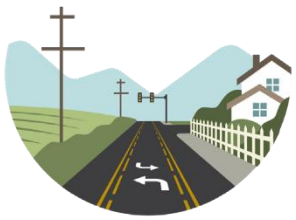
APPENDIX 4:

IMPROVEMENT OPTIONS



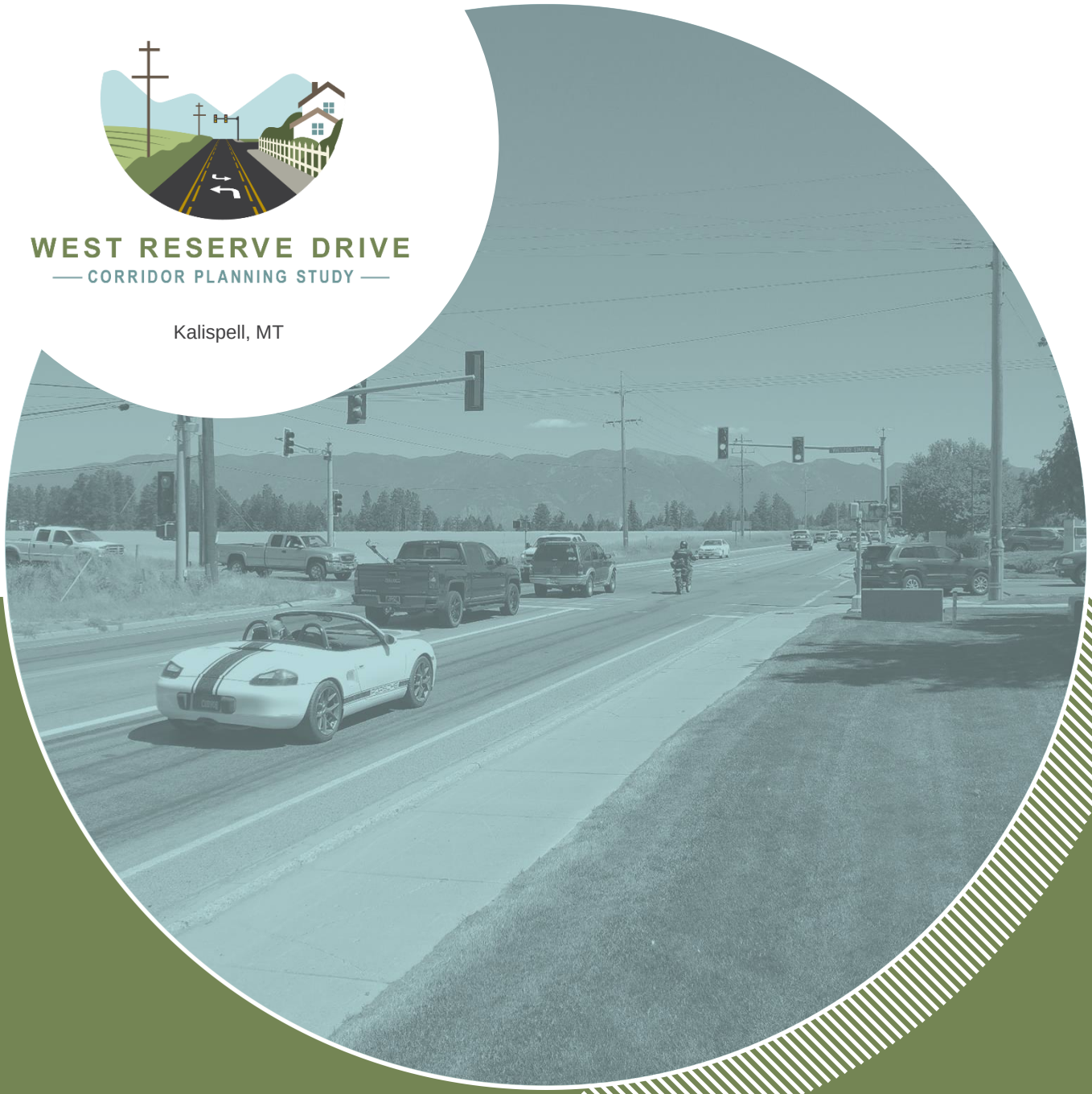
WEST RESERVE DRIVE

CORRIDOR PLANNING STUDY

WEST RESERVE DRIVE

CORRIDOR PLANNING STUDY

Kalispell, MT



JULY 2021

IMPROVEMENT OPTIONS

Prepared for:

