is that the existing US Highway 93 does have vertical roadway grade design exceptions on Polson Hill, as the vertical grades in both directions are over the MDT design criteria of 4 percent for a rural principal arterial. It is noted that the potential for design criteria exceptions, related to vertical roadway grades, may need to be explored in the first level screening process.

1.3 Data Gathering

The primary objective in gathering data was to identify potential constraints within the study area that could inhibit the development of an alignment. If information was not available within MDT's internal repositories, other GIS data repositories such as Natural Resource Information System (NRIS) were searched. Additional information was gathered from public sources, interviews with local governments, and staff input. Specific tribal sensitive area data was provided by the Confederated Salish and Kootenai Tribes. Information contained within the Environmental Scan for the study area was also included.

In order to determine the preliminary alignments for the project, the Technical Oversight Committee (TOC) reviewed the identified constraints and prioritized the information. The TOC determined which features should be avoided, which data should be considered sensitive, which should be considered an additional cost to the project, and which should be shown on the mapping for reference only. The TOC's conclusions are listed in Table 2.

Table 2 Feature Identification and Prioritization

Linear Features		Roads, railroad, irrigation canals, streams, drainages		
Special Zones		4(f) / 6(f) resources (schools, parks, etc.), cemeteries,		
	Avoid Areas	public water supply, abandoned mines, landfills, sewage		
		lagoons		
	Sensitive Areas	Wildlife habitat & crossings, Fairgrounds, native		
		grasslands, specific lands of tribal importance		
	Additional Costs	Hazardous areas (underground storage tanks), wetlands		
Additional Data		Study area boundary, Polson city limits, topography, land		
		ownership, vegetation		

The identification of "avoid" areas and "sensitive" areas was important in the process because Quantm recognizes the importance of certain features based on these two definitions and attempts to route alignments that stay clear of these areas whenever possible. Accordingly, very few of the Quantm generated alignments were found to traverse through an "avoid" area. This recognizes the importance of certain features within the community, and results in efforts to stay clear of these areas with a potential alternate alignment.

1.4 Quantm Background

The Trimble Quantm Alignment Planning System (i.e. Quantm) is a planning tool that uses route optimization software to generate multiple cost-based alignments that balance social, environmental, and terrain constraints and scenarios. This unique software generated hundreds of potential alignments for review by local stakeholders. As the study progressed, different scenarios were created and revised alignments were produced for further consideration and refinement. This approach to alignment identification allowed for multiple iterations to fulfill local stakeholders' needs (Trimble 2009).

To begin the Quantm process, all data including linear features, special zones, geometric standards, structure sizes, and Digital Terrain Model (DTM) was synthesized into a GIS format. Once start and end points were determined, the Quantm system generated multiple potential alignments as presented in the discussion herein.

Figure 1 is reflective of a totally "unconstrained" model run in that Quantm alignments generated primarily cut through the existing city proper, without sensitivity to established routes and/or land uses. The purpose of this first model run was to identify what Quantm would generate in an unconstrained condition. The type of information shown in Figure 1 is commonly referred to as a "spaghetti" map, in that it portrays a series of fine lines representing potential alignments within the study area.

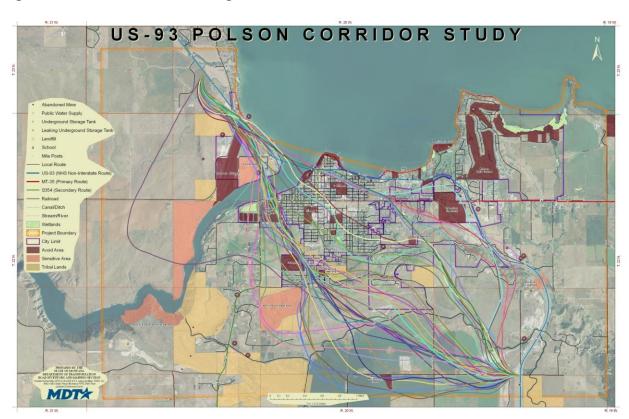


Figure 1 First Run of Potential Alignments

1.5 Quantm Alignment Trends

A starting point was determined to be the intersection of Caffrey Road and US 93. The end point was determined to be near RP 63, approximately 0.75 miles northwest of the intersection of Irvine Flats Road with US Highway 93. All of the Quantm alignments use the existing two-mile segment of Caffrey Road from the westerly termini of Caffrey Road back to the US 93/Caffrey Road intersection. Figure 2 shows a screen shot of the Quantm alignment for the Caffrey Road segment. The estimated range of costs for the Caffrey Road segment is \$4.3 to \$5.1 million dollars. These costs are generated by the Quantm route optimization tool and are reflective of construction costs (i.e. do not include detailed right-of-way cost, project development costs, utility relocation costs, inflation, etc.) This planning level cost does not include preliminary engineering, construction engineering, and/or IDC costs. Note that this is the case for all planning level costs presented in this Technical Memorandum.

12800

Figure 2 Quantm Screen Shot (Caffrey Road)

The five alignment trends produced by Quantm are described below, and are shown graphically on Figure 10.

Northern Bridge - 1

This alignment follows Caffrey Road to the westerly termini as described above, traverses in a northwest direction, clips the tribal native grassland sensitive area, follows Kerr Dam Road to the north, and cuts through the Fairgrounds property. It then intersects US 93 between the airport and the west end of the

Flathead River Bridge. Figure 3 shows a screen shot of the Quantm alignment for the Northern Bridge – 1 route. The bridge length crossing the Flathead River as computed by Quantm is 1,350 feet. The total length of this alignment, including the Caffrey Road segment, is 5.14 miles. The estimated range of costs for this alignment, which includes the Caffrey Road segment, is \$31.0 to \$37.0 million dollars.

225000

Figure 3 Quantm Screen Shot (Northern Bridge - 1)

Northern Bridge – 2

This alternative follows Caffrey Road, similar to Northern Bridge – 1 described above, and then traverses in a northwest direction. The alignment skirts around the southwest corner of the tribal native grassland sensitive area. As with Northern Bridge – 1, this alignment follows Kerr Dam Road, bisecting the Fairgrounds property prior to intersecting with US 93 between the airport and the west end of the Flathead River Bridge. Figure 4 shows a screen shot of the Quantm alignment for the Northern Bridge – 2 route. The bridge length crossing the Flathead River as computed by Quantm is 1,450 feet. The total length of this alignment, including the Caffrey Road segment, is 5.43 miles. The estimated range of costs for this alignment, which includes the Caffrey Road segment, is \$33.0 to \$39.1 million dollars.

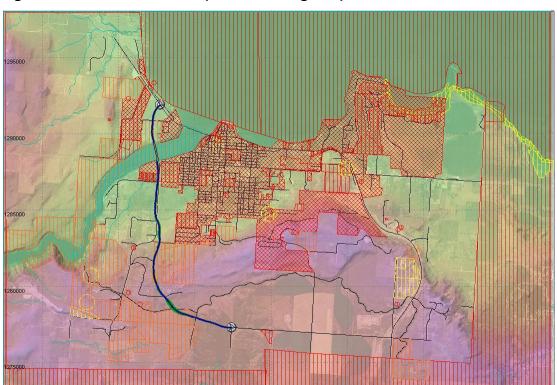


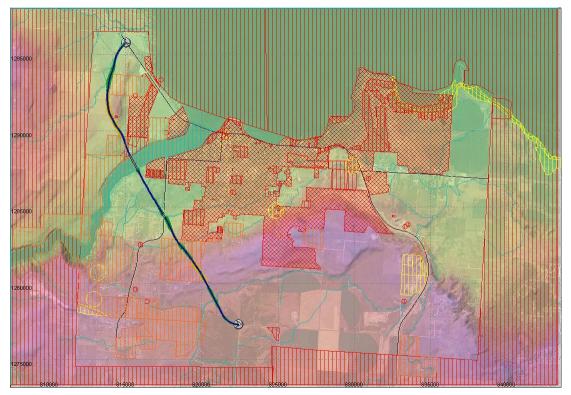
Figure 4 Quantm Screen Shot (Northern Bridge - 2)

Central Bridge

The Central Bridge alignment follows Caffrey Road, skirts around the tribal native grassland sensitive area, travels north/northwest and crosses the Flathead River at the southern edge of the airport property. Then, the alignment skirts the western edge of a tribal land parcel (southwest of the existing US 93) and connects with US 93 north of the airport and south of Stone Horse Drive.

Figure 5 shows a screen shot of the Quantm alignment for the Central Bridge route. The bridge length crossing the Flathead River as computed by Quantm is 1,100 feet. The total length of this alignment, including the Caffrey Road segment, is 6.06 miles. The estimated range of costs for this alignment, which includes the Caffrey Road segment, is \$36.0 to \$43.5 million dollars.

Figure 5 Quantm Screen Shot (Central Bridge)



Southern Bridge - 1

The South Bridge – 1 alignment follows Caffrey Road, clips the tribal native grassland sensitive area, and travels just north of the Bald Eagle winter area where it crosses the Flathead River. This alternative connects with US 93 near RP 63.

Figure 6 shows a screen shot of the Quantm alignment for the Southern Bridge – 1 route. The bridge length crossing the Flathead River as computed by Quantm is 1,150 feet. This bridge crossing is almost 100 feet above the river surface (at its highest point). The total length of this alignment, including the Caffrey Road segment, is 7.16 miles. This results in the longest alignment of the five generated by Quantm. The estimated range of costs for this alignment, which includes the Caffrey Road segment, is \$34.0 to \$44.0 million dollars.

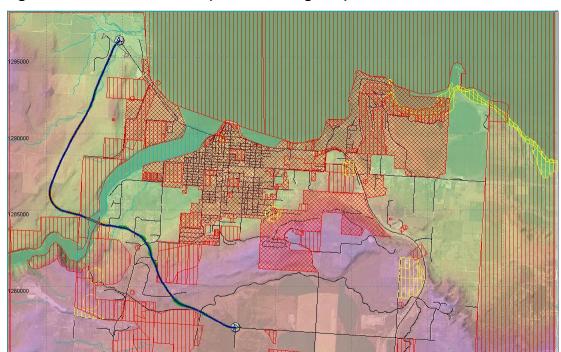


Figure 6 Quantm Screen Shot (Southern Bridge - 1)

South Bridge – 2

This alignment follows Caffrey Road, cuts through the tribal native grassland sensitive area, clips the Bald Eagle winter area, travels along the western side of the study area boundary, and connects to US 93 near RP 63.

Figure 7 shows a screen shot of the Quantm alignment for the Southern Bridge – 2 route. The bridge length crossing the Flathead River as computed by Quantm is 1,800 feet. This bridge crossing is the longest bridge crossing length of the five Quantm alignments, and is due to the alignment skew and crossing at a wide spot of the river. Additionally, the elevation of the bridge is the highest and is almost 160 feet above the river surface (at its highest point). The total length of this alignment, including the Caffrey Road segment, is 6.65 miles. The estimated range of costs for this alignment, which includes the Caffrey Road segment, is \$37.0 to \$47.2 million dollars.

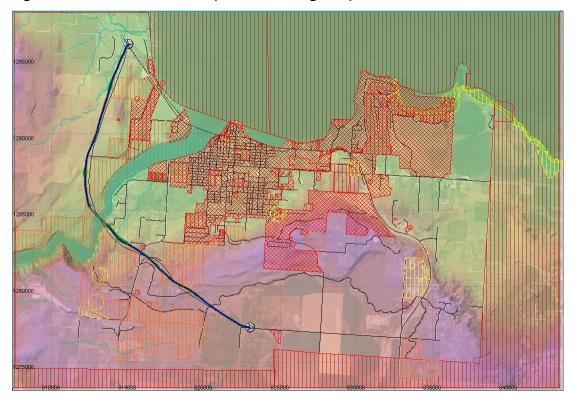


Figure 7 Quantm Screen Shot (Southern Bridge - 2)

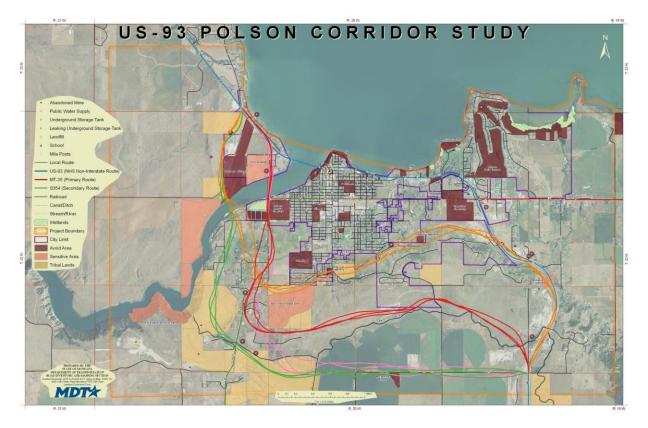
1.6 EIS Alignments

The TOC reviewed and analyzed the eight alternative alignments developed during the preparation of the US 93-Evaro to Polson EIS (see Figure 9). Quantm was used to analyze four of the EIS alignments (EIS 2, 3, 5, and 6) which were manually entered into the software (see Figure 8). Because the remaining four alignments (EIS 1, 4, 7, and 8) traverse through the city of Polson proper and are more "urban", the decision was made by CDM and MDT staff that Quantm would not be the appropriate tool for analysis of these alignments. Each of the alignments is defined below and shown on Figure 9. Costs generated for each alignment are reflective of construction costs (i.e. do not include detailed right-of-way cost, project development costs, utility relocation costs, inflation, etc.). Planning level costs do not include preliminary engineering, construction engineering, and/or IDC costs. Note that this is the case for all planning level costs presented in this Technical Memorandum.

1.6.1 EIS Alignments Modeled in Quantm

Figure 8 shows the EIS alignments that were modeled in Quantm. Each alignment is described in the text that follows.

Figure 8 EIS Alignments Modeled in Quantm



EIS Alignment 2

The Quantm alignments generated for EIS Alignment 2 are shown as pink lines in Figure 8. This alignment follows Caffrey Road, then curves northwest with no impacts to the tribal native grasslands, before proceeding north along Kerr Dam Road and crossing the river just east of the Fairgrounds property. A new bridge across the Flathead River would be constructed to continue the general Kerr Dam Road alignment straight north over the river.

The bridge length crossing the Flathead River as computed by Quantm is 1,520 feet. The total length of this alignment is 5.74 miles. The estimated range of costs for this alignment is \$34.7 to \$41.6 million dollars.

EIS Alignment 3

The Quantm alignments generated for EIS Alignment 3 are shown as green lines in Figure 8. This alignment follows Caffrey Road and extends approximately one mile west of the end of the road (at the 90 degree bend) before curving to the northwest. The alignment travels north through tribal lands, and then crosses the river just south of the airport. The alignment continues northbound, west of the airport, and ties into US 93 at Rocky Point Road. A new bridge across the Flathead River would be constructed.

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The bridge length crossing the Flathead River as computed by Quantm is 1,100 feet. The total length of this alignment is 6.48 miles. The estimated range of costs for this alignment is \$30.4 to \$36.4 million dollars.

EIS Alignment 5

The Quantm alignments generated for EIS Alignment 5 are shown as orange lines in Figure 8. This alignment begins near Saw Mill Road, heads west, then southwest, where it bisects the tribal land located east of the Hospital Cemetery and the tribal native grasslands before heading north toward the southwest corner of the airport. EIS Alignment 5 then continues northbound, west of the airport property, until it connects to US 93.

The bridge length crossing the Flathead River as computed by Quantm is 1,200 feet. The total length of this alignment is 5.17 miles. The estimated range of costs for this alignment is \$41.0 to \$44.1 million dollars.

EIS Alignment 6

The Quantm alignments generated for EIS Alignment 6 are shown as red lines in Figure 8. EIS Alignment 6 starts just north of the intersection of US 93 and Caffrey Road and crosses the Pablo Feeder Canal. This alignment continues to travel west in the general vicinity of the Pablo Feeder Canal, then curves northward (with no impacts to the tribal native grasslands and tribal lands). This alignment proceeds along Kerr Dam Road and crosses the river just east of the Fairgrounds property. A new bridge across the Flathead River would be constructed to continue the general Kerr Dam Road alignment straight north over the river.

The bridge length crossing the Flathead River as computed by Quantm is 1,650 feet. The total length of this alignment is 6.64 miles. The estimated range of costs for this alignment is \$45.0 to \$48.8 million dollars.

1.6.2 Additional EIS Alignments

As discussed previously, due to the urban nature of the remaining four alignments from the US 93-Evaro to Polson EIS (EIS 1, 4, 7, and 8), the decision was made by CDM and MDT staff that Quantm would not be the appropriate tool for analysis of these alignments. These four alignments are shown in Figure 9 and described below.

EIS Alignment 1

This alignment follows the current US 93 alignment and consisted of reconstructing the roadway in its existing corridor with adjustments to allow for widening, improving horizontal curves, reconstructing substandard intersections, improving vertical alignment (includes removing the road surface from the floodplain), and avoiding any important feature adjacent to the roadway. The bridge over the Flathead River would be replaced. The bridge length crossing the Flathead River is 1,560 feet. The total length of this alignment is 5.65 miles, however the segment from the intersection of Caffrey Road to MT-35 has

already been improved. Accordingly, the true length of the alignment that would be in need of reconstruction is 3.11 miles. The estimated range of costs for this alignment is \$23.7 to \$28.4 million dollars.

EIS Alignment 4

Alignment 4 starts near Saw Mill Road and travels west/northwest until it intersects 7th Street East. At this point EIS Alignment 4 continues due west until it reaches 1st Street East, there it turns south and follows 1st Street East until it reaches 10th Avenue East. At this intersection it travels due west until it reaches the Sports Complex. EIS Alignment 4 then traverses north, crossing the Flathead River and joining US 93 just west of the current bridge. A new bridge crossing the Flathead River would be constructed. The bridge length crossing the Flathead River is 1,400 feet. The total length of this alignment is 3.25 miles. The estimated range of costs for this alignment is \$27.8 to \$33.4 million dollars.

EIS Alignment 7

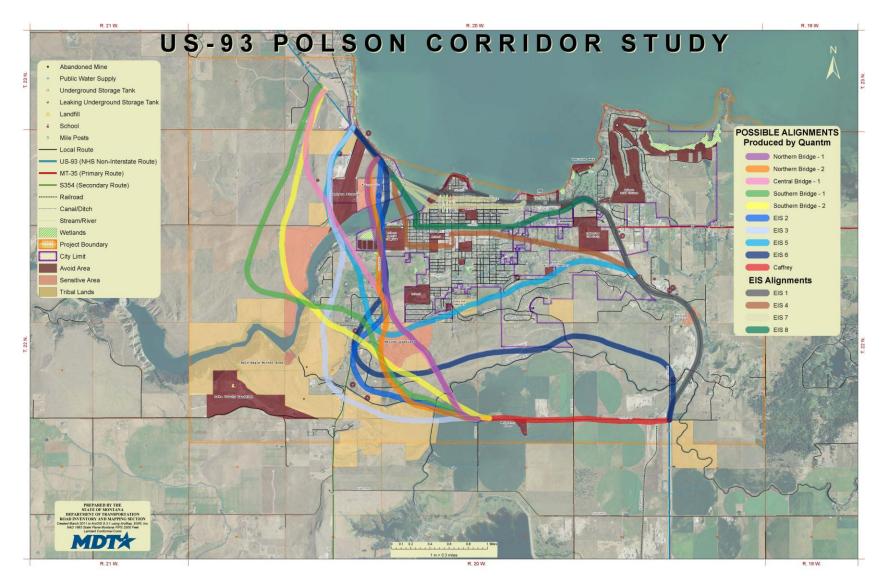
This alignment consists of a couplet utilizing the existing US Highway 93 for the westbound direction, and 3rd Avenue and 4th Avenue, in their entirety, for the eastbound direction (i.e., this alignment start where 3rd Avenue and 4th Avenue connect to US 93 and follow each street until the street ends). As a couplet, this alternative would require a total of three bridge crossings. Two of these bridge crossings would be new (e.g. for the eastbound direction). The couplet alignments would tie into US 93 east of Regatta Road. The total length of this alignment is 2.60 miles. The estimated range of costs for this alignment is \$22.1 to \$26.5 million dollars.

EIS Alignment 8

This alignment starts at the intersection of 7th Avenue East / Hillcrest Road and US 93. This alignment follows 7th Avenue for approximately the first ¼ mile, then veers off 7th Avenue to form a relatively tangent alignment to the intersection of 11th Street East. This alignment then follows 7th Avenue until the intersection of 4th Street West, at which point it follows 4th Street West northward, crosses the river and unites US 93 just west of the current bridge. A new bridge crossing the Flathead River would be constructed. The bridge length crossing the Flathead River is 1,750 feet. The total length of this alignment is 2.49 miles. The estimated range of costs for this alignment is \$26.9 to \$32.3 million dollars.

Figure 9 shows the alignments produced by Quantm as well as the EIS alignments previously identified in the 1995 EIS. These alignments will be further analyzed in the screening criteria process.

Figure 9 Potential EIS Alignments and Alignments Produced by Quantm



1.7 Overall Trends

The Quantm analysis identified five trend areas resulting in three distinct bridge crossing locations over the Flathead River. These three bridge crossing locations are shown on Figure 10 and are as follows:

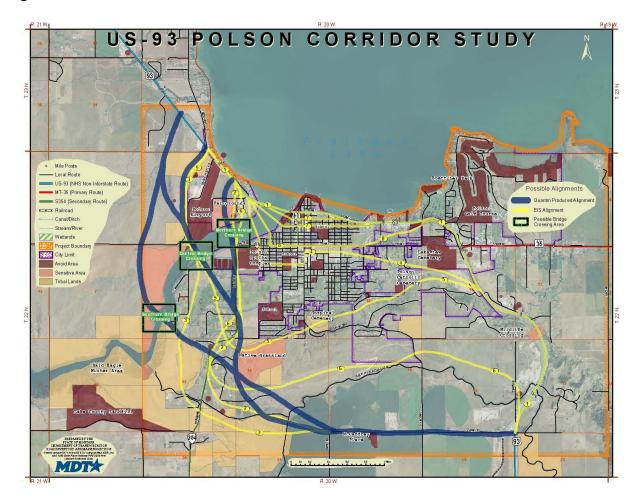
- Northern Bridge Crossing Two northern bridge trends (near the Fairgrounds) were found within the Quantm analysis. A detailed review of these two trends led to the creation of a single alignment "swath" to carry forward onto the screening process. The Northern Bridge Crossing alignment resulted in a total length of 5.43 miles, and a planning level cost range of \$33.0 to \$39.1 million dollars
- Central Bridge Crossing One central bridge trend (just southwest of the airport runway) was observed in the Quantm analysis. The Central Bridge Crossing alignment resulted in a total length of 6.06 miles, and a planning level cost of \$36.0 to \$43.5 million dollars. Note that there are two possible variations to the "Central Bridge Crossing" alignment one traversing west of the ridge near the Polson airport, and one going east of the ridge near the Polson airport.
- Southern Bridge Crossing Two southern bridge trends were observed in Quantm. The two observed trends were combined into a single Southern Bridge Crossing alignment "swath" with a total length of 6.65 miles and a planning level cost range of \$37.0 to \$47.2 million dollars.

The Quantm generated alignment "swaths" described above are shown in blue on Figure 10. It is recommended that these three general alignments be carried forward into the screening process. In addition, the EIS alignments described herein, and shown in yellow on Figure 10, should be carried forward into screening. This results in eleven alignments to be screened in the first level screening. Table 3 shows the eleven alignments and their respective total length, bridge length and planning level cost range.

Table 3 Alignment Length and Planning Cost Comparison

Criteria	Northern Bridge*	Central Bridge*	Southern Bridge	EIS 1	EIS 2	EIS 3	EIS 4	EIS 5	EIS 6	EIS 7	EIS 8
Total Length	5.43 miles	6.06 miles	6.65 miles	5.65 miles (3.11)	5.74 miles	6.48 miles	3.25 miles	5.17 miles	6.64 miles	2.60 miles	2.49 miles
Bridge Length	1,450 feet	1,100 feet	1,800 feet	1,560 feet	1,520 feet	1,100 feet	1,400 feet	1,200 feet	1,650 feet	1,650 feet	1,750 feet
Planning Level Range of Costs	\$33.0 – 39.1M	\$36.0 – 43.5M	\$37.0 - 47.2M	\$23.7 – 28.4M	\$34.7 – 41.6M	\$30.4 – 36.4M	\$27.8 – 33.4M	\$41.0 - 44.1M	\$45.0 – 48.8M	\$22.1 – 26.5M	\$26.9 – 32.3M

Figure 10 Overall Trends



1.8 References

HKM Engineering inc., Sidney Truck Route Study, August 2003.

Carter Burgess/WGM Group Inc., US Highway 93 – Polson, Traffic Operations and Environmental Study, March 1995

Trimble, Quantm System Brochure, 2009-2010, http://www.trimble.com/alignment/

US 93 Polson Corridor Study



First Level Screening Criteria

Prepared For:

City of Polson

Lake County

Confederated Salish & Kootenai Tribes

Montana Department of Transportation

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana

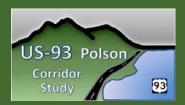


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	tuture (2030) Urban Arterials' Rating	
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	Horizontal Curve Design Criteria Ratingoad and Bridge Design Criteria Rating	
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Section 6.3 Improvement Option Screening Process

Screening criteria were developed to assist in the evaluation of the eleven (11) potential alignments of US 93 between RP 56.5 and RP 63.0. Screening criteria provide a means of reducing the range of potential alignments for consideration by comparing them both quantitatively and qualitatively with a set of specific measures. The screening process consisted of two screening steps. The "first level" screening was a high level screen that was utilized to identify alignment options that satisfied the needs and objectives laid forth previously, and subsequently could be carried forward for consideration in the second level of screening. The second level of screening will be more detailed and will evaluate shifts in traffic volumes, intersection operations, and potential impacts to safety.

The screening process described in this section illustrates each alignment's ability to meet the screening criteria and each alignment's respective scoring. Figure 6-1 depicts the eleven (11) alignments.

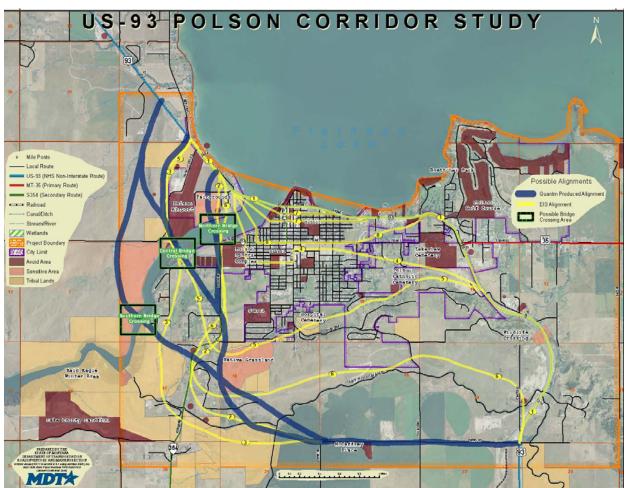


Figure 6-1 US 93 Polson Original Alignment Options

6.1 Rating Factors

In order to rate each screening criterion, rating factors were developed. Low, medium and high rating factors were assigned to each screening criterion for each alignment. The factors represented the likelihood of a screening criterion to meet the needs and objectives established for the corridor. Table 6.1 describes the impact rating factors.

Table 6.1 Initial Screening Criteria Rating Factors

0	•	•
Low Impact	Medium Impact	High Impact
Best Able to Meet Need &	Moderately Able to Meet Need &	Least Able to Meet Need &
Objectives	Objectives	Objectives

A qualitative and quantitative comparison of each alignment against the needs identified for the US 93 corridor is described below. A matrix summary of the results of the first screening is shown in Table 6.22.

6.2 First Level Screening Criteria

The needs and objectives previously defined for the US 93 corridor through Polson informed the development of 18 screening criteria. The screening criteria were developed based on input by the Technical Oversight Committee (TOC) and general public. The first level of screening evaluates 11 alignment options against the six (6) needs and objectives.

The primary concerns for the US 93 corridor are as follows:

- system linkage and function,
- transportation demand and operation,
- roadway geometrics,
- safety,
- livability and connectivity, and
- truck traffic.

6.2.1 System Linkage and Function

System linkage and function of an alignment relates to the ability to implement access control, and to maintain principal arterial speed. Two screening criteria were developed based on this need.

Access Control

Access control is the condition in which the right of owners or occupants of land abutting a highway is fully or partially controlled by public authority. Access control limits the conflicts with through traffic by limiting the location and number of private and public approaches. (Pizzini 2007) Access control is more difficult to implement in a developed corridor because of the multiple existing private and public approaches that exist. From an access control perspective, the rating factors take into consideration the general distance which an alignment travels through types of land as follows:

Range of Access Control	Rating Factor
Less Developed Land	\circ
Some Developed Land	$lackbox{}$
Mostly Developed Land	

Table 6.2 Access Control Rating Factor

		EIS Alignments									QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge		
Rating Factor	•	0	0	•	•	0	•	•	0	0	0		

Principal Arterial Speeds

The second criterion under System Linkage and Function is the principal arterial speed of the alignments. The concept of traffic channelization provides for a hierarchy of highway systems that allows for functional specialization in meeting both access and mobility requirements. Principal arterials are designed to provide a high level of mobility for through movement. Alignments that cross through developed areas, such as the city, are considered urban and would therefore be subject to speed reduction. Conversely, alignments that stay within rural land would be able to maintain the higher speeds assigned to rural principal arterials. From a principal arterial speed perspective, the rating factors are measured against the distance which an alignment travels within city limits as follows:

Range for Principal Arterial Speeds	Rating Factor
Does not enter City Limits	\circ
Some Distance within City Limits	$lackbox{1}$
Mostly within City Limits	

Table 6.3 Rating for Principal Arterial Speed

		EIS Alignments									QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge		
Rating Factor	•	•	0	•	•	•	•	•	0	0	•		

6.2.2 Transportation Demand and Operation

To accommodate existing and future transportation demand on US 93 through the planning horizon of the year 2030 and fulfill the needs and objectives, an alignment must maintain roadway traffic flow at a Level B or better for rural principal arterials and Level C or better for urban principal arterials. Additionally, an alignment would need to have ROW available to provide for non-motorized users. There are three screening criteria under this need.

Rural Arterials

Arterials provide the highest level of mobility, at the highest speed, for long uninterrupted travel. The roadway operational performance standard for a rural principal arterial is a level of service of B or better. To quantify the operational performance of those segments of the various alignments that are likely to perform as a rural principal arterial, the TransCad travel demand model was utilized. The TransCad model was used to evaluate each of the 11 alignments, and the volume-to-capacity (v/c) ratios were examined along both the existing US 93 corridor and the proposed alignment. For the screening, v/c ratios that were less than 0.59 were identified for all of the alignments under existing year conditions (2010) as well as future year conditions (year 2030). V/c ratios less than 0.59 correspond to a level of service of B or better. Accordingly, all proposed alignments were found to operate at a level of service B or better under 2010 and 2030 traffic conditions, and are therefore not explicitly included in Table 6.4. However, the ability of each alignment to pull traffic off US 93 caused a variance in the v/c ratios on the existing US 93. Table 6.4 describes the percentage of the existing US 93, outside of city limits, that operates at a level of service C or worse once traffic is diverted to the respective proposed alignments. The range developed for the rating factors were initially based on third points between 0 and 100 percent, however in reviewing the actual data it was determined to use a range of less than 20 percent, and greater than 60 percent, to realize rating factors that correlated better to the data observed.

Range for Rural LOS B	Rating Factor
Less than 20 percent	\circ
20 to 60 percent	$lackbox{}$
Greater than 60 percent	

Table 6.4 Future (2030) Rural Arterials' Rating

Existing US 93 EIS Alignments QI									QUA	UANTM Alignments		
Rating Factor	1	2	3	4	Е	6	7	8	South	Central	North	
	1	2	3	4	3	O	,	0	Bridge	Bridge	Bridge	
Percent of US 93	100%	23%	23%	11%	23%	23%	11%	11%	23%	11-16%	23%	
(Rural) >0.59	100%	23/0	23/0	11/0	23/0	23/0	11/0	11/0	23/0	11-10/0	23/0	
2030 Rating						•			•			
Factor												

Urban Arterials

The urban principal arterial system serves major metropolitan centers, corridors with the highest traffic volumes, and those with the longest trip lengths. It carries most trips entering and leaving urban areas, and it provides continuity for all rural arterials that intercept urban boundaries. (State of Montana Department of Transportation 2008)

The roadway operational performance standard for an urban principal arterial is a level of service of C or better. To quantify the operational performance of those segments of the various alignments that are likely to perform as an urban principal arterial, the TransCad travel demand model was utilized. The TransCad model was used to evaluate each of the 11 alignments, and the v/c ratios were examined along the existing US 93 corridor and the proposed alignment. For the screening, v/c ratios that were less than 0.79 were identified for all of the alignments under existing year conditions (2010), as well as future year conditions (year 2030). Accordingly, all proposed alignments were found to operate at a level of service C or better under 2010 and 2030 traffic conditions, and are therefore not explicitly included in Table 6.5. However, Table 6.5 does include ratings for the existing US 93 performance under future conditions (year 2030), as noted. The range developed for the rating factors were based on third points between 0 and 100 percent.

Range for Urban LOS C	Rating Factor
Less than 33 percent	\circ
33 to 67 percent	$lackbox{}$
Greater than 67 percent	•

Table 6.5 Future (2030) Urban Arterials' Rating

Existing US 93				QUANTM Alignments							
Rating Factor	1	1 2 3 4 5 6 7 8								Central	North
	1	2	3	Ť	3	O	,	5	Bridge	Bridge	Bridge
Percent of US 93	28%	29%	41%	29%	29%	27%	25%	29%	42%	29-41%	29%
(Urban) >0.79	2070	2370	41/0	2370	2370	2770	23/0	2370	42/0	25-41/0	23/0
2030 Rating											
Factor)))			

Right-of-Way for Non-motorized Users

The availability of right-of-way needed to provide for non-motorized users depends on the current land use of the area through which an alignment crosses. In an urban/developed area, there are multiple buildings and other constraints that could impede the acquisition of land needed for a smaller facility such as a sidewalk or shared bicycle/pedestrian path to accommodate non-motorized users. In areas where there are numerous existing buildings and/or other constraints, the area was considered to be "highly constrained". If the area an alignment crosses is primarily vacant pasture or agricultural land with few existing buildings and/or other constraints, the area was considered to be "minimally constrained". Rating factors were assigned based on field observations regarding the built-up nature along the alignment paths, as well as a review of aerial photographs. Rating factors for this screening criterion are as follows:

Range for ROW Available	Rating Factor
Minimally Constrained Area	\circ
Moderately Constrained Area	
Highly Constrained Area	

Table 6.6 Right-of-Way Available for Non-motorized Users Rating

			QUANTM Alignments								
	1	2	2	4	_	6	7	0	South	Central	North
	1	2	3	4	3	В	/	8	Bridge	Bridge	Bridge
Rating Factor	•	0	0	•	•	0	•	•	0	0	0

6.2.3 Roadway Geometrics

To provide a facility that accommodates the diversity of vehicle types and fulfills the objectives for the US 93 corridor, potential screening criteria were developed that would meet the roadway geometric need and objectives. In order to meet these objectives and needs, an alignment would need to meet

horizontal curve, and road and bridge width, design standards. There are two screening criteria under this need.

Horizontal Curves

Each alignment was reviewed to see if it would meet horizontal curve design standards for the design speed of 65 mph for rural roadways and 45 mph for urban roadways. Although alignment EIS 1 currently passes horizontal curve design standards for the posted speed, it was not designed to meet the design standard for 45 mph through the city limits. Additionally, EIS alignments 4, 7, and 8 are not designed to meet urban design standards of 45 mph at intersections where curves are incorporated. Conversely, all new alignments would be designed to meet the MDT's geometric design standards.

Range for Horizontal Curves Design Criteria	Rating Factor
Meet Design Criteria at 65 mph rural/ 45 mph urban	\bigcirc
Not Able to Meet Design Criteria at 65 mph rural/ 45 mph urbai	n

Table 6.7 Horizontal Curve Design Criteria Rating

			QUANTM Alignments								
	1 2 3 4 5 6 7 8								South Bridge	Central Bridge	North Bridge
Rating Factor	0	0	0	•	0	0	•	•	0	0	0

Bridge and Road Width

The existing Flathead River Bridge does not meet width requirements. Since all alignments would require the construction of a new bridge structure, all new bridge structures would be designed to meet bridge width standards, and therefore pass the bridge width screening criterion. In terms of roadway width, any new roadway would be designed to meet the MDT's road width standards. Conversely, existing roadways would be more difficult to facilitate such a request. Rating factors for design width criteria are as follows:

Range for Width Design Criteria	Rating Factor
Meet Road and Bridge Design Width	\circ
Not Able to Meet Road and Bridge Design Widt	h

Table 6.8 Road and Bridge Design Criteria Rating

			QUANTM Alignments								
	1	1 2 3 4 5 6 7 8								Central Bridge	North Bridge
Rating Factor	•	0	0	•	0	0	•	•	0	0	0

6.2.4 Safety

As stated previously, there is a need to select an alignment that can maintain travel speeds for a principal arterial. In order to maintain the safest roadway environment possible with the desired travel speeds, the selected alignment must manage public access points and private approaches. One way to measure the ability to meet this need is by investigating access density per mile. This is the only screening criterion under this need.

Access Density

In this analysis the total number of access points along each alignment was counted. Access points included each business entrance, private driveway, and street connection. To make this comparison relative to a common unit, the final number of accesses was divided by the total alignment length, in miles, to obtain a density of accesses per mile. Table 6.9 shows the results of this analysis, along with the assigned rating factor.

Range for Access Densities per Mile	Rating Factor
Less than or equal to 5	\circ
6 less than or equal to 14	
Greater than or equal to 15	

Table 6.9 Access Density per Mile Rating

			QUANTM Alignments								
	1	2	3	4	5	6	7	Q	South	Central	North
	1		3	4	3	U	,	8	Bridge	Bridge	Bridge
Access Density per Mile	20	4	4	15	3	3	20	18	4	4	5
Rating Factor	•	0	0	•	0	0	•	•	0	0	0

6.2.5 Livability and Connectivity

To minimize impacts to neighborhoods and to environmental, sensitive, and recreational resources, each alignment was compared with regard to the number of 4(f) / 6(f) resources, residential parcels, sensitive areas, and wetlands impacted, as well as the connectivity to public parks and recreation. There are five screening criteria under this need.

4(f) / 6(f) Resources

The number of 4(f) / 6(f) resources potentially impacted by an alignment ranges from 0 to 4. Potential 4(f) / 6(f) resources impacts, along with their respective rating factors for each alignment, are described in Table 6.10. A potential impact to a 4(f) / 6(f) resource was noted if any portion of an alignment "swath", as shown on Figure 6-1, appeared to touch or cross a defined resource. This was assessed in this manner as a "worst case" scenario. The accounting of potential 4(f) / 6(f) resource impacts does not include potential impacts to eligible historic homes and/or other structures.

Range for 4(f) / 6(f) Resources	Rating Factor
No resource impacted	\circ
1 or 2 resources impacted	lacktriangle
3 or 4 resources impacted	

Table 6.10 4(f) / 6(f) Resources Rating

Aligr	nment ID	4(f) / 6(f) Resource(s) Potentially Impacted *	Number of 4(f) / 6(f) Resources	Rating Factor
	1	Ducharme Park, Waterfront Facilities, Riverside Park, Polson 5-6	4	•
	2	Sports Complex	1	lacktriangle
S	3		0	0
nment	4	Cherry Valley School, Sports Complex	2	•
EIS Alignments	5		0	0
Ш	6	Sports Complex	1	•
	7	Linderman Elementary School, Riverside Park	2	•
	8	Polson 5-6	1	•
	Southern Bridge		0	0
QUANTM Alignments	Central Bridge		0	0
QUANTM	North Bridge	Sports Complex	1	•

[•] Does not include potential impacts to eligible historic homes and/or other structures.

Wetlands

Wetlands were identified throughout the study area and are documented in the Environmental Scan. The number of wetlands potentially impacted by an alignment ranges from zero to four. Comparative results of this analysis are shown in Table 6.11.

Range for Wetlands	Rating Factor
No wetlands impacted	\bigcirc
1 or 2 wetlands impacted	$lackbox{}$
3 or 4 impacted wetlands	

Table 6.11 Wetlands Rating

				QUANTM Alignments							
	1	2	2	4	Е	6	7	8	South	Central	North
	1	2	3	4	3	6	,	0	Bridge	Bridge	Bridge
Wetlands	1	0	1	1	1	2	1	2	0	2	4
Impacted											
Rating				•	•		•				
Factor											

Residential Parcels

The number of residential parcels impacted by an alignment ranges from 4 to 132. To determine the rating factor for this category, the range of residential parcels potentially impacted was divided evenly into three groups: low, medium and high impact. Table 6.12 shows the number of potentially impacted parcels, and rating factor, for each of the alignments.

Range for Residential Parcels	Rating Factor
low impact: 0 to 46 parcels impacted	\circ
medium impact: 47 to 89 parcels impacted	lacktriangle
high impact: > 90 parcels impacted	

Table 6.12 Residential Parcels Impacted

				QUANTM Alignments							
	1	1 2 3 4 5 6	7	8	South	Central	North				
	1	2	3	4	3	O	/	0	Bridge	Bridge	Bridge
Impacted	71	29	19	68	61	68	<46*	132	26-27	17	4-18
Parcels											
Rating											
Factor											

^{*}Note: This assumes the existing roadway for EIS Alignment 7 (one-way couplet) would be reconfigured within the existing right-of-way prism which would therefore only result in impacts where right-of-way for construction would be needed.

Sensitive Areas

Many sensitive areas were identified throughout the study area as documented in the Environmental Scan. The number of sensitive areas potentially impacted by an alignment ranges from 0 to two. Comparative results of this analysis are shown in Table 6.13.

Range for Sensitive Areas	Rating Factor
No sensitive area impacted	\circ
1 sensitive area impacted	lacktriangle
2 sensitive areas impacted	•

Table 6.13 Sensitive Areas Rating

		EIS Alignments									QUANTM Alignments		
	1	2	3	4	Е	6	7	8	South	Central	North		
	1	2	٦	4	J	U	,	0	Bridge	Bridge	Bridge		
Areas	1	1	0	0	1	0	0	0	2	1	2		
Impacted													
Rating													
Factor))									

Connectivity to public parks and recreation

Based on local input, an element of the screening process needed to be responsive to land use plans such as connectivity to public parks and recreation wherever practicable. Rating factors were assigned based on the relative distance through which the alignments traversed the grid system within the city limits. Alignments that were far away from the grid system, or only entered the system for a few blocks, would not provide this desired connectivity. Conversely, alignments that were within the grid of the city had more potential to connect public parks and recreational areas, and were therefore given a more desirable rating. This analysis is shown below.

Range for Connectivity	Rating Factor
Mostly Within City Grid System	\bigcirc
Within Grid and Remote Locations	lacktriangle
Mostly Remote Location	•

Table 6.14 Parks and Recreation Connectivity Rating

				QUANTM Alignments							
	1	2	2 3 4 5 6 7 8	0	South	Central	North				
	1	2	3	4	3	O	/	0	Bridge	Bridge	Bridge
Rating Factor	0	•	•	0	•	•	0	0	•	•	•

6.2.6 Truck Traffic

In the corridor study area, US 93 realizes a diverse mix of traffic, including trucks, recreational vehicles, and tourism related traffic and passenger vehicles. To minimize the impacts of truck traffic to the existing US 93, and fulfill the needs and objectives previously discussed, the TOC found it important to screen alignments based on the length of grades greater than 4 percent. This is the only screening criterion under this need.

Length of Grades

Vertical grades greater than four percent require a design exception. Not only do these steeper grades require a design exception, but they are undesirable for truck drivers. Alignments with steep grades may not draw the desired truck traffic away from the existing US 93 facility, especially in the downtown area. Therefore, the longer lengths of grade, greater than the current MDT design standard of four percent, receive a less desirable rating. To determine the rating factor for this category, the range of lengths was divided into three groups as listed below. Table 6.15 shows the rating factor for each of the alignments.

Range for Length of Grades	Rating Factor
Less than 5000 feet	\circ
5000 to 7500 feet	lacktriangle
Greater than 7500 feet	

Table 6.15 Rating by Length of Grade Greater than Four Percent

					QUANTM Alignments						
	1	2	3	4	_	6	7	8	South	Central	North
	1	2	3	4	3	U	,	0	Bridge	Bridge	Bridge
Length (ft)	8600	6790	6740	>7500	7770	7040	>7500	>7500	4050	6300- 8840	8540
Rating Factor	•	•	•	•	•	•	•	•	0		•

6.2.7 Other

The TOC identified four other criteria in which to screen the alignments. These include the overall planning level cost, the ability of utilities to be incorporated into bridge location and design, community preference, and maintenance cost. Each of these final screening criteria is described herein.

Planning Level Cost

High level planning cost estimates were prepared for each of the eleven potential alignments that were considered. The planning level cost estimates were primarily for construction costs (i.e. did not include

detailed right-of-way costs, project development costs, utility relocation costs, inflation, etc.). To develop the planning level cost estimates, line item costs for cut, fill, borrow, demolition, paving, mass haul, retaining walls, culverts, bridges, footprint areas, and road costs were generated for the alignments. The results of the planning level cost estimates are shown in Table 6.16. The rating factors were measured against the highest range of costs for each alignment, with ranges calculated for the three possible ratings:

Range of Planning Level Costs	Rating Factor
Less than \$30,000,000	\circ
Between \$30,000,000 and \$40,000,000	lacktriangle
Greater than \$40,000,000	

Table 6.16 Planning Level Cost Rating

				QUANTM Alignments							
	1	2	3	4	5	6	7	8	South	Central	North
	1	2	3	4	3	U	,	8	Bridge	Bridge	Bridge
Planning	\$23.7	\$34.7	\$30.4	\$27.8	\$41.0	\$45.0	\$22.1	\$26.9	\$37.0	\$36.0	\$33.0
Level	to	to	to	to	to	to	to	to	to	to	to
Cost	28.4M	41.6M	36.4M	33.4M	44.1M	48.8M	26.5M	32.3M	47.2M	43.5M	39.1M
Rating			0	•							
Factor											

Incorporation of Utilities into Bridge Location and Design

Based on TOC input, it was agreed that any alignment should attempt to be responsive to local sewer and water planning documents. To uphold the goals set forth in these planning documents, rating factors were assigned based on the ability of utility lines (i.e. water and sewer) to be incorporated into the alignment, coupled with the alignment's ability to perpetuate long-term utility needs in accordance with overall infrastructure requirements. As such, alignments closest to the current bridge were rated higher than alignments with bridge locations that would be constructed further away.

Range of Utilities	Rating Factor
North Bridge Location	\circ
Central Bridge Location	lacktriangle
South Bridge Location	

Table 6.17 Utilities Incorporation Rating

	EIS Alignments									QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge	
Rating Factor	0	0		0	•	0	0	0	•		0	

Community Preference

An additional criterion considered in the first level screening process was whether the alignment had the support of the community. Community preference is an important screening criterion because if the community does not support an alignment early in the planning process there is likelihood that the alignment will not be supported as a project moves forward. Community preference was solicited on general corridor areas via written and verbal feedback at the informational meetings, solicitation of comments via the study website, and personal conversations with members of the community. Input from the TOC was offered throughout the process to help refine the community's preferences. EIS Alignments 3, 4, 5, 6 and the Central Bridge Crossing received low support due to various factors, including potential impacts to residential housing areas. EIS Alignments 1, 2, and 7 received a relatively equal amount of support and opposition. EIS Alignment 8, and the South and North Bridge Crossing alignments, received the highest support from the community. Table 6.18 shows the results of the community preference assessment.

Range of Community Preference	Rating Factor
High Community Preference	\bigcirc
Medium Community Preference	lacktriangle
Low Community Preference	

Table 6.18 Rating for Community Preference

				QUANTM Alignments							
	1 2 2 4	Е	6	7	0	South	Central	North			
	1	2	3	4	5	0	/	0	Bridge	Bridge	Bridge
Rating Factor	•	•	•	•	•	•	•	0	0	•	0

Maintenance Cost

A query of the statewide average maintenance cost resulted in an average maintenance cost of \$4300 per lane mile. All new alignments include the maintenance cost of not only the new alignment, but also of the current US 93 alignment. Since all alignments are two-lane facilities, this factor is primarily dependent upon the length of the alignment.

Range of Maintenance Costs	Rating Factor
Less than \$100,000	\circ
Between \$100,000 and \$125,000	
Greater than \$125,000	

Table 6.19 Maintenance Cost Rating

				EIS Alig	nments				QUANTM Alignments				
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge		
Length (mi)	6.5	5.74	6.48	3.25	5.17	6.64	2.6	2.49	6.65	6.06	5.53		
Maintenance. Cost (\$1000)	95	127*	133*	105*	122*	135*	100*	99*	135*	130*	125*		
Rating Factor	0	•	•	•	•	•		0	•	•			

^{*}Note: The cost of maintenance to this alignment includes both the current US 93 facility (approximately \$77,000) and the new alignment.

6.2.8 Weighted Average Scoring

Part of the screening process included querying the TOC to identify which criteria was of most importance and least importance to the constituents they represent. Accordingly, each TOC member was asked to rate the screening criteria into thirds by assigning the top third of the eighteen screening criteria a numerical value of 1, the middle third of the eighteen screening criteria a numerical value of 2, and the bottom third of the screening criteria a numerical value of 3. TOC member scores for each of the criteria were totaled. The results of this exercise are shown in Table 6.20. These totals were divided into four categories of importance. Weighting for the highest importance was given a "1", high importance a "5", medium importance an "8" and lowest importance a "10". Each empty circle was given zero points, each half circle was given half of the category points, and circles that were filled in received the full number of possible points for that screening criterion. Scoring of the objectives is described in Table 6.21.

Table 6.20 Importance of Objectives – Weighted Average Exercise for TOC Entities

Corridor Need & Objectives Screening Criteria		Weightin	g Exercise	– Average	of Each Ent	ity
Corridor Need & Objectives Screening Criteria	CSKT	Lake Co.	City	MDT*	FHWA*	Total Value
System linkage and function						
Ability to implement access control	1	1	3	1	2	8
Ability to maintain principal arterial speeds	3	3	3	1	2	12
Transportation demand and operation						
Maintain roadway traffic flow at LOS B or better (rural principal arterial)	2	2	2	2	2	10
Maintain roadway traffic flow at LOS C or better (urban principal arterial)	1	1	2	2	2	8
ROW available to provide for non-motorized users	2	2	1	2	2	9
Roadway geometrics						
Meet horizontal curve design criteria	2	3	3	3	2	13
Meet road and bridge width design criteria	2	2	2	2	2	10
Safety						
Access density per mile	1	2	1	3	3	10
Livability and connectivity						
Number of 4(f) / 6(f) resources potentially impacted	1	1	1	1	1	5
Number of wetlands potentially impacted	2	1	1	2	2	8
Number of residential parcels potentially impacted	1	1	1	1	1	5
Number of sensitive areas potentially impacted	1	1	1	1	1	5
Connectivity to public parks and recreation	2	2	1	3	3	11

Corridor Need & Objectives Screening Criteria	Weighting Exercise – Average of Each Entity									
Corridor Need & Objectives Screening Criteria	CSKT	Lake Co.	City	MDT*	FHWA*	Total Value				
Truck traffic										
Length of grades greater than 4 percent	3	2	3	2	1	11				
Other										
Overall planning level cost	2	3	3	2	3	13				
Ability of utilities to be incorporated into bridge location and design	3	2	2	3	3	13				
Community preference	1	1	2	1	1	6				
Maintenance cost	3	3	2	3	2	13				

^{*}Note: The weighting exercise for these stakeholders resulted in an average of multiple individuals involved. Rounding of average results led to final values contained in this table.

Table 6.21 Weight Point System Assigned to Screening Criteria

Total Points	Corresponding Level of	Highest Possible Points given to	Corresponding Points for each of the Rating Factors							
from Table 6.20	Importance	Objectives	0	•	•					
5 to 7	Highest Importance	1.0	0.0	0.5	1.0					
8 or 9	High Importance	5.0	0.0	2.5	5.0					
10 or 11	Moderate Importance	8.0	0.0	4.0	8.0					
12 to 14	Low Importance	10.0	0.0	5.0	10.0					

6.2.9 First Level Screening Results

This scoring system helped identify which alignments could be dropped from further consideration and which alignments should be carried forward to the second level of screening. Options with the lowest overall numerical value were kept for further consideration and are detailed in Table 6.22. The remaining alignments, which were dropped from further consideration, are also presented in Table 6.22 for completeness.

US 93 POLSON CORRIDOR PLANNING STUDY
FIRST LEVEL SCREENING CRITERIA

May 10, 2011

Table 6.22 Summary of Corridor Need & Objectives Screening Criteria (First Level)

				QUANTM Alignments							
Corridor Need & Objectives Screening Criteria (highest possible rating value)	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
System linkage and function											
Ability to implement access control (5)	5.0	0.0	0.0	5.0	2.5	0.0	5.0	5.0	0.0	0.0	0.0
Ability to maintain principal arterial speeds (10)	10.0	5.0	0.0	10.0	5.0	5.0	10.0	10.0	0.0	0.0	5.0
Transportation demand and operation					,	_					
Maintain 2030 roadway traffic flow at LOS B or better (rural principal arterial) (8)	8.0	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	4.0
Maintain 2030 roadway traffic flow at LOS C or better (urban principal arterial) (5)	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	2.5	0.0
ROW available to provide for non-motorized users (5)	5.0	0.0	0.0	5.0	2.5	0.0	5.0	5.0	0.0	0.0	0.0
Roadway geometrics						_	Ť				_
Meet horizontal curve design criteria (10)	0.0	0.0	0.0	10.0	0.0	0.0	10.0	10.0	0.0	0.0	0.0
Meet road and bridge width design criteria (8)	8.0	0.0	0.0	8.0	0.0	0.0	8.0	8.0	0.0	0.0	0.0
Safety					V	,					
Access density per mile (8)	8.0	0.0	0.0	8.0	0.0	0.0	8.0	8.0	0.0	0.0	0.0
Livability and connectivity					V	,					
Number of 4(f) / 6(f) resources potentially impacted (1)	1.0	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.0	0.0	0.5
Number of wetlands potentially impacted (5)	2.5	0.0	2.5	2.5	2.5	2.5	2.5	2.5	0.0	2.5	5.0
Number of residential parcels potentially impacted (1)	0.5	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.0	0.0	0.0
Number of sensitive areas potentially impacted (1)	0.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	1.0	0.5	1.0

US 93 Polson Corridor Planning Study

First Level Screening Criteria

May 10, 2011

				EIS Alig	nments				QUANTM Alignments			
Corridor Need & Objectives Screening Criteria (highest possible rating value)	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge	
Connectivity to public parks and recreation (8)	0.0	4.0	8.0	0.0	4.0	4.0	0.0	0.0	8.0	8.0	4.0	
Truck traffic												
Length of grades greater than 4 percent (8)	8.0	4.0	4.0	8.0	8.0	4.0	8.0	8.0	0.0	8.0	8.0	
Other												
Overall planning level cost (10)	0.0	10.0	5.0	5.0	10.0	10.0	0.0	5.0	10.0	10.0	5.0	
Ability of utilities to be incorporated into bridge location and design (10)	0.0	0.0	5.0	0.0	5.0	0.0	0.0	0.0	10.0	5.0	0.0	
Community preference (1)	0.5	0.5	1.0	1.0	1.0	1.0	0.5	0.0	0.0	1.0	0.0	
Maintenance cost (10)	0.0	10.0	10.0	5.0	5.0	10.0	5.0	0.0	10.0	10.0	5.0	
Screen Result	57	38.5	42	68.5	50.5	41.5	62.5	63	45.5	51.5	37.5	

Based on results of the first level of screening, it can be seen that five (5) alignment options score lowest out of the eleven total alignments considered. These five (5) alignments were selected based on their point ratings as measured against all 11 alignments. The point ratings for each alignment that were within a range of 10 points or less were identified and selected for consideration. These include the following:

- North bridge crossing (score of 37.5)
- EIS alignment 2 (score 38.5)
- EIS alignment 6 (score 41.5)
- EIS alignment 3 (score 42)
- South bridge crossing (score 45.5)

The remaining six (6) alignments that scored outside the point margin were dropped from further consideration. Reasons for exclusion of each of the alternatives are detailed below.

EIS Alignment 1

Alignment 1 was unable to accommodate eight of the 18 screening criteria and was moderately able to accommodate 4 other screening criteria. Because this alignment traverses the heart of Polson's business district, there is a high access density. It would be difficult to implement access control throughout the urban sections of this alignment. It would also be difficult to receive the public's and businesses' support for widening the roadway footprint to accompany non-motorized users, or to bring the roadway up to current MDT design standards. Although this alignment is being dropped from further consideration, there will be improvements required along the existing US 93 during the twenty-year planning horizon. Potential improvements to the existing US 93 will be identified in the Polson Area Transportation Plan, which is currently under development at this time.

This alignment has the potential to impact a moderate number of residential parcels and sensitive areas, and has the potential to impact the highest number of 4(f) and 6(f) resources. This alignment received minimal support from the community.

EIS Alignment 4

Alignment 4 was unable to meet eight of the 18 screening criteria and was moderately able to meet five other screening criteria. Because this alignment travels through the existing roadway network and residential part of the city of Polson, this alignment has a very high access density throughout its urban section. This alignment would be unable to implement access control.

With the constrained environment surrounding the urban portion of this alignment, this alignment would be unable to provide additional ROW needed for non-motorized users or to upgrade the existing transportation facility to the current MDT roadway design standards. Due to the sharp horizontal curves

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throughout this alignment, the desired standard for a 45 mph urban principal arterial would not be met. This alignment also had steep grades, which would deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and residential parcels, and was not an alignment desired by the community. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 5

Alignment 5 was unable to meet three screening criteria. It was only moderately able to meet 10 additional screening criteria. Because a large portion of the length of this alignment travels through the city limits of Polson, the posted speed limit would be reduced to that of an urban principal arterial. The slower urban principal arterial speed, coupled with the number of long grades over four percent, could deter trucks from using this route.

This alignment travels through a large amount of remote, virgin terrain which has minimal connections to Polson's transportation grid system. With only minimal connections to the existing transportation system, this alignment is moderately able to provide connectivity to public parks and recreation facilities. A high overall construction cost and moderate maintenance cost also played a factor in this alignment's elimination.

This alignment had the potential to impact a moderate number of residential parcels and sensitive areas. Additionally, this alignment did not receive support from the community and was therefore not a preferred alignment. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 7

Alignment 7 was unable to meet seven screening criteria and was moderately able to meet four additional screening criteria. Because this alignment travels through the roadway network and residential/commercial part of the city of Polson, this alignment has a very high access density throughout its urban section. This alignment would be unable to accommodate access control.

Due to the horizontal curves near the two bridges for this alignment, the desired criteria for a 45 mph urban principal arterial would not be met. This alignment also had steep grades and a slower speed associated with an urban arterial, which would deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and received mixed feedback regarding its preference from the community. Additionally, this alignment would require two new bridges, and potentially impact the downtown core, especially in light of recent streetscape improvements to Main Street. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 8

Alignment 8 was unable to meet eight screening criteria and was moderately able to meet three additional screening criteria. Because this alignment travels through the roadway network and residential/commercial part of the city of Polson, this alignment has a very high access density throughout its urban section. Similarly, this alignment would be unable to implement access control.

With the constrained environment surrounding the urban portion of this alignment, this alignment would be unable to provide additional ROW needed for non-motorized users or to upgrade the existing transportation facility to the current MDT roadway design standards. Due to the right angle horizontal curve near the bridge for this alignment, the desired criteria for a 45 mph urban principal arterial would not be met. This alignment also had steep grades, which may deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and a large number of residential parcels. All of the factors described above caused this alignment to be dropped from further consideration.

Central Bridge Crossing

The Central Bridge Crossing alignment was unable to meet five screening criteria and was moderately able to meet five additional criteria. A high overall construction cost and maintenance cost played a factor in the Central Bridge Crossing's elimination. All of the factors described above caused this alignment to be dropped from further consideration.

6.2.10 Refined Hybrid Alignments

Community input, coupled with direction from the TOC, led to slight modifications of the five selected alignments to minimize residential impacts near Ponderrilla Hills. Since the original EIS alignments numbers 2 and 3 are relatively close to the Quantm generated alignments of the southern bridge crossing and the northern bridge crossing, a hybrid was developed between the southern bridge crossing alignment and EIS alignment number 3. A second hybrid was developed between the northern bridge crossing alignment and EIS alignment number 2. These two hybrid alignments, referred to as the "southern bridge crossing hybrid alignment" and the "northern bridge crossing hybrid alignment" respectively, are shown on Figure 6-2 on the following page. The third alignment under consideration, EIS 6, has been modified slightly from that presented in the 1995 EIS to follow the existing roadway of Ponderilla Drive. Should this alignment screen highest in the second level of screening, it is recommended to further explore modifications to deviate from Ponderilla Drive by traversing to the southeast along the irrigation canal system before tying into Kerr Dam Road.

The three hybrid alignments described above, and shown in Figure 6-2, are recommended to be carried forward into the second level of screening. The three hybrid alignments are reflective of the results of the first level screening, and capture the analysis results accordingly. It is noted that the three hybrid alignments are planning level "swaths" that may be subject to additional modifications after the second level of screening is completed.

Short Report Page 1 of 1

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Green Ratio		0.77	0.77		0.87	0.84			0.10			0.10	
Uniform Dela	ay d ₁	2.9	4.2		1.7	1.9			48.5			44.0	
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v/c Ratio		0.0	0	0.54		0.16	0.45		<u> </u>	2.39				0.06	
Green Ratio		0.7	7	0.77		0.87	0.84			0.10	<u> </u>			0.10	
Uniform Dela	ay d ₁	2.9)	4.9		2.8	2.1			48.5				43.8	
Delay Factor	k	0.1	1	0.14		0.11	0.11			0.50				0.50	
Incremental I	Delay d ₂	0.0)	0.4		0.1	0.2			645.2				0.8	
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Control Delay			9	5.3		2.9	2.3			693.7				44.6	
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Approach De	elay			5.3			2.4			693.7				44.6	
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	Effective Gree				2.0	2.0	-		2.0	╀	_	2.0	
Arrival Type		3	3		3	3	_	-	3	-	+-	3	┼
Unit Extension		3.0	3.0		3.0	3.0		\vdash	3.0	<u> </u>		3.0	
Ped/Bike/RT	OR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Parking/Grad	do/Porkina	12.0 N	12.0 0	N	12.0 N	12.0 0	N	N	12.0 0	N	H _N	12.0 0	N
Parking/Hou		14		//	1 //		11	/\ 		11	- 14	+ -	111
Bus Stops/H		0	0		0	0			0	╁		0	
	destrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02		03	0.	4	NS Pe	rm	06	Ī	07	<u> </u>	08
Timing		G = 0.0		0.0	G = (G = 68	.0	G = 0.0		G = 0.0	G =	
	Y = 3 Analysis (hrs) =	Y = 0	Y =	0	Y = ()	Y = 3		Y = 0		Y = 0 $C = 140.$	Y =	0
	up Capacity		l Dela	v and	LLOS	Detern	ninatio	n	Oycie Lei	igui	0 = 140.	<u> </u>	
	ap Capacity	1	EB	y, and	T	WB	············	T	NB			SB	
Adjusted Flo	w Rate	12	549	Π	139	301	1	1	246	Т		59	T
Lane Group		415	845	 	223	871	†		717	\vdash		761	\vdash
v/c Ratio	1 7	0.03	0.65		0.62	0.35	 		0.34	\vdash		0.08	\vdash
Green Ratio		0.47	0.47		0.47	0.47	 		0.49	\vdash		0.49	\vdash
Uniform Dela		19.8	28.2	 	27.7	23.4	 		22.2	\vdash		19.2	1
Delay Factor	- 1	0.50	0.50		0.50	0.50		\vdash	0.50	+	+	0.50	\vdash
Incremental		0.30	3.9	\vdash	12.4	1.1	╁	\vdash	1.3	\vdash		0.2	╁
PF Factor	, -2	1.000	1.000	-	1.000	1.000	_	\vdash	1.000			1.000	\vdash
Control Dela	V	20.0	32.0		40.1	24.5	 		23.5	\vdash		19.4	
Lane Group		В	C		D	C	 	\vdash	C	\vdash	-	В	\vdash
Approach De		+-	31.8	<u> </u>	+-	29.4	<u> </u>	\vdash	23.5			19.4	
Approach LC		+	C			C 29.4			C			B	
Intersection		+	28.9		+		Intersec	tion !			\dashv	C	
mersection	Delay		20.9				CS+ TM Ve				Generated	U	

				SI	HORT	REPO	RT						
General Info	ormation						formati	on					
Analyst Agency or C Date Perforn Time Period	ned <i>5/10/2011</i>	rithout byp	oass			Interse Area T Jurisdi Analys	уре	Str	d Avenue eet E other area 30		*& 1st		
Volume and	l Timing Input												
			EB			WB	,		NB			SB	
Niverban of I		LT	TH	RT	LT	TH	RT	LT	TH	R		TH	RT
Number of L	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	.\	L	TR	00	L 120	TR	7	170	LTR	22	4 20	LTR	25
Volume (vph		12	441	99	120	486	7	173	25	22	_	47	25
% Heavy Ve	nicies	2	2	2	2	2	2	2	2	2		2	2
PHF Protimod/Ass	tuotod (D/A)	0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.9		0.92	0.92
Pretimed/Ac	· , , ,	P 2.0	P	P	P	P	P	P	P 2.0	P	P	P 2.0	P
Startup Lost	Effective Green	2.0	2.0		2.0	2.0	-		2.0	\vdash	+	2.0	+
	Effective Green		2.0		2.0	2.0	\vdash	_	2.0	\vdash		2.0	+
Arrival Type		3	3		3	3	-		3	╀	_	3	+
Unit Extension		3.0	3.0 0	0	3.0	3.0	1	0	3.0	0	0	3.0	0
Ped/Bike/RT	OR volume	0	12.0	U	0	12.0	0	0		0	- 0		0
Lane Width Parking/Grad	do/Parking	12.0 N	0	N	12.0 N	0	N	N	12.0 0	N	N	12.0	N
Parking/Hou		177		//	1 //		17	1 / /	10	11	17	+ -	1 //
Bus Stops/H		0	0		0	0			0	\vdash		0	1
	destrian Time	1	3.2			3.2			3.2			3.2	
Phasing	EW Perm	02		03	0.	4	NS Pe	rm	06	Ì	07	Ť	08
Timing		G = 0.0		0.0	G = (G = 84	.0	G = 0.0	_	G = 0.0	G =	
	Y = 3 Analysis (hrs) =	Y = 0	Y =	0	Y = ()	Y = 3		Y = 0 Cycle Lei	_	Y = 0	Y =	0
	up Capacity		l Dela	v and	LLOS	Detern	ninatio	n l	Oycle Lei	igui	0 = 173	<i></i>	
	ap capacity	1	EB	y, and	<u> </u>	WB	matic	T	NB		1	SB	
Adjusted Flo	w Rate	13	587	Π	130	536	1		455	Т	_	120	1
Lane Group		260	900	 	223	924	†		649	\vdash	\dashv	655	1
v/c Ratio	1 7	0.05	0.65	\vdash	0.58	0.58	 	t	0.70	\vdash	\dashv	0.18	†
Green Ratio		0.50	0.50		0.50	0.50	 		0.47	\vdash	\dashv	0.47	†
Uniform Dela		23.2	33.5	\vdash	31.9	31.8	 		37.6	\vdash	-	27.6	
Delay Factor	- '	0.50	0.50		0.50	0.50	_	\vdash	0.50	\vdash	+	0.50	+
Incremental		0.30	3.7	\vdash	10.7	2.7	_	\vdash	6.2	\vdash	_	0.6	+
PF Factor	- o.a, a ₂	1.000	1.000		1.000	1.000		\vdash	1.000	\vdash	+	1.000	+
Control Dela	V	23.6	37.1		42.5	34.5	 		43.8	\vdash	+	28.2	1
Lane Group		C	D	\vdash	D D	C	╁	\vdash	D	\vdash	\dashv	C	+
Approach De		╅	36.9		+	36.0	<u> </u>	 	43.8	1	+	28.2	1
Approach LC		+				D		\vdash	43.6 D		\dashv	C	
Intersection		+	37.7				Intersec	tion!			_	D	
mersection	University of Florida						CS+ TM V				Generate		

				SI	HORT	REPO	RT						
General Info	ormation					Site Ir	nformati						
Analyst Agency or Condition Date Perform Time Period	ned <i>5/10/2011</i>	hout Byr	oass			Interso Area Jurisd Analys	Гуре	Stre	ther area		Main		
Volume and	l Timing Input												
			EB	Y		WB	1		NB			SB	
Nl Cl.		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of L	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	`	L	TR	407	L	TR	111		LTR		<u> </u>	LTR	
Volume (vph	·	12	415	137	117	241	14	3	5	3	4	5	1
% Heavy Ve	hicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Act	` '	Α	Α	Α	Α	A	Α	P	P	P	P	P	Р
Startup Lost		2.0	2.0		2.0	2.0	-	<u> </u>	2.0			2.0	
	Effective Green	2.0	2.0		2.0	2.0	-	ļ	2.0	<u> </u>	<u> </u>	2.0	
Arrival Type		3	3		3	3			3			3	
Unit Extension		3.0	3.0		3.0	3.0	ļ		3.0		ļ	3.0	
Ped/Bike/RT	OR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0		12.0	12.0	ļ	<u> </u>	12.0		<u> </u>	12.0	
Parking/Grad		Ν	0	N	N	0	N	N	0	N	N	0	Ν
Parking/Hou		_					-						
Bus Stops/H	destrian Time	0	<i>0</i> 3.2		0	3.2	+	_	3.2			3.2	
Phasing	EW Perm	02		03	0.	<u> </u>	NS Pe	rm I	06	<u> </u>	<u>1</u> 07	<u> </u>)8
		= 0.0		0.0	G = (G = 17		3 = 0.0	G =	: 0.0	G =	
Timing	Y = 3 Y	= 0	Y =		Y = (Y = 3	١	′ = 0	Y =	: 0	Y =	0
	Analysis (hrs) = 0								Cycle Ler	ngth C =	: 140.0)	
Lane Grou	up Capacity, (Contro		y, and	LOS		ninatio	n					
		_	EB	1	ļ	WB	1		NB			SB	
Adjusted Flo	w Rate	13	600		127	277	<u> </u>		11			10	
Lane Group	Capacity	908	1498		632	1544			210			211	
v/c Ratio		0.01	0.40	ļ	0.20	0.18		<u> </u>	0.05			0.05	
Green Ratio		0.84	0.84		0.84	0.84			0.12			0.12	
Uniform Dela	ay d ₁	1.9	2.8		2.3	2.2			54.4			54.3	
Delay Factor	r k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	Delay d ₂	0.0	0.2		0.2	0.1			0.5			0.4	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	ıy	1.9	3.0		2.4	2.3			54.9			54.8	
Lane Group	LOS	Α	Α		Α	Α			D			D	
Approach De	elay		3.0			2.3	*		54.9	-		54.8	
Approach LC	DS .		Α			Α			D			D	
Intersection	Delay		3.8				Intersec	tion LC)S			Α	$\overline{}$
	University of Florida, A	All Riahts R				н	S+ TM Ver			Ger	nerated: 5	5/11/2011	12:18 PM