VISION ZERO
zero deaths · zero serious injuries

MONTANA DEPARTMENT OF TRANSPORTATION

Prepared by:

DOWL

TABLE OF CONTENTS

List of Figures

List of Tables

Attachments

Appendix 1: Preliminary Cost Estimates

Appendix 2: Improvement Options Operational Analysis

ACRONYMS

AADT	Annual Average Daily Traffic
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DNRC	Montana Department of Natural Resources and Conservation
DOC	Department of Commerce
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
FWP	Montana Fish, Wildlife, and Parks
GIS	Geographic Information System
GWIC	Groundwater Information Center
HUC	Hydrologic Unit Code
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MAAQS	Montana Ambient Air Quality Standards
MBMG	Montana Bureau of Mines and Geology
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MPDES	Montana Pollutant Discharge Elimination System
MS4	Municipal Separate Storm Sewer System
MSATs	Mobile Source Air Toxics
MTNHP	Montana Natural Heritage Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PM	Particulate Matter
RCRA	Resource Conservation and Recovery Act
RP	Reference Post
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SOC	Species of Concern
TMDL	Total Maximum Daily Load
US 2	United States Highway 2
US 93	United States Highway 93
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank

1.0 INTRODUCTION & BACKGROUND

The Montana Department of Transportation (MDT) has initiated a corridor study of W. Reserve Drive (Dr.), between the intersection with United States Highway 93 (US 93) and United States Highway 2 (US 2). A portion of Whitefish Stage Road (Rd.) is also included as part of this study, extending 0.5 miles north of W. Reserve Dr. and 300 feet south of W. Reserve Dr. The goal of the W. Reserve Dr. corridor study is to develop a comprehensive long-range plan for managing the corridor and determining what can be done to improve the corridor based on needs, public and agency input, and financial feasibility. This is a collaborative process with local jurisdictions, resource agencies, MDT, Federal Highway Administration (FHWA), and the public to identify transportation needs and potential solutions given environmental and funding constraints.

The intent of the W. Reserve Dr. *Improvement Options Technical Memorandum* is to identify and evaluate options for improving W. Reserve Dr. Potential improvement options are intended to address issues or areas of concern defined in the *Existing and Projected Conditions Technical Memorandum* prepared for the study corridor. Recommended improvement options considered in this report reflect input from stakeholders and the public as well as a thorough evaluation of the existing conditions of W. Reserve Dr. within the study area.

1.1 Corridor Study Area

The study area for the W. Reserve Dr. corridor planning study is located in the northeast part of Kalispell, within Flathead County, Montana. The study corridor includes W. Reserve Dr. (P-267) beginning at the intersection with US 93 (Reference Post [RP] 4.0) and continues east to the intersection with US 2 (RP 6.5). The study corridor also includes 0.5 miles of Whitefish Stage Rd. (U-6736) north of W. Reserve Dr. and 300 feet of Whitefish Stage Rd. (U-6728) south of W. Reserve Dr. For the purposes of this planning study, the study limits include a 250-foot buffer from the centerline of each roadway. Figure 1 shows the study area and the system designation for the roads within the study area. As shown in the figure, much of the corridor lies outside the existing city limits. However, the corridor is within Kalispell's urban boundary.

Traffic at Whitefish Stage Rd. Intersection

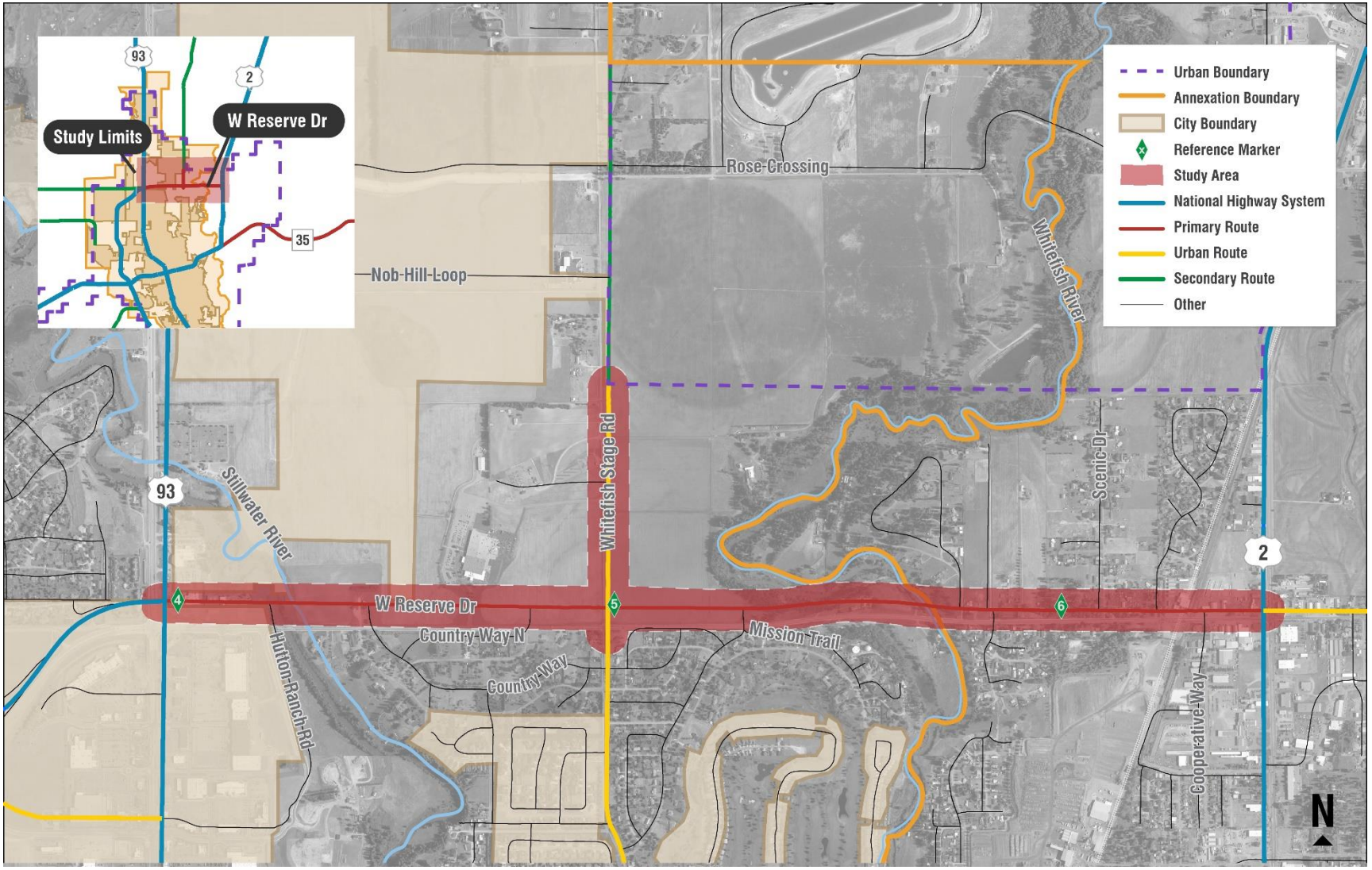


Figure 1: Study Area

1.2 Needs and Objectives

Needs and objectives for the W. Reserve Dr. corridor planning study were developed based on the social, environmental, and engineering conditions described in the *Existing and Projected Conditions Technical Memorandum*; input from the public, stakeholders, and resource agencies; review of local plans; and coordination with the technical oversight committee. Improvement options identified in this study address the needs and objectives to the extent feasible. As projects are advanced from this study, needs and objectives may be incorporated in purpose and need statements for future National and Montana Environmental Policy Act (NEPA/MEPA) documentation. Needs, objectives, and considerations are not listed in order of priority.