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				SI	HORT	REPO	RT						
General Info	rmation					Site Ir	nformati	on					
Analyst Agency or Co Date Perforn Time Period	ned <i>5/10/2011</i>		oass			Interse Area T Jurisd Analys	Гуре	Stre	other area		Main		
Volume and	Timing Input												
			EB			WB	1	ļ . <u></u>	NB		ļ	SB	
Number of L	222	LT 1	TH 1	RT 0	LT 1	TH 1	RT 0	LT 0	TH 1	RT 0	LT 0	TH 1	RT 0
Lane Group	aries	' L	TR		L	TR	10		LTR		0	LTR	
Volume (vph	\	14	507	115	134	547	8	135	20	174	111	19	134
% Heavy Vel	<u> </u>	2	2	2	2	2	2	2	2	2	2	2	2
PHF	Tilcles	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Act	tuated (P/A)	0.92 A	0.92 A	A	0.92 A	0.92 A	0.92 A	0.92 P	P	0.92 P	P P	0.92 P	0.92 P
Startup Lost		2.0	2.0	^	2.0	2.0	1	 '	2.0	'	+'-	2.0	+
<u> </u>	Effective Greer		2.0	 	2.0	2.0	+	 	2.0	 	+	2.0	+
Arrival Type	Lifective Oreer	3	3	╁	3	3		╫	3		╁	3	┼──
Unit Extension	n .	3.0	3.0	-	3.0	3.0	+		3.0		╁	3.0	┼──
Ped/Bike/RT		0	0	0	0	0	0	0	0.0	0	0	0	0
Lane Width	OK Volume	12.0	12.0	+	12.0	12.0	+ -	 	12.0		╁	12.0	╁
Parking/Grad	de/Parking	N	0	N	N	0	$\frac{1}{N}$	N	0	N	l _N	0	N
Parking/Hou		1	_					1	1		 		
Bus Stops/H		0	0		0	0			0			0	
Minimum Pe	destrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02		03	0		NS Pe		06		07		08
Timing		G = 0.0 $Y = 0$	G = Y =	0.0	G = 0		G = 17 $Y = 3$		G = 0.0 $Y = 0$		= <i>0.0</i> = <i>0</i>	G = Y =	
Duration of A	nalysis (hrs) =		1 =	: 0	11 = 0	,	1 = 3		T = 0 Cycle Ler				<u>U</u>
	up Capacity,		l Dela	ıv, and	LOS	Deterr	ninatio		- ,				
			EB	,		WB			NB			SB	
Adjusted Flo	w Rate	15	676		146	604			358			288	
Lane Group		629	1513		577	1554			135			132	
v/c Ratio		0.02	0.45		0.25	0.39			2.65			2.18	
Green Ratio		0.84	0.84		0.84	0.84			0.12			0.12	
Uniform Dela	ay d ₁	1.9	3.0		2.4	2.8			61.5			61.5	
Delay Factor	·k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	Delay d ₂	0.0	0.2		0.2	0.2			764.2		İ	555.9	
PF Factor	- 2		1.000		1.000	1.000			1.000			1.000	
Control Dela	у	1.9	3.2		2.6	3.0			825.7			617.4	
Lane Group	LOS	Α	Α		Α	Α			F			F	
Approach De	elay		3.2			2.9	•		825.7	-		617.4	
Approach LC)S		Α			Α			F			F	
Intersection I	Delay		228.9				Intersec	tion LC	DS .		1	F	
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						SH	HORT	REP	OR	RT								
General Info	ormation							Site	Info	ormatio	on							
Analyst Agency or Co Date Perform		า						Inter			He	eritag	Shore ge Ln er area		ad &			
Time Period	AM Peak (EIS 6)	with	out by	oas.	S			Juris		tion S Year	20	010						
Volume and	Timing Inpu				7 ti iai	yold	, rour		-10									
				_	EB			WI					NB				SB	
			LT	_	TH	RT	LT	TI	<u> </u>	RT	_	_T	TH	╀	RT	LT	TH	RT
Number of La	anes			_	2	0	1	1			 	1		╀	1	<u> </u>	 	+
Lane Group				<u> </u>	R		L	T						╀	R			
Volume (vph				_	17	103	19	290)		4			╀	5			1
	hicles			-	2	2	2	2		ļ	2			Ļ	2	<u> </u>	ļ	
PHF				0.	78	0.71	0.54	0.8	5		0.1	71		(0.50			\bot
	. ,			_	4	Α	Α	A			F			퇶	Р		ļ	\downarrow
Startup Lost	Time			2	.0		2.0	2.0)		2.	.0			2.0			
Extension of	imed/Actuated (P/A) tup Lost Time nsion of Effective Green ral Type Extension /Bike/RTOR Volume e Width ring/Grade/Parking ring/Hour Stops/Hour mum Pedestrian Time sing EW Perm			2	.0		2.0	2.0)		2.	.0			2.0			
Arrival Type				,	3		3	3			3	3			3			
Unit Extension	Extension /Bike/RTOR Volume e Width king/Grade/Parking /king/Hour			3	.0		3.0	3.0)		3.	0			3.0			
Ped/Bike/RT	/Bike/RTOR Volume e Width king/Grade/Parking				0	0	0	0)	0		0	0	0	
Lane Width	e Width			12	2.0		12.0	12.	0		12	2.0			12.0			
Parking/Grad	king/Grade/Parking /		Ν	(0	Ν	N	0		Ν	1	V	0		Ν	N	0	N
Parking/Hou	king/Hour													L				
Bus Stops/H					0		0	0			(0		퇶	0			\bot
	v	1		3	.2		<u> </u>	3.2	_			,	3.2	<u> </u>			3.2	
Phasing	<u> </u>	Ļ	02			03	04			NB On			06			07	G =	08
Timing					G = Y =		G = C		_	3 = 15. $4 = 3$	0	Y =	0.0		G = Y =		Y =	
Duration of A							1 - 0					_	de Len	gth				Ŭ
Lane Grou	up Capacity	y, C	ontro) I C	Dela	y, and	LOS	Dete	mi	inatio	n							
					EB			WE	3				NB				SB	
Adjusted Flo	w Rate			42	23		35	341			68			10	0			
Lane Group	Capacity			28	352		799	1579	7		192			17	72			
v/c Ratio				0.	15		0.04	0.22			0.35	5		0.0	06			
Green Ratio				0.0	85		0.85	0.85			0.11	1		0.1	11			
Uniform Dela	ay d ₁			1.	.8		1.7	2.0	П		57.0			55	.2			
Delay Factor	·k			0.	11		0.11	0.11	╗		0.50)		0.5	50			
Incremental	Delay d ₂			C	0.0		0.0	0.1	T		5.1			0.	.6			
PF Factor				1.0	000		1.000	1.000	7		1.00	00		1.0	000			
Control Dela	у			1	.9		1.7	2.0			62.	1		55	5.8			
Lane Group	LOS			/	4		Α	Α	\dashv		Е	\neg		Ε				
Approach De	elay			1	1.9			2.0					61.3					•
Approach LC)S				A			Α					E		o			
Intersection I		\dashv			7.2				In	ntersect	ion l	LOS			\dashv		Α	
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HCS+TM Version 5.4

						SH	IORT I	REP)R	RT							
General Info	ormation							Site I	nfo	ormatio	on						
Analyst Agency or C Date Perform	ned <i>5/5/11</i>							Inters	Ту	ре	Herita	n Shore age Ln her area		ad &			
Time Period		with	nout by	oas.	S			Juriso		tion s Year	2010						
Volume and	, ,			7													
	<u> </u>		ļ	WE				NB				SB					
			LT	$\overline{}$	TH	RT	LT	Th	<u> </u>	RT	LT	TH	+	RT	LT	TH	RT
	anes				2	0	1	1			1		_	1			
Lane Group				_	R		L	T			L		4	R	ļ	 	╀
Volume (vph				_	52	252	26	284			264		_	24			╀
	Heavy Vehicles F timed/Actuated (P/A) rtup Lost Time ension of Effective Green val Type t Extension d/Bike/RTOR Volume o e Width				2	2	2	2			2	4	╀	2	↓	╄	↓
PHF	etimed/Actuated (P/A) artup Lost Time tension of Effective Green ival Type it Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking N				95	0.82	0.71	0.87			0.97		(0.83	<u> </u>		
	Itume (vph) Heavy Vehicles IF etimed/Actuated (P/A) artup Lost Time tension of Effective Green ival Type it Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time asing EW Perm Offerication			4	Α	Α	A		ļ	P			Р	<u> </u>	<u> </u>	 	
Startup Lost	ne Group ume (vph) Heavy Vehicles F stimed/Actuated (P/A) urtup Lost Time tension of Effective Green ival Type it Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time asing EW Perm Ty = 3 Ty =				.0		2.0	2.0)		2.0			2.0			
Extension of	Interpretation of Analysis (hrs) = 0.2 Jume Group Jume (vph) Heavy Vehicles Jetimed/Actuated (P/A)			.0		2.0	2.0)		2.0	<u> </u>	Ļ	2.0	<u> </u>			
Arrival Type				,	3		3	3			3		╧	3			
Unit Extension	In Period (EIS 6) Itume and Timing Input Imber of Lanes Ine Group Itume (vph) Heavy Vehicles It Iteration of Effective Gree Inival Type Iteration of Effective Gree Ite				2.0		3.0	3.0)		3.0			3.0		<u> </u>	
Ped/Bike/RT	Interpretation of the composition of the compositio				0	0	0	0			0	0		0	0	0	
Lane Width	it Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time				2.0		12.0	12.	0		12.0			12.0			
	rking/Grade/Parking			(0	Ν	N	0		N	N	0	╀	Ν	N	0	N
Parking/Hou													_		ļ	 	╀
	rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time				0		0	0		_	0	1	+	0	 	1	
	king/Grade/Parking king/Hour s Stops/Hour simum Pedestrian Time asing EW Perm G = 117.0 G =			3		00	1 0	3.2	_	ND O	<u> </u>	3.2			0.7	3.2	
<u> </u>		<u> </u>					G = C			NB Onl		06 = 0.0		G =	07 0.0	G =	08 0.0
Timing							Y = 0		_	$rac{3 - 70.}{1}$		= 0		Y =		Y =	
Duration of A	Analysis (hrs) =	= 0.2	25								С	ycle Ler	ngth	n C =	144.0)	
Lane Gro	up Capacity	, C	Contro			y, and	LOS [Deter	mi	<u>inatio</u>	n						
					EB	1		WB				NB				SB	
Adjusted Flo	w Rate			-			37	326	4		272	<u> </u>	2	9			
Lane Group	Capacity			26	586		579	1514			234		20	9			
v/c Ratio				0.2	25		0.06	0.22			1.16		0.1	14			
Green Ratio				0.8	81		0.81	0.81			0.13		0.1	13			
Uniform Dela	hasing EW Perm G = 117.0 Y = 3 uration of Analysis (hrs) = ane Group Capacity djusted Flow Rate ane Group Capacity c Ratio			3.	.2		2.7	3.1			62.5		55	.3			
Delay Factor	rk			0.	11		0.11	0.11	\downarrow		0.50		0.5	50			
Incremental	Delay d ₂			C	0.0		0.0	0.1			109.7		1	.4			
PF Factor				1.	000		1.000	1.000	7		1.000		1.0	000			
Control Dela	een Ratio form Delay d ₁ ay Factor k remental Delay d ₂ Factor			3	3.2		2.7	3.1			172.2		56	5.6			
Lane Group	LOS				4		Α	Α			F		E	=			
Approach De	elay			3	3.2			3.1				161.1					
Approach LC	os				Α			Α				F					
Intersection	Delay			3	8.6				Ir	ntersect	ion LO	S				D	
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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY			
General Information	<u> </u>		Site I	nform	natio	on .			
Analyst	N. Fosse	n	Interse	otion			US 93 & I	Pooley Po	int Dood
Agency/Co.	CDM		Jurisdi				03 93 & 1	NOCKY FO	iiii Noau
Date Performed	5/11/201		Analys	sis Yea	r		2030		
Analysis Time Period	AM Peak 6)	without bypass (E	IS		_				
Project Description			•						
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	ents							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	<u> </u>	T (0.5	R			L	T		R
Volume (veh/h) Peak-Hour Factor, PHF	5 0.92	435	1.00			1.00	0 0.92		0
Hourly Flow Rate, HFR	0.92	0.92	1.00	'		1.00	0.92		0.92
(veh/h)	5	472	0			0	0		0
Percent Heavy Vehicles	0					0			
Median Type			,	Undi	vided	1			
RT Channelized			0				ļ		0
Lanes	0	1	0			0	1		0
Configuration	LT		<u> </u>						TR
Upstream Signal		0					0		
Minor Street		Northbound	1 ^			10	Southbou	ınd	10
Movement	7	8	9			10	11		12
V(-1 (1 /1)	L	Т	R			L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	1.00	1.00	1.00	$\overline{}$		171	1.00		6
Hourly Flow Rate, HFR		1.00	1.00			0.92	1.00		0.92
(veh/h)	0	0	0			185	0		6
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N	<u> </u>				N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a		1							
Approach	Eastbound	Westbound		Northb	ound		S	outhbour	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	5							191	
C (m) (veh/h)	1636							554	Ī
v/c	0.00							0.34	1
95% queue length	0.01							1.53	
Control Delay (s/veh)	7.2							14.9	1
LOS	A						<u> </u>	В	
Approach Delay (s/veh)				1		<u> </u>		14.9	
Approach LOS							 	B	
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	TW	O-WAY STOP	CONTR	OL S	UMN	MARY			
General Information	n		Site I	nforn	natio	on			
Analyst	N. Fosse	n	Interse	ction			US 93 & I	Rocky Poi	nt Road
Agency/Co.	CDM		Jurisdi	ction					
Date Performed	5/10/201		Analys	is Yea	ır		2030		
Analysis Time Period	PM Peak	without bypass							
Project Description			,						
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme				ı				
Major Street		Eastbound					Westbou	nd	
Movement	1 1	2	3		<u> </u>	4	5		6
\/ a /a . /b \	L	327	R		 	L	T		R
Volume (veh/h) Peak-Hour Factor, PHF	0.92	0.92	1.00	1	┝	1.00	0 0.92		0 0.92
Hourly Flow Rate, HFR			1		 	1.00			
(veh/h)	1	355	0			0	0		0
Percent Heavy Vehicles	0					0			
Median Type				Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ınd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)						112			2
Peak-Hour Factor, PHF	1.00	1.00	1.00			0.92	1.00		0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			121	0		2
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Eastbound	Westbound	1	Northb	ound		S	outhboun	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	Ī
v (veh/h)	1							123	
C (m) (veh/h)	1636							649	
v/c	0.00							0.19	
95% queue length	0.00							0.69	1
Control Delay (s/veh)	7.2						i i	11.8	1
LOS	A							В	
Approach Delay (s/veh)						1		11.8	
Approach LOS							 	B	
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	TW	O-WAY STOP	CONTR	OL SU	JMN	/IARY				
General Information	n		Site I	nform	atio	on .				
Analyst	N. Fosse	n	Interse	action			12. US 9	3 & <i>Irv</i>	ine F	lats
Agency/Co.	CDM	11	─ 				Road			
Date Performed	5/10/201	1	Jurisdi				2000			
Analysis Time Period		without bypass	Analys	sis Year	•		2030			
Drainat Description										
Project Description East/West Street: US 9	3		North/9	South S	troo	t: Irvine F	lats Road			
Intersection Orientation:						: 0.25	iais riodu			
Vehicle Volumes ar		nte	Jetaay .	004 (. 0.20				
Major Street		Eastbound		Т			Westbou	ınd		
Movement	1	2	3			4	5	1		6
	L	Т	R			L	T			R
Volume (veh/h)	5	546	8			0	0			0
Peak-Hour Factor, PHF	0.92	0.92	0.92	·]		0.92	0.92		(0.92
Hourly Flow Rate, HFR (veh/h)	5	593	8			0	0			0
Percent Heavy Vehicles	0					0				
Median Type				Undiv	ided	1				
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LTR					LTR				
Upstream Signal		0					0			
Minor Street		Northbound					Southboo	und		
Movement	7	8	9			10	11			12
	L	T	R			L	Т			R
Volume (veh/h)	0	0	6							
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>		0.25	0.25		(0.50
Hourly Flow Rate, HFR (veh/h)	0	0	6			0	0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	0			0
Configuration		LTR					ļ			
Delay, Queue Length, a	nd Level of Se	T								
Approach	Eastbound	Westbound	1	Northbo	und] 5	Southb	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LTR	LTR		LTR	2					
v (veh/h)	5	0		6						
C (m) (veh/h)	1636	986		507						
v/c	0.00	0.00		0.01	1					
95% queue length	0.01	0.00		0.04	_					
Control Delay (s/veh)	7.2	8.7		12.2			1			
LOS	A	A		В						
Approach Delay (s/veh)				12.2	,					<u> </u>
Approach LOS				72.2 В			 			
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	TW	O-WAY STOP	CONTR	OL SU	M۱	/IARY				
General Information	1		Site I	nforma	atic	n				
Analyst	N. Fosse	n	Interse	oction			12. US 9	3 & <i>Irv</i>	ine F	lats
Agency/Co.	CDM	11	I				Road			
Date Performed	5/10/201	1	Jurisdi							
Analysis Time Period		without bypass	— Analys	is Year			2030			
	<u>'</u>	, , , , , , , , , , , , , , , , , , ,								
Project Description	0		N = -41- /C) tl Ot		to Indian - F	Tata Dagat			
East/West Street: US 9 Intersection Orientation:				Period (h		t: Irvine F	iats Road			
			Study	enou (i	115)	. 0.23				
Vehicle Volumes ar	nd Adjustme			ı			107 (1			
Major Street		Eastbound	1 2			4	Westbou	ınd T		
Movement	1 1	2 T	3 R			4 L	5 T			6 R
Volume (veh/h)	5	429	3	_		0	0			0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92	-		0.92
Hourly Flow Rate, HFR							1			
(veh/h)	5	466	3			0	0			0
Percent Heavy Vehicles	0					0				
Median Type				Undivi	dea	1				
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LTR					LTR				
Upstream Signal		0					0			
Minor Street		Northbound					Southboo	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)	6	1	11							
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.60	0.25		().44
Hourly Flow Rate, HFR (veh/h)	6	1	11			0	0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	0			0
Configuration		LTR								
Delay, Queue Length, a	nd Level of Se	rvice					*			
Approach	Eastbound	Westbound		Vorthbo	und			Southb	ound	
Movement	1	4	7	8		9	10	1		12
Lane Configuration	LTR	LTR	<u> </u>	LTR				† 		<u> </u>
v (veh/h)	5	0	 	18			 	\vdash		
C (m) (veh/h)	1636	1103	 	574				\vdash		
v/c	0.00	0.00		0.03	_		 	\vdash		
			 				 	\vdash		-
95% queue length	0.01	0.00		0.10			-	├──		
Control Delay (s/veh)	7.2	8.3		11.5				 		
LOS	Α	Α		В						
Approach Delay (s/veh)				11.5						
Approach LOS				В						
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		ALL-WA		lou I c				
General Information				Site Inform	mation			
Analyst	N. Fos	sen		Intersection Jurisdiction		6. 4	h Avenue East &	1st Stree
Agency/Co. Date Performed	CDM 5/5/11			Analysis Yea	r	2010)	
Analysis Time Period		eak without by	pass (EIS 6)	-		,		
Project ID	•	,						
East/West Street: 4th Avenu	e Fast			North/South S	Street: 1st Street	t Fast		
Volume Adjustments		haraotorio	rties	rtora // Codar C	701 011 011			
Approach	I Site C	ilai acteris	Eastbound			١٨	/estbound	
Movement	L		T	R	L		T	R
Volume (veh/h)	5	j	1	4	58		5	23
%Thrus Left Lane			T I					
Approach		,	Northbound			So	outhbound	
Movement	L		Т	R	L		Т	R
/olume (veh/h)	1	6	224	92	18		206	18
%Thrus Left Lane								
	Eas	tbound	We	stbound	North	bound	Sout	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR	+	LTR		LTR		LTR	+
PHF	0.92	+	0.92	+	0.92	 	0.92	+
Flow Rate (veh/h)	10	+	92	+	359	 	261	+
	0	 	0	-	0	 	0	}
% Heavy Vehicles No. Lanes	0	1		1		<u> </u>	+ -	1
	+	<u>1</u> 1	_	1			-	<u>1</u> 1
Geometry Group		1		•				1
Duration, T	A -1! 1	\A/ l l -			.25			
Saturation Headway	1	Worksne						
Prop. Left-Turns	0.5		0.7		0.0		0.1	
Prop. Right-Turns	0.4		0.3		0.3		0.1	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
nLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
nRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
nHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
nadj, computed	-0.1	1	-0.0	1	-0.2	ì	-0.0	†
Departure Headway a	<u> </u>	Timo				<u>. </u>		
	-1	Tillie	1 220	1	1 220	1	1 220	1
nd, initial value (s)	3.20	1	3.20		3.20		3.20	+
c, initial	0.01	1	0.08		0.32		0.23	+
nd, final value (s)	5.31	 	5.28		4.33		4.54	1
x, final value	0.01		0.13	2.0	0.43	<u> </u>	0.33	2.0
Move-up time, m (s)	1	.0	1	2.0	2.	U		2.0
Service Time, t _s (s)	3.3	<u> </u>	3.3		2.3	<u> </u>	2.5	<u> </u>
Capacity and Level o	f Service							
	Eas	tbound	We	stbound	North	bound	Sout	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	260	+					511	+
	-	+	342	+	609	-		+
Delay (s/veh)	8.39	<u> </u>	9.10		10.57	ļ	9.76	
_OS	Α	<u></u>	Α		В		Α	
Approach: Delay (s/veh)		8.39	S	0.10	10.	57	9.	.76
LOS		Α	1	Α	E		_	A
ntersection Delay (s/veh)	†		<u> </u>		0.06			•
ntersection LOS	+				<u>оо</u> В			

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General Information				Site Inform	mation			
				Intersection	паноп	6 1th	Avenue East &	1at Straa
Analyst Agency/Co.	N. Fos CDM	sen		Jurisdiction		0. 4111	AVERIUE East &	181 31166
Date Performed	5/5/11			Analysis Yea	r	2010		
Analysis Time Period		eak without by	pass (EIS 6)	-		•		
Project ID		•	, ,					
East/West Street: 4th Avenu	ıe East			North/South S	Street: 1st Stree	t East		
Volume Adjustments		haractoric	tios	rtora // Codar C	701 01100	Luci		
Approach	l and Site C		Eastbound			We	stbound	
Movement	L		T	R	L	1	T	R
/olume (veh/h)	12	2	7	29	79		10	42
%Thrus Left Lane								
Approach	- i	<u>,</u>	Northbound		- 	Sou	thbound	
Movement	L		Т	R	L		Т	R
/olume (veh/h)	20	3	234	67	29		212	22
%Thrus Left Lane								
	Fas	bound	We	stbound	North	bound	South	nbound
	L1	L2	L1	L2	L1	L2	L1	L2
2fin-metica		LZ.		LZ		LZ		LZ.
Configuration	LTR	 	LTR	+	LTR		LTR	
PHF	0.92	 	0.92	-	0.92	<u> </u>	0.92	╄
Flow Rate (veh/h)	51		140	<u> </u>	356		284	
% Heavy Vehicles	0		0		0		0	
No. Lanes	_	1		1		1		1
Geometry Group	<u> </u>	1		1		1		1
Duration, T				0	.25			
Saturation Headway	Adjustment	Workshe	et					
Prop. Left-Turns	0.3		0.6		0.1		0.1	
Prop. Right-Turns	0.6		0.3	1	0.2		0.1	
Prop. Heavy Vehicle	0.0	1	0.0	1	0.0		0.0	
nLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
-	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
nRT-adj								
nHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
nadj, computed	-0.3		-0.1		-0.1		-0.0	
Departure Headway a	and Service	Time						
nd, initial value (s)	3.20		3.20		3.20		3.20	
κ, initial	0.05	ĺ	0.12	ĺ	0.32		0.25	
nd, final value (s)	5.40	1	5.46		4.72		4.87	
c, final value	0.08	1	0.21		0.47		0.38	
Move-up time, m (s)	_	.0		2.0		.0	7	.0
Service Time, t _s (s)	3.4		3.5		2.7		2.9	
		<u> </u>	1 0.0				10	<u> </u>
Capacity and Level o	1				1			
	Eas	bound	We	stbound	North	bound	South	nbound
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	301	1	390		606		534	
Delay (s/veh)	8.85	†	9.93		11.77		10.89	†
		+		+		 	+	
.OS	Α		Α		В		В	<u> </u>
Approach: Delay (s/veh)	,	3.85	9	9.93	11.	.77	10	.89
LOS		Α		Α	E	3		3
ntersection Delay (s/veh)				10	0.98			
ntersection LOS	1				В			

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		ALL-VVA	Y STOP C	ONTROL	ANAL I SI	<u> </u>		
General Information				Site Inforr	nation			
Analyst	N. Fos	sen		Intersection		4th A	venue East & 2r	nd Street E
Agency/Co.	CDM			Jurisdiction		0000		
Date Performed	5/10/2			Analysis Year		2030		
Analysis Time Period	дм Ре	ak without by	oass	<u> </u>				
Project ID								
East/West Street: 4th Avenu				North/South S	treet: 2nd Stree	et East		
Volume Adjustments	and Site C							
Approach Movement			Eastbound T	R	+	We	estbound T	R
Volume (veh/h)	L	3	77	7	L		94	21
%Thrus Left Lane	- '		- ' '	,	+	_	34	
Approach			Northbound		+		uthbound	
Movement			T	R			T	R
Volume (veh/h)	5		28	21	37		24	19
%Thrus Left Lane						ĺ	T T	
		bound	10/0	stbound	North	bound	90	thbound
		1		1				1
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR	ļ	LTR	 	LTR	ļ	LTR	┼
PHF	0.92	ļ	0.92		0.92	ļ	0.92	┼
Flow Rate (veh/h)	107	ļ	132		57		86	
% Heavy Vehicles	0		0		0		0	
No. Lanes		1		1	_	1		1
Geometry Group	<u> </u>	1		1		1		1
Duration, T				0.	.25			
Saturation Headway	Adjustment	Workshe	et					
Prop. Left-Turns	0.2		0.1		0.1		0.5	
Prop. Right-Turns	0.1		0.2		0.4		0.2	
Prop. Heavy Vehicle	0.0		0.0	1	0.0		0.0	
hLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	-0.0	1.7	-0.1	1.7	-0.2	1.7	-0.0	1.7
		<u> </u>	-0.1		-0.2	<u> </u>	-0.0	
Departure Headway a	-	rime		1	1 0 7 7	1	1 000	
hd, initial value (s)	3.20	<u> </u>	3.20	1	3.20		3.20	1
x, initial	0.10		0.12	1	0.05		0.08	+
hd, final value (s)	4.37	 	4.26	 	4.33		4.46	
x, final value	0.13	<u> </u>	0.16	1	0.07		0.11	
Move-up time, m (s)		.0		2.0	2.	U		2.0
Service Time, t _s (s)	2.4		2.3		2.3		2.5	<u> </u>
Capacity and Level o	f Service							
	1	bound	We	stbound	North	bound	Sout	thbound
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	357		382	1	307		336	+
Delay (s/veh)	8.02	 	8.05	1			7.99	+
		 	_	 	7.65			
LOS	Α	<u> </u>	Α		A	<u> </u>	A	
Approach: Delay (s/veh)		3.02	8	.05	7.0	65	7	.99
LOS		Α		Α	A	4		Α
Intersection Delay (s/veh)				7.	.97			
Intersection LOS					A			

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General Information				Cita Inform	notion			
				Site Inforr	nation	144- 4		-l Ctrot F
Analyst	N. Fos	sen		Intersection Jurisdiction		4th A	venue East & 2n	d Street E
Agency/Co. Date Performed	CDM 5/10/2	011		Analysis Year	r	2030		
Analysis Time Period		ak without b	vpass					
Project ID	*		,,,	<u> </u>				
East/West Street: 4th Avenu	e Fast			North/South S	street: 2nd Stree	et Fast		
Volume Adjustments		haractori	etics	rtora // Coda / C	270 01700	n Luot		
Approach	and Site C	ilai acteri	Eastbound		1	We	stbound	
Movement	L		T	R	L		T	R
/olume (veh/h)	35	5	51	20	11		77	20
%Thrus Left Lane			Î					
Approach	İ	•	Northbound			Sou	ıthbound	
Movement	L		Т	R	L		Т	R
/olume (veh/h)	2	1	35	6	12		37	23
%Thrus Left Lane								
	East	bound	We	stbound	North	bound	Sout	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR	+	LTR	+	LTR		LTR	1
PHF	0.92	+	0.92	+	0.92		0.92	+
Flow Rate (veh/h)	114	+	115	+	66	-	77	+
, ,	0	 	0	 	0		0	+
% Heavy Vehicles No. Lanes	+	1		1	1	1		1
	4	<u>1</u> 1	_	1	1			<u>1</u> 1
Geometry Group	+	I						1
Ouration, T	1			0.	.25			
Saturation Headway	7	Worksh	-					1
Prop. Left-Turns	0.3		0.1		0.3		0.2	
Prop. Right-Turns	0.2		0.2		0.1		0.3	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
nLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
nRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
nHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
nadj, computed	-0.0	 	-0.1	 	0.0		-0.2	1
		Time o	-0.1		0.0		-0.2	
Departure Headway a	-	Time	1 000		1 000	1		1
nd, initial value (s)	3.20		3.20		3.20		3.20	
k, initial	0.10	 	0.10	+	0.06	<u> </u>	0.07	
nd, final value (s)	4.32	 	4.27	 	4.52	<u> </u>	4.34	
c, final value	0.14		0.14	2 0	0.08		0.09	1
Move-up time, m (s)	1	.0		2.0	2.	U	-	2.0
Service Time, t _s (s)	2.3		2.3		2.5	<u> </u>	2.3	
Capacity and Level o	f Service							
	East	bound	We	stbound	North	bound	Sout	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	364	+		+			327	1
	\	 	365	1	316			1
Delay (s/veh)	8.00	 	7.94		7.93		7.79	1
.OS	Α	<u> </u>	Α		Α		Α	
Approach: Delay (s/veh)	-	3.00	7	7.94	7.9	93	7.	79
LOS	1	Α		Α	1	1		A
ntersection Delay (s/veh)	†		-		.92			
ntersection LOS	+				A			

General Information				Site Inform	nation				
	In -			Intersection	паноп	7 7th	Street East/We	et & Main	
Analyst Agency/Co.	N. Fos CDM	sen		Jurisdiction		7. 741	Orrect Last West & Main		
Date Performed	5/10/2	011		Analysis Yea	r	2030			
Analysis Time Period	AM Pe	ak without b	oypass (EIS 6)						
Project ID				,					
ast/West Street: 7th Street	East/West			North/South S	Street: Main Stre	et			
Volume Adjustments	and Site C	haracteri	istics						
Approach			Eastbound			Wes	stbound		
Movement	L		T	R	L		T	R	
/olume (veh/h)	0		251	74	44		148	0	
%Thrus Left Lane									
Approach	L		Northbound T	R		Sou	thbound T	R	
Movement /olume (veh/h)	2	7	0	40	0	_	0	0	
%Thrus Left Lane		<u>'</u>		40	 		<u> </u>	- 0	
o minus Leit Lähe							<u> </u>		
	Eas	bound	We	stbound	North	bound	Sout	thbound	
	L1	L2	L1	L2	L1	L2	L1	L2	
Configuration	LTR		LTR		LTR				
PHF	0.92		0.92		0.92				
Flow Rate (veh/h)	352		207		72				
% Heavy Vehicles	0		0		0				
No. Lanes		1		1	1			0	
Geometry Group		1		1	1				
Ouration, T				0	.25		•		
Saturation Headway	Adiustment	Worksh	eet						
Prop. Left-Turns	0.0		0.2		0.4		1	1	
Prop. Right-Turns	0.2		0.0	†	0.6		1		
Prop. Heavy Vehicle	0.0	 	0.0		0.0		1		
nLT-adj	0.0	0.2	0.0	0.2	0.0	0.2			
	+				+	<u> </u>	1		
nRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6			
nHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	ļ		
nadj, computed	-0.1		0.0		-0.3				
Departure Headway a	and Service	Time							
nd, initial value (s)	3.20		3.20		3.20				
κ, initial	0.31		0.18		0.06				
nd, final value (s)	4.18		4.49		4.83				
r, final value	0.41		0.26		0.10				
Move-up time, m (s)	2	.0		2.0	2.	0			
Service Time, t _s (s)	2.2		2.5		2.8				
Capacity and Level o	f Service	1							
Dapaony and Lovel O	1	hound	14/-	stbound	North	bound	Carri	thhouse	
	L1	bound L2	_	L2	L1	L2	L1	thbound L2	
2	\	L L L L L L L L L L L L L L L L L L L	L1	LZ.		LZ	L L 1	LZ	
Capacity (veh/h)	602	 	457	 	322		 		
Delay (s/veh)	10.03	<u> </u>	9.04		8.35		<u> </u>	Į	
.OS	В		Α		Α				
Approach: Delay (s/veh)	1	0.03	9	9.04	8.3	35			
LOS	1	В		A	-		i		
	<u> </u>					-			
ntersection Delay (s/veh)				a	.51				

General Information				Cita Infar	motion			
				Site Inform	nation	7 746	Street East/We	ant 9 Main
Analyst Agency/Co.	N. Fos CDM	sen		Intersection Jurisdiction		7. 7th	Street East/VV	est & Main
Date Performed	5/10/2	011		Analysis Yea	r	2030		
Analysis Time Period		eak without by	rpass (EIS 6)					
Project ID								
East/West Street: 7th Street	East/West			North/South S	Street: Main Stre	et		
Volume Adjustments	and Site C	haracteris	stics					
Approach			Eastbound			We	estbound	
Movement	L		T	R	L		T	R
Volume (veh/h)	3		258	51	8		209	0
%Thrus Left Lane								
Approach	 -	ĺ	Northbound			Sou	uthbound	
Movement	L	2	T1	R	L		T	R
Volume (veh/h)	52	<u>-</u>	1	63	0		0	0
%Thrus Left Lane								
	Eas	tbound	We	stbound	North	bound	Sou	ithbound
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR	1	LTR		LTR	Î .		
PHF	0.92	1	0.92		0.92			
Flow Rate (veh/h)	338	ĺ	235		125			Ì
% Heavy Vehicles	0		0		0			
No. Lanes		1		1		1		0
Geometry Group	Î	1		1		1		
Duration, T	î .		•	0	.25		•	
Saturation Headway	Adiustment	Workshe	et					
Prop. Left-Turns	0.0	1	0.0		0.4	1		
Prop. Right-Turns	0.2		0.0		0.5		1	+
Prop. Heavy Vehicle	0.0		0.0		0.0		+	1
nLT-adj	0.0	0.2	0.0	0.2	0.0	0.2	+	_
-	-				+		-	
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6		_
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7		
nadj, computed	-0.1		0.0		-0.2			
Departure Headway a	nd Service	Time						
nd, initial value (s)	3.20		3.20		3.20			
k, initial	0.30		0.21		0.11			
nd, final value (s)	4.41		4.62		4.96			
x, final value	0.41		0.30		0.17			
Move-up time, m (s)	2	.0		2.0	2.	0		
Service Time, t _s (s)	2.4		2.6		3.0			
Capacity and Level o	f Service	<u> </u>						
capacity and Ector of	1	tbound	10/0	stbound	Morth	bound	90	ıthbound
	1	1	_		+		-	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	588		485		375			
Delay (s/veh)	10.50		9.60		8.98			
_OS	В	1	Α		Α			
Approach: Delay (s/veh)	-	0.50		2.60	8.9	. 98		
LOS	 	<u>о.50</u> В		A	<i>J.</i>			
	 	D				1		
ntersection Delay (s/veh)	J			9	.92			

	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY			
General Information	<u> </u>		Site I	nform	atio	on .			
Analyst	N. Fosse	n	1	-4!			10. 7th A	venue V	/est & 2nd
Agency/Co.	CDM		Interse				Stre		
Date Performed	5/10/201		Jurisdi						
Analysis Time Period	AM Peak 6)	without bypass (E	Analys	sis Yea	r		2030		
Project Description	, ,								
East/West Street: 7th A	venue West		North/S	South S	Stree	t: 2nd Stre	eet West		
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	ents							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	T	R			L	T		R
Volume (veh/h)	0	251	32			330	99	_	2
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92		0.92
(veh/h)	0	272	34			358	107		2
Percent Heavy Vehicles	0					0			
Median Type			4	Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street		Northbound	1				Southbou	ınd	
Movement	7	8	9			10	11	_	12
	L	T	R			<u>L</u>	T		R
Volume (veh/h)	5	6	93			4	8	-+	0
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92	-	0.92
(veh/h)	5	6	101			4	8		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N	<u> </u>				N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration		LTR					LTR		
Delay, Queue Length, a	ind Level of Se	rvice							
Approach	Eastbound	Westbound	1	Northbo	ound	l	S	Southbou	ınd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR		LTF	₹			LTR	
v (veh/h)	0	358		112	2			12	
C (m) (veh/h)	1494	1266		531	1			130	
v/c	0.00	0.28		0.2	1			0.09	
95% queue length	0.00	1.17		0.79	9		ĺ	0.30	
Control Delay (s/veh)	7.4	9.0		13.0			35		
LOS	Α	A		В		Ì	<u> </u>	E	<u> </u>
Approach Delay (s/veh)				13.0		<u> </u>		35.5	
Approach LOS				В	-		1	E	
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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY			
General Information	n		Site I	nform	atio	on			
Analyst	N. Fosse	n	Interse	otion			10. 7th A	venue W	est & 2nd
Agency/Co.	CDM						Stre		
Date Performed	5/10/201		Jurisdi						
Analysis Time Period	PM Peak 6)	without bypass (E	Analys	is Yea	r		2030		
Project Description									
East/West Street: 7th A			North/S	South S	tree	t: 2nd Stre	eet West		
Intersection Orientation:	East-West		Study F	Period ((hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound	,				Westbou	nd	
Movement	1	2	3			4	5		6
	L L	T	R			L	T		R
Volume (veh/h)	0	199	15			181	299		26
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92	-+	0.92
(veh/h)	0	216	16			196	324		28
Percent Heavy Vehicles	0					0			
Median Type			1	Undiv	⁄idec	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street		Northbound	í				Southbou	ınd	
Movement	7	8	9			10	11	_	12
	L	Т	R			L	Т		R
Volume (veh/h)	22	12	142			9	6		4
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	-		0.92	0.92		0.92
(veh/h)	23	13	154			9	6		4
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration		LTR					LTR		
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Eastbound	Westbound	I	Northbo	ound		S	outhbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR		LTF	?			LTR	
v (veh/h)	0	196		190)			19	ĺ
C (m) (veh/h)	1218	1348		521	'			193	
v/c	0.00	0.15		0.36	3			0.10	
95% queue length	0.00	0.51		1.66				0.32	1
Control Delay (s/veh)	8.0	8.1		15.8				25.7	_
LOS	A	A A		C	-			D	+
Approach Delay (s/veh)				15.8	3	<u> </u>	25.7		
Approach LOS				75.C				D	
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General Information				Site Inforr	mation				
	1			Intersection	паноп	7th Au	renue East & 7th	Stroot E	
Analyst Agency/Co.	N. Fos	ssen		Jurisdiction		7 UT AV	renue Last & 7ti	I Sileel L	
Date Performed	5/10/2	011		Analysis Year	r	2030			
Analysis Time Period	АМ Ре	ak without b	ypass (EIS 6)						
Project ID				<u>, , , , , , , , , , , , , , , , , , , </u>					
ast/West Street: 7th Avenue	e East			North/South S	Street: 7th Street	t East			
/olume Adjustments	and Site C	haracteri	stics						
pproach			Eastbound			We	stbound		
lovement	L		T	R	L		T	R	
olume (veh/h)	30)	65	13	24		57	12	
6Thrus Left Lane									
pproach			Northbound			Sou			
Movement	L		T 01	R 12	L	_	T	R	
olume (veh/h)	1:	9	81	12	8	_	51	23	
Thrus Left Lane									
	East	tbound	We	stbound	North	bound	Sout	uthbound	
	L1	L2	L1	L2	L1	L2	L1	L2	
Configuration	LTR	1	LTR	1	LTR		LTR	i i	
PHF	0.92		0.92		0.92		0.92	1	
low Rate (veh/h)	116		100	1	121		87	1	
6 Heavy Vehicles	0		0	1	0		0		
lo. Lanes	+	1	 	1	1		+	1	
Geometry Group	4	<u>.</u> 1	1	1	1			<u>.</u> 1	
Ouration, T	†				.25		J		
Saturation Headway	Adjustment	Worksh			.20				
Prop. Left-Turns	0.3	I	0.3		0.2		0.1	1	
·				+					
rop. Right-Turns	0.1		0.1		0.1		0.3		
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	ļ	
LT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
RT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	
HV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
adj, computed	-0.0		-0.0		-0.0		-0.1		
Departure Headway a	nd Service	Time			•	,		<u> </u>	
d, initial value (s)	3.20	1	3.20	1	3.20		3.20	Ī	
, initial	0.10	1	0.09	+	0.11		0.08	1	
d, final value (s)	4.49	†	4.50	+	4.48		4.41	1	
, final value	0.14	†	0.12	†	0.15		0.11	†	
Nove-up time, m (s)	_	.0		2.0	2.	0		.0	
	2.5	ĭ	2.5	<u> </u>	2.5	<u> </u>	2.4	ĭ	
service Time, t _s (s)		<u> </u>	2.0		2.0		2.4		
Capacity and Level o	Service								
	East	tbound	We	stbound	North	bound	Sout	hbound	
	L1	L2	L1	L2	L1	L2	L1	L2	
apacity (veh/h)	366	1	350	1	371		337	1	
elay (s/veh)	8.25	†		†			7.93	†	
		+	8.14	+	8.27			 	
OS	Α	<u> </u>	A		Α		Α	<u> </u>	
pproach: Delay (s/veh)		3.25		3.14	8.2	27	7.	93	
LOS		Α		Α	ļ.			4	
tersection Delay (s/veh)			-	8.	.16		,		
ntersection LOS	1				A				

General Information				Site Inforr	nation			
	f =			Intersection	паноп	7th Au	renue East & 7th	2 Stroot E
Analyst Agency/Co.	N. Fos CDM	sen		Jurisdiction		7 UT AV	renue Last & 7ti	i Street L
Date Performed	5/11/2	011		Analysis Year		2030		
Analysis Time Period	PM Pe	ak without l	bypass (EIS 6)					
Project ID								
ast/West Street: 7th Avenu	e East			North/South S	treet: 7th Street	t East		
/olume Adjustments	and Site C	haracter	istics					
pproach			Eastbound			We	stbound	
Movement	L		T 100	R	L		T	R
/olume (veh/h)	40	,	103	26 33			49	4
6Thrus Left Lane								
Approach			Northbound T	R	L	Sou	thbound	R
Movement Volume (veh/h)	2	1	90	23	5	_	101	37
, ,		+	90	23	 	_	101	37
6Thrus Left Lane								
	Eas	bound	We	stbound	North	bound	Sout	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.92		0.92		0.92		0.92	
low Rate (veh/h)	182		92		147		154	
6 Heavy Vehicles	0		0		0		0	
lo. Lanes	1	1	İ	1	1			1
Geometry Group	1	1	1	1	1			1
Ouration, T	1		•	0.	.25			
Saturation Headway	Adiustment	Worksh	eet					
Prop. Left-Turns	0.2		0.4		0.2		0.0	1
Prop. Right-Turns	0.2	1	0.0	+	0.2		0.3	1
Prop. Heavy Vehicle	0.0		0.0	-	0.0		0.0	
		0.2		0.2		0.0	+	0.2
LT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
RT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
HV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
adj, computed	-0.0		0.1		-0.1		-0.1	
Departure Headway a	ınd Service	Time						
d, initial value (s)	3.20		3.20		3.20		3.20	
, initial	0.16		0.08		0.13		0.14	
d, final value (s)	4.72		4.93		4.72		4.63	
, final value	0.24		0.13		0.19		0.20	
Nove-up time, m (s)	2	.0		2.0	2.	0	2	2.0
Service Time, t _s (s)	2.7		2.9		2.7		2.6	
Capacity and Level o		<u> </u>			<u> </u>			
apaony and Level U	1	ile a !	344	- 41	N1. 0	L	1 0 4	la la consti
		bound		stbound	+	bound	+	hbound
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	432		342		397		404	
elay (s/veh)	9.19		8.64		8.85		8.77	
OS	Α	1	Α		Α		Α	
pproach: Delay (s/veh)		9.19		3.64	8.8	25		77
	 				+			
LOS	 	Α		<u>A</u>	<i>A</i>	ı		<u> </u>
ntersection Delay (s/veh)				8.	.90			

	TW	O-WAY STOP	CONTR	OL SI	UMI	MARY			
General Information	1		Site I	nform	natio	on			
Analyst	N. Fossei	า	Interes	otion			142 115 0	2 Coff	roy Dood
Agency/Co.	CDM		Interse Jurisdi				13. US 93	3 & Calli	ey Roau
Date Performed	5/5/11		Analys		r		2010		
Analysis Time Period	AM Peak 6)	without bypass (E	EIS EIS						
Project Description									
East/West Street: Caffr						t: <i>US 93</i>			
Intersection Orientation:	North-South		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
	L	T	R				T (50	_	R
Volume (veh/h) Peak-Hour Factor, PHF	116	521	0			1	453	_	9
Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92	_	0.92
(veh/h)	126	566	0			1	492		9
Percent Heavy Vehicles	0					0			
Median Type			1	Undi	<i>Individed</i>				
RT Channelized			0						0
Lanes	1	2	0			1	2		1
Configuration	L	T	TR			L	T		R
Upstream Signal		0					0		
Minor Street		Eastbound	1 0			10	Westbou	nd	10
Movement	7	8	9			10	11		12
V (1 / 1 / 1 .)	L	T	R			L	T		R
Volume (veh/h) Peak-Hour Factor, PHF	5 0.92	0.92	49			0.92	0.92	_	0 00
Hourly Flow Rate, HFR		0.92	0.92			0.92	0.92	_	0.92
(veh/h)	5	1	53			1	1		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0	1				0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0				<u> </u>		0
Lanes	0	1	0			0	1		0
Configuration		LTR					LTR		
Delay, Queue Length, a									
Approach	Northbound	Southbound		Westbo			<u> </u>	Eastbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	L	L		LTF	7			LTR	
v (veh/h)	126	1		2				59	
C (m) (veh/h)	1074	1016		145	5			575	
v/c	0.12	0.00		0.0	1			0.10	
95% queue length	0.40	0.00		0.0	4			0.34	
Control Delay (s/veh)	8.8	8.5	30.2			12.0			
LOS	Α	Α		D				В	
Approach Delay (s/veh)				30.2		1	i	12.0	ı
Approach LOS				D			 	В	
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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY					
General Information	 n		Site I	nform	atio	on .					
Analyst	N. Fosse	า	Interse	oction			13. US 93	2 & Ca	ffroy	Pood	
Agency/Co.	CDM		Jurisdi				13. 03 9	o & Ca	mey	Ruau	
Date Performed	5/5/11		Analys	is Year			2010				
Analysis Time Period	PM Peak 6)	without bypass (E	IS								
Project Description			<u> </u>								
East/West Street: Caffr			North/S	South S	tree	t: <i>US 93</i>					
Intersection Orientation:	North-South		Study I	Period (hrs)	: 0.25					
Vehicle Volumes ai	nd Adjustme	nts									
Major Street		Northbound					Southbou	ınd			
Movement	1	2	3			4	5			6	
Mala a de a la 11 N	L	T 710	R			L	T 744			R	
Volume (veh/h) Peak-Hour Factor, PHF	82 0.92	716 0.92	<i>4</i> 0.92			0.92	714 0.92	-		14).92	
Hourly Flow Rate, HFR	89	778	0.92			1				15	
(veh/h)		776	4				776		770		15
Percent Heavy Vehicles	0										
Median Type			Undivided			1	Î				
RT Channelized			0								0
Lanes	1	2	0			1	2		1		
Configuration	L	T	TR	\rightarrow		L	T			R	
Upstream Signal		0					0				
Minor Street		Eastbound	1 0			10	Westbou	nd		10	
Movement	7 L	8 T	9 R			10 L	11 T	-		12 R	
Volume (veh/h)	7	0	47			1	0			1	
Peak-Hour Factor, PHF	0.92	0.92	0.92	-		0.92	0.92	_	0.92		
Hourly Flow Rate, HFR	7	0	51	$\neg \uparrow$		1	0			1	
(veh/h) Percent Heavy Vehicles	0	0	0	\rightarrow		0	0			0	
Percent Grade (%)	<u> </u>	0	0	<u> </u>		U	0			U	
Flared Approach			1	-			N	Т			
Storage	+	0	 	-			0				
RT Channelized	+	+	0	$\overline{}$				_		0	
Lanes	0	1	0	\rightarrow		0	1			0	
Configuration	 	LTR	<u> </u>	$\neg \uparrow$			LTR				
Delay, Queue Length, a	and Level of Se										
Approach	Northbound	Southbound	,	Westbo	und			astbo	und		
Movement	1	4	7	8		9	10	1.		12	
Lane Configuration	L	L		LTR				LTI			
v (veh/h)	89	1		2				58			
C (m) (veh/h)	838	845		165				40			
v/c	0.11	0.00		0.01				0.1			
95% queue length	0.36	0.00		0.04				0.5			
Control Delay (s/veh)	9.8	9.3		27.1				15.			
LOS	3.0 A	9.5 A		D D				, , , , , , , , , , , , , , , , , , ,			
Approach Delay (s/veh)				27.1	,	<u> </u>		15.5			
Approach LOS				D				75.c			
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	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY				
General Information	1		Site I	nform	atio	on .				
Analyst	N. Fosse	า	lusto roc				15. Kerr	Dam I	Road	& Grenie
Agency/Co.	CDM		Interse	ection			La			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period		without bypass (I	EIS Analys	sis Yea	r		2030			
Project Description	6)									
East/West Street: Gren	ior I ano		North/9	South 9	Stroo	t: Kerr Da	m Road			
Intersection Orientation:						: 0.25	iiii Noau			
Vehicle Volumes ar		nte	lotady i	Onou	(1110)	. 0.20				
Major Street	Ta Adjustine	Northbound					Southbo	und		
Movement	1	2	3			4	5			6
	L	Т	R			L	Т			R
Volume (veh/h)	0	121	87			21	55			0
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>		0.92	0.92		(0.92
Hourly Flow Rate, HFR (veh/h)	0	131	94			22	59			0
Percent Heavy Vehicles	0					0				
Median Type				Undi	/idec	1				
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration		LTR		$\neg \neg$		LTR	 			
Upstream Signal		0					0			
Minor Street	Ť	Eastbound					Westbou	ınd		
Movement	7	8	9			10	11	1		12
	L	T	R			L	T			R
Volume (veh/h)	-	<u> </u>		$\neg \uparrow$		16	0			10
Peak-Hour Factor, PHF	1.00	1.00	1.00	,		0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			17	0			10
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach	_	N		\neg			T N			
Storage	+	0		$\neg \neg$			0			
RT Channelized	1		0	\neg						0
Lanes	0	0	0	$\neg \uparrow$		0	1			0
Configuration							LTR			
Delay, Queue Length, a	nd Level of Se	rvice					ļ			
Approach	Northbound	Southbound	,	Westbo	ound			Eastb	ound	
Movement	1	4	7	8		9	10	ır.	1	12
Lane Configuration	LTR	LTR		LTF						
v (veh/h)	0	22		27						
C (m) (veh/h)	1558	1356		755			1			<u> </u>
v/c	0.00	0.02		0.04				1		
95% queue length	0.00	0.05		0.1			1			
Control Delay (s/veh)	7.3	7.7		9.9				+		
LOS	7.3 A				•		 	+		
		Α		A 0.0	,					
Approach Delay (s/veh)				9.9	'					
Approach LOS				Α]			

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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY				
General Information	า		Site I	nform	atio	on .				
Analyst	N. Fosse	n	lunta va				15. Kerr	Dam F	Road	& Grenie
Agency/Co.	CDM		Interse				La			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period	PM Peak 6)	without bypass (E	EIS Analys	sis Yea	ſ		2030			
Project Description	<u> </u>][
East/West Street: Gren	ier Lane		North/S	South S	tree	t: Kerr Da	m Road			
Intersection Orientation:						: 0.25				
Vehicle Volumes ar	nd Adiustme	nts								
Major Street	1	Northbound					Southbo	und		
Movement	1	2	3			4	5			6
	L	Т	R			L	Т			R
Volume (veh/h)	0	110	34			9	148			0
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>		0.92	0.92		(0.92
Hourly Flow Rate, HFR (veh/h)	0	119	36			9	160			0
Percent Heavy Vehicles	0					0				
Median Type	1	•		Undiv	/idec	1				
RT Channelized	1		0					ĺ		0
Lanes	0	1	0	ĺ		0	1			0
Configuration	LTR					LTR	ĺ	ĺ		
Upstream Signal		0					0			
Minor Street		Eastbound					Westbou	ınd		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)						37	0			16
Peak-Hour Factor, PHF	1.00	1.00	1.00)		0.92	0.92		(0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			40	0			17
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)	ĺ	0		ĺ			0			
Flared Approach		N					N			
Storage		0	ĺ				0			
RT Channelized			0							0
Lanes	0	0	0			0	1	Î		0
Configuration							LTR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Northbound	Southbound		Westbo	ound			Eastbo	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LTR	LTR		LTF	?					
v (veh/h)	0	9		57						
C (m) (veh/h)	1432	1438		735	5					ĺ –
v/c	0.00	0.01		0.08	3					ĺ
95% queue length	0.00	0.02		0.25			1			
Control Delay (s/veh)	7.5	7.5		10.3			1			<u> </u>
LOS	A	A		В				\vdash		
Approach Delay (s/veh)				10.3	3	<u> </u>				<u> </u>
Approach LOS				В	-		1			
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	TW	O-WAY STOP	CONTR	OL SI	JMN	IARY			
General Information	n		Site I	nform	atio	n			
Analyst	N. Fossei	n	Interse	action				Dam Road	l & Back
Agency/Co.	CDM	1					Road		
Date Performed	5/10/201	1	Jurisdi				2000		
Analysis Time Period		without bypass	Analys	is Yea	r		2030		
Drainet Description									
Project Description East/West Street: <i>Back</i>	Poad		North/9	South S	Stroot	: Kerr Da	m Poad		
Intersection Orientation:			Study F				illi Noau		
Vehicle Volumes ar		nte	jotady i	onea	(1110).	0.20			
Major Street	la Adjustifie	Northbound					Southbou	ınd	
Movement	1 1	2	3			4	5	ind	6
Movement	 		R			L	T		R
Volume (veh/h)	4	181	0			0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	4	196	0			0	0		0
Percent Heavy Vehicles	0		Ī			0	1		
Median Type		•		Undi	vided	1		<u> </u>	
RT Channelized		Î	0						0
Lanes	0	1	0			0	1		0
Configuration	LTR		1			LTR	ĺ		
Upstream Signal		0					0		
Minor Street		Eastbound					Westbou	nd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	18	0	5				ļ		
Peak-Hour Factor, PHF	0.92	0.92	0.92			1.00	1.00		1.00
Hourly Flow Rate, HFR (veh/h)	19	0	5			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	0		0
Configuration		LTR							
Delay, Queue Length, a	ınd Level of Se	rvice							
Approach	Northbound	Southbound	,	Westbo	ound		I	Eastbound	t
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR						LTR	
v (veh/h)	4	0			T			24	
C (m) (veh/h)	1636	1389			ĺ		ĺ	836	1
v/c	0.00	0.00						0.03	
95% queue length	0.01	0.00						0.09	
Control Delay (s/veh)	7.2	7.6			$\overline{}$			9.4	
LOS	A	A						A	+
Approach Delay (s/veh)							1	9.4	
Approach LOS							 	A A	
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	TW	O-WAY STOP	CONTR	OL SI	UMN	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	N. Fossei	n	Interse	oction			16. Kerr L	Dam Roa	d & Back
Agency/Co.	CDM	1	─ 				Road		
Date Performed	5/10/2011	1	— Jurisdi						
Analysis Time Period		without bypass	— Analys	is Yea	r		2030		
		71							
Project Description East/West Street: Back	Deed		N 1 =41= /C) 4 l C	24	t.	Da!		
East/West Street: Back Intersection Orientation:						t: <i>Kerr Da</i> : 0.25	т коаа		
,			Study	enou	(1115)	. 0.25			
Vehicle Volumes ar	<u>nd Adjustme</u>						0 (1)		
Major Street	1	Northbound	1 2			4	Southbou	ind	
Movement	1 1	2 	3 R			4 	5 T		6 R
Volume (veh/h)	8	96	0			0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	8	104	0.02			0	0		0
Percent Heavy Vehicles	0					0			
Median Type	 			Undi	videc				
RT Channelized	+	1	0	Onai	videc	<u> </u>	1	1	0
Lanes	0	1	0			0	1		0
Configuration	LTR	,				LTR	,		U
Upstream Signal	LIN	0				LIIX	0		
Minor Street	+	Eastbound					Westbou	nd nd	
Movement	7	8 Easibourid	9			10	11	l l	12
iviovernent	 	T	R			L	T		R
Volume (veh/h)	17	0	4				'		IX
Peak-Hour Factor, PHF	0.92	0.92	0.92			1.00	1.00		1.00
Hourly Flow Rate, HFR (veh/h)	18	0	4			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)	+	0					0		
Flared Approach	1	N		$\neg \neg$			l N		
Storage	+	0	+				0		
RT Channelized	+	-	0						0
Lanes	0	1	0			0	0		0
Configuration	 	LTR	 				Ŭ		
Delay, Queue Length, a	and Level of Se						ļ	<u> </u>	
Approach	Northbound	Southbound	,	Westbo	aund		1 .	Eastboun	4
Movement	1	4	7	8		9	10	11	12
	-		- '	├─°		9	10		12
Lane Configuration	LTR	LTR		 			-	LTR	+
v (veh/h)	8	0					-	22	+
C (m) (veh/h)	1636	1500		<u> </u>			<u> </u>	909	
v/c	0.00	0.00					ļ	0.02	
95% queue length	0.01	0.00					ļ	0.07	
Control Delay (s/veh)	7.2	7.4						9.1	
LOS	Α	Α						Α	
Approach Delay (s/veh)								9.1	
Approach LOS								Α	
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							HOR	ΓREP	ORT									
General Info	rmation								Informa	tion								
Analyst Agency or Co Date Perform Time Period	J. Jespers o. CDM ned 5/10/2011 AM Peak		Bypas	s (I	Vorth	n)		Area Juris	rsection a Type sdiction lysis Yea	A		& Sou er area		Shor	e Road			
Volume and	Timing Inpu	t																
					В			WB	T ==			NB	_			SB		
Number of La	0000		LT	<u> </u>	ТН	RT	LT 1	TH	RT 1	LT	2	TH	R 1		LT 2	TH 1	RT	
Lane Group	anes				-		L	╁	R		_	T I	R		L	T	\vdash	
Volume (vph	١		-	┞	\dashv		118	+-	222	╁	33		64		129	266	\vdash	
	-				-		2	╁	2		2	-	2	-	2	2	\vdash	
% Heavy Vel	TIICIES		-	┞	\dashv		0.92	+-	0.92	╁	0.9		0.9		0.92	0.92	\vdash	
Pretimed/Act	tuated (P/A)			┝	\dashv		0.92 P	+-	P 0.92	┢	F		D.S		0.92 P	0.92 P	\vdash	
Startup Lost	, ,				-		2.0	+-	2.0	\vdash	+	.0	2.0		2.0	2.0	\vdash	
·	Effective Gre	on		┝	\dashv		2.0	+-	2.0	┢		.0	2.0		2.0	2.0	\vdash	
Arrival Type	Lilective Gre	EII			-		3	+-	3	\vdash	_	3	3		3	3	\vdash	
Unit Extension	n .						3.0	+	3.0	╁		.0	3.0		3.0	3.0	\vdash	
Ped/Bike/RT			0	(,		0	0	0	0		0	0.0		0	0	\vdash	
Lane Width	OK Volume		 		_		12.0	10	12.0	+	`	2.0	12		12.0	-		
Parking/Grad	de/Parking		N	()	N	N N	0	N N	$\frac{1}{N}$	_	0	N	_	N N	N		
Parking/Hou								+	1	 		1				N 0 1		
Bus Stops/H							0		0		1	0	C)	0	0		
Minimum Pe	destrian Time			3.	2			3.2			3.	.2				3.2		
Phasing	WB Only		02			03		04	SB C			u & R			07		8	
Timing	G = 17.0 Y = 3		= <i>0.0</i> = <i>0</i>		G = Y =	0.0	G = Y =	0.0	G = 1 Y =	2.0	G = Y =	65.0)	G = Y =	0.0	G = (
Duration of A	n = 3 Analysis (hrs) :	_			-	0	11=	U	11=				ngth		: 100.0			
	up Capacity) [)ela	y, an	d LOS	Dete	rminati	on								
					EB	•		WE				NB				SB		
Adjusted Flo	w Rate						128		241		3	366	70)	140	289		
Lane Group	Capacity						301		507		2	2306	10	29	412	1435		
v/c Ratio							0.43		0.48		0	.16	0.0)7	0.34	0.20		
Green Ratio				Τ			0.17		0.32		0	.65	0.6	35	0.12	0.77		
Uniform Dela	ay d ₁			T			37.1		27.3		1	5.8	6.	4	40.4	3.1		
Delay Factor	·k			T			0.50		0.50		0	.50	0.5	50	0.50	0.50		
Incremental	Delay d ₂			Ť			4.4		3.2			0.1	0.	. 1	2.2	0.3		
PF Factor							1.000)	1.000		1	.000	1.0	000	1.000	1.000		
Control Dela	у						41.5		30.4			7.0	6	.5	42.6 3.4			
Lane Group	LOS						D		С		\neg	Α	A	A D A		Α		
Approach De	elay			_		•		34.3	3			6.9			16.2			
Approach LC)S							С		Τ		Α				В		
Intersection I	Delay			1	8.3		1		Interse	ction	LOS					В		
	ntersection Delay 18.3 pyright © 2008 University of Florida, All Rights Reserved								HCS+ TM V					Gei	nerated: 5	/11/2011	11:56 AM	

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SHORT REPORT General Information Site Information J. Jespersen Analyst US 93 & South Shore Road Intersection Agency or Co. CDM Area Type All other areas Date Performed 5/10/2011 Jurisdiction PM Peak with Bypass (North) Time Period Analysis Year 2030 Volume and Timing Input EΒ WB NB SB LT TH RT TH RT LT RT RT LT TH LT TH Number of Lanes 1 1 2 2 1 L R Τ R L Τ Lane Group 303 470 144 285 403 Volume (vph) 222 % Heavy Vehicles 2 2 2 2 2 2 PHF 0.92 0.92 0.92 0.92 0.92 0.92 Р Pretimed/Actuated (P/A) Ρ Р Ρ Ρ Р Startup Lost Time 2.0 2.0 2.0 2.0 2.0 2.0 Extension of Effective Green 2.0 2.0 2.0 2.0 2.0 2.0 3 3 3 Arrival Type 3 3 3 Unit Extension 3.0 3.0 3.0 3.0 3.0 3.0 Ped/Bike/RTOR Volume 0 0 0 0 0 0 0 0 0 0 Lane Width 12.0 12.0 12.0 12.0 12.0 12.0 Ν Parking/Grade/Parking Ν 0 Ν Ν 0 Ν 0 Ν Ν 0 Ν Parking/Hour Bus Stops/Hour 0 0 0 0 0 0 3.2 Minimum Pedestrian Time 3.2 3.2 3.2 WB Only 02 03 04 SB Only Thru & RT 08 Phasing 07 G = 25.0G = 0.0G = 0.0G = 0.0G = 23.0G = 57.0G = 0.0G = 0.0Timing Y = 3Y = 0Y = 0Y = 0Duration of Analysis (hrs) = 0.25Cycle Length C = 111.0 Lane Group Capacity, Control Delay, and LOS Determination WB NB SB Adjusted Flow Rate 241 329 511 157 310 438 1343 1821 712 399 727 813 Lane Group Capacity 0.28 0.19 0.60 0.44 v/c Ratio 0.45 0.33Green Ratio 0.23 0.46 0.51 0.51 0.21 0.72 Uniform Delay d₁ 20.5 15.3 14.6 38.3 5.7 38.6 Delay Factor k 0.50 0.50 0.50 0.50 0.50 0.50 Incremental Delay d₂ 2.0 0.4 0.5 1.9 0.6 6.6 PF Factor 1.000 1.000 1.000 1.000 1.000 1.000 Control Delay 45.2 22.5 15.7 15.1 40.3 6.3 С Lane Group LOS D В В D Α Approach Delay 32.1 15.6 20.4 Approach LOS С В С С 22.1 Intersection LOS Intersection Delay

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				SI	HORT	REPO	RT						
General Info	rmation					Site Ir	nformati	on					
Analyst Agency or Co Date Perform Time Period	J. Jespersen o. CDM ned 5/10/2011 AM Peak wit		s (North)		Interso Area Jurisd Analys	Гуре	All c	93 & 4th other area		e East		
Volume and	Timing Input												
			EB	Y		WB	1		NB	,		SB	
Nl (1		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of La	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	`	L	TR		L	TR		10	LTR	00	 	LTR	\vdash
Volume (vph		2	401	8	56	397	3	13	3	96	7	3	1
% Heavy Vel	hicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Act	, ,	Α	Α	Α	Α	Α	Α	P	P	P	P	P	Р
Startup Lost		2.0	2.0		2.0	2.0	-		2.0	<u> </u>	-	2.0	<u> </u>
	Effective Green	2.0	2.0		2.0	2.0			2.0	ļ	 	2.0	<u> </u>
Arrival Type		3	3		3	3			3			3	
Unit Extension		3.0	3.0		3.0	3.0			3.0		<u> </u>	3.0	
Ped/Bike/RT	OR Volume	0	0	0	0 12.0	0	0	0	0	0	0	0	0
	Lane Width 12.0 12.0					12.0	ļ	ļ.,.	12.0	ļ	.	12.0	<u> </u>
Parking/Grade/Parking N 0 N					N	0	N	N	0	N	N	0	N
Parking/Hour Bus Stops/Hour		0	0		0	0	+		0	_	+	0	
	destrian Time	0	3.2		U	3.2	+		3.2		+	3.2	╆──┤
Phasing		<u>l</u> W Perm		03	0		NS Pe	rm I	06		07		08
		= 83.0		0.0	G = (G = 11		3 = 0.0	G	= 0.0	G =	
Timing	Y = 0 Y	= 3	Y =		Y = (Y = 3	ĺ	/ = 0	Υ	= 0	Y =	
	nalysis (hrs) = 0								Cycle Ler	ngth C	= 108.0)	
Lane Grou	up Capacity,	Contro		y, and	LOS		ninatio	n			1		
		╄	EB	1		WB	1		NB	1		SB	
Adjusted Flo	w Rate	2	445		61	435			121		<u> </u>	12	
Lane Group	Capacity	730	1427		809	1568			163		<u> </u>	151	
v/c Ratio		0.00	0.31	ļ	0.08	0.28		<u> </u>	0.74	ļ		0.08	
Green Ratio		0.77	0.77		0.87	0.84			0.10			0.10	
Uniform Dela	ay d ₁	2.9	3.8		1.3	1.7			47.1			43.9	
Delay Factor	·k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental I	Delay d ₂	0.0	0.1		0.0	0.1			26.0			1.0	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	у	2.9	3.9		1.3	1.8			73.1			44.9	
Lane Group	LOS	Α	Α		Α	Α			Ε			D	
Approach De	elay		3.9			1.8	*		73.1			44.9	
Approach LC	pproach LOS A				Α			Ε			D		
Intersection I	ersection Delay 11.2				1		Intersec	tion LC)S		1	В	
	ersection Delay 11.2 rright © 2008 University of Florida, All Rights Reserved				1	н	S+ TM Ve			G	enerated: 5		 11:57 AM