Need 1: Improve the Safety of the Corridor

- Reduce the frequency and severity of crashes for all users, in support of MDT's Vision Zero
- Reduce vehicle conflicts

Need 2: Improve the Corridor Transportation Operations

- Accommodate existing and future travel demands
- Improve intersection operations and level of service
- Consider all modes of transportation
- Employ travel demand management strategies

Other Considerations:

- Consistency with local plans and developments
- Municipal infrastructure improvements
- Public and private utilities
- Constructability and related impacts
- Impacts to adjacent businesses and residences
- Impacts to environmental resources and social equity
- Stormwater management
- Funding availability
- Maintenance operations, responsibility, and cost

1.3 Projects Under Development

Planned developments and construction projects affecting the corridor study area include the following:

- **US 93 North Signals-Kalispell**: Construction of this project is anticipated in calendar year 2021. The US 93 North Signals-Kalispell project will upgrade traffic signals, so they are more visible and are timed to allow more efficient movement of traffic. The project will also make improvements to pedestrian accessibility with ramps and crosswalk signals that meet ADA standards. The US 93 and W. Reserve Dr. intersection is included in this project.
- **Center Line Rumble Strips-Kalispell Area:** Construction of this project is anticipated in calendar year 2021. The project will install center line rumble strips in the Kalispell area including Whitefish Stage Rd., north of W. Reserve Dr.
- **City of Kalispell Projects**: The City of Kalispell's 2018 Water Facility Plan Update and 2019 Wastewater Facility Plan Update identify future water and wastewater capital improvement projects between US 93 and Whitefish Stage Rd. The future wastewater improvements include an 8-inch gravity wastewater collection system and sewer lift station east of the Stillwater River within Whitefish Stage Rd. and W. Reserve Dr. The future water improvements consist of a transmission main between US 93 and Whitefish Stage Rd. along W. Reserve Dr. and Whitefish Stage Rd. The water and wastewater capital improvement projects are on a 5- to 15-year timeline and are driven by growth and development in the surrounding area. MDT prefers utilities to be located outside of the paved roadway; projects will require a permit if located within MDT right-of-way.

  The city also plans to develop a regional stormwater system that runs parallel to Whitefish Stage Rd. and then flows west to an outfall at the Stillwater River. Development in the area, including the North Town Center, will drive the need to collect and convey stormwater runoff. This future project is described in detail in the 2019 Kalispell Stormwater Management Projects report.
- **Kalispell North Town Center:** The Kalispell North Town Center is a planned development located on Rose Crossing between US 93 and Whitefish Stage Rd. The project will add significant traffic with the development of 13 commercial lots (hotel, supermarket, bank, car sales, fast-food restaurant, and offices), residential apartments, an elementary school, and a shopping center[1]. When fully complete, this development is expected to attract additional traffic to the study area. The development tentatively plans to add one additional access point on W. Reserve Dr., located near the Country Way intersection. Water and wastewater facilities are also tentatively planned with the development including a new municipal well at the Hutton Ranch Road intersection. A wastewater lift station is tentatively planned near the Stillwater River bridge.

2.0 IMPROVEMENT OPTIONS

Improvement options were developed to address the needs and objectives identified for the W. Reserve Dr. corridor. These options are organized as intersection improvements, roadway widening improvements, multimodal improvements, travel demand management improvements, and access management improvements. Each improvement option can be implemented independent of other options or combined as a larger project. Grouping options into larger projects may result in cost savings and efficiencies.

Implementation Agency & Funding Sources: Successful implementation of improvements may require cooperation and effort from multiple entities. The lead agency(s) responsible for each improvement option are identified, however coordination with other entities may be necessary. The ability to advance recommendations from this study and develop projects on W. Reserve Dr. depends on the availability of existing and future federal, state, local, and private funding sources. Recommendations identified in this study may be eligible for funding through a variety of programs and sources. Currently, no funding has been identified to complete any of the recommended improvement options contained in this study.

Implementation Timeframe: An implementation timeline was identified for each improvement option based on minimum LOS thresholds, considering the time necessary for design, right of way (ROW) acquisition, and utility relocation. The implementation timeframes are as follows:

- Short-term: within 0 to 5 years (by 2025)
- Mid-term: within 5 to 10 years (by 2030)
- Long-term: within 10 to 20 years (by 2040)

Cost Estimates: Planning-level cost estimates were developed for each improvement option using average bid prices from MDT's AASHTOWare Project Estimation software. MDT's Cost Estimation Procedures[2] were followed for estimating costs related to preliminary engineering, construction engineering, traffic control, mobilization, contingency/miscellaneous items, indirect costs, right-of-way, incidental construction/utility relocation, and inflation. The cost estimates are provided in **Appendix 1**. Each cost estimate represents cost during the construction year and represents that alternative alone (i.e., cost estimate is independent of other improvements). Present value (2021) cost is also included for planning and programming purposes.