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				SI	HORT	REPC	RT						
General Info	rmation						nformati	ion					
Analyst Agency or Co Date Perform Time Period	J. Jesperse o. CDM ned 5/10/2011 PM Peak w		s (North)		Interse Area Jurisd Analys	Гуре	All	93 & 4th other area		e East		
Volume and	Timing Input												
			EB	•		WB	,		NB	,		SB	,
Nl (1		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of La	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	`	L	TR	42	L	TR	+ -	11	LTR	151	1	LTR	
Volume (vph	-	2	521	13	63	484	2	44	1	154	4	1	4
% Heavy Vel	nicies	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Act		A	A	Α	A	A 2.0	Α	P	P	P	P	P	P
Startup Lost		2.0	2.0		2.0	2.0	+-	\vdash	2.0		+	2.0	
	Effective Green		2.0		2.0	2.0	┼	├	2.0		-	2.0	
Arrival Type		3	3		3	3	+	├	3		-	3	
Unit Extension		3.0	3.0		3.0	3.0	1		3.0			3.0	
Ped/Bike/RT Lane Width	OR volume	0 12.0	0 12.0	0	0 12.0	0 12.0	0	0	0 12.0	0	0	0 12.0	0
Parking/Grad	Ne/Parking	12.0 N	0	N	12.0 N	0	N	N	0	N	N	0	N
Parking/Hour		1,4		/ /	177		+ "	'\	+ -	1	177		
Bus Stops/He		0	0		0	0	†	 	0		†	0	
	destrian Time		3.2			3.2	1		3.2			3.2	
Phasing	WB Only	EW Perm		03	0	4	NS Pe	rm	06		07	. (08
Timing		G = 83.0		0.0	G = (G = 11		G = 0.0		= 0.0	G =	
	Y = 0 Analysis (hrs) =	Y = 3	Y =	0	Y = ()	Y = 3		Y = 0 Cycle Ler		= 0 = 108 (Y =	0
	up Capacity		l Dela	v. and	LOS	Deteri	minatio		Cyclo Loi	igai o -	- 100.0	<u>, </u>	
	ир сарасту		EB	y ,		WB			NB			SB	
Adjusted Flo	w Rate	2	580	1	68	528			216			9	
Lane Group		670	1426		701	1569			157			149	
v/c Ratio		0.00	0.41		0.10	0.34			1.38			0.06	
Green Ratio		0.77	0.77		0.87	0.84			0.10			0.10	
Uniform Dela	ay d ₁	2.9	4.2		1.7	1.9			48.5			43.8	
Delay Factor	·k	0.11	0.11		0.11	0.11	1		0.50			0.50	
Incremental		0.0	0.2		0.1	0.1	1	1	203.9			0.8	
PF Factor		1.000	1.000		1.000	1.000	1		1.000			1.000	
Control Dela	у	2.9	4.4		1.7	2.0			252.4			44.6	
Lane Group	LOS	Α	Α		Α	Α			F			D	
Approach De	elay	1	4.4		1	2.0		1	252.4			44.6	
Approach LC)S	1	Α			Α			F			D	
	tersection Delay 41.8						Intersec	tion L	OS			D	
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				SI	HORT	REPC	RT									
General Info	ormation					Site I	nformati	on								
Analyst Agency or C	J. Jesperse Co. CDM med 5/10/2011	n				Inters		Stre	Avenue et E ther area		& 1st					
	AM Poak w	ith Bypas	s (North	1)		Jurisd		All U	uner area	13						
Time Period	l			Analy	sis Year	2030)									
Volume and	d Timing Input	1									<u> </u>					
		LT	EB TH	RT	LT	WB TH	RT	LT	NB TH	RT	LT	SB TH	RT			
Number of L	anes	1	1	0	1	1	0	0	1	0	0	1	0			
Lane Group		L	TR	<u> </u>	L	TR	+ -	<u> </u>	LTR	Ť	+ $$	LTR	+ -			
Volume (vph		8	282	94	96	197	11	85	15	103	21	24	9			
% Heavy Ve	•	2	2	2	2	2	2	2	2	2	2	2	2			
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92			
Pretimed/Ac	tuated (P/A)	P	Р	Р	Р	Р	P	Р	Р	Р	P	Р	Р			
Startup Lost	t Time	2.0	2.0		2.0	2.0	1		2.0		1	2.0				
Extension of	f Effective Greer		2.0	2.0			2.0			2.0						
Arrival Type		3	3		3	3			3			3				
Unit Extensi	on	3.0	3.0		3.0	3.0			3.0			3.0				
Ped/Bike/R1	ΓOR Volume	0	0	0	0	0	0	0	0	0	0	0	0			
Lane Width		12.0	12.0		12.0	12.0			12.0			12.0				
Parking/Gra		N	0	N	Ν	0	N	N	0	N	N					
Parking/Hou			<u> </u>	ļ	ļ	ļ		ļ		<u> </u>			<u> </u>			
Bus Stops/H		0	0	ļ	0	0	<u> </u>	<u> </u>	0	<u> </u>		0	<u> </u>			
	edestrian Time	<u> </u>	3.2		<u> </u>	3.2	l l	<u> </u>	3.2	<u> </u>		3.2	<u></u>			
Phasing	EW Perm G = 66.0	$\frac{02}{G = 0.0}$	G -	0.0	G = 0		NS Pe G = <i>6</i> 8		$\frac{06}{6} = 0.0$		07 G = 0.0	G =	08 0.0			
Timing		Y = 0	Y =		Y = (Y = 3		' = 0		f = 0.0	Y =				
	Analysis (hrs) =								Cycle Ler	ngth C	C = 140.0)				
Lane Gro	up Capacity,	Contro	ol Dela	y, and	LOS		ninatio	n								
			EB			WB			NB			SB				
Adjusted Flo	ow Rate	9	409	<u> </u>	104	226			220	<u> </u>		59				
Lane Group	Capacity	479	845		328	871			719			767				
v/c Ratio		0.02	0.48		0.32	0.26	<u> </u>	ļ	0.31			0.08	<u> </u>			
Green Ratio)	0.47	0.47		0.47	0.47			0.49			0.49				
Uniform Dela	ay d ₁	19.7	25.3		23.0	22.3			21.7			19.2				
Delay Facto	r k	0.50	0.50		0.50	0.50			0.50			0.50				
Incremental	Delay d ₂	0.1	2.0		2.5	0.7			1.1			0.2				
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000				
Control Dela	Control Delay 19.8 27.3			25.5	23.0		ļ	22.8			19.4	<u> </u>				
Lane Group	ane Group LOS B C				С	С		<u> </u>	С			В				
Approach D	elay		27.2			23.8			22.8			19.4				
Approach LO	OS		С			С			С			В				
Intersection	Delay		24.7				Intersec	tion LC	S			С				
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				SI	HORT	REPO	RT						
General Info	rmation					Site In	formati	on					
Analyst Agency or Co Date Perform Time Period	J. Jespersen c. CDM ed 5/10/2011 PM Peak wit		s (North))		Interse Area T Jurisdi Analys	уре	Stre	ther area		1st		
Volume and	Timing Input												
			EB			WB	LDT		NB			SB	
Number of La	nes	LT 1	TH 1	RT 0	LT 1	TH 1	RT 0	LT 0	TH 1	RT 0	LT 0	TH 1	RT 0
Lane Group		L	TR	"	L	TR	-	"	LTR	0		LTR	0
Volume (vph)		9	329	74	90	367	5	154	22	198	39	47	25
% Heavy Veh		2	2	2	2	2	2	2	2	2	2	2	2
PHF	licies	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actu	uated (P/A)	0.92 P	P	0.92 P	P.92	0.92 P	P	0.92 P	P	0.92 P	0.92 P	0.92 P	0.92 P
Startup Lost 7		2.0	2.0	 	2.0	2.0	┼′─	<u> </u>	2.0	 	 '	2.0	'
· ·	Effective Green	2.0	2.0		2.0	2.0	 	_	2.0			2.0	
Arrival Type	Lifective Green	3	3		3	3	 		3			3	
Unit Extension	n	3.0	3.0		3.0	3.0	\vdash	_	3.0		_	3.0	
Ped/Bike/RTC		0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	on volume	12.0	12.0		12.0	12.0	+ -	"	12.0	0		12.0	
Parking/Grade	e/Parking	N N	0	N	N	0	l N	N	0	N	N	0	N
Parking/Hour	on anang			'` <u> </u>			 '`	'`			~~		1,1
Bus Stops/Ho	our	0	0		0	0			0			0	
Minimum Ped			3.2			3.2			3.2			3.2	
Phasing	EW Perm	02		03	0.	4	NS Pe	rm	06		07)8
		= 0.0		0.0	G = (G = 84		$\theta = 0.0$		0.0	G =	
	Y = 3 Y nalysis (hrs) = 0	= 0	Y =	0	Y = ()	Y = 3		<u>′ = 0</u> Cycle Ler	Y =		Y =	0
	p Capacity,		l Dela	v. and	LOS	Detern	ninatio		Dyolo Loi	igiii O =	. 170.0	,	
	р сарасну,	1	EB	y ,		WB			NB			SB	
Adjusted Flow	v Rate	10	438	1	98	404			406			120	
Lane Group C		360	901		334	924	†		651			669	
v/c Ratio	. ,	0.03	0.49		0.29	0.44			0.62			0.18	
Green Ratio		0.50	0.50	†	0.50	0.50	†		0.47			0.47	
Uniform Delay	v d.	22.9	29.8		26.5	28.9	\vdash		35.6			27.5	
Delay Factor	•	0.50	0.50	+	0.50	0.50	\vdash	 	0.50	_		0.50	_
Incremental D		0.30	1.9	 	2.2	1.5	 		4.5			0.6	
PF Factor	70lay u ₂	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	,	23.1	31.7	+	28.7	30.4	+		40.1			28.1	
Lane Group L		C C	C	+-	C	C	+-		D	 	_	C C	
Approach Del		╁	31.5		╁	30.1			40.1	<u> </u>		28.1	<u> </u>
Approach LO	, ,					C			D			C C	
Intersection D		+	33.1		+		Intersec	tion I C				С	
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					SI	HORT	REPO)R	T											
General Info	ormation						Site I	nfo	rmati	on										
Analyst Agency or C Date Perform	J. Jesperse o. CDM ned 5/10/2011	en					Inters Area			Stre	Avenue et other area		st & I	Main						
Time Period	AM Poak	vith Bypas	s (N	orth)		Juriso	dicti	ion											
							Analy	/sis	Year	203	0									
Volume and	Timing Input	1	FI				W/R				NR			<u> </u>	SB					
		LT	-		RT	LT	7	Т	RT	LT	TH	F	RT	LT		RT				
Number of L	anes	1	1		0	1	1	T	0	0	1	$\overline{}$		0	1	0				
Lane Group		L	TF	₹		L	TR	T			LTR	Π			LTR					
Volume (vph	1)	8	26	6	88	88	180		11	2	4	2	2	4	5	1				
% Heavy Ve	hicles	2	2		2	2	2	T	2	2	2	2	2	2	2	2				
PHF		0.92	0.9	2	0.92	0.92	0.92	7	0.92	0.92	0.92	0.	92	0.92	0.92	0.92				
Pretimed/Ac	tuated (P/A)	Α	Α		Α	Α	Α	T	Α	Р	Р	I	>	Р	Р	Р				
Startup Lost	Time	2.0	2.0)		2.0	2.0				2.0									
Extension of	Effective Gree	n 2.0	2.0)		2.0	2.0	T			2.0			0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0						
Number of Lanes																				
Note																				
Ped/Bike/RT	0	0	0	T	0	0	0	()	0	0	0								
Lane Width		12.0	12.	.0		12.0	12.0				12.0									
Parking/Grad	de/Parking	N	0		Ν	Ν	0	I	Ν	Ν	0	1	V	Ν	TH TH 0 1					
								┵							<u> </u>					
		0	Ť			0		4				L								
			3.2			<u> </u>	<u> </u>	<u> </u>						<u> </u>	' , 	<u> </u>				
Phasing			_										<u> </u>							
Timing								_							_					
Duration of A					-				_			ngth								
Lane Gro	up Capacity	, Contro	ol D	ela	y, and	LOS	Deter	mi	natio	n										
			Е	В			WB				NB				SB					
Adjusted Flo	w Rate	9	38	5		96	208	┙			8				10					
Lane Group	Capacity	977	149	98		808	ļ	╧			212				211					
v/c Ratio		0.01	0.2	6		0.12	0.13	ᆚ			0.04	Ļ			0.05					
Green Ratio		0.84	0.8	4		0.84	0.84				0.12				0.12					
Uniform Dela	ay d ₁	1.9	2.4	1		2.1	2.1				54.3				54.3					
Delay Factor	r k	0.11	0.1	1		0.11	0.11	floor			0.50				0.50					
Incremental	Delay d ₂	0.0	0.	1		0.1	0.0				0.3				0.4					
PF Factor		1.000	1.0	00		1.000	1.000)			1.000				1.000					
Control Dela	у	1.9	2.	5		2.2	2.2	\int			54.6		54.8		54.8					
Lane Group	ne Group LOS A A			Α	Α				D				D							
Approach De	elay		2.	5			2.2				54.6				54.8					
Approach LC	DS .		A				Α				D				D					
Intersection	Delay		3.	7				In	tersec	tion LC)S				Α					
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				SI	HORT	REPO	RT							
General Inf	ormation					Site I	nformat	ion						
Analyst Agency or C	J. Jesperser Co. CDM med 5/10/2011)				Inters Area	ection Type	Stre	Avenue eet other area		st & 1	Main		
Time Period	PM Poak wi	th Bypas	s (Nort	h)		Jurisc	liction		ouror area					
						Analy	sis Year	203	80					
Volume and	d Timing Input	1				WD		1	ND				CD.	
		LT	EB TH	RT	LT	WB TH	RT	LT	NB TH	Т	RT	LT	SB TH	RT
Number of L	anes	1	1	0	1	1	0	0	1	-	<u>; </u>	0	1	0
Lane Group		L	TR		L	TR	1		LTR				LTR	
Volume (vpł	า)	9	325	73	100	409	6	97	15	12	25	112	20	136
% Heavy Ve		2	2	2	2	2	2	2	2	1	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.	92	0.92	0.92	0.92
Pretimed/Ac	ctuated (P/A)	Α	Α	Α	Α	Α	Α	P	P	I	D D	Р	Р	Р
Startup Lost	Time	2.0	2.0		2.0	2.0			2.0	T			2.0	
Extension of	f Effective Green	2.0	2.0		2.0	2.0			2.0				2.0	
Arrival Type	:	3	3		3	3			3	T			3	
Unit Extensi	on	3.0	3.0		3.0	3.0			3.0				3.0	
Ped/Bike/R	ΓOR Volume	0	0	0	0	0	0	0	0	()	0	0	0
Lane Width		12.0	12.0		12.0	12.0			12.0				12.0	
Parking/Gra	de/Parking	Ν	0	N	Ν	0	N	N	0	1	V	Ν	Ν	
Parking/Hou	ır													
Bus Stops/F		0	0		0	0			0	L			0	
<u> </u>	edestrian Time		3.2		<u> </u>	3.2	<u> </u>	<u> </u>	3.2	<u> </u>			3.2	<u> </u>
Phasing	EW Perm	02		03	0		NS Pe		06			07		08
Timing		$\dot{S} = 0.0$ $\dot{S} = 0$		= <i>0.0</i> = <i>0</i>	G = 0		G = 17 $Y = 3$		G = 0.0 $Y = 0$		Y =	= 0.0 = 0	G = Y =	
Duration of	Analysis (hrs) = 0				1 (1. – 0		Cycle Lei	ngth				
Lane Gro	up Capacity,	Contro	l Dela	ay, and	LOS	Deter	minatio	on						
			EB			WB			NB				SB	
Adjusted Flo	ow Rate	10	432		109	452			257				292	
Lane Group	Capacity	750	1514		767	1553			135				132	
v/c Ratio		0.01	0.29		0.14	0.29		<u> </u>	1.90	上		<u> </u>	2.21	ļ
Green Ratio)	0.84	0.84		0.84	0.84			0.12				0.12	
Uniform Del	ay d ₁	1.9	2.5		2.1	2.5			61.5				61.5	
Delay Facto	r k	0.11	0.11		0.11	0.11			0.50				0.50	
Incremental	Delay d ₂	0.0	0.1		0.1	0.1			433.0				569.3	
PF Factor		1.000	1.000		1.000	1.000			1.000				1.000	
Control Dela	elay 1.9 2.6			2.2	2.6			494.5				630.8		
Lane Group	ane Group LOS A A			Α	Α			F				F		
Approach D	Approach Delay 2.6					2.5			494.5				630.8	
Approach Lo	os		Α			Α			F				F	
Intersection	Delay		202.2				Intersec	ction Lo	OS				F	
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						SH	HORT	REP	OR	₹T									
General Info	ormation							Site	Info	ormatio	on								
Analyst Agency or Co Date Perform	J. Jespers o. CDM ned 5/10/2011								South Shore Road & Heritage Ln										
Time Period			Bypas	s (I	Vorth,)		Juris	dict	tion				_					
								Anal	ysis	s Year	20)30							
Volume and	Timing Inpu	t	Ī		EB			١٨/١			_		ND			т —		B	
			LT	_	<u>EB</u> TH	RT	LT			T RT	+	Т	-	Т	RT	IT	_	H	RT
Number of La	anes			_	2	0	1			1	_			Ť		<u> </u>	┰		
Lane Group				7	R		L	7				_		T	R		\top		
Volume (vph)			2	17	103	19	290)		4	8		Ť	5				
% Heavy Vel	hicles				2	2	2	2			2	2		T	2		Τ		
PHF				0.	92	0.92	0.92	0.92	2		0.	92		7	0.92		1		
Pretimed/Act	tuated (P/A)			,	4	Α	Α	Α			1	ס			Р				
Startup Lost	irtup Lost Time tension of Effective Green ival Type it Extension d/Bike/RTOR Volume ne Width				.0		2.0	2.0)		2	.0		T	2.0				
Extension of	timed/Actuated (P/A) rtup Lost Time ension of Effective Green val Type t Extension d/Bike/RTOR Volume ene Width king/Grade/Parking king/Hour s Stops/Hour imum Pedestrian Time asing EW Perm G = 117.0 G = Y = 3 Y =				.0		2.0	2.0)		2	.0			2.0				
Arrival Type				,	3		3	3			,	3			3				
Unit Extension	amber of Lanes The Group The Gr			3	.0		3.0	3.0)		3	.0			3.0				
Ped/Bike/RT	mber of Lanes ne Group ume (vph) Heavy Vehicles F stimed/Actuated (P/A) Intup Lost Time Itension of Effective Green Itension of Effective Green Itension of Malysis (Parking) Itension of Effective Green Itension of Grade/Parking Itension of Malysis (Parking) Intup Lost Time Itension of Malysis (Parking) Itension of Analysis (Parking) Itensi				0	0	0	0			()	0		0	0	0)	
Lane Width	Ilume (vph) Heavy Vehicles IF etimed/Actuated (P/A) artup Lost Time tension of Effective Green rival Type it Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time asing EW Perm G = 117.0 G = 117			1:	2.0		12.0	12.	0		12	2.0		Ţ	12.0				
	Parking/Grade/Parking		Ν	_	0	Ν	N	0		N	/	V	0	╀	Ν	N	0)	N
Parking/Hou							<u> </u>			<u> </u>	Ļ			Ļ					$ldsymbol{ldsymbol{ldsymbol{eta}}}$
					0		0					0		╀	0		4		
,	v			3	.2	<u> </u>	<u> </u>			1	<u> </u>			<u> </u>	1	<u> </u>	3.		
Phasing	<u> </u>	G -	02		G =	03	G = C					G -						= 0	
Timing					Y =		Y = 0		_									= 0	
Duration of A	Analysis (hrs) :	= 0.2	25									Сус	de Len	gth	1 C =	138.0)		
Lane Grou	up Capacity	y, C	ontro) [)ela	y, and	LOS	Dete	rmi	inatio	n								
					EB			WE	3				NB	1			SI	3	
Adjusted Flo	w Rate			-	<i>4</i> 8		21	315			52			_ 5	5				
Lane Group	Capacity			28	361		858	1579	1		192	?		17	72				
v/c Ratio				0.	12		0.02	0.20			0.27	7		0.0	03				
Green Ratio				0.	85		0.85	0.85			0.1	1		0.1	11				
Uniform Dela	ay d ₁			1.	.8		1.6	1.9			56.5	5		55	.0				
Delay Factor	·k			0.	11		0.11	0.11			0.50)		0.5	50				
Incremental	Delay d ₂			(0.0		0.0	0.1			3.4			0	.3				
PF Factor				1.	000		1.000	1.000)		1.00	00		1.0	000				
Control Dela	у			1	.8		1.6	2.0			59.	9		55	5.3				
Lane Group	LOS				4		Α	Α			Ε			E					
Approach De	pproach Delay 1.8					2.0					59.5								
Approach LC	pproach LOS A						Α					E							
Intersection I	Delay			ϵ	6.3				Ir	ntersect	tion	LOS					Α		
Copyright © 2008	ersection Delay right © 2008 University of Florida, All Rights Rese				rved			ŀ	ICS-	+ TM Ver	sion 5	5.4			Gene	rated: 5	5/11/20	11	11:55 AM

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						SH	IORT I	REP)R	RT.									
General Info	rmation							Site	nfo	ormatio	on								
Analyst Agency or Co Date Perform	J. Jespers o. CDM ned 5/10/2011	en									NB								
Time Period	PM Peak	with	Bypas	s (N	lorth,)		Juris	NB										
								Analy	/Sis	Year	20	30							
Volume and	Timing Input	<u> </u>		-	EB			۱۸/۶			Т		NR			1	SE		
			LT		H	RT	LT	_		RT	+	т_		Т	RT	LT	TH		RT
Number of La	anes			2		0	1	_			1	1		T					
Lane Group				TI	R		L	Т			L			T	R				
Volume (vph)			35	2	252	26	285	;		26	64		T	24		1		
% Heavy Vel	hicles			2	?	2	2	2			2)		Ī	2				
PHF				0.9	92	0.92	0.92	0.92	2		0.9	92		().92		1		
Pretimed/Act	uated (P/A)			Α	1	Α	Α	Α			F	•		Ī	Р				
Startup Lost	Time			2.	0		2.0	2.0)		2.	0			2.0				
Extension of	nit Extension				0		2.0	2.0)		2.	0			2.0				
Arrival Type	Interpretation of the composition		3	}		3	3			3	}		Τ	3					
Unit Extension	ne Group blume (vph) Heavy Vehicles HF etimed/Actuated (P/A) artup Lost Time Itension of Effective Green rival Type hit Extension ed/Bike/RTOR Volume ne Width arking/Grade/Parking arking/Hour as Stops/Hour nimum Pedestrian Time hasing EW Perm asing EW Perm Ty = 3 Y = are Group Capacity, Compared to the property of th			3.	0		3.0	3.0)		3.	0			3.0				
Ped/Bike/RT	Heavy Vehicles HF retimed/Actuated (P/A) artup Lost Time Attension of Effective Green rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension red/Bike/RTOR Volume rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type hit Extension rival Type rival Type rival Type hit Extension rival Type rival T			C)	0	0	0			()	0		0	0	0		
Lane Width	arking/Grade/Parking			12	2.0		12.0	12.	0		12	2.0			12.0				
			N	C)	N	N	0		N	٨	<i>I</i>	0	L	Ν	N	0		Ν
Parking/Hou			ļ					╄		<u> </u>				┸		ļ	<u> </u>	_	
				`)		0				()		┸	0	<u> </u>	1	_	
,		_		3.		00			7	ND O	<u> </u>	<u> </u>		L		27	3.2		
		G	02 = 0.0	十	G =	03	G = C					G -					G -	08 = 0	
Timing			= 0.0	_	Y =		Y = 0		_									: 0	
												Сус	de Len	gth	C =	144.()		
Lane Grou	up Capacity	/, C	ontro			y, and	LOS [inatio	n								
				_	ЕВ			1	_				NB				SB		
Adjusted Flo	w Rate		ļ	65			28		_		287			26	5		<u> </u>	_	
Lane Group	Capacity			27	02		592	1514			234			20	9				
v/c Ratio				0.2	24		0.05	0.20			1.23			0.1	12				
Green Ratio				0.8	31		0.81	0.81			0.13	3		0.1	13				
Uniform Dela	ny d ₁			3.2	2		2.6	3.0			62.5	,		55.	.2				
Delay Factor	k			0.1	11		0.11	0.11						0.5	50				
Incremental I	Delay d ₂			0.	.0		0.0	0.1			133.	7		1.	.2				
PF Factor				1.0	000		1.000	1.000			1.00	0		1.0	000				
Control Delay	у			3.	.2		2.7	3.1			196.	2		56	6.4				
Lane Group	LOS			Α	l .		Α	Α			F			E					
Approach De	Approach Delay 3.2					3.1				1	84.6								
Approach LC	pproach LOS A						Α					F							
Intersection I	tersection Delay 46.6						3.0 62.5 55.2 1 0.11 0.50 0.50 0 0.1 133.7 1.2 0 1.000 1.000 1.000 7 3.1 196.2 56.4 A F E S S S S S S S S S S S S S S S S S S												
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	TW	O-WAY STOP	CONTR	OL SI	UMN	MARY			
General Information	n		Site Ir	nform	natio	on			
Analyst	J. Jesper	sen	Interse	otion			US 93 & I	Pooley De	int Bood
Agency/Co.	CDM		Jurisdi				03 93 & 1	ROCKY PC	IIII KUau
Date Performed	5/10/201		Analys		r		2030		
Analysis Time Period	AM Peak (North)	with Bypass							
Project Description									
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<u> </u>	T	R			L	T 122		R
Volume (veh/h)	5 0.92	441	1.00			1.00	168		49
Peak-Hour Factor, PHF Hourly Flow Rate, HFR		0.92	1.00			1.00	0.92		0.92
(veh/h)	5	479	0			0	182	2 53	
Percent Heavy Vehicles	0				<u> </u>	0			
Median Type			1	Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street	 _	Northbound	1 ^			10	Southbou	nd	10
Movement	7	8	9			10	11		12
\(\langle \)	L	T	R			L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	1.00	1.00	1.00			171	1.00		6 0.92
Hourly Flow Rate, HFR		1	1.00			0.92			
(veh/h)	0	0	0			185	0		6
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Eastbound	Westbound	1	Vorthb	ound		S	outhbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	5							191	
C (m) (veh/h)	1344							415	
v/c	0.00							0.46	1
95% queue length	0.01							2.36	1
Control Delay (s/veh)	7.7							20.9	+
LOS	A			<u> </u>				C C	+
Approach Delay (s/veh)						<u> </u>		20.9	
,							20.9 C		
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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY			
General Information	<u> </u>		Site I	nform	natio	on .			
Analyst	J. Jesper	sen	Interes	ation			1110 00 0	Doolay D	aint Dood
Agency/Co.	CDM		Interse Jurisdi				US 93 & I	ROCKY PO	Jirit Roau
Date Performed	5/10/201			sis Yea	r		2030		
Analysis Time Period	PM Peak (North)	with Bypass							
Project Description									
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	ents							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	<u> </u>	T	R			L	T		R
Volume (veh/h)	1	330	1.00			4.00	375	_	160
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	1.00	<u>'</u>		1.00	0.92	-	0.92
(veh/h)	1	358	0			0	407		173
Percent Heavy Vehicles	0					0			
Median Type				Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT		ļ						TR
Upstream Signal		0					0		
Minor Street		Northbound	1				Southbou	ınd	
Movement	7	8	9			10	11	_	12
	L	Т	R			L	Т		R
Volume (veh/h)	1.00	1.00	4.00			112	1.00		2
Peak-Hour Factor, PHF	1.00	1.00	1.00	<u>'</u>		0.92	1.00	_	0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			121	0		2
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound		Northb	ound		S	outhbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	1	i						123	
C (m) (veh/h)	1004	ì						334	
v/c	0.00							0.37	\dashv
95% queue length	0.00	1		<u> </u>				1.65	
Control Delay (s/veh)	8.6			\vdash				21.9	+
LOS		 		\vdash				21.9 C	+
Approach Delay (s/veh)	Α	-		<u> </u>				21.9	
Approach LOS								С	
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	TW	O-WAY STOP	CONTR	OL SUI	MMARY			
General Information	 າ		Site I	nforma	tion			
Analyst	J. Jesper	sen	<u> </u>			12. US 9	3 & Irvine	Flats
Agency/Co.	CDM		Interse	ection		Road		
Date Performed	5/10/201		Jurisdi					
Analysis Time Period		with Bypass	Analys	sis Year		2030		
-	(North)							
Project Description East/West Street: US 9	2		North/9	South Str	eet: <i>Irvine</i>	Elate Poad		
Intersection Orientation:					rs): 0.25	riais Ruau		
Vehicle Volumes ar		nto	Otady	Criod (II	13). 0.20			
Major Street	id Adjustine	Eastbound				Westbou	ınd	
Movement	1	2	3	_	4	5	1	6
	'	T	R	-+	<u> </u>	T		R
Volume (veh/h)	5	480	7		8	242		30
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	5	521	7		8	263		32
Percent Heavy Vehicles	0				0			
Median Type		•		Undivid	led	,		
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration	LTR				LTR			
Jpstream Signal		0				0		
Minor Street		Northbound				Southbo	und	
Movement	7	8	9		10	11		12
	L	T	R		L	Т		R
Volume (veh/h)	0	0	6		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	!	0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	0	0	6		0	0		0
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N	ļ			N		
Storage		0				0		
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration		LTR				LTR		
Delay, Queue Length, a	nd Level of Se	rvice						
Approach	Eastbound	Westbound	١	Northbou	ınd	5	Southboun	ıd
Movement	1	4	7	8	9	10	11	12
_ane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	5	8		6			0	
C (m) (veh/h)	1278	1049		557				
//c	0.00	0.01		0.01	1			
95% queue length	0.01	0.02		0.03				
Control Delay (s/veh)	7.8	8.5	<u> </u>	11.5	1		1	
_OS	A	A	<u> </u>	В			<u> </u>	
Approach Delay (s/veh)			 	11.5				
Approach LOS				B		 		
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		O-WAY STOP								
General Information	1		Site I	nforma	atio	n				
Analyst	J. Jesper	sen	Interse	oction			12. US 9	3 & Irvin	e Fl	ats
Agency/Co.	CDM						Road			
Date Performed	5/10/201		Jurisdi				2020			
Analysis Time Period	PM Peak (North)	with Bypass	Anaiys	is Year			2030			
Project Description										
East/West Street: US 93	3		North/S	South St	treet	: Irvine F	lats Road			
ntersection Orientation:	East-West		Study F	Period (I	hrs):	0.25				
/ehicle Volumes an	d Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5			6
	<u>L</u>	T	R			L	T 510			R
Volume (veh/h)	5	377	2			12	516		23	
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92		0.92	
veh/h)	5	409	2			13	560		24	
Percent Heavy Vehicles	0					0				
Median Type		-	1	Undivi	ided	'	1			
RT Channelized	1		0				<u> </u>			0
_anes	0	1	0		0		1			0
Configuration	LTR					LTR				
Jpstream Signal		0					0			
Minor Street	<u> </u>	Northbound	1 -			- 10	Southbou	<u>ınd</u>		
Movement	7	8	9			10	11			12
() () () () () ()	L	T	R			L	T			R
Volume (veh/h) Peak-Hour Factor, PHF	6 0.92	0.92	11 0.92	-		0 0.92	0 0.92	_	0 0.92	
Hourly Flow Rate, HFR			1	_			1		0	
veh/h)	6	1	11			0	0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
lared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
_anes	0	1	0			0	1			0
Configuration		LTR					LTR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound	I	Northbo	und		S	Southbo	und	
Movement	1	4	7	8		9	10	11		12
_ane Configuration	LTR	LTR		LTR				LTR		
/ (veh/h)	5	13		18				0		
C (m) (veh/h)	1001	1159		364						
r/c	0.00	0.01		0.05						
95% queue length	0.02	0.03		0.16						
Control Delay (s/veh)	8.6	8.1		15.4						
.OS	Α	Α		С	一				一	
Approach Delay (s/veh)				15.4	:					
		ı								

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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY				
General Information	n		Site I	nform	atio	on .				
Analyst	J. Jesper	sen	Interes	otion			142 115 0	2 0 000	ffranc	Dood
Agency/Co.	CDM		Interse Jurisdi				13. US 93	o & Cai	ney	Ruau
Date Performed	5/10/2011			is Year			2030			
Analysis Time Period	AM Peak (North)	with Bypass	l i i i i i i i i i i i i i i i i i i i							
Project Description	**									
East/West Street: Caffr	ey Road		North/S	South S	tree	t: <i>US 93</i>				
Intersection Orientation:	North-South		Study F	Period (hrs)	: 0.25				
Vehicle Volumes aı	nd Adjustme	nts								
Major Street		Northbound					Southbou	ınd		
Movement	1	2	3			4	5			6
	L	T	R			<u> </u>	T			R
Volume (veh/h)	126	566	0			1	362	_		7
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	\longrightarrow		0.92	0.92	-+).92
(veh/h)	136	615	0			1	393		7	
Percent Heavy Vehicles	0					0				
Median Type			Í	Undiv	ridec	1	1	-		_
RT Channelized			0	\longrightarrow						0
Lanes	1	2	0			1	2		1	
Configuration	L	T	TR			L	T			R
Upstream Signal		0					0			
Minor Street	7	Eastbound	9	\dashv		10	Westbou	nd T		12
Movement	7 L	8 T	R R	\rightarrow		10 L	11 T	-+		R
Volume (veh/h)	556	111	5004	, +		1	1	-+		0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92	
Hourly Flow Rate, HFR (veh/h)	604	120	5439			1	1			0
Percent Heavy Vehicles	0	0	0	\rightarrow		0	0	$\overline{}$		0
Percent Grade (%)	 	0	Ů				0			
Flared Approach	1	N					l N	Т		
Storage		0		\dashv			0	o		
RT Channelized			0							0
Lanes	0	1	0	$\neg \uparrow$		0	1			0
Configuration		LTR					LTR			
Delay, Queue Length, a	and Level of Se	rvice								
Approach	Northbound	Southbound	1	Westbo	und		E	Eastbo	und	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	L	L		LTR	?			LTF	₹	
v (veh/h)	136	1		2				616	3	
C (m) (veh/h)	1170	974		0				592		
v/c	0.12	0.00						10.4	11	
95% queue length	0.39	0.00						699.6	_	
Control Delay (s/veh)	8.5	8.7					<u> </u>	425		
LOS	A	A A		F				F		
Approach Delay (s/veh)				<u> </u>		<u> </u>	 	4253		<u> </u>
Approach LOS							4255 F			
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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY			
General Information	n		Site I	nform	atio	on			
Analyst	J. Jesper	sen	Interse	otion			112 115 0	o e Coffi	ov Bood
Agency/Co.	CDM		Jurisdi				13. US 93	& Calli	ey Roau
Date Performed	5/10/2011			is Year			2030		
Analysis Time Period	PM Peak (North)	with Bypass							
Project Description	N /								
East/West Street: Caffr	ey Road		North/S	South St	tree	t: <i>U</i> S 93			
Intersection Orientation:	North-South		Study F	Period (hrs)	: 0.25			
Vehicle Volumes ai	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	89	778	5	\rightarrow		1	571		11
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	96	845	5			1	620		11
Percent Heavy Vehicles	0					0			
Median Type			4	Undiv	idec	1	_		
RT Channelized			0						0
Lanes	1	2	0			1	2		1
Configuration	L	T	TR		L		T		R
Upstream Signal		0					0		
Minor Street		Eastbound					Westbou	nd	
Movement	7	8	9	\longrightarrow		10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	667	0	4782			1	0		1
Peak-Hour Factor, PHF	0.92	0.92	0.92	\rightarrow		0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	724	0	5197	7		1	0		1
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					Ν		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration		LTR					LTR		
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Northbound	Southbound		Westbo	und		[Eastbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	L	L		LTR				LTR	
v (veh/h)	96	1		2				5921	
C (m) (veh/h)	961	797		0				459	
v/c	0.10	0.00					Ì	12.90	\neg
95% queue length	0.33	0.00					i e	685.99	_
Control Delay (s/veh)	9.2	9.5		_			 	5376	+
LOS	A A	A A		F				5570 F	+
Approach Delay (s/veh)							 	<u> </u>	
,							5376		
Approach LOS	orida, All Rights Rese			CS+ TM V			F Generated: 5/11/2011 12		/2011 12:05 F

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	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY				
General Information	า		Site I	nform	atio	on .				
Analyst	J. Jesper	sen	1,	-4:			15. Kerr	Dam F	Road	& Grenie
Agency/Co.	CDM		Interse	ection			La			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period		with Bypass	Analys	sis Yea	r		2030			
-	(North)									
Project Description East/West Street: Gren	ionlone		N a matho /C	Cauth C	٠٠	t: Kerr Da	ma Dand			
Intersection Orientation:						: <i>Nerr Da</i>	im Road			
			Olddy I	enou	(1113)	. 0.23				
Vehicle Volumes ar Major Street	ia Aajustine	Northbound					Southbo	und		
Movement	1	2	3			4	5			6
Wovement	 	T T	R			L	T			R
Volume (veh/h)	0	197	141			35	93			0
Peak-Hour Factor, PHF	0.92	0.92	0.92	2		0.92	0.92		0.92	
Hourly Flow Rate, HFR	0	214	153			38	101		0	
(veh/h)		_							 	
Percent Heavy Vehicles	0			l lo di	ر مام د	0				
Median Type RT Channelized	-	Undi				l 0				
	0	1	0			0	1			0
Lanes Configuration	LTR	'	+ -			LTR	,			U
Upstream Signal	LIK	0	+	-		LIK	0			
Minor Street		Eastbound					Westbou	und		
Movement	7	8 Eastbouriu	9			10	11			12
Movement	† 	T	R			L	 ''			R
Volume (veh/h)	 	- 	1	$\overline{}$		22	0			14
Peak-Hour Factor, PHF	1.00	1.00	1.00)		0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			23	0	Î		15
Percent Heavy Vehicles	0	0	0			0	0	Î		0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0	Î		
RT Channelized			0							0
Lanes	0	0	0			0	1			0
Configuration							LTR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Northbound	Southbound	,	Westbo	ound			Eastbo	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LTR	LTR		LTF	?					1
v (veh/h)	0	38		38						
C (m) (veh/h)	1504	1203		608	}					i
v/c	0.00	0.03		0.06						
95% queue length	0.00	0.10		0.20			1			
Control Delay (s/veh)	7.4	8.1		11.3			†			
LOS	A	A		В			†	╁		
Approach Delay (s/veh)				11.3	3]	 			
Approach LOS				B						
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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY				
General Information	<u> </u>		Site I	nform	atio	on .				
Analyst	J. Jesper	sen	lusto roc	ation.			15. Kerr	Dam I	Road	& Grenie
Agency/Co.	CDM		Interse				La			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period		with Bypass	Analys	is Yea	r		2030			
	(North)									
Project Description East/West Street: Gren.	ionlone		No who /C	Sauth C	٠	t. Karr Da	nn Dood			
Intersection Orientation:						t: <i>Kerr Da</i> : 0.25	iiii Road			
		1-	Study I	enou	(1113)	. 0.20				
Vehicle Volumes ar Major Street	ia Aajustine	Northbound					Southbo	und		
Movement	1 1	2	3	\dashv		4	5	unu		6
WOVERNETIC	 	† †	R			L	T			R
Volume (veh/h)	0	178	55			16	250			0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92			0.92
Hourly Flow Rate, HFR	0	193	59			17	271			0
(veh/h)			+						+	
Percent Heavy Vehicles	0			Undiv	iida -	0				
Median Type RT Channelized	+		/iuec	ı	0					
	0	1	0	\longrightarrow		0	1			0
Lanes	LTR	1	0			LTR	1			U
Configuration Upstream Signal	LIK	0	+	\dashv		LIK	0			
<u> </u>										
Minor Street Movement	7	Eastbound 8	9			10	Westbound 11			12
Movement	1 1	T	R	-		L	T T			R
Volume (veh/h)	+ -	<u>'</u>	IX			53	0			22
Peak-Hour Factor, PHF	1.00	1.00	1.00	,		0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			57	0			23
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)	+	0		\dashv			0			
Flared Approach	+	T N	1				T N			
• • • • • • • • • • • • • • • • • • • •	+	0	+	-			0		_	
Storage RT Channelized	+	0	0	\dashv			0			
Lanes	0	0	0			0	1			0
Configuration	 		1			U	LTR			U
Delay, Queue Length, a	and Level of So	rvice					LIIN			
Approach	Northbound	Southbound	,	Westbo	nund			Eastb	ound	
Movement	1	4	7	8		9	10	_	11	12
Lane Configuration	LTR	LTR	- '	LTF			'0	+		'-
v (veh/h)	0	17		80			1	+-		
C (m) (veh/h)	1304	1325		571			1	╫		
v/c	0.00	0.01					1	╫		
				0.14			}	+		
95% queue length	0.00	0.04		0.48			 	╫		-
Control Delay (s/veh)	7.8	7.8		12.3	3		 	 		
LOS	Α	Α		В				1		
Approach Delay (s/veh)				12.3	3		ļ			
Approach LOS				В						

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	TW	O-WAY STOP	CONTR	OL S	UMN	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	J. Jesper	sen	Interse	otion			16. Kerr L	Dam Road	l & Back
Agency/Co.	CDM						Road		
Date Performed	5/10/201		Jurisdi				2000		
Analysis Time Period	AM Peak (North)	with Bypass	Analys	is Yea	ır		2030		
Project Description	"\								
East/West Street: Back	Road		North/S	South S	Stree	t: Kerr Da	m Road		
Intersection Orientation:	North-South		Study F	Period	(hrs)	: <i>0.</i> 25			
Vehicle Volumes aı	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
N/ - 1 / 1 / 1 N	<u> </u>	T	R			L	T		R
Volume (veh/h) Peak-Hour Factor, PHF	5 0.92	234 0.92	0.92			0.92	69 0.92		20 0.92
Hourly Flow Rate, HFR			1						
(veh/h)	5	254	0			0	74		21
Percent Heavy Vehicles	0					0			
Median Type		<u> </u>	1	Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street	 	Eastbound	1 0			40	Westbou	nd	10
Movement	7	8	9			10	11		12
\\al\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	L	T	R			L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	18 0.92	0.92	5 0.92			1.00	1.00		1.00
Hourly Flow Rate, HFR	1	1							
(veh/h)	19	0	5			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	0		0
Configuration		LTR							
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Northbound	Southbound	١	Westb	ound		E	astbound	t
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR						LTR	
v (veh/h)	5	0						24	
C (m) (veh/h)	1512	1323						700	
v/c	0.00	0.00						0.03	
95% queue length	0.01	0.00						0.11	
Control Delay (s/veh)	7.4	7.7						10.3	
LOS	Α	Α						В	1
Approach Delay (s/veh)						ı		10.3	II.
Approach LOS							В		
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	TW	O-WAY STOP	CONTR	OL S	UMN	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	J. Jesper	sen	Interes	otion			16. Kerr L	Dam Road	d & Back
Agency/Co.	CDM		Interse				Road		
Date Performed	5/10/201		Jurisdi						
Analysis Time Period	PM Peak (North)	with Bypass	Analys	is Yea	ır		2030		
Project Description	"\								
East/West Street: Back	Road		North/S	South S	Stree	t: Kerr Da	m Road		
Intersection Orientation:	North-South		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	11	124	0			0	161		37
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			0.92	0.92		0.92
(veh/h)	11	134	0			0	174		40
Percent Heavy Vehicles	0					0			
Median Type			4	Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street		Eastbound	1				Westbou	nd	
Movement	7	8	9			10	11		12
	L	T	R			L	Т		R
Volume (veh/h)	17	0	4			1.00	1.00		1.00
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92			1.00	1.00		1.00
(veh/h)	18	0	4			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N	ļ				N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	0		0
Configuration		LTR							
Delay, Queue Length, a									
Approach	Northbound	Southbound	١	Vestb	ound	_	E	Eastbound	t
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR						LTR	
v (veh/h)	11	0						22	
C (m) (veh/h)	1368	1463						676	
v/c	0.01	0.00						0.03	1
95% queue length	0.02	0.00						0.10	1
Control Delay (s/veh)	7.7	7.5						10.5	
LOS	Α	Α						В	1
Approach Delay (s/veh)						ı		10.5	
Approach LOS							В		
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							НО	RT	REPO	ORT							
General Info	rmation									nformat	ion						
Analyst Agency or Co Date Perform Time Period	J. Jespers o. CDM ned 5/10/2011 AM Peak (South)		Bypas	s					Area Juriso	ection Type diction sis Year	All	S 93 & So other are		Shor	e Road		
Volume and	Timing Inpu	t							•								
					В				WB			NB				SB	
Niverban of L			LT	1	Ή	RT		T	TH	RT	LT	TH	-	RT	LT	TH	RT
Number of La	anes		<u> </u>		_		1			1		2	1		2	1	├
Lane Group	`		 		\dashv		L			R	-	T	F		L 100	T	\vdash
	-		<u> </u>				11			222	-	332	6		129	265	┼──
	nicies		<u> </u>		_		2			2	-	2	2		2	2	├──
PHF	L - (- 1 (D (A)		<u> </u>		_		0.9			0.92	-	0.92	0.9		0.92	0.92	┼──
			<u> </u>				P			P		P	F		P	P	├──
<u>.</u>				_			2.0			2.0		2.0	2.		2.0	2.0	├ ──
	Effective Gre	en		L	_		2.0			2.0		2.0	2.		2.0	2.0	
Arrival Type					_		3			3		3	3		3	3	├──
							3.0		_	3.0	_	3.0	3.		3.0	3.0	—
	OR Volume		0	C)		0		0	0	0	0	(0	0	
Lane Width	. /D . ! :			L	$\overline{}$		12			12.0	ļ.,	12.0	-	.0	12.0	12.0	
			N	C	<u>'</u>	N	Λ		0	N	N	0			N	0	N
			 	┢	\dashv		()		0		0	╁)	0	0	\vdash
			_	3.	2			,	3.2	,		3.2	 '	,	0	3.2	+
Phasing		Т	02	<u> </u>	<u>- </u>	03	┰	0	4	SB O	nlv	Thru & I	RT	Γ	07	')8
Timing	G = 17.0		= 0.0		G =	0.0		3 =		G = 12		G = 65.			= 0.0	G =	0.0
			= 0		Y =	0	١	/ =	0	Y =		Y = 3		Y =		Y = 0)
					<u> </u>		-1.1.4		D = 1 = =	!		Cycle Le	engtl	ո C =	= 100.0)	
Lane Grou	up Capacity	y, C	ontro			y, an		<u> </u>		minatio	on T	ND				<u> </u>	
A 15 - 4 - 1 F1 -	Dete			-	EB	т —	-	20	WB	1044	-	NB	1.		4.40	SB	
			<u> </u>	╀		├	\dashv	28	┼	241	+	361 2306	6	8)29	140	288 1435	
Lane Group	Capacity						30	01		507		2300)23	412	1433	
v/c Ratio							0.	43		0.48		0.16	0.	07	0.34	0.20	
Green Ratio							0.	17		0.32		0.65	0.	65	0.12	0.77	
Uniform Dela	ay d ₁						37	7.1		27.3		6.8	6.	4	40.4	3.1	
Delay Factor	·k						0.	50		0.50		0.50	0.	50	0.50	0.50	
Incremental	Delay d ₂			Ĺ			4	1.4		3.2	ĺ	0.1	C	. 1	2.2	0.3	
PF Factor							1.	000		1.000		1.000	1.0	000	1.000	1.000	
Control Delay	у						4	1.5		30.4		7.0	6	.5	42.6	3.4	
Lane Group	ren Ratio form Delay d ₁ ay Factor k remental Delay d ₂ Factor atrol Delay re Group LOS proach Delay							D		С		Α	1	A .	D	Α	
Approach De	Extension //Bike/RTOR Volume e Width king/Grade/Parking king/Hour Stops/Hour imum Pedestrian Time sing WB Only ing G = 17.0						↿		34.3	,	ĺ	6.9				16.3	
Approach LC	imed/Actuated (P/A) tup Lost Time tup Lost Time transion of Effective Gre val Type Extension /Bike/RTOR Volume the Width sing/Grade/Parking sing/Hour Stops/Hour mum Pedestrian Time sing WB Only representation of Analysis (hrs) the Group Capacity Ratio ten						十		С		1	Α				В	
Intersection I	timed/Actuated (P/A) tup Lost Time ension of Effective Gr val Type Extension /Bike/RTOR Volume e Width king/Grade/Parking king/Hour Stops/Hour imum Pedestrian Tim sing WB Only ing G = 17.0 Y = 3 ation of Analysis (hrs) ne Group Capaci usted Flow Rate e Group Capacity Ratio en Ratio form Delay d ay Factor k emental Delay d ay Factor trol Delay e Group LOS roach Delay roach LOS rsection Delay			1	8.4		\top			Interse	ction L	.OS				В	
ļ		da Al	I Rights F							HCS+TM V				G	enerated:	5/11/2011	1:03 PM

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						S	HOR	T F	REPO	RT							
General Info	rmation							_		nformat	ion						
			Bypas	s					Area durisc	ection Type liction sis Year	All	93 & So other are		Shor	e Road		
Volume and	Timing Inpu	t															
					В				WB			NB				SB	
Number of L			LT		ТН	RT	LT	+	TH	RT	LT	TH	-	T	LT	TH	RT
	anes				_		1	+		1		2	1		2	1	
	\			┞	\dashv		L	+		R		T 460	14		L	T 100	
	-						222	+		303		462			285	402	
	lyst J. Jesper ncy or Co. CDM Performed 5/10/201 PM Peak (South) Ime and Timing Input The and The						2	+		2		2	2		2	2	
PHF	lyst J. Jesper ncy or Co. CDM Performed 5/10/201 PM Peak (South) PM Peak (Sout						0.92	╁		0.92		0.92	0.9		0.92	0.92	
	ncy or Co. CDM Performed 5/10/201 PM Peak (South) Imme and Timing Input The Period (South) Imme and Timing Input The Period (South) Imme and Timing Input The Period (South) Imme and Timing Input The Period (P/A) The Per						P	+		P		P	F		P	P	
	lyst J. Jesper ncy or Co. CDM Performed 5/10/201 PM Peak (South) Ime and Timing Inputation of Lanes Period (South) Ime and Timing Inputation of Lanes Period (South) Ime and Timing Inputation of Lanes Period (South) Ime and Timing Inputation of Lanes Period (P/A) Ime and Timing Inputation of Lanes Period (P/A) Ime and Timing Inputation of Lanes Period (P/A) Imputation of Effective Green of E			_			2.0	+		2.0		2.0	2.		2.0	2.0	+
	Effective Gre	en			\dashv		2.0	+		2.0		2.0	2.		2.0	2.0	
					\dashv		3	+		3		3	3		3	3	
					\vdash		3.0	+		3.0		3.0	3.		3.0	3.0	
	OR Volume		0	C	_		0	+	0	0	0	0	10		0	0	
	do/Parking		N	(N	12.0 N	十	0	12.0 N	N	12.0 0	12 N		12.0 N	12.0 0	N
			//			11	//	十	U	10	11	0			7.0		170
							0	十		0		0)	0	0	
				3.	2		بُ	十	3.2			3.2	Ť			3.2	
Phasing	mber of Lanes e Group ume (vph) Heavy Vehicles timed/Actuated (P/A) rtup Lost Time ension of Effective Greeval Type t Extension MBike/RTOR Volume e Width king/Grade/Parking king/Hour Stops/Hour imum Pedestrian Time asing WB Only ing G = 25.0 Y = 3 ation of Analysis (hrs): The Group Capacity Ratio en Ratio form Delay d1 ay Factor k emental Delay d2 Factor htrol Delay e Group LOS proach Delay		02	<u> </u>	<u> </u>	03	<u>' T</u>	04	ļ	SB Or	nly	Thru & F	RT		07	0	8
Timing			= 0.0			0.0	G =			G = 23	3.0	G = 57.0)		= 0.0	G =	
	_	_	= 0		Y =	0	Y =	= 0		Y =		Y = 3 Cycle Le	natk	Y =		Y = (2
				<u>Л</u> Г	l Jala	v an	410	S L)otor	minatio	<u></u>	Cycle Le	ngu	10=	111.0		
Lane Grot	up Capacit	y , C			EB	y, am		<u> </u>	WB	iiiiiati	T	NB				SB	
Adjusted Flor	w Rate			Τ		Т	241			329	╁	502	15	3	310	437	
				╁		\vdash	_	\dashv			 	1821	╁		 	1343	
	Capacity			<u> </u>		├	399	_		727	_		81		712		
v/c Ratio				╀		-	0.60	_		0.45		0.28	0.		0.44	0.33	
Green Ratio				丄		<u> </u>	0.23	_		0.46		0.51	0.3		0.21	0.72	
	* 1			_		<u> </u>	38.6	_		20.5	<u> </u>	15.3	14		38.3	5.7	
Delay Factor				Ļ			0.50			0.50		0.50	0.3	50	0.50	0.50	
Incremental I	Delay d ₂			L			6.6			2.0	<u> </u>	0.4	0	.5	1.9	0.6	
PF Factor				Ļ		ـــــــ	1.00	_		1.000	<u> </u>	1.000	$\overline{}$	000	1.000	1.000	
Control Delay	-			Ļ			45.2	2		22.5		15.7	15	5.1	40.3	6.3	
Lane Group	asing WB Only G = 25.0 Y = 3 ation of Analysis (hrs) The Group Capacit Susted Flow Rate The Group Capacity Ratio The Group Capacity Ratio The Group Capacity Ratio The Group Capacity Ratio The Group Capacity Ratio The Group Capacity The Group Capacit						D			С		В	E	3	D	Α	
Approach De	elay								32.1			15.5				20.4	
Approach LC)S								С			В				С	
Intersection I	Delay			2	2.2					Intersec	ction L	os				С	
Copyright © 2008	e and Timing Input r of Lanes roup e (vph) // Vehicles ed/Actuated (P/A) Lost Time on of Effective Greet Type tension ce/RTOR Volume //idth //Grade/Parking //Hour m Pedestrian Time g WB Only G = 25.0 Y = 3 n of Analysis (hrs) = Group Capacity ed Flow Rate roup Capacity ed Flow Rate roup Capacity ed Flow Rate roup Capacity for Delay d ental Delay d tor Delay roup LOS ch Delay ch LOS ction Delay		l Riahts F	Rese	rved				-	HCS+ TM V	ersion 5	4		G	enerated:	5/11/2011	1:03 PM

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				SI	HORT	REPO	RT							
General Info	rmation						nformati	on						
Analyst Agency or Co Date Perform Time Period	J. Jespers o. CDM ned 5/10/2011 AM Peak v (South)		s			Interse Area T Jurisd Analys	Гуре	All o	93 & 4th . ther area		nue	East		
Volume and	Timing Input													
			EB			WB	1		NB				SB	
Niverban of L		LT	TH	RT	LT	TH	RT	LT	TH	R	_	LT	TH	RT
	anes	1	1	0	1	1	0	0	1	0		0	1	0
<u>.</u>	١	L	TR		L	TR		42	LTR	0.5		7	LTR	1
		2	400	8	55	396	3	13	3	95			3	
	nicies	2	2	2	2	2	2	2	2	2		2	2	2
PHF	- (- L/D/A)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.9		0.92	0.92	0.92
		A	A	Α	A	A	Α	P	P	P		Р	P	Р
<u> </u>		2.0	2.0		2.0	2.0	-		2.0	_			2.0	
	Effective Gree		2.0		2.0	2.0			2.0	┢			2.0	
Arrival Type		3	3		3	3	-		3	<u> </u>			3	
		3.0	3.0		3.0	3.0	 		3.0				3.0	
	OR Volume	12.0	0	0	0	0	0	0	0	0		0	0	0
Lane Width	rtimed/Actuated (P/A) rtup Lost Time ension of Effective Gre ival Type It Extension Id/Bike/RTOR Volume Ine Width Ine Analysis (hrs) Ine Group Capacity		12.0		12.0	12.0	 	.	12.0	L .			12.0	
	rtup Lost Time ension of Effective Gre ival Type It Extension Id/Bike/RTOR Volume Ine Width Inking/Grade/Parking Inking/Hour Is Stops/Hour Inimum Pedestrian Time Inimum Pedestrian Tim		0	N	N	0	N	N	0	N		N	0	N
		0	0	 	0	0	 	 	0				0	
	mber of Lanes ne Group ume (vph) Heavy Vehicles F stimed/Actuated (P/A) rtup Lost Time ension of Effective Gre ival Type It Extension d/Bike/RTOR Volume ne Width rking/Grade/Parking rking/Hour s Stops/Hour nimum Pedestrian Time asing WB Only Name of Analysis (hrs) ration of Analysis (hrs) reform Capacit water Flow Rate ne Group Capacity Ratio een Ratio form Delay d ay Factor k remental Delay d Factor introl Delay		3.2		U	3.2			3.2				3.2	
Phasing		EW Pern		03	<u> </u>		NS Pe	rm I	06	<u> </u>		07	' ,)8
		G = 83.0		0.0	G = 0		G = 11		3 = 0.0	一	G =	0.0	G =	_
Timing		Y = 3	Y =	0	Y = ()	Y = 3		/ = 0		Y =		Y =	0
			<u></u>				•		Cycle Ler	ngth	<u>C</u> =	108.0)	
Lane Grou	up Capacity	, Contro		y, and	LOS		ninatio	n T						
			EB	1	-	WB	1		NB	_			SB	1
Adjusted Flor	w Rate	2	444	<u> </u>	60	433	 	ļ	120				12	
Lane Group	Capacity	731	1427		809	1568			163				152	
v/c Ratio		0.00	0.31		0.07	0.28			0.74				0.08	
Green Ratio		0.77	0.77		0.87	0.84			0.10				0.10	
Uniform Dela	ay d ₁	2.9	3.8		1.3	1.7			47.1				43.9	
Delay Factor	k	0.11	0.11		0.11	0.11			0.50				0.50	
Incremental I	Delay d ₂	0.0	0.1		0.0	0.1			25.4				1.0	
PF Factor		1.000	1.000		1.000	1.000			1.000				1.000	
Control Delay	y	2.9	3.9		1.3	1.8			72.5				44.9	
Lane Group	LOS	Α	Α		Α	Α			Ε				D	
Approach De	elay		3.9			1.8			72.5				44.9	
Approach LC)S		Α			Α			Ε				D	
Intersection [Delay		11.1				Intersec	tion LC)S				В	
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				SI	HORT	REPC	RT						
General Info	rmation					Site I	nformati	on					
Analyst Agency or Co Date Perform Time Period	J. Jespersei o. CDM ned 5/10/2011 PM Peak wi (South)		s			Interse Area Jurisd Analys	Гуре	All c	93 & 4th other area		East		
Volume and	Timing Input												
			EB			WB			NB			SB	
Nl (1		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of La	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	`	L	TR	10	L	TR	 	14	LTR	450	<u> </u>	LTR	
Volume (vph	<u> </u>	2	520	13	62	483	2	44	1	153	4	1	4
% Heavy Vel	nicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Act		A	Α	Α	Α	Α	A	P	P	P	P	P	Р
Startup Lost		2.0	2.0		2.0	2.0	-	<u> </u>	2.0			2.0	
	Effective Green		2.0	<u> </u>	2.0	2.0	ļ		2.0	<u> </u>	<u> </u>	2.0	
Arrival Type		3	3		3	3	ļ		3			3	
Unit Extension		3.0	3.0	ļ	3.0	3.0	ļ		3.0		ļ	3.0	
Ped/Bike/RT	OR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0	ļ	12.0	12.0	ļ	ļ	12.0	ļ	ļ	12.0	
Parking/Grad		N	0	N	N	0	N	N	0	N	N	0	Ν
Parking/Hou							+						
Bus Stops/H	destrian Time	0	0 3.2		0	3.2	+		3.2			<i>0</i> 3.2	
Phasing		I W Perm	<u></u>	03	<u> </u>		NS Pe	rm I	06	<u> </u>	<u>I</u> 07	<u> </u>)8
		6 = 83.0		0.0	G = (G = 11		3 = 0.0	G =	: 0.0	G =	
Timing	Y = 0	′ = 3	Y =		Y = (Y = 3	ĺ	/ = 0	Y =	: 0	Y =	
	nalysis (hrs) = 0		<u></u>						Cycle Ler	ngth C =	: 108.0)	
Lane Grou	up Capacity,	Contro		y, and	LOS		ninatio	n					
		_	EB		_	WB	1		NB			SB	
Adjusted Flo	w Rate	2	579	ļ	67	527	ļ		215			9	
Lane Group	Capacity	670	1426	<u> </u>	702	1569			157			149	
v/c Ratio		0.00	0.41		0.10	0.34	<u> </u>	<u> </u>	1.37			0.06	
Green Ratio		0.77	0.77		0.87	0.84			0.10			0.10	
Uniform Dela	ay d ₁	2.9	4.2		1.7	1.9			48.5			43.8	
Delay Factor	·k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	Delay d ₂	0.0	0.2		0.1	0.1			201.3			0.8	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	у	2.9	4.4		1.7	2.0			249.8			44.6	
Lane Group	LOS	Α	Α		Α	Α			F			D	
Approach De	elay		4.4	-		2.0	*		249.8	-		44.6	
Approach LC)S		Α			Α			F			D	
Intersection I	Delay	†	41.3				Intersec	tion LC)S			D	$\overline{}$
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				SI	HORT	,							
General Info						Site Ir	formati						
Analyst Agency or C Date Perforr	med 5/10/2011	a Diman	_			Interse	Гуре	Stree	Avenue et E ther area		1st		
Time Period	AM Peak with (South)	ı Bypas	S			Jurisdi Analys	iction sis Year	2030)				
Volume and	d Timing Input					•							
		17	EB	l DT	1	WB	T DT		NB	l DT		SB	Lot
Number of L	anes	LT 1	TH 1	RT 0	LT 1	TH 1	RT 0	<u>LT</u>	TH 1	RT 0	LT 0	TH 1	RT 0
Lane Group		L	TR	ا ا	L	TR	+ -	-	LTR	<u> </u>	-	LTR	
Volume (vph		8	275	91	95	195	11	85	15	103	21	24	9
% Heavy Ve		2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Ac	tuated (P/A)	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Startup Lost	Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of	f Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type		3	3		3	3			3			3	
Unit Extensi	on	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RT	ΓOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Gra		Ν	0	Ν	Ν	0	N	N	0	Ν	N	0	Ν
Parking/Hou							-						
Bus Stops/H	edestrian Time	0	<i>0</i> 3.2		0	<i>0</i> 3.2	-		<i>0</i> 3.2			<i>0</i> 3.2	
Phasing	EW Perm	02		03	0.	<u> </u>	NS Pe	rm I	06	<u> </u>	<u>1</u> 07	')8
		= 0.0		0.0	G = (G = 68		i = 0.0	G =	= 0.0	G =	
Timing		= 0	Y =	0	Y = 0)	Y = 3		= 0	Y =		Y =	0
	Analysis (hrs) = 0.		l Dala			D = 1 =			ycle Ler	ngth C =	= 140.0)	
Lane Gro	up Capacity, (ontroر آ		y, and	LOSI	WB	ninatio	n T	ND			SB	
۸ مانی مدم ما تارم	Data		EB	1	100		1		NB Iaaa	1		1	ſ
Adjusted Flo Lane Group		9 481	398 845		103 337	224 871			220 719	 		59 767	
v/c Ratio	Сараспу	0.02	0.47	-	0.31	0.26	+-	 	0.31			0.08	
Green Ratio		0.02	0.47		0.47	0.20			0.37			0.49	
Uniform Dela		19.7	0.47 25.1		22.8	22.3	+	-	21.7			19.2	
Delay Factor	· '	0.50	0.50		0.50	0.50			0.50			0.50	
Incremental		0.30	1.9		2.3	0.7	+-	 	1.1	 		0.2	
PF Factor		1.000	1.000		1.000	1.000		\vdash	1.000			1.000	
Control Dela	ay	19.8	27.0		25.2	23.0			22.8			19.4	
Lane Group		В	С		С	С			С			В	
Approach De			26.9			23.7	1		22.8			19.4	
Approach LO			С			С			С			В	
Intersection			24.5				Intersec	tion LO				С	
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				SI	HORT	ir .							
General Info						Site Ir	formati						
	med 5/10/2011	a Punas	6			Interse Area T Jurisdi	уре	Stree	Avenue et E ther area		1st		
Time Period	(South)	т Бураз	5				sis Year	2030)				
Volume and	d Timing Input					,							
		17	EB		1 -	WB	T DT		NB	l DT		SB	l DT
Number of L	anes	LT 1	TH 1	RT 0	LT 1	TH 1	RT 0	<u>LT</u>	TH 1	RT 0	<u>LT</u>	TH 1	RT 0
Lane Group		L	TR		L	TR	+ -	-	LTR	<u> </u>	-	LTR	
Volume (vph		9	320	72	89	362	5	155	22	198	39	47	25
% Heavy Ve		2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Ac	tuated (P/A)	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Startup Lost	Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of	f Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type		3	3		3	3			3			3	
Unit Extensi	on	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RT	ΓOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Gra		Ν	0	Ν	Ν	0	N	N	0	Ν	N	0	Ν
Parking/Hou							 	<u> </u>		<u> </u>			
Bus Stops/H	edestrian Time	0	<i>0</i> 3.2		0	<i>0</i> 3.2	-		<i>0</i> 3.2			<i>0</i> 3.2	
Phasing	EW Perm	02		03	0.	<u> </u>	NS Pe	rm [06	<u> </u>	<u>1</u> 07	'	<u> </u>
		= 0.0		0.0	G = (G = 84		i = 0.0	G =	= 0.0	G =	
Timing		= 0	Y =	0	Y = 0)	Y = 3		= 0	Y =		Y =	0
	Analysis (hrs) = 0.		l Dala			D = 1 =			ycle Ler	ngth C =	= 179.0)	
Lane Gro	up Capacity, (ontroر آ		y, and	LOSI	WB	ninatio	n T	ND			SB	
۸ مانی مدم ما تارم	Data	10	EB	1	07	1	1		NB	1		1	
Adjusted Flo		10 365	426 901		97 343	398 924	╁		407 650	 		120 669	_
v/c Ratio	Сараспу	0.03	0.47		0.28	0.43	╁	 	0.63			0.18	
Green Ratio		0.50	0.47	<u> </u>	0.28	0.43	╁	 	0.03	 		0.18	
Uniform Dela		22.9	29.6		26.3	28.8	\vdash		35.7			27.5	
Delay Factor	· '	0.50	0.50		0.50	0.50	+		0.50			0.50	
Incremental		0.30	1.8		2.1	1.5	 		4.5			0.6	
PF Factor	Delay u ₂	1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	ay	23.1	31.4		28.4	30.3	+	t	40.2			28.1	
Lane Group		C	С		C	С	\vdash	t	D	<u> </u>		C	\vdash
Approach De		 	31.2		†	29.9		†	40.2	<u> </u>		28.1	
Approach LO		 	С		\dagger	C			D			C	
Intersection		 	33.0		†		Intersec	tion LO				С	
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				SI	HORT	REPC	RT						
General Info	ormation					Site I	nformati	on					
Analyst Agency or C Date Perforr	med 5/10/2011					Inters	Гуре	Stree	Avenue et ther area		Main		
Time Period	AM Peak wit (South)	h Bypas	S			Jurisd Analy	iction sis Year	2030)				
Volume and	d Timing Input					1							
			EB			WB			NB	1		SB	
Nl(1		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of L	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	- \	L	TR	07	L	TR	111		LTR		 	LTR	1
Volume (vph		8	265	87	87	178	11	2	4	2	4	5	1
% Heavy Ve	enicies	2	2	2	2	2	2	2	2	2	2	2	2
		0.92	0.92	0.92	0.92	0.92	0.92	0.92 P	0.92 P	0.92 P	0.92 P	0.92 P	0.92 P
Pretimed/Ac Startup Lost		A 2.0	A 2.0	Α	2.0	2.0	Α		2.0			2.0	P
	f Effective Green		2.0		2.0	2.0	╁		2.0			2.0	
Arrival Type		3	3	<u> </u>	3	3	+		3			3	
Unit Extensi		3.0	3.0	_	3.0	3.0	╁	_	3.0			3.0	
	FOR Volume	0	0	0	0.0	0	0	0	0	0	0	0	0
Lane Width	TOTE VOIGITIO	12.0	12.0	Ů	12.0	12.0	+ -	<u> </u>	12.0		 	12.0	Ů
Parking/Gra	de/Parking	N	0	N	N	0	N	N	0	Ν	N	0	N
Parking/Hou													
Bus Stops/H	lour	0	0		0	0			0			0	
Minimum Pe	edestrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02		03	0.		NS Pe		06		07)8
Timing		0.0	G = Y =	0.0	G = 0		G = 17 $Y = 3$		$\dot{s} = 0.0$	Y =	= 0.0	G = Y =	
Duration of A	Analysis (hrs) = 0		<u> </u>		11-0	,	1 - 0		ycle Ler	u u			0
Lane Gro	up Capacity,	Contro	l Dela	y, and	LOS	Deteri	ninatio	n					
			EB			WB			NB			SB	
Adjusted Flo	ow Rate	9	383		95	205			8			10	
Lane Group	Capacity	979	1498		810	1543			212			211	
v/c Ratio		0.01	0.26		0.12	0.13			0.04			0.05	
Green Ratio	ı	0.84	0.84		0.84	0.84			0.12			0.12	
Uniform Dela	ay d ₁	1.9	2.4		2.1	2.1			54.3			54.3	
Delay Facto	r k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	Delay d ₂	0.0	0.1		0.1	0.0			0.3			0.4	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	ay	1.9	2.5		2.2	2.2	<u> </u>	<u> </u>	54.6		<u> </u>	54.8	
Lane Group	LOS	Α	Α		Α	Α			D			D	
Approach De	elay		2.5			2.2			54.6			54.8	
Approach L0	os		Α			Α			D			D	
Intersection	Delay		3.7				Intersec	tion LO	S			Α	
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				SI	HORT								
General Inf						Site I	nformati						
Analyst Agency or 0 Date Perfor	med 5/10/2011					Area ·		Stre	Avenue et ther area		& Main		
Time Period	d AM Peak wit (South)	n Bypas	S			Juriso Analy	sis Year	2030)				
Volume an	d Timing Input	-											,
		L	EB	T ==		WB	T ==	ļ. <u>.</u>	NB		 	SB	T ==
Number of I	l anes	LT 1	TH 1	RT 0	LT 1	TH 1	RT 0	LT 0	TH 1	RT 0	LT 0	TH 1	RT 0
Lane Group		L	TR	<u> </u>	L	TR	+ -	۲	LTR		+ -	LTR	╁
Volume (vp		9	324	73	99	404	6	104	16	134	112	20	135
% Heavy Ve	-	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Ad	ctuated (P/A)	Α	Α	Α	Α	Α	A	Р	P	Р	P	Р	Р
Startup Los	t Time	2.0	2.0		2.0	2.0			2.0		1	2.0	
Extension o	of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	Э	3	3		3	3			3			3	
Unit Extens	ion	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/R	TOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Gra	ade/Parking	N	0	Ν	Ν	0	N	N	0	Ν	N	0	N
Parking/Ho													
Bus Stops/l		0	0		0	0			0			0	<u> </u>
	edestrian Time		3.2	<u> </u>	<u> </u>	3.2	<u> </u>	<u> </u>	3.2	<u> </u>		3.2	<u></u>
Phasing	EW Perm G = 117.0 G	02 0.0	G -	0.0	G = 0		NS Pe G = 17		$\frac{06}{6} = 0.0$		07 $i = 0.0$	G =	0.0
Timing		= 0.0	Y =		Y = (Y = 3		' = 0.0		= 0.0	Y =	
Duration of	Analysis (hrs) = 0).25						C	Cycle Ler	ngth C	= 140.0)	
Lane Gro	oup Capacity,	Contro	l Dela	y, and	LOS	Deter	minatio	n					
			EB			WB			NB			SB	
Adjusted Flo	ow Rate	10	431		108	446			276	ļ		291	
Lane Group	Capacity	755	1514		768	1553			135			132	
v/c Ratio		0.01	0.28		0.14	0.29		ļ	2.04	<u> </u>		2.20	
Green Ratio	o	0.84	0.84		0.84	0.84			0.12			0.12	
Uniform De	lay d ₁	1.9	2.5		2.1	2.5			61.5			61.5	
Delay Facto	or k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	l Delay d ₂	0.0	0.1		0.1	0.1			494.8			565.9	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	ay	1.9	2.6		2.2	2.6		<u> </u>	556.3			627.4	
Lane Group	LOS	Α	Α		Α	Α		ļ	F			F	
Approach D	Delay		2.6			2.5			556.3			627.4	
Approach L	.OS		Α			Α			F			F	
Intersection	Delay		216.8				Intersec	tion LC	S			F	
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						SH	IORT	REP	OR	T								
General Info	ormation							Site	Info	ormati	on							
Analyst Agency or C Date Perforr	med 5/10/2011							Inte Area	a Ty	ре	Her	itag	Shore I le Ln er area		ad &			
Time Period	AM Peak (South)	with	Bypas	S				Juris		tion S Year	203	0						
Volume and		:						7 1110	iy Oic	- Tour								
	<u> </u>				EΒ			W					NB				SB	
			LT	_	Н	RT	LT		Ή	RT	L1		TH	╀	RT	LT	TH	RT
	anes			2		0	1	1			1			_	1		<u> </u>	<u> </u>
Lane Group				TI			L	7		<u> </u>	L			Ļ	R		 	<u> </u>
Volume (vph				21		103	19	29			48			Ļ	5		—	
	hicles		ļ	2		2	2	2		<u> </u>	2			Ļ	2		<u> </u>	<u> </u>
PHF				0.9	92	0.92	0.92	0.9	92		0.92	-		C).92		<u> </u>	$oldsymbol{oldsymbol{oldsymbol{eta}}}$
	· · ·			Α		Α	Α	A			P			Ļ	Р			
Startup Lost	Time			2.	0		2.0	2.	0		2.0			1 2	2.0			
Extension of	f Effective Gree	en		2.	0		2.0	2.	0	<u> </u>	2.0			1	2.0		<u> </u>	
Arrival Type				3	3		3	3	3		3				3			
Unit Extensi	on			3.	0		3.0	3.	0		3.0			<u> </u>	3.0			
Ped/Bike/R1	TOR Volume		0	C)	0	0	0)		0		0		0	0	0	
Lane Width				12	2.0		12.0	12	2.0		12.)		1	12.0			
Parking/Gra	de/Parking		Ν	C)	Ν	Ν	()	Ν	N		0	L	Ν	Ν	0	N
Parking/Hou								<u> </u>						Ļ			ļ	$oldsymbol{ol}}}}}}}}}}}}}}}}}}$
Bus Stops/H				(0	_)	ļ	0			Ļ	0		<u> </u>	
	-	1		3.		Į.	<u> </u>	3.	,		<u> </u>		3.2	<u> </u>			3.2	
Phasing	-		02 = 0.0	_	G =	03	G = 0			NB On 3 = 15.			06 0.0		G =	07	G =	08
Timing			= 0.0 = 0	_	Y =		Y = 0			' = 3		<u> </u>			Y = (Y =	
Duration of A	me (vph) eavy Vehicles med/Actuated (P/A) rup Lost Time nsion of Effective Gre al Type Extension Bike/RTOR Volume e Width ing/Grade/Parking ing/Hour Stops/Hour mum Pedestrian Time sing EW Perm ng G = 117.0 Y = 3 ration of Analysis (hrs) and the Group Capacity extension en Ratio com Delay d1 y Factor k emental Delay d2 factor			ゴ			,			_			le Len	gth				.
Lane Gro	e Group me (vph) eavy Vehicles med/Actuated (P/A) rup Lost Time nsion of Effective Gree al Type Extension Bike/RTOR Volume e Width ing/Grade/Parking ing/Hour Stops/Hour mum Pedestrian Time sing EW Perm ng G = 117.0 Y = 3 rtion of Analysis (hrs) = 1 re Group Capacity et actor can Ratio can Ratio can Ratio can Ratio can Ratio can Ratio can Ratio can Capacity et actor carol Delay cach LOS coach LOS			ol D	elay	y, and	LOS I	Dete	rm	inatio	n							
				E	ЕΒ			W	В				NB				SB	
Adjusted Flo	w Rate			34	8		21	315			52			5				
Lane Group	Capacity			28	61		858	157	9		192			17.	2			
v/c Ratio				0.1	12		0.02	0.20	<u> </u>		0.27			0.0)3			
Green Ratio	ı			0.8	35		0.85	0.85	, [0.11			0.1	1			
Uniform Dela	ay d ₁			1.8	8		1.6	1.9			56.5			55.	.0			
Delay Facto	r k			0.1	11		0.11	0.11			0.50			0.5	50			
Incremental	Delay d ₂			0.	.0		0.0	0.1			3.4			0.	3			
PF Factor				1.0	000		1.000	1.00	0		1.000			1.0	000			
Control Dela	ny			1.	.8		1.6	2.0	T		59.9			55	5.3			
Lane Group	LOS			Α			Α	Α	\neg		E			Е				
Approach D	elay			1.	.8			2.0)				59.5					
Approach L0	OS			-	4			Α					E		$\neg \uparrow$			
Intersection					.3				lr	itersec	tion L0	os					Α	$\overline{}$
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						SH	HORT	REPO	DR	₹ T							
General Info	ormation							Site I	nfo	ormatio	on						
Date Perforn	ned 5/10/2011		n Bynas	s				Inters Area Juriso	Туј	ре	Herita	n Shore age Ln her area		ad &			
Time Period	(South))							Year	2030						
Volume and	l Timing Input																
			LT		EB TH	RT	LT	WE TH		RT	LT	NB TH	_	RT	LT	SB TH	RT
Number of L	anas		<u> </u>	$\overline{}$	<u>гн</u> 2	0	1	1	1	KI	1	 	╁	1		1 1 1 1 1	RI
Lane Group	anes		 		R		 '	T			L	+	╁	R			+
<u> </u>)		╁	_	51	251	26	285	_		264	+	十	24		+	+
			╁	_	2	2	2	2		+	2	+	+	2	1	+-	+-
PHF	1110103		 	_	92	0.92	0.92	0.92			0.92	+-	+,).92	1	+-	+-
	tuated (P/A)			_	4	A	A	A	_		P	+	╁	P		+	+-
				₩	.0		2.0	2.0			2.0	+	十	2.0		+	+
		en	 	_	.0		2.0	2.0			2.0	†	-	2.0	1	+	\dagger
Arrival Type				₩	3		3	3			3	+	\dagger	3			+-
Unit Extension	on			3	.0		3.0	3.0	,		3.0	1	╁	3.0			†
Ped/Bike/RT	OR Volume		0		0	0	0	0			0	0	T	0	0	0	†
Lane Width				12	2.0		12.0	12.	0		12.0		T	12.0			
Parking/Grad	recy or Co. CDM Performed 5/10/2011 PM Peak Period PM Peak (South) Reperiod PM Peak Reperiod PM			(0	Ν	Ν	0		Ν	Ν	0		Ν	N	0	N
Parking/Hou	PM Peak (South) Imme and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Timing Input The and Type The and Actuated (P/A) The actuated (P/A) The												Ţ				
Bus Stops/H					0		0	0			0		_	0	ļ		╀
	4		<u> </u>	3	.2			3.2		<u> </u>	<u> </u>	3.2				3.2	
Phasing		G	02 = 0.0		G =	03	G = C			NB Onl		06 = 0.0		G =	0.0	G =	08
Timing			= 0.0 = 0		Y =		Y = 0		_	$rac{3 - 13.}{4 - 5}$		= 0.0		Y =		Y =	
Duration of A	Analysis (hrs) =	= 0.2	25						_		С	ycle Ler	ngth	n C =	144.0)	
Lane Gro	up Capacity	, C	Contro			y, and	LOS [inatio	n						
				_	EB			WB	_			NB	1			SB	
Adjusted Flo	w Rate		ļ	65			28	310	4		287		2	6		<u> </u>	<u> </u>
Lane Group	Capacity			2,	702		593	1514	╛		234		20	9			
v/c Ratio				0.2	24		0.05	0.20			1.23		0.1	12			
Green Ratio				0.	81		0.81	0.81			0.13		0.1	13			
Uniform Dela	ay d ₁			3.	.2		2.6	3.0			62.5		55	.2			
Delay Factor	rk			0.	11		0.11	0.11	ightharpoons		0.50		0.5	50			
Incremental	Delay d ₂			C	0.0		0.0	0.1			133.7		1	.2			
PF Factor				1.	000		1.000	1.000	\Box		1.000		1.0	000			
Control Dela				3	3.2		2.7	3.1	ightharpoons		196.2		₩	6.4			<u> </u>
Lane Group	LOS			1	4		Α	Α	$oldsymbol{\perp}$		F		E	=			
Approach De			<u> </u>		3.2		ļ	3.1				184.6		ļ			
Approach LC	DS .				Α			Α				F					
Intersection	Delay			4	6.6				In	ntersect	ion LO	3				D	
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	TWO	-WAY STOP	CONTR	OL S	UMMARY			
General Information	on		Site I	nfori	mation			
Analyst	J. Jespei	rsen	Interes	action		US 93 &	Rocky Po	int
Agency/Co.	CDM		Inters	ection		Road		
Date Performed	5/10/201	1	Jurisd					
Analysis Time Period	AM Peak (South)	with Bypass	Analys	sis Ye	ar	2030		
Project Description						*		
East/West Street: US	93		North/	South	Street: Roc	ky Point Ro	ad	
Intersection Orientation	n: <i>East-West</i>		Study	Period	d (hrs): 0.25			
Vehicle Volumes	and Adjustr	nents						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	T	R		L	Т		R
Volume (veh/h)	5	441				168		49
Peak-Hour Factor, PH	_	0.92	1.00)	1.00	0.92	().92
Hourly Flow Rate, HFR (veh/h)	5	479	0		0	182		53
Percent Heavy Vehicle	s 0				0			
Median Type				Undi	vided			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration	LT							TR
Upstream Signal		0				0		
Minor Street		Northbound				Southboo	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	T		R
Volume (veh/h)					171			0
Peak-Hour Factor, PHF	1.00	1.00	1.00)	0.92	1.00	(0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0		185	0		0
Percent Heavy Vehicle	s 0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized		1	0					0
Lanes	0	0	0		0	0		0
Configuration		1				LR		
Delay, Queue Length	and Level of	Service	*			*		
Approach	Eastbound	Westbound	N	lorthb	ound	S	outhbound	
Movement	1	4	7	8		10	11	12
Lane Configuration	LT	•				1	LR	
v (veh/h)	5					+	185	
C (m) (veh/h)	1344					+	408	
v/c	0.00					+	0.45	
95% queue length	0.00						2.30	
Control Delay (s/veh)					_	+		
	7.7					+	20.9	
LOS	Α						С	j