Project Development Considerations: Improvement options forwarded from this study will be subject to MDT's standard project development process. This process typically includes project-specific design activities such as stakeholder coordination, environmental impact analysis and permitting, utility conflict mitigation, traffic and safety analysis, hydraulic and geotechnical investigations, and ROW acquisition based on project location and design features. For projects initiated outside of MDT that may substantially and permanently impact the transportation system, the MDT System Impact Action Process may apply. Notable project development considerations are listed for each option such as potential stakeholder interests, resources and site features, indirect effects, and other factors to be addressed during project development.

If improvements are forwarded from this study, detailed analysis would be required during the project development process to quantify specific resource impacts, and identify associated permits, laws, and regulations that may apply. Information contained in this report may be used to support future project development and environmental documentation. A list of regulatory and resource agencies that may be consulted during project development as well as associated permits, laws, regulations, and guidelines administered by those agencies are listed in Table 1.

Information provided in this report may be forwarded into applicable documentation for the NEPA and/or MEPA process.

Table 1: Regulatory and Resource Agencies and Responsibilities

Regulatory Entity	Responsibilities/Authorizations	Resource Affected
Federal Highway Administration (FHWA)	• National Environmental Policy Act (NEPA) • Section 4(f) of Department of Transportation Act • Uniform Relocation Assistance Act	All Resources
United States Fish and Wildlife Service (USFWS)	• NEPA • Endangered Species Act • Bald and Golden Eagle Protection Act • Migratory Bird Treaty Act • Birds of Conservation Concern	Wildlife, Habitat, Protected Species
United States Forest Service (USFS)	• NEPA	Lands under USFS Jurisdiction
Bureau of Land Management (BLM)	• NEPA	Public Lands
United States Army Corps of Engineers (USACE)	• NEPA • Clean Water Act (CWA) Section 404 Permit	Wetlands, Riverbed, Riverbank, Irrigation Canals/Ditches
US Environmental Protection Agency (EPA)	• NEPA • Resource Conservation and Recovery Act (RCRA) • Clean Air Act (CAA) • CWA	Surface Waters, Irrigation Features, Wetlands, Hazardous Materials
Montana Department of Environmental Equality (DEQ)	• Montana Environmental Policy Act (MEPA) • Montana Water Quality Act • 401 Water Quality Certification • Short-term Water Quality Standard for Turbidity (318 Authorization) • Montana Pollutant Discharge Elimination System (MPDES) General Permit • CAA • RCRA	Wetlands, Riverbed, Riverbanks, Floodplains, Stormwater Discharges into Surface Waters
Montana Fish, Wildlife, & Parks (FWP)	• MEPA • Stream Protection Act (SPA) 124 Authorization • Land and Water Conservation Fund (LWCF) – Section 6(f)	Riverbed, Riverbanks, LWCF Properties
Montana Department of Natural Resources & Conservation (DNRC)	• MEPA • Montana Land Use License or Easement on Navigable Waters	State Lands, Groundwater, Surface Waters, Irrigation Features, Wetlands, Floodplains
State Historic Preservation Office (SHPO)	• MEPA • National Historic Preservation Act (NHPA) Section106 Coordination/Consultation	Historic/Cultural Resources
Flathead County, City of Kalispell, Evergreen, and Local Communities	• Local Planning Documents • Flathead County Floodplain Regulations	All Resources

2.1 Intersection Improvement Options

Improvement options in this section address operations, capacity, and safety concerns at intersections. Traffic delay was quantified for both existing and projected conditions using Synchro / SimTraffic version 10. SimTraffic is a microsimulation tool within Synchro and was used for the traffic analysis because Synchro is limited in its ability to analyze congested traffic conditions. SimTraffic results are reported based on the average of 10 simulation runs. The traffic analysis reports are provided in **Appendix 2**. The proposed 2040 traffic analysis aims to provide a level of service (LOS) of D or better at signalized intersections. Table 2 shows the delay thresholds for signalized and unsignalized intersections.