	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY			
General Information	n		Site Ir	nform	natio	on			
Analyst	J. Jesper	sen	Interse	otion			US 93 & I	Poolar Po	int Dood
Agency/Co.	CDM		Jurisdi				03 93 & 1	KUCKY PU	IIII KUau
Date Performed	5/10/201		Analys		r		2030		
Analysis Time Period	PM Peak (South)	with Bypass							
Project Description			•						
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	T	R			L	T		R
Volume (veh/h)	0.92	330	1.00			1.00	375		160
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	1.00			1.00	0.92		0.92
(veh/h)	1	358	0			0	407		173
Percent Heavy Vehicles	0					0			
Median Type			1	Undi	vided	<u> </u>			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street	 _	Northbound	1 ^			10	Southbou	ınd	40
Movement	7	8	9			10	11		12
\(\langle \)	L	T	R			L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	1.00	1.00	1.00			112	1.00		2
Hourly Flow Rate, HFR		1	1.00			0.92	1		0.92
(veh/h)	0	0	0			121	0		2
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Eastbound	Westbound	1	Northb	ound		S	outhboun	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	1							123	1
C (m) (veh/h)	1004							334	1
v/c	0.00					<u> </u>		0.37	1
95% queue length	0.00							1.65	†
Control Delay (s/veh)	8.6							21.9	1
LOS	A.							C C	+
Approach Delay (s/veh)						<u> </u>		21.9	
,								C C	
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	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY				
General Information	<u> </u>		Site I	nform	atio	on .				
Analyst	J. Jesper	sen					12. US 93	3 & Irvin	e Fla	ts
Agency/Co.	CDM		Interse				Road			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period	AM Peak (South)	with Bypass	Analys	sis Yea	r		2030			
Project Description	,									
East/West Street: US 9						t: <i>Irvine F</i>	lats Road			
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5			6
	L	T	R			<u>L</u>	Т			R
Volume (veh/h)	4	405	6			6	179		2.	
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	\longrightarrow		0.92	0.92		0.9	92
(veh/h)	4	440	6			6	194		2	3
Percent Heavy Vehicles	0					0				-
Median Type				Undiv	/idec	<u> </u>				
RT Channelized			0						(
Lanes	0	1	0			0	1		()
Configuration	LTR					LTR				
Upstream Signal		0					0			
Minor Street		Northbound	1 0			10	Southbou	ınd		•
Movement	7	8	9			10	11			2
V (1 / 1 / 1 .)	L	T	R			L	T			R
Volume (veh/h) Peak-Hour Factor, PHF	0.92	0.92	5			0.92	0 0.92		0.9	
Hourly Flow Rate, HFR		1	0.92	-		0.92	0.92			
(veh/h)	0	0	5			1	0		2	
Percent Heavy Vehicles	0	0	0			0	0		()
Percent Grade (%)		0	_				0			
Flared Approach		N					N			
Storage		0	<u> </u>				0			
RT Channelized			0				<u> </u>		()
Lanes	0	1	0			0	1		()
Configuration		LTR					LTR			
Delay, Queue Length, a		ì	1							
Approach	Eastbound	Westbound	1	Northbo	ounc		S	outhbou	und _	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LTR	LTR		LTF	?			LTR		
v (veh/h)	4	6		5				3		
C (m) (veh/h)	1365	1125		619)			587		
v/c	0.00	0.01		0.0	1			0.01		
95% queue length	0.01	0.02		0.02	2			0.02		
Control Delay (s/veh)	7.6	8.2		10.9				11.2	_	
LOS	A	A		В		Ì	<u> </u>	В		
Approach Delay (s/veh)				10.9	9	<u> </u>		11.2		
Approach LOS				В				B		
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	TW	O-WAY STOP	CONTR	OL SU	ΜN	1ARY				
General Information	n		Site I	nforma	atio	n				
Analyst	J. Jesper	sen	Interes	otion			12. US 93	3 & Irvi	ine F	lats
Agency/Co.	CDM		Interse				Road			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period	PM Peak (South)	with Bypass	Analys	is Year			2030			
Project Description	**						•			
East/West Street: US 9	3		North/S	South St	reet	: Irvine Fi	lats Road			
Intersection Orientation:	East-West		Study F	Period (h	nrs):	0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound	_				Westbou	nd		
Movement	1	2	3			4	5			6
	<u> </u>	T	R	\rightarrow		_ <u>L</u>	T			R
Volume (veh/h)	4	318	2			9	381			17
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	-		0.92	0.92	+	().92
(veh/h)	4	345	2			9	414			18
Percent Heavy Vehicles	0					0				
Median Type		1	1	Undivi	ded			-		
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LTR			\longrightarrow		LTR				
Upstream Signal		0					0			
Minor Street	<u> </u>	Northbound	1 .	\longrightarrow			Southbou	ınd		
Movement	7	8	9			10	11			12
	L L	T	R	\longrightarrow		L	T			R
Volume (veh/h)	5	1	9			24	0	-		7
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	-		0.92	0.92).92
(veh/h)	5	1	9			26	0			7
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration		LTR					LTR			
Delay, Queue Length, a										
Approach	Eastbound	Westbound	l	Vorthboo	und		S	outhbo	ound	
Movement	1	4	7	8		9	10	11	1	12
Lane Configuration	LTR	LTR		LTR				LTI	R	
v (veh/h)	4	9		15				33	3	
C (m) (veh/h)	1138	1223		458				330	6	
v/c	0.00	0.01		0.03	T			0.1	0	
95% queue length	0.01	0.02		0.10				0.3	2	
Control Delay (s/veh)	8.2	8.0		13.1				16.		
LOS	Α	Α		В	寸			С		
Approach Delay (s/veh)				13.1				16.9		
Approach LOS				В				C	-	
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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY				
General Information	 n		Site I	nform	atio	on .				
Analyst	J. Jesper	sen	Interse	otion			13. US 93	2 & Caf	frov	Pond
Agency/Co.	CDM		Jurisdi				13. 03 9	o & Can	rey i	Noau
Date Performed	5/10/2011			is Year			2030			
Analysis Time Period	AM Peak (South)	with Bypass								
Project Description										
East/West Street: Caffr						t: <i>US 93</i>				
Intersection Orientation:	North-South		Study F	Period (hrs)	: 0.25				
Vehicle Volumes aı	nd Adjustme	nts								
Major Street		Northbound					Southboo	ınd		
Movement	1	2	3			4	5			6
	L	T	R			<u>L</u>	T			R
Volume (veh/h)	133	596	0			1	362			7
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.92	0.92	0.92	\longrightarrow		0.92	0.92			.92 7
(veh/h)	144	647	0			1	393			
Percent Heavy Vehicles	0					0				
Median Type		Г	1	Undiv	rided	1				
RT Channelized			0	\longrightarrow					0	
Lanes	1	2	0			1	2			1
Configuration	L	T	TR			L	T			R
Upstream Signal		0					0			
Minor Street	-	Eastbound	1 0			40	Westbou	nd		40
Movement	7 L	8 T	9 R			10 L	11 T			12
Volume (veh/h)	662	132	5960	+			1			R 0
Peak-Hour Factor, PHF	1.00	0.92	0.92			0.92	0.92		0	.92
Hourly Flow Rate, HFR	662	143	6478			1	1		U	0
(veh/h)	0	0	0	\dashv		0	0	-		0
Percent Heavy Vehicles Percent Grade (%)	- U	0	U	\longrightarrow		<u> </u>	0			0
Flared Approach	_	T N	1	\dashv			l N			
	+	0		\dashv			0			
Storage RT Channelized	+		0	-			U			0
Lanes	0	1	0	\rightarrow		0	1			0
Configuration	 	LTR		\rightarrow			LTR	_		<u> </u>
Delay, Queue Length, a	and Level of Se		Į							
Approach	Northbound	Southbound	,	Westbo	und			Eastbou	ınd	
Movement	1	4	7	8	J. 10	9	10	11		12
Lane Configuration	Ĺ	L	•	LTR			- ``	LTR	,	
v (veh/h)	144	1		2	-		 	7283	-	
C (m) (veh/h)	1170	948		0			 	588		
v/c	0.12	0.00		Ť			-	12.3	_	
95% queue length	0.42	0.00		_			-	840.1	_	
Control Delay (s/veh)	8.5	8.8					 	5141	_	
LOS	6.5 A	0.0 A		F				514 F	_	
Approach Delay (s/veh)]		5141		
,							-	5141 F		
Approach LOS	orida, All Rights Rese			CS+ TM \			<u> </u>	# ated: 5/1		12:59 P

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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY				
General Information	 n		Site I	nform	atio	on .				
Analyst	J. Jesper	sen	Interse	otion			13. US 93	2 & Caff	rov l	Pood
Agency/Co.	CDM		Jurisdi				13. 03 9	o & Call	геуг	Noau
Date Performed	5/10/201			is Year			2030			
Analysis Time Period	PM Peak (South)	with Bypass								
Project Description										
East/West Street: Caffr			North/S	South S	tree	t: <i>US 93</i>				
Intersection Orientation:	North-South		Study F	Period (hrs)	: 0.25				
Vehicle Volumes aı	nd Adjustme	nts								
Major Street		Northbound					Southboo	ınd		
Movement	1	2	3			4	5			6
	L	T	R			<u>L</u>	T			R
Volume (veh/h)	94 0.92	819	5 0.92			1	571			11
Peak-Hour Factor, PHF Hourly Flow Rate, HFR		0.92				0.92	0.92	 -		92
(veh/h)	102	890	5			1	620		•	11
Percent Heavy Vehicles	0					0				
Median Type			1	Undiv	idea	1				
RT Channelized			0						0	
Lanes	1	2	0			1	2			1
Configuration	L	T	TR			L	T			R
Upstream Signal		0					0			
Minor Street		Eastbound	1 .				Westbou	<u>nd</u>		
Movement	7	8	9			10	11			12
M. L / L /L \	L 705	T	R			L	T			R
Volume (veh/h) Peak-Hour Factor, PHF	795 0.92	0.92	5696			0.92	0 0.92			1
Hourly Flow Rate, HFR	1		0.92			0.92		-	U.	92
(veh/h)	864	0	6191			1	0			1
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N	ļ				N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration		LTR					LTR			
Delay, Queue Length, a										
Approach	Northbound	Southbound	١	Westbo	und		[Eastbou	nd	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	L	L		LTR	2			LTR		
v (veh/h)	102	1		2				7055		
C (m) (veh/h)	961	767		0				445		
v/c	0.11	0.00						15.85	5	
95% queue length	0.36	0.00						829.4	4	
Control Delay (s/veh)	9.2	9.7						6706	$\overline{}$	
LOS	A	Α		F			ĺ	F	一	
Approach Delay (s/veh)						ı	6706			
Approach LOS								F		
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	TW	O-WAY STOP	CONTR	OL SI	JMN	//ARY				
General Information	า		Site I	nform	atio	on .				
Analyst	J. Jesper	sen					15. Kerr	Dam F	Road	& Grenie
Agency/Co.	CDM		Interse	ection			La			
Date Performed	5/10/201		Jurisdi							
Analysis Time Period		with Bypass	Analys	sis Yea	r		2030			
-	(South)									
Project Description East/West Street: Gren	ionlone		N a matho /C	Cauth C	4	t: Kerr Da	m Dood			
Intersection Orientation:						: <i>Nerr Da</i> : 0.25	im Road			
			Olddy I	enou	(1113)	. 0.20				
Vehicle Volumes ar Major Street	ia Aajustine	Northbound					Southbo	und		
Movement	1	2	3			4	5	unu 1		6
Wie vermeine	i	-	R			L	T			R
Volume (veh/h)	0	63	45			10	27			0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		().92
Hourly Flow Rate, HFR	0	68	48			10	29			0
(veh/h) Percent Heavy Vehicles	0					0	 			
Median Type	+ 0			Undiv	idoc		ļ	l		<u></u>
RT Channelized			0	Oriali	nuec	1	Ì	ſ		0
Lanes	0	1	0			0	1	-		0
Configuration	LTR	<u>'</u>	1			LTR	'			0
Upstream Signal	LIK	0	+	$\overline{}$		LIIX	0			
Minor Street		Eastbound					Westbou	ınd		
Movement	7	8	9			10	11	I I		12
	 	T	R			L	T			R
Volume (veh/h)	 	· ·	1			17	0			10
Peak-Hour Factor, PHF	1.00	1.00	1.00	,		0.92	0.92		(0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			18	0			10
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0	Î		
RT Channelized			0					Î		0
Lanes	0	0	0			0	1			0
Configuration							LTR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Northbound	Southbound	,	Westbo	ound			Eastbo	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LTR	LTR		LTF	?					
v (veh/h)	0	10		28						
C (m) (veh/h)	1597	1485		890)					
v/c	0.00	0.01		0.03	3					
95% queue length	0.00	0.02		0.10)					
Control Delay (s/veh)	7.3	7.4		9.2				1		
LOS	A	A		A			1			
Approach Delay (s/veh)				9.2				1		I.
Approach LOS				A						
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	TW	O-WAY STOP	CONTR	OL SU	M۱	/IARY				
General Informatio	n		Site I	nforma	atic	n				
Analyst	J. Jesper	sen	Interse	otion			15. Kerr	Dam F	Road	& Grenier
Agency/Co.	CDM						La			
Date Performed	5/10/201		Jurisdi				0000			
Analysis Time Period	PM Peak (South)	with Bypass	Anaiys	is Year			2030			
Project Description	<u> </u>									
East/West Street: Gren	ier Lane		North/S	South St	ree	t: Kerr Da	m Road			
Intersection Orientation:	North-South		Study F	Period (I	nrs)	: 0.25				
Vehicle Volumes a	nd Adjustme	nts								
Major Street		Northbound					Southboo	und		
Movement	1	2	3			4	5			6
	L	Т	R			L	T			R
Volume (veh/h)	0	57	18			5	72			0
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	0	61	19			5	78			0
Percent Heavy Vehicles	0					0				
Median Type				Undivi	dea	l				
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LTR					LTR				
Upstream Signal		0					0			
Minor Street		Eastbound					Westbou	ınd		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)			1			39	0			17
Peak-Hour Factor, PHF	1.00	1.00	1.00	<u> </u>		0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			42	0			18
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			0	1			0
Configuration							LTR			
Delay, Queue Length, a	and Level of Se	rvice								
Approach	Northbound	Southbound	,	Westbo	und			Eastb	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LTR	LTR		LTR						
v (veh/h)	0	5		60						
C (m) (veh/h)	1533	1531		878						Ì
v/c	0.00	0.00		0.07						
95% queue length	0.00	0.01		0.22	_		†			<u> </u>
Control Delay (s/veh)	7.3	7.4		9.4				\vdash		
LOS	A	A		A			 	†		
Approach Delay (s/veh)				9.4			 			
Approach LOS	<u></u>			A			 			
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	TW	O-WAY STOP	CONTR	OL SI	UMN	MARY			
General Information	n		Site I	nform	natio	on .			
Analyst	J. Jesper	sen	1	-4!			16. Kerr L	Dam Roa	d & Back
Agency/Co.	CDM		Interse				Road		
Date Performed	5/10/2011		Jurisdi						
Analysis Time Period		with Bypass	Analys	is Yea	r		2030		
	(South)								
Project Description East/West Street: Back	Poad		North/9	South 9	Stroo	t: Kerr Da	m Poad		
Intersection Orientation:						: 0.25	iiii Noau		
Vehicle Volumes ar		nte	ptady .	onoa	(1110)	. 0.20			
Major Street	Aujustine	Northbound		1			Southbou	ınd	
Movement	1	2	3			4	5		6
	Ĺ	T	R			L	T		R
Volume (veh/h)	5	200	0			0	60		17
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	5	217	0			0	65		18
Percent Heavy Vehicles	0					0			
Median Type				Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1	0	
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street		Eastbound					Westbou	nd	
Movement	7	8	9			10	11		12
	L	T	R			L	Т		R
Volume (veh/h)	18	0	5			1.00	4.00		4.00
Peak-Hour Factor, PHF	0.92	0.92	0.92			1.00	1.00	_	1.00
Hourly Flow Rate, HFR (veh/h)	19	0	5			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	0		0
Configuration		LTR							
Delay, Queue Length, a									
Approach	Northbound	Southbound		Westb			 	=astboun	
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR				<u></u>	ļ	LTR	
v (veh/h)	5	0						24	
C (m) (veh/h)	1527	1365						740	
v/c	0.00	0.00						0.03	
95% queue length	0.01	0.00						0.10	
Control Delay (s/veh)	7.4	7.6						10.0	
LOS	Α	Α						В	
Approach Delay (s/veh)						•	1	10.0	R.
Approach LOS								В	
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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	J. Jesper	sen	Interes	otion			16. Kerr L	Dam Road	d & Back
Agency/Co.	CDM		Interse				Road		
Date Performed	5/10/201		Jurisdi						
Analysis Time Period	PM Peak (South)	with Bypass	Analys	is Yea	ır		2030		
Project Description	, , , , , , , , , , , , , , , , , , ,		I						
East/West Street: Back	Road		North/S	South S	Stree	t: Kerr Da	m Road		
Intersection Orientation:	North-South		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes aı	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
N/-1 / 1/12	L	T	R			L	T 110		R
Volume (veh/h) Peak-Hour Factor, PHF	9 0.92	106	0		<u> </u>	0	140		32
Hourly Flow Rate, HFR		0.92	0.92		├─	0.92	0.92	-	0.92
(veh/h)	9	115	0			0	152		34
Percent Heavy Vehicles	0					0			
Median Type				Undi	vided	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LTR					LTR			
Upstream Signal		0					0		
Minor Street		Eastbound	1				Westbou	nd	
Movement	7	8	9			10	11		12
	L	T	R		<u> </u>	L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	17 0.92	0.92	0.92		 	1.00	1.00		1.00
Hourly Flow Rate, HFR	1	1	0.92		 	1.00			
(veh/h)	18	0	4			0	0		0
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	1	0			0	0		0
Configuration		LTR							
Delay, Queue Length, a	and Level of Se	rvice							
Approach	Northbound	Southbound	١	Vestb	ound		E	astboun	t
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LTR	LTR						LTR	
v (veh/h)	9	0						22	
C (m) (veh/h)	1401	1487						718	
v/c	0.01	0.00					Î	0.03	
95% queue length	0.02	0.00						0.09	1
Control Delay (s/veh)	7.6	7.4				Ì		10.2	1
LOS	A	A				Ì	<u> </u>	В	1
Approach Delay (s/veh)						<u> </u>		10.2	
Approach LOS							 	B	
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						S	HOR	ΓREF	o	RT							
General Info	rmation									format	ion						
Analyst Agency or Co Date Perform Time Period	N. Fosser o. CDM ned 5/5/2011 AM Peak		ı bypas	s (E	EIS 6	·)		Are: Juri	a T sdi	ction ype ction is Year	All	93 & So other are		Shor	e Road		
Volume and	Timing Inpu	t															
					В			WB				NB				SB	
Number of La	0000		LT		Н	RT	LT 1	TH	+	RT 1	LT	TH 2	R	T	LT 2	TH 1	RT
	anes			_	\dashv			-	+	•						T	
Lane Group	١		 		\dashv		117	╁	十	<i>R</i>		<i>T</i> 327	62 62		L 128	264	
Volume (vph	-		<u> </u>				2	+	十	220		2	2		2	204	
% Heavy Vel	nicies		 		\dashv		0.85	╁	十	0.82		0.82	0.9		0.73	0.95	
Pretimed/Act	tuotod (D/A)				\dashv		0.65 P	╁	╁	0.62 P		0.62 P	P.S		0.73 P	0.95 P	
			-	┢	\dashv		2.0	+	+	2.0		2.0	2.		2.0	2.0	
	Startup Lost Time Extension of Effective Green						2.0	╁	十	2.0		2.0	2. 2.		2.0	2.0	
	Ellective Gree	211	-		\dashv		3	+	+	3		3	3		3	3	
Arrival Type Unit Extension			-	┢	\dashv		3.0	╁	╁	3.0		3.0	3.		3.0	3.0	
Ped/Bike/RT			0	($\overline{}$		0	0	+	0	0	0	3.		0	0	
Lane Width	OK Volume		-	_	'		12.0	+	╁	12.0	-	12.0	12		12.0	12.0	
Parking/Grad	de/Parking		N	()	N	N	0	十	N	N	0	12		N	0	N
Parking/Hou			 ``					† <u> </u>	十			<u> </u>				Ť	
Bus Stops/H							0	1	十	0		0	()	0	0	
Minimum Pe	destrian Time			3.	2			3.2				3.2				3.2	
Phasing	WB Only		02			03		04	Į	SB Or		Thru & F			07	0	
Timing	G = 17.0 Y = 3		= <i>0.0</i> = <i>0</i>		G = Y =	0.0	G = Y =	0.0		G = 12 Y =		G = 65.0 $Y = 3$)	G = Y =	- 0.0	G = (
Duration of A	nalysis (hrs) :	_			1 =	0) T =	U	L	Τ =		Cycle Le	nath				
	up Capacity) I C	ela	y, an	d LOS	Dete	rn	ninatio							
					EB			W				NB				SB	
Adjusted Flo	w Rate						138			268		399	6	6	175	278	
Lane Group	Capacity						301			507		2306	10)29	412	1435	
v/c Ratio				Г			0.46			0.53		0.17	0.0	06	0.42	0.19	
Green Ratio							0.17			0.32		0.65	0.6	65 65	0.12	0.77	
Uniform Dela	ay d ₁			T			37.4			27.8	ĺ	6.9	6.	4	40.8	3.1	
Delay Factor	·k						0.50			0.50		0.50	0.3	50	0.50	0.50	
Incremental I	Delay d ₂						5.0			3.9		0.2	0	. 1	3.2	0.3	
PF Factor							1.000)		1.000		1.000	1.0	000	1.000	1.000	
Control Delay	у						42.3			31.7		7.1	6	.5	44.0	3.4	
Lane Group	LOS						D			С		Α	1	1	D	Α	
Approach De	elay							35.	3			7.0				19.1	
Approach LC)S							D				Α				В	
Intersection I	Delay			1	9.8				ı	Intersed	ction L	os				В	
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						S	HOR	ΓREP	ORT								
General Info	rmation								Informa	ation	1						
Analyst Agency or Co Date Perform Time Period			ı bypas	s (E	EIS 6	5)		Area Juris	rsection a Type sdiction lysis Yea			93 & Sou ther are		Shor	e Road		
Volume and	Timing Inpu	t															
					В			WB	1	Τ.	_ [NB				SB	
Number of La	0000		LT	<u> </u>	ТН	RT	<u>LT</u>	TH	RT 1	╁	LT	TH 2	R		LT 2	TH 1	RT
Lane Group	anes				-		L		R	╁	_	T	R		L	T	+-+
Volume (vph	\				-		220		300	╫	\dashv	456	13		283	399	$\vdash \vdash \vdash$
% Heavy Vel	-		 				2		2	╁	┽	2	2		2	2	\vdash
PHF	TIICICS		 	┢	\dashv		0.83		0.86	╁	一	0.93	0.7		0.83	0.90	$\vdash \vdash \vdash$
Pretimed/Act	tuated (P/A)		_		\dashv		P		P	╁	\dashv	P.0.00	<u> Р</u>		P	P	++
Startup Lost			\vdash	\vdash	\dashv		2.0	+-	2.0	╫	\dashv	2.0	2.0		2.0	2.0	+-+
<u> </u>	Effective Gre	en	\vdash	\vdash	\dashv		2.0	+-	2.0	+	-	2.0	2.0		2.0	2.0	$\vdash \vdash \vdash$
Arrival Type	LIIOOLIVO OIO						3		3	╁	_	3	3		3	3	\vdash
Unit Extension	on .						3.0		3.0	╁╴	┰	3.0	3.		3.0	3.0	\vdash
Ped/Bike/RT			0	()		0	0	0	+	2	0	0		0	0	\vdash
Lane Width			H				12.0	1	12.0	╁		12.0	12		12.0	12.0	$\vdash \vdash \vdash$
Parking/Grad	de/Parking		N	()	Ν	N	0	N	1	V	0	٨	,	N	0	N
Parking/Hou	r																
Bus Stops/He	our						0		0			0	C)	0	0	
Minimum Pe	destrian Time			3.	2		<u></u>	3.2				3.2				3.2	
Phasing	WB Only		02			03		04	SB (hru & R			07		8
Timing	G = 25.0 Y = 3		= <i>0.0</i> = <i>0</i>		Y =	0.0	Y =	0.0	G = 2	23.0		6 = 57.0 $6 = 3$)	Y =	= 0.0 = 0	G = (
Duration of A	nalysis (hrs)	_					<u> </u>					Cycle Le	ngth				
Lane Grou	up Capacity	y, C	ontro	ol C	Dela	y, an	d LOS	Dete	rminat	ion							
					EB			WI	3			NB				SB	
Adjusted Flo	w Rate						265		349			490	19	9	341	443	
Lane Group	Capacity						399		727			1821	81	3	712	1343	
v/c Ratio							0.66		0.48			0.27	0.2	24	0.48	0.33	
Green Ratio							0.23		0.46			0.51	0.5	51	0.21	0.72	
Uniform Dela	ay d ₁						39.2		20.8			15.2	15	.0	38.7	5.7	
Delay Factor	·k						0.50		0.50			0.50	0.5	50	0.50	0.50	
Incremental I	Delay d ₂						8.4		2.3	\top		0.4	0	.7	2.3	0.7	
PF Factor							1.000)	1.00)		1.000	1.0	000	1.000	1.000	
Control Delay	у						47.6		23.1			15.6	15	5.7	41.0	6.3	
Lane Group	LOS						D		С			В	E	3	D	Α	
Approach De	elay							33.7	7			15.6				21.4	
Approach LC)S							С		T		В				С	
Intersection I	Delay			2	3.1				Inters	ectio	n LC	S				С	
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				SI	HORT	REPO	RT						
General Info	rmation						formati	on					
Analyst Agency or Co Date Perform Time Period		vith bypas	s (EIS 6)		Interse Area T Jurisdi Analys	уре		93 & 4th . ther area		nue East		
Volume and	Timing Input												
			EB	Y		WB	1		NB			SB	
N		LT	TH	RT	LT	TH	RT	LT	TH	R ⁻	_	TH	RT
Number of La	anes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	١	L	TR	0	L	<i>TR</i> 395	3	12	LTR 3	05	7	LTR 3	1
Volume (vph		2	399 2	8 2	55	395	2	13	2	95	_	2	2
% Heavy Vel	nicies	_			2			2		2	2		- -
PHF Dratimod/Act	usted (D/A)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92
Pretimed/Act		2.0	A 2.0	Α	A	A 2.0	A	P	P 2.0	P	P	P 2.0	P
Startup Lost		2.0	2.0	-	 	2.0	├		2.0				
	Effective Gree		2.0		2.0	2.0	-		2.0	├	+	2.0	
Arrival Type		3.0	3.0		3	3	-	_	3	┢	_	3	
Unit Extension			3.0	3.0			3.0	_	 	3.0	0		
Ped/Bike/RT	OR volume	0	0 12.0	0	0	0 12.0	0	0	0	0	0	0	0
Lane Width Parking/Grad	No/Parking	12.0 N	0	N	12.0 N	0	N	N	12.0	N	N	12.0 0	N
Parking/Hour		17	U	//	1 //		177	/v	1 0	11	17	+ 0	10
Bus Stops/He		0	0		0	0			0	\vdash	+	0	
	destrian Time	1	3.2			3.2			3.2			3.2	
Phasing	WB Only	EW Perm		03	0.	4	NS Pe	rm	06	Ī	07	<u>, </u>)8
Timing		G = 83.0		0.0	G = (G = 11		3 = 0.0		G = 0.0	G =	
Ů	Y = 0 analysis (hrs) =	Y = 3	Y =	0	Y = ()	Y = 3		$rac{1}{2} = 0$		Y = 0 $C = 108.$	Y =	0
	up Capacity		l Dela	v and	LLOS	Deterr	ninatio		Jycie Lei	igui	0 = 700.	<u> </u>	
24110 0100	ap cupucity	1	EB	y, and	T	WB	·····atio	<u> </u>	NB			SB	
Adjusted Flo	w Rate	2	443		60	432	Τ		120		+	12	
Lane Group		732	1427		810	1568			163			152	
v/c Ratio		0.00	0.31		0.07	0.28			0.74			0.08	
Green Ratio		0.77	0.77		0.87	0.84			0.10		1	0.10	
Uniform Dela	ay d ₁	2.9	3.8		1.3	1.7			47.1			43.9	İ
Delay Factor	•	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental I		0.0	0.1		0.0	0.1			25.4			1.0	
PF Factor		1.000	1.000		1.000	1.000			1.000	T	1	1.000	
Control Delay	y	2.9	3.9		1.3	1.8			72.5		i	44.9	
	ne Group LOS A A				Α	Α			E	Ì		D	
Approach De	elay	1	3.9			1.8		İ	72.5			44.9	
Approach LC		1	Α			Α			Ε			D	
Intersection [1	11.1				Intersec	tion LC)S		1	В	
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				SI	HORT	REPO	RT							
General Info	rmation					Site Ir	nformati	on						
Analyst Agency or Co Date Perform Time Period		vith bypas	s (EIS 6)		Interse Area T Jurisd Analys	Гуре		93 & 4th . ther area		nue l	East		
Volume and	Timing Input													
			EB	Y		WB	1		NB		\Box		SB	
Nl (1		LT	TH	RT	LT	TH	RT	LT	TH	R	_	LT	TH	RT
Number of La	anes	1	1	0	1	1	0	0	1	0	-	0	1	0
Lane Group	١	L	TR 510	12	L	TR 482	2	44	LTR 1	15	2	4	LTR 1	4
Volume (vph		2	519	13	62		+			15				
% Heavy Vel	nicies	2	2	2	2	2	2	2	2	2	-	2	2	2
	wated (D/A)	0.92	0.92	0.92	0.92 A	0.92 A	0.92	0.92	0.92	0.9	-	0.92	0.92	0.92
	Pretimed/Actuated (P/A) A A A Startup Lost Time 2.0 2.0						A	P	P 2.0	P	\dashv	Р	P	Р
		2.0	2.0	+	 	2.0	\vdash	\dashv		2.0				
	Effective Gree		2.0		2.0	2.0			2.0	┢	\dashv		2.0	
Arrival Type		3.0	3.0		3	3	-		3	┢	\dashv		3	
Unit Extension			3.0	3.0			3.0	<u> </u>	\dashv		3.0	0		
Ped/Bike/RT	OR volume	0	0 12.0	0	0	0 12.0	0	0	0	0	\dashv	0	0	0
Lane Width Parking/Grad	No/Parking	12.0 N	0	N	12.0 N	0	N	N	12.0	N	, -	N	12.0 0	N
Parking/Hour		17	U	//	1 //		10	/\ 	1 0	1 //	\dashv	7.V		11
Bus Stops/He		0	0		0	0		 	0	\vdash	廿		0	
	destrian Time	1	3.2			3.2	1		3.2		┪		3.2	
Phasing	WB Only	EW Perm		03	0.	4	NS Pe	rm	06	<u>.</u>		07		8
Timing		G = 83.0		0.0	G = (G = 11		3 = 0.0		G =		G =	
	Y = 0 nalysis (hrs) =	Y = 3	Y =	0	Y = ()	Y = 3		<u>/ = 0</u> Cycle Ler		Y =		Y = (0
	up Capacity		l Dela	v and	LLOS	Deterr	ninatio		Jycie Lei	igiii	<u> </u>	100.0	,	
24110 0100	ap capacity	1	EB	y, and	T	WB			NB				SB	
Adjusted Flo	w Rate	2	578		67	526	1		215				9	
Lane Group		671	1426		703	1569			157				149	
v/c Ratio		0.00	0.41		0.10	0.34			1.37				0.06	
Green Ratio		0.77	0.77		0.87	0.84			0.10				0.10	
Uniform Dela	ny d ₁	2.9	4.2		1.6	1.9			48.5				43.8	
Delay Factor	•	0.11	0.11		0.11	0.11	1		0.50				0.50	
Incremental	Delay d ₂	0.0	0.2		0.1	0.1		İ	201.3				0.8	
PF Factor		1.000	1.000		1.000	1.000			1.000				1.000	
Control Delay	y	2.9	4.4		1.7	2.0			249.8				44.6	
Lane Group	ne Group LOS A A			Α	Α			F				D		
Approach De	elay	1	4.4			2.0	R		249.8	_	一		44.6	•
Approach LC)S	1	Α			Α			F				D	
Intersection I	Delay		41.4				Intersec	tion LC)S				D	
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				S	HORT	REPO	RT						
General Inf	ormation					Site Ir	nformati	on					
Analyst Agency or C Date Perford Time Period	med 5/10/2011	h bypass	s (EIS 6	·)		Interse Area T Jurisd Analys	Гуре	Stre	ther area		1st		
Volume and	d Timing Input												
			EB	,		WB			NB			SB	
NII		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of L		1	1	0	1	1	0	0	1	0	0	1	0
Lane Group		L	TR	00	L	TR	144	0.4	LTR	400	100	LTR	40
Volume (vpl	·	8	280	93	96	197	11	84	15	102	23	26	10
% Heavy Ve	ehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	ctuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	Р
Startup Lost		2.0	2.0		2.0	2.0	-	<u> </u>	2.0	-	-	2.0	
	f Effective Green	2.0	2.0		2.0	2.0	-	 	2.0		-	2.0	
Arrival Type		3	3		3	3	₩	<u> </u>	3	<u> </u>	-	3	<u> </u>
Unit Extensi		3.0	3.0		3.0	3.0			3.0			3.0	
	TOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0	ļ	12.0	12.0	ļ	ļ.,.	12.0	ļ	.	12.0	ļ
Parking/Gra		N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hou Bus Stops/F		0			0	0	\vdash		0		-	0	
	edestrian Time	0	<i>0</i> 3.2		U	3.2			3.2			3.2	
Phasing	EW Perm	02	J.2	03	0		NS Pe	rm I	06	<u> </u>	<u>1</u> 07)8
•		= 0.0	G =	0.0	G = (G = 68		3 = 0.0	G	= 0.0	G =	
Timing		= 0	Y =	0	Y = ()	Y = 3		/ = 0		= 0	Y =	0
	Analysis (hrs) = 0						•		Cycle Ler	ngth C	= 140.0)	
Lane Gro	up Capacity, (Contro		y, and	LOS		ninatio	n			1		
		ļ.,	EB			WB	_	<u> </u>	NB		_	SB	1
Adjusted Flo		9	405	<u> </u>	104	226	ļ		218			64	
Lane Group	Capacity	479	845	 	331	871			718			763	
v/c Ratio		0.02	0. 4 8	<u> </u>	0.31	0.26	<u> </u>		0.30	<u> </u>		0.08	
Green Ratio		0.47	0.47		0.47	0.47			0.49			0.49	
Uniform Del	ay d ₁	19.7	25.3		23.0	22.3			21.7			19.3	
Delay Facto	or k	0.50	0.50		0.50	0.50			0.50			0.50	
Incremental	Delay d ₂	0.1	1.9		2.5	0.7			1.1			0.2	
PF Factor		1.000	1.000		1.000	1.000			1.000			1.000	
Control Dela	ay	19.8	27.2		25.4	23.0			22.8			19.5	
Lane Group LOS B C			С	С			С			В			
Approach Delay 27.0					23.8			22.8			19.5	-	
Approach Lo	pproach LOS C					С			С		1	В	
	ersection Delay 24.6						Intersec	tion LC)S		1	С	
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General Information Analyst N. Fossen Agency or Co. CDM Date Performed 5/10/2011 Time Period N. Fossen Area Type Jurisdiction Analysis Year 2030 Volume and Timing Input LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT TH RT LT RT LT RT LT LT LT RT LT LT LT LT LT LT LT LT LT LT LT LT LT		1st LT 0 42 2 0.92 P	SB TH 1 LTR 50 2 0.92	RT 0 27 2
Agency or Co. CDM Intersection Street E Date Performed 5/10/2011 PM Peak with bypass (EIS 6) Area Type All other area Volume and Timing Input EB WB NB LT TH RT LT TH RT LT TH Number of Lanes 1 1 0 1 1 0 0 1 Lane Group L TR L TR LTR Volume (vph) 9 326 73 90 365 5 153 22 % Heavy Vehicles 2 0 9 0.92 </th <th>RT 0 196 2 0.92</th> <th>LT 0 42 2 0.92</th> <th>TH 1 LTR 50 2</th> <th>0 27</th>	RT 0 196 2 0.92	LT 0 42 2 0.92	TH 1 LTR 50 2	0 27
Volume and Timing Input EB WB NB LT TH RT LT TH RT LT TH Number of Lanes 1 1 0 1 1 0 0 1 Lane Group L TR L TR LTR LTR Volume (vph) 9 326 73 90 365 5 153 22 % Heavy Vehicles 2 0 92	0 196 2 0.92	0 42 2 0.92	TH 1 LTR 50 2	0 27
EB	0 196 2 0.92	0 42 2 0.92	TH 1 LTR 50 2	0 27
Number of Lanes 1 1 0 1 1 0 0 1 Lane Group L TR L TR L TR LTR Volume (vph) 9 326 73 90 365 5 153 22 % Heavy Vehicles 2 0 992 0.92 0.92	0 196 2 0.92	0 42 2 0.92	1 LTR 50 2	0 27
Lane Group L TR L TR LTR Volume (vph) 9 326 73 90 365 5 153 22 % Heavy Vehicles 2 0 92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	196 2 0.92	42 2 0.92	LTR 50 2	27
Volume (vph) 9 326 73 90 365 5 153 22 % Heavy Vehicles 2 0 92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 <td>2 0.92</td> <td>2 0.92</td> <td>50 2</td> <td> </td>	2 0.92	2 0.92	50 2	
% Heavy Vehicles 2	2 0.92	2 0.92	2	
PHF 0.92	0.92	0.92		2
Pretimed/Actuated (P/A) P		+	0.92	1
Startup Lost Time 2.0 2.0 2.0 2.0 2.0 Extension of Effective Green 2.0 2.0 2.0 2.0 2.0	P	P	1 -	0.92
Extension of Effective Green 2.0 2.0 2.0 2.0 2.0		1	P	P
		-	2.0	—
Arrival Type			2.0	—
			3	—
Unit Extension 3.0 3.0 3.0 3.0		ļ	3.0	<u> </u>
Ped/Bike/RTOR Volume 0 0 0 0 0 0 0	0	0	0	0
Lane Width 12.0 12.0 12.0 12.0 12.0			12.0	<u> </u>
Parking/Grade/Parking N 0 N N 0 N N 0	N	N	0	N
Parking/Hour		-	1	
Bus Stops/Hour 0 0 0 0 0 Minimum Pedestrian Time 3.2 3.2 3.2 3.2			3.2	
Phasing EW Perm 02 03 04 NS Perm 06		<u>1</u> 07	_	<u> </u>
G-890 G-00 G-00 G-840 G-00	G =	= 0.0	G =	
Timing $Y = 3$ $Y = 0$ $Y = 0$ $Y = 0$ $Y = 3$ $Y = 0$	Y =	= 0	Y =	
Duration of Analysis (hrs) = 0.25 Cycle Len	gth C =	= 179.	0	
Lane Group Capacity, Control Delay, and LOS Determination		1		
EB WB NB			SB	
Adjusted Flow Rate 10 433 98 402 403			129	
Lane Group Capacity 361 901 338 924 647			661	
v/c Ratio 0.03 0.48 0.29 0.44 0.62			0.20	Ļ
Green Ratio 0.50 0.50 0.50 0.50 0.47			0.47	<u> </u>
Uniform Delay d ₁ 22.9 29.7 26.4 28.9 35.6			27.8	
Delay Factor k 0.50 0.50 0.50 0.50 0.50			0.50	
Incremental Delay d ₂ 0.1 1.8 2.2 1.5 4.5			0.7	
PF Factor 1.000 1.000 1.000 1.000 1.000 1.000			1.000	
Control Delay 23.1 31.6 28.6 30.4 40.1			28.4	
Lane Group LOS C C C D			С	
Approach Delay 31.4 30.0 40.1	•		28.4	
Approach LOS C C D			С	
Intersection Delay 33.0 Intersection LOS			С	
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5/10/2011

	SHORT REPORT Seneral Information Site Information													
General Info	ormation					Site I	nformat	ion						
Analyst Agency or C	J. Jesperser Co. CDM med 5/10/2011	1				Inters Area	ection Type	Stre	Avenue et other area		st & 1	Main		
Time Period	AM Poak wi	th Bypas	s (EIS	6)		Jurisc	liction		inor arec					
						Analy	sis Year	203	0					
Volume and	d Timing Input	1				\A/D		_	ND				0.0	
		LT	EB TH	RT	LT	WB TH	RT	LT	NB TH	T	RT	LT	SB TH	RT
Number of L	anes	1	1	0	1	1	0	0	1	$\overline{}$)	0	1	0
Lane Group		L	TR		L	TR			LTR	T			LTR	
Volume (vpł		8	260	86	87	178	87	2	4		2	4	5	1
% Heavy Ve	-	2	2	2	2	2	2	2	2		2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.	92	0.92	0.92	0.92
Pretimed/Ac	ctuated (P/A)	A	Α	Α	Α	Α	A	P	P	1	-	P	Р	Р
Startup Lost	. ,	2.0	2.0		2.0	2.0			2.0	T			2.0	
	f Effective Green	2.0	2.0		2.0	2.0			2.0	┢			2.0	
Arrival Type		3	3		3	3	1		3	十			3	
Unit Extensi		3.0	3.0		3.0	3.0		<u> </u>	3.0	┢			3.0	
Ped/Bike/R1	ΓOR Volume	0	0	0	0	0	0	0	0	()	0	0	0
Lane Width		12.0	12.0		12.0	12.0		<u> </u>	12.0	┢			12.0	
Parking/Gra	Parking/Grade/Parking		0	N	Ν	0	N	N	0	1	V	N	0	Ν
Parking/Hou	Parking/Hour													
Bus Stops/H		0	0		0	0			0				0	
Minimum Pe	edestrian Time		3.2			3.2			3.2				3.2	
Phasing	EW Perm	02		03	0		NS Pe		06			07		08
Timing		$\dot{S} = 0.0$ $\dot{S} = 0$		= <i>0.0</i> = <i>0</i>	G = 0		G = 17 $Y = 3$		G = 0.0 $Y = 0$		Y =	= 0.0 = 0	G = Y =	
Duration of A	Analysis (hrs) = (1 (1 - 0		Cycle Lei	ngth				
Lane Gro	up Capacity,	Contro	l Dela	ay, and	LOS	Deter	minatio	on						
			EB			WB			NB				SB	
Adjusted Flo	ow Rate	9	376		95	288			8				10	
Lane Group	Capacity	898	1499		816	1480			212				211	
v/c Ratio		0.01	0.25		0.12	0.19			0.04				0.05	
Green Ratio)	0.84	0.84		0.84	0.84			0.12				0.12	
Uniform Del	ay d ₁	1.9	2.4		2.1	2.3			54.3				54.3	
Delay Facto	r k	0.11	0.11		0.11	0.11			0.50				0.50	
Incremental	Delay d ₂	0.0	0.1		0.1	0.1			0.3				0.4	
PF Factor		1.000	1.000		1.000	1.000			1.000				1.000	
Control Dela	ay	1.9	2.5		2.2	2.3			54.6				54.8	
Lane Group	LOS	Α	Α		Α	Α			D				D	
Approach D	Approach Delay 2.5				2.3			54.6	,			54.8		
Approach Lo	pproach LOS A				Α		ĺ	D				D		
Intersection	ersection Delay 3.6				1		Intersec	tion LC	DS .				Α	
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				SI	HORT	REPC	RT						
General Inf	ormation					Site I	nformati	on					
Analyst Agency or C	J. Jespersen Co. CDM med 5/10/2011					Inters Area	ection Type	Stree	Avenue : et ther area		& Main		
Time Period	DM Dook with	n Bypas	s (EIS6))		Jurisd	iction						
						Analy	sis Year	2030)				
Volume and	d Timing Input				T	WD			NID		ı		
		LT	EB TH	RT	LT	WB TH	RT	LT	NB TH	R	T LT	SB T TH	RT
Number of I	Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group)	L	TR		L	TR	1		LTR			LTR	†
Volume (vp	h)	9	318	72	99	404	6	96	14	124	1 108	3 19	130
% Heavy Ve	ehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	2 0.92	2 0.92	0.92
Pretimed/Ad	ctuated (P/A)	Α	Α	Α	Α	Α	Α	Р	Р	Р	P	Р	Р
Startup Los	t Time	2.0	2.0		2.0	2.0			2.0			2.0	T
Extension o	f Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	;	3	3		3	3			3			3	T
Unit Extens	ion	3.0	3.0		3.0	3.0			3.0			3.0	T
Ped/Bike/R	TOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Gra		N	0	N	Ν	0	N	N	0	Ν	N	0	Ν
Parking/Hou							ļ		<u> </u>				$oldsymbol{oldsymbol{\perp}}$
Bus Stops/H		0	0		0	0	↓		0			0	
<u> </u>	edestrian Time		3.2			3.2	<u> </u>	<u> </u>	3.2	<u> </u>		3.2	<u></u>
Phasing	EW Perm G = 117.0 G	02 = 0.0		0.0	G = 0		NS Pe G = 17		$\frac{06}{6} = 0.0$		$\frac{07}{G = 0.0}$		0.0 0.0
Timing		= 0.0	Y =		Y = 0		Y = 3		$\dot{r} = 0.0$		Y = 0.0	Y =	
Duration of	Analysis (hrs) = 0.								cycle Ler				
Lane Gro	oup Capacity, (Contro	l Dela	y, and	LOS	Deteri	minatic	n					
			EB			WB			NB			SB	
Adjusted Flo	ow Rate	10	424		108	446			254			279	
Lane Group	Capacity	755	1513		774	1553			135			132	
v/c Ratio		0.01	0.28		0.14	0.29	<u> </u>	<u> </u>	1.88			2.11	<u> </u>
Green Ratio)	0.84	0.84	ļ	0.84	0.84	<u> </u>	<u> </u>	0.12			0.12	
Uniform De	lay d ₁	1.9	2.5		2.1	2.5			61.5			61.5	
Delay Facto	or k	0.11	0.11		0.11	0.11			0.50			0.50	
Incremental	Delay d ₂	0.0	0.1		0.1	0.1			423.3			525.8	
PF Factor		1.000	1.000	ļ	1.000	1.000			1.000			1.000	
Control Dela	ay	1.9	2.6		2.2	2.6			484.8			587.3	
Lane Group	LOS	Α	Α		Α	Α			F			F	
Approach D	pproach Delay 2.6				2.5			484.8			587.3		
Approach L	pproach LOS A					Α			F			F	
Intersection	rsection Delay 190.3						Intersec	tion LO	S			F	
Conveight @ 2009	8 University of Florida A	II Diahte D	oconyod		-		co.TM va				Conoratos	H: 5/11/2011	12:27 DM

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						SH	IORT	R	EPO	RT	-									
General Info	rmation							S	Site In	for	matic	on								
Analyst Agency or Co Date Perform Time Period			bypas	s (E	EIS 6,)		A J	nterse Area Ti Iurisdio Analys	ype ctic	e on	He Ali	eritag	Shore i ge Ln er area		ad &				
Volume and	Timing Inpu	t						_												
					EB				WB			Ш		NB					SB	
			LT	_	ГН	RT	LT	4	TH	4	RT	_	<u>.T</u>	TH	╀	RT	LT	_	TH	RT
Number of La	anes					0	1	4	1	4		_	1		╀	1	-	4		<u> </u>
Lane Group	.			_	R		L	4	T	4		L			╀	R	-	+		<u> </u>
Volume (vph)				21		102	19	4	288	4		4			╀	5	-	+		
% Heavy Vel	nicles			2		2	2	4	2	4		2			\perp	2		+		
PHF	(5/4)			0.		0.71	0.54	4	0.85	4		0.7			(0.50	╁	+		
Pretimed/Act	· , ,		<u> </u>			Α	A	4	A	4		F			丰	<i>P</i>	_	+		<u> </u>
Startup Lost				2.			2.0	4	2.0	4		2.			+	2.0		+		
	Effective Gre	en		_	.0		2.0	4	2.0	4		2.			╀	2.0	-	+		
Arrival Type				_	3		3	4	3	4		3			╀	3	-	+		
Unit Extension				3.			3.0	4	3.0	4		3.			╀	3.0	-	+		
	Ped/Bike/RTOR Volume 0 Lane Width)	0	0	4	0	4		(0	╀	0	0	+	0	
	Lane Width			_	2.0	Λ/	12.0 N	4	12.0	4	N	12	2.0	0	╀	12.0 N	N	┿		N
Parking/Grad	Parking/Grade/Parking		N	_)	N	//	4	0	\dashv	IV	\	<u>v</u>	0	╁	N	1//	╬	0	//
Bus Stops/Ho			 		0		0	┪	0	+		 	<u> </u>	_	╁	0	+	╁		
	destrian Time			3.				┪	3.2	+		╆		3.2	╁		1	+;	3.2	
Phasing	EW Perm		02			03	0.	4	Ī	N	B On	ly		06	_		07	十	0	<u>. </u>
Timing	G = 117.0		= 0.0		G =		G = (= 15.	0		0.0		G =			G = (
,	Y = 3 nalysis (hrs) :		= 0	_	Y =	0	Y = ()		Y =	= 3		Y =	0 de Len	ath	Y =			Y = ()
	up Capacity			1 D	Alay	, and	100	<u></u>	otorn	ain	atio	n	Сус	de Len	gu	C =	130.	U		
Lane Oroc	ap Capacit	<i>y</i> , C			EB	y, and			WB		iatio			NB		Ī			SB	
Adjusted Flo	w Rate			42		1	35	[3	339	Π		68			10	2		T		
Lane Group					352		800		1579	T		192	寸		17	-		十		
v/c Ratio				0.	15		0.04	0).21	T		0.35	5		0.0	06		十		
Green Ratio				0.8			0.85	┿).85	┢		0.11	-		0.1	_		十		
Uniform Dela	ay d₁			1.			1.7	┿	2.0	十		57.0	-		55.	_		╁		
Delay Factor	<u> </u>			0.			0.11	┿).11	t		0.50	-		0.5			十		
Incremental I				┿	0.0		0.0	┿	0.1	T		5.1			0.	_		十		
PF Factor	· ∠			4—	000		1.000	+	.000	T		1.00				000		十		
Control Delay	y			1	.8	Ì	1.7	T	2.0	İ		62.	1		55	5.8		\top		
Lane Group	LOS			1	1		Α	T	Α	Τ		Ε	\neg		Ε			十		
Approach Delay 1.8					_	2.0	1				61.3									
Approach LOS A						Α					Ε									
	tersection Delay 7.2							Inte	ersect	ion l	LOS			\dashv			4			
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						SH	IORT I	REPO)R	T									
General Info	rmation							Site I	nfo	rmatic	n								
Analyst Agency or Co Date Perform)						Inters Area			He	ritag	Shore ge Ln er area		ad &				
Time Period	PM Peak	with	n bypas	s (El	IS 6))		Juriso	licti	ion				-					
								Analy	sis	Year	20	10							
Volume and	Timing Input	<u> </u>	1		<u>- </u>			\\/D			_		ND			1	01		
			LT	T	B H	RT	LT	WB		RT		т —	NB TH	т	RT	LT	SI Th		RT
Number of La	anes		<u> </u>	2		0	1	1		- 1	1			t	1	+	╁┈	┪	111
Lane Group				TF			L	T			L			t	R	1	+	┪	
Volume (vph)			34		249	25	283			26	4		t	24	\vdash	+	┪	
% Heavy Vel				2		2	2	2			2			╁	2	1	+	┪	
PHF				0.9		0.82	0.71	0.87	,		0.9			1	0.83		十一		
Pretimed/Act	uated (P/A)			Α		Α	Α	A			P	1		T	Р	1	1	╗	
Startup Lost	Time			2.0	0		2.0	2.0			2.0)		T	2.0		\top		
Extension of	Effective Gree	en		2.0	0		2.0	2.0			2.0)			2.0				
Arrival Type				3			3	3			3			T	3		1		
Unit Extension	on			3.0	0		3.0	3.0			3.0)		Ī.	3.0				
Ped/Bike/RT	OR Volume		0	0		0	0	0			0		0		0	0	0		
Lane Width				12	.0		12.0	12.0)		12	.0			12.0				
Parking/Grad	Parking/Grade/Parking		Ν	0		Ν	N	0		Ν	Λ	'	0	L	Ν	N	0		Ν
Parking/Hou								<u> </u>						Ļ				_	
Bus Stops/H			ļ	0			0	0			C)		Ļ	0	<u> </u>	┷		
,	destrian Time		,	3.2			<u> </u>	3.2			<u> </u>		3.2	<u> </u>			3.2		
Phasing	EW Perm G = 117.0	Ļ	02 = 0.0	4		0.0 0.0	04			NB Onl = 19.		_	06		G =	07	+	30 = 0	
Timing	Y = 3		= 0.0 = 0		<u>G =</u> Y =		G = C Y = 0		_	= 19. = 5	0	Y =			Y =			= 0 = 0	
Duration of A	nalysis (hrs) =												le Len	gth			_		
Lane Grou	up Capacity	/, C	Contro	ol D	elay	y, and	LOS [Deter	mi	natio	n								
				Е	В			WB					NB				SB	}	
Adjusted Flo	w Rate			67	1		35	325			272			29	9				
Lane Group	Capacity			268	86		583	1514			234			20	9				
v/c Ratio				0.2	5		0.06	0.21	T		1.16	П		0.1	14				
Green Ratio				0.8	1		0.81	0.81			0.13			0.1	13				
Uniform Dela	ay d ₁			3.2	2		2.7	3.1			62.5			55.	.3				
Delay Factor	k			0.1	1		0.11	0.11	Ţ		0.50			0.5	50				
Incremental I	Delay d ₂			0.	0		0.0	0.1			109.	7		1.	.4				
PF Factor				1.0	00		1.000	1.000	\prod		1.00	0		\vdash	000			Ţ	
Control Dela	у		<u> </u>	3	2		2.7	3.1	\perp		172.	2		56	6.6				
Lane Group			<u> </u>	Α			Α	Α			F			E					
Approach De	Approach Delay 3.2				3.1				1	61.1									
Approach LC	pproach LOS A						Α					F							
Intersection I	ersection Delay 38.9							In	tersect	ion L	os					D			
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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY			
General Information	 າ		Site I	nform	natio	on .			
Analyst	N. Fosse	n	Interse				US 93 &	Rocky Poi	nt Road
Agency/Co.	CDM		Jurisdi					, ,	
Date Performed	5/10/201	1	Analys	is Yea	r		2030		
Analysis Time Period	AM Peak	with bypass (EIS	6)						
Project Description			•						
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme								
Major Street		Eastbound					Westbou	nd	
Movement	1 1	2	3			4	5		6
\	<u> </u>	T	R			L	T 100		R
Volume (veh/h) Peak-Hour Factor, PHF	5 0.92	441 0.92	1.00	1		1.00	168 0.92		49 0.92
Hourly Flow Rate, HFR		0.92	1.00			1.00	0.92		
(veh/h)	5	479	0			0	182		53
Percent Heavy Vehicles	0					0			
Median Type			1						
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ınd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)						171			6
Peak-Hour Factor, PHF	1.00	1.00	1.00)		0.92	1.00		0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			185	0		6
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0	•	
Flared Approach	1	N					N		
Storage	 	0					0		
RT Channelized	1		0						0
Lanes	0	0	0			0	0		0
Configuration	 		†				LR		
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound		Northb	ound		S	outhboun	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	5							191	
C (m) (veh/h)	1344							415	1
v/c	0.00						i	0.46	1
95% queue length	0.01						ĺ	2.36	1
Control Delay (s/veh)	7.7							20.9	1
LOS	A							C	+
Approach Delay (s/veh)				L		<u> </u>	 	20.9	
Approach LOS								C C	
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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY			
General Information	 າ		Site I	nform	natio	on .			
Analyst	N. Fosse	n	Interse				US 93 & I	Rockv Po	int Road
Agency/Co.	CDM		Jurisdi					, , , , , , , , , , , , , , , , , , ,	
Date Performed	5/10/201	1	Analys	is Yea	r		2030		
Analysis Time Period	PM Peak	with bypass (EIS	6)						
Project Description			,						
East/West Street: US 9						t: Rocky F	Point Road		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme								
Major Street		Eastbound					Westbou	<u>nd</u>	
Movement	1 1	2	3			4	5		6
\/aluma a /u ab /b\	1 1	T 220	R			L	T 375	_	R
Volume (veh/h) Peak-Hour Factor, PHF	0.92	330 0.92	1.00)	_	1.00	0.92	_	160 0.92
Hourly Flow Rate, HFR	0.92		1			1.00	0.92		
(veh/h)	1	358	0			0	407		173
Percent Heavy Vehicles	0			Undi		0			
Median Type			1						
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ınd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)			ļ			112			2
Peak-Hour Factor, PHF	1.00	1.00	1.00)		0.92	1.00		0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			121	0		2
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach	1	N					N		
Storage	Ti Ti	0	1				0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration	1		1				LR		
Delay, Queue Length, a	nd Level of Se	rvice					•		
Approach	Eastbound	Westbound		Northb	ound		s	outhboun	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	1							123	
C (m) (veh/h)	1004							334	
v/c	0.00						Ì	0.37	1
95% queue length	0.00						ĺ	1.65	1
Control Delay (s/veh)	8.6	i					ì	21.9	1
LOS	A			<u> </u>			<u> </u>	C	
Approach Delay (s/veh)				<u> </u>			1	21.9	ı
Approach LOS							 	C	
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	TW	O-WAY STOP	CONTR	OL SU	JMN	MARY				
General Information	1		Site I	nform	atio	on				
Analyst	N. Fosse	n	Interse	action			12. US 9	3 & Irvii	ne F	ats
Agency/Co.	CDM	11					Road			
Date Performed	5/10/201	1	Jurisdi							
Analysis Time Period		with bypass (EIS	Analys	is Year	•		2030			
	,	77								
Project Description	0		N = -41- /C) t l O	4	t. Indiaa F	Tata Dagat			
East/West Street: US 9 Intersection Orientation:						t: <i>Irvine F</i> : 0.25	lats Road			
			Study	enou (1115)	. 0.25				
Vehicle Volumes ar	<u>nd Adjustme</u>						107 (1			
Major Street	1	Eastbound	1 2			4	Westbou	ind T		
Movement	1 1	2 T	3 R			4 	5 T			6 R
Volume (veh/h)	5	480	7	-		8	242			30
Peak-Hour Factor, PHF	0.92	0.92	0.92	,		0.92	0.92).92
Hourly Flow Rate, HFR							1			
(veh/h)	5	521	7			8	263			32
Percent Heavy Vehicles	0					0				
Median Type				Undiv	ridec	d				
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LTR					LTR				
Upstream Signal		0					0			
Minor Street	1	Northbound					Southboo	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)	0	0	6	T						
Peak-Hour Factor, PHF	0.92	0.92	0.92	· [0.92	0.92		C	.92
Hourly Flow Rate, HFR (veh/h)	0	0	6			0	0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	0	ĺ		0
Configuration		LTR								
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound	1	Northbo	und			Southbo	und	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LTR	LTR		LTR	2	<u> </u>		 		
v (veh/h)	5	8		6		 	 	 		
C (m) (veh/h)	1278	1049		557	,	 	+	 		
v/c	0.00	0.01		0.01		-		 		
	0.00					 	1	-		
95% queue length		0.02		0.03			-	-		
Control Delay (s/veh)	7.8	8.5		11.5			-			
LOS	<u> </u>	Α		В						
Approach Delay (s/veh)				11.5	5					
Approach LOS				В						
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	TW	O-WAY STOP	CONTR	OL SU	ΜN	//ARY				
General Information	1		Site I	nforma	atic	on				
Analyst	N. Fosse	n	Interse	oction			12. US 9	3 & Ir	vine F	lats
Agency/Co.	CDM	· I	¬I∟				Road			
Date Performed	5/10/201	1	Jurisdi							
Analysis Time Period		with bypass (EIS	6) Analys	is Year			2030			
Drainat Departmen										
Project Description East/West Street: US 9	2		North/S	South St	root	t: Irvine F	late Poad			
Intersection Orientation:				Period (I			iais Noau			
Vehicle Volumes ar		nto	lotudy i	i) bono	113)	. 0.20				
Major Street	Ta Adjustine	Eastbound					Westbou	ınd		
Movement	1	2	3			4	5	inu	1	6
Movement	 	T T	R			L	T			R
Volume (veh/h)	5	377	2			12	516			23
Peak-Hour Factor, PHF	0.92	0.92	0.92	- 		0.92	0.92			0.92
Hourly Flow Rate, HFR (veh/h)	5	409	2			13	560			24
Percent Heavy Vehicles	0		Ī			0				
Median Type				Undivi	idea	1				
RT Channelized			0							0
Lanes	0	1	0	İ		0	1			0
Configuration	LTR		1			LTR				
Upstream Signal		0					0			
Minor Street		Northbound					Southbo	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)	6	1	11							
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.60	0.25			0.44
Hourly Flow Rate, HFR (veh/h)	6	1	11			0	0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	1	0			0	0			0
Configuration		LTR								
Delay, Queue Length, a	nd Level of Se						_			
Approach	Eastbound	Westbound	1	Northbo	und		9	South	bound	
Movement	1	4	7	8		9	10		11	12
Lane Configuration	LTR	LTR		LTR						
v (veh/h)	5	13		18						
C (m) (veh/h)	1001	1159		406						
v/c	0.00	0.01		0.04				1		
95% queue length	0.02	0.03		0.14	-			\top		
Control Delay (s/veh)	8.6	8.1		14.3	_			\vdash		
LOS	A	A		B	\dashv			†		
Approach Delay (s/veh)				14.3						
Approach LOS				14.3 B						
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	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY					
General Information	 າ		Site II	nform	atio	on					
Analyst	N. Fossei	n	Interse				13. US 93	3 & Caffr	ev Road		
Agency/Co.	CDM		Jurisdi						.,		
Date Performed	5/5/11		Analys	is Yea	r		2010				
Analysis Time Period	AM Peak	with bypass (EIS	6)								
Project Description			•								
East/West Street: Caffro						t: <i>US 93</i>					
Intersection Orientation:	North-South		Study F	Period	(hrs)	: 0.25					
Vehicle Volumes ar	nd Adjustme										
Major Street		Northbound					Southbou	ınd			
Movement	1 1	2	3			4	5		6		
\/aluma a /u ab /b\	L 420	T	R			L	530		R		
Volume (veh/h) Peak-Hour Factor, PHF	136 0.92	609 0.92	0.92			2 0.92	0.92		10 0.92		
Hourly Flow Rate, HFR	0.92		1	-			0.92				
(veh/h)	147	661	0			2	576		10		
Percent Heavy Vehicles	0					0					
Median Type	Undivided 0 0										
RT Channelized											
Lanes	1	2	0			1	2		1		
Configuration	L	T	TR			L	Т		R		
Upstream Signal		0					0				
Minor Street		Eastbound					Westbou	nd			
Movement	7	8	9			10	11		12		
	L	Т	R			L	Т		R		
Volume (veh/h)	3	1	25			1	1		0		
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92		
Hourly Flow Rate, HFR (veh/h)	3	1	27			1	1		0		
Percent Heavy Vehicles	0	0	0			0	0		0		
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
Lanes	0	1	0			0	1		0		
Configuration		LTR					LTR				
Delay, Queue Length, a	nd Level of Se	rvice									
Approach	Northbound	Southbound	,	Westbo	ound		E	astbour	nd		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration	L	L		LTF	₹			LTR			
v (veh/h)	147	2		2				31			
C (m) (veh/h)				105	5			445			
v/c	0.15 0.00			0.02	2			0.07			
95% queue length	0.52	0.01		0.00	6			0.22			
Control Delay (s/veh)	9.2	8.9		40.0				13.7			
LOS	A	A		Ε				В			
Approach Delay (s/veh)			40.0					13.7	l		
Approach LOS				Ε				В			
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	TW	O-WAY STOP	CONTR	OL SU	MM	ARY			
General Information	<u> </u>		Site I	nforma	atior	1			
Analyst	N. Fossei	า	Interse	ection			13. US 93	3 & Caffi	ey Road
Agency/Co.	CDM		Jurisdi	ction					,
Date Performed	5/5/11		Analys	is Year			2010		
Analysis Time Period	PM Peak	with bypass (EIS	6)						
Project Description									
East/West Street: Caffro	ey Road		North/S	South St	treet:	US 93			
Intersection Orientation:	North-South		Study F	Period (I	hrs):	0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Northbound					Southbou	ınd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	96	837	5			2	836		17
Peak-Hour Factor, PHF	0.92	0.92	0.92		0).92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	104	909	5			2	908		18
Percent Heavy Vehicles	0					0			
Median Type				Undivi	ided				
RT Channelized			0						0
Lanes	1	2	0			1	2		1
Configuration	L	T	TR			L	Т		R
Upstream Signal		0					0		
Minor Street		Eastbound					Westbou	nd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	3	0	23			1	0		1
Peak-Hour Factor, PHF	0.92	0.92	0.92		0	.92	0.92		0.92
Hourly Flow Rate, HFR (veh/h)	3	0	24			1	0		1
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0	•	
Flared Approach	1	N					N		
Storage	1	0					0		
RT Channelized			0						0
Lanes	0	1	0	- 		0	1		0
Configuration	 	LTR	†				LTR		
Delay, Queue Length, a	nd I evel of Se								
Approach	Northbound	Southbound	,	Westbo	und		[astbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	L	L		LTR		-		LTR	
v (veh/h)	104	2		2				27	
C (m) (veh/h)	746	754		116				324	
v/c	0.14	0.00		0.02	—		<u> </u>	0.08	
95% queue length	0.48	0.01		0.05				0.27	\dashv
Control Delay (s/veh)	10.6	9.8		36.6				17.1	
LOS	В	A		E	十			C	
Approach Delay (s/veh)				36.6				17.1	ı
Approach LOS				E			 	C	
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	TW	O-WAY STOP	CONTR	OL SU	JMN	//ARY					
General Information				Site Information							
Analyst <i>N. Fossen</i>			Interse	Intersection				15. Kerr Dam Road & Grenier			
Agency/Co.	CDM	•	-				La				
Date Performed	5/10/201	1		Jurisdiction			0000				
Analysis Time Period		with bypass (EIS	6) Analys	Analysis Year			2030				
Project Description											
East/West Street: Gren	ier I ane		North/S	South S	tree	t: <i>Kerr Da</i>	m Road				
Intersection Orientation:						: 0.25	mitoda				
Vehicle Volumes ar		nts									
Major Street		Northbound					Southbound				
Movement	1	2	3			4	5			6	
	L	Т	R			L	T		R		
Volume (veh/h)	0	204	147			37	97			0	
Peak-Hour Factor, PHF	0.92	0.92	0.92	· [0.92	0.92		().92	
Hourly Flow Rate, HFR (veh/h)	0	221	159			40	105			0	
Percent Heavy Vehicles	0					0					
Median Type		,		Undiv	ridea	1					
RT Channelized			0							0	
Lanes	0	1	0			0	1			0	
Configuration	LTR					LTR					
Upstream Signal		0					0				
Minor Street		Eastbound		1			Westbound				
Movement	7	8	9			10	11		12		
	L	Т	R		L		Т		R		
Volume (veh/h)					21		0		13		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00 0.92		0.92	0.92		(0.92	
Hourly Flow Rate, HFR (veh/h)	0	0	0			22	0		14		
Percent Heavy Vehicles	0	0	0			0	0			0	
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
Lanes	0	0	0		0		1			0	
Configuration							LTR				
Delay, Queue Length, a	nd Level of Se	rvice									
Approach	Northbound	Southbound	,	Westbound			Eastb		bound		
Movement	1	4	7	8		9	10	1	1	12	
Lane Configuration	LTR	LTR		LTR	?						
v (veh/h)	0	40		36							
C (m) (veh/h)	1499	1190		594							
v/c	0.00	0.03		0.06			1				
95% queue length	0.00	0.10		0.19				1			
Control Delay (s/veh)	7.4	8.1		11.5			 	1			
LOS	A A	A		11.0 B	•		 				
Approach Delay (s/veh)				11.5	-		 			<u> </u>	
					,		-				
Approach LOS				В							

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	TW	O-WAY STOP	CONTR	OL SI	JMI	MARY						
General Information				Site Information								
Analyst N. Fossen			Interse	Intersection				15. Kerr Dam Road & Grenier				
Agency/Co.	CDM	•	─	-			La					
Date Performed	5/10/11			Jurisdiction			0000					
Analysis Time Period	PM Peak	with bypass (EIS	6) Analys	Analysis Year			2030					
Project Description												
East/West Street: Gren	ier I ane		North/S	South S	tree	t: Kerr Da	m Road					
Intersection Orientation:						: 0.25	minoaa					
Vehicle Volumes ar		nte	10.10.0.7		(*****)							
Major Street		Northbound						Southbound				
Movement	1	2	3			4	1	5		6		
	i		R			L	T			R		
Volume (veh/h)	0	185	57			17	260		0			
Peak-Hour Factor, PHF	0.92	0.92	0.92	· Í		0.92	0.92		(0.92		
Hourly Flow Rate, HFR (veh/h)	0	201	61			18	282			0		
Percent Heavy Vehicles	0					0						
Median Type		,		Undiv	/idec	1						
RT Channelized			0				1			0		
Lanes	0	1	0			0	1		0			
Configuration	LTR					LTR						
Upstream Signal		0					0					
Minor Street		Eastbound					Westbound					
Movement	7	8	9			10	11		12			
	L	Т	R		L		Т		R			
Volume (veh/h)					51		0		21			
Peak-Hour Factor, PHF	1.00	1.00	1.00	00 0.92		0.92	0.92		(0.92		
Hourly Flow Rate, HFR (veh/h)	0	0	0			55	0		22			
Percent Heavy Vehicles	0	0	0			0	0			0		
Percent Grade (%)		0					0					
Flared Approach		N					N					
Storage		0					0					
RT Channelized			0						0			
Lanes	0	0	0		0		1		0			
Configuration							LTR					
Delay, Queue Length, a	nd Level of Se	rvice										
Approach	Northbound	Southbound		Westbound			Eastb		bound			
Movement	1	4	7	8		9	10	1	1	12		
Lane Configuration	LTR	LTR		LTF	?							
v (veh/h)	0	18		77						Î		
C (m) (veh/h)	1292	1314		555	5					ĺ		
v/c	0.00	0.01		0.14				1				
95% queue length	0.00	0.04		0.48			†			1		
Control Delay (s/veh)	7.8	7.8		12.5				†				
LOS	7.0 A	A A		12.0 B			 	+				
Approach Delay (s/veh)				12.5			 					
							 					
Approach LOS		erved	<u> </u> Н	В		I	rated: 5/		1 10:32 Al			

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	TW	O-WAY STOP	CONTR	OL SI	UMN	//ARY					
General Information				Site Information							
Analyst <i>N. Fossen</i>			Interse	Intersection				16. Kerr Dam Road & Back			
Agency/Co.	CDM	•	-				Road				
Date Performed	5/10/2011	1		- Jurisdiction				2000			
Analysis Time Period		with bypass (EIS	6) Analys	Analysis Year				2030			
Project Description							<u> </u>				
East/West Street: Back	Road		North/S	South S	Street	t: Kerr Da	m Road				
Intersection Orientation:						: 0.25	mmoad				
Vehicle Volumes ar		nte	10.10.00		(****)						
Major Street		Northbound					Southbou	ınd			
Movement	1	2	3			4	5	1	6		
	i	 	R			L	Ť		R		
Volume (veh/h)	5	207	0			0	61		17		
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92		
Hourly Flow Rate, HFR (veh/h)	5	224	0			0	66		18		
Percent Heavy Vehicles	0					0					
Median Type		,		Undi	videa	1	*				
RT Channelized			0						0		
Lanes	0	1	0			0	1		0		
Configuration	LTR					LTR					
Upstream Signal		0					0				
Minor Street		Eastbound					Westbound				
Movement	7	8	9			10	11		12		
	L	Т	R		L		Т		R		
Volume (veh/h)	18	0	5								
Peak-Hour Factor, PHF	0.92	0.92	0.92			1.00	1.00		1.00		
Hourly Flow Rate, HFR (veh/h)	19	0	5			0	0		0		
Percent Heavy Vehicles	0	0	0			0	0		0		
Percent Grade (%)		0	_		0						
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
Lanes	0	1	0		0		0		0		
Configuration		LTR									
Delay, Queue Length, a		i					1				
Approach	Northbound	Southbound		Westbound			Eastb		1		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration	LTR	LTR						LTR			
v (veh/h)	5	0						24			
C (m) (veh/h)	1526	1357						732			
v/c	0.00	0.00						0.03			
95% queue length	0.01	0.00						0.10			
Control Delay (s/veh)	7.4	7.7						10.1			
LOS	Α	Α						В			
Approach Delay (s/veh)							i i	10.1			
Approach LOS								В			
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	TW	O-WAY STOP	CONTR	OL SI	UMN	//ARY						
General Information			Site I	Site Information								
Analyst N. Fossen			Interse	Intersection				16. Kerr Dam Road & Back Road				
Agency/Co.	CDM		lurisdi	Jurisdiction			Noau					
Date Performed	5/10/2011		Analys	Analysis Year			2030					
Analysis Time Period PM Peak with bypass (EIS 6)			<u>6)</u>	ois i ca			2030					
Project Description												
East/West Street: Back Road				North/South Street: Kerr Dam Road								
Intersection Orientation:			Study I	Period	(hrs)	: 0.25						
Vehicle Volumes ar	nd Adjustme											
Major Street		Northbound					Southbound					
Movement	1	2	3			4	5		6			
	L	T	R			_ <u>L</u>	T		R			
Volume (veh/h)	10	110	0			0			33			
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92			
Hourly Flow Rate, HFR (veh/h)	10	119	0			0	154		35			
Percent Heavy Vehicles	0					0						
Median Type				Undi	vided	1						
RT Channelized			0						0			
Lanes	0	1	0			0	1		0			
Configuration	LTR					LTR						
Upstream Signal	1	0					0					
Minor Street		Eastbound					Westbou	nd				
Movement	7	8	9	9 10		11		12				
	L	Т	R			L	T		R			
Volume (veh/h)	17	0	4									
Peak-Hour Factor, PHF	0.92	0.92	0.92	·	1.00		1.00		1.00			
Hourly Flow Rate, HFR (veh/h)	18	0	4			0	0		0			
Percent Heavy Vehicles	0	0	0			0	0		0			
Percent Grade (%)	1	0					0					
Flared Approach	1	N					N					
Storage	1	0					0					
RT Channelized	1		0				1		0			
Lanes	0	1	0			0	0		0			
Configuration		LTR										
Delay, Queue Length, a	nd Level of Se	rvice										
Approach	Northbound	Southbound	,	Westbound		l l	Eastboun	d				
Movement	1	4	7	8		9	10	11	12			
Lane Configuration	LTR	LTR						LTR				
v (veh/h)	10	0						22				
C (m) (veh/h)	1397	1482						710				
v/c	0.01	0.00					1	0.03	1			
95% queue length	0.02	0.00					1	0.10	†			
Control Delay (s/veh)	7.6	7.4						10.2	+			
LOS	A A	A A		\vdash			†	B	+			
Approach Delay (s/veh)				<u> </u>			 	10.2				
Approach LOS							<u> </u>	B				
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