Table 2: LOS Criteria for Signalized and Unsignalized Intersections

LOS	Average Control Delay (Seconds / Vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

S1. US 93 Intersection

W. Reserve Dr. and US 93 is a signalized intersection located at the west end of the corridor. In the existing condition, the east-west approaches operate with split phasing and have one exclusive left and one shared thru-left turn lane. The intersection currently operates at LOS D in the PM peak hour. The intersection is forecasted to operate at LOS D in year 2030 and LOS F in year 2040. Figure 2 shows the existing and forecasted 2040 turning movements in the AM and PM peak hours.

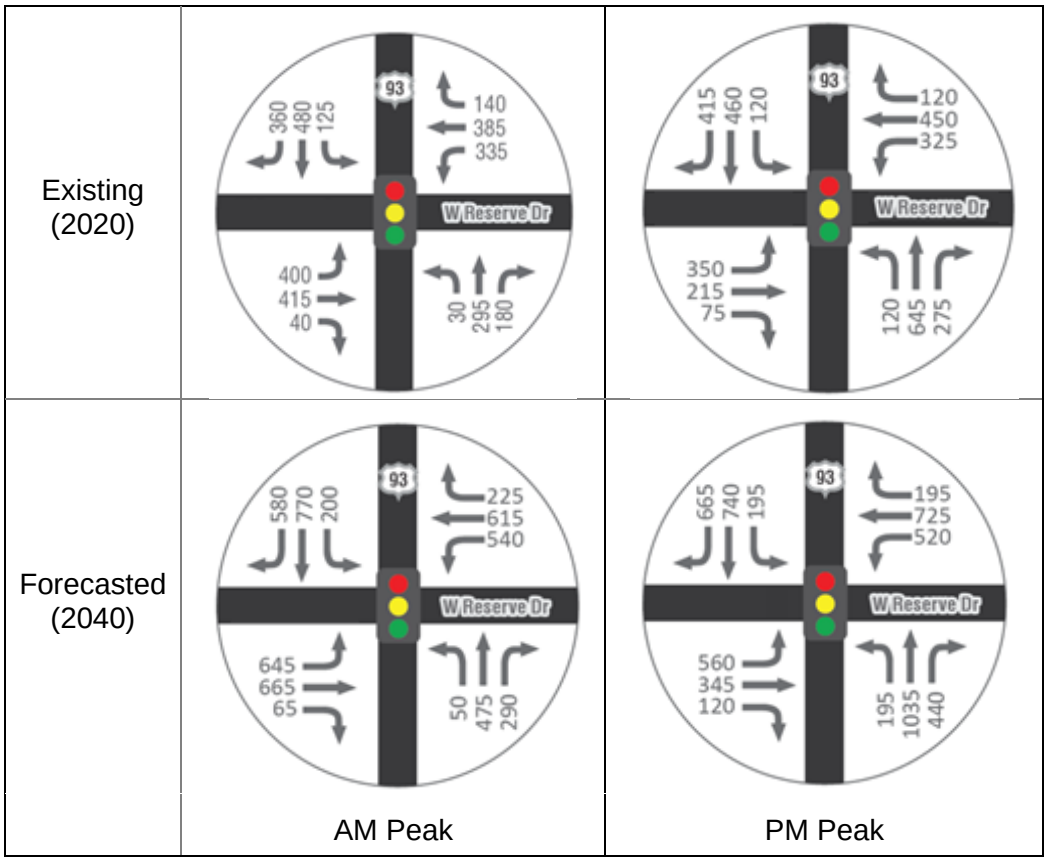


Figure 2: US 93 Existing and Forecasted Volumes

Figure 3 shows the existing intersection laneage, along with proposed interim and full build laneage. The recommended interim build configuration provides dual left-turn lanes on the eastbound and westbound approaches, which allows for removal of east-west split phasing. A full build configuration was considered, but its footprint, impacts to adjacent properties, and overall cost would make its implementation difficult. The full build configuration is discussed further in this section.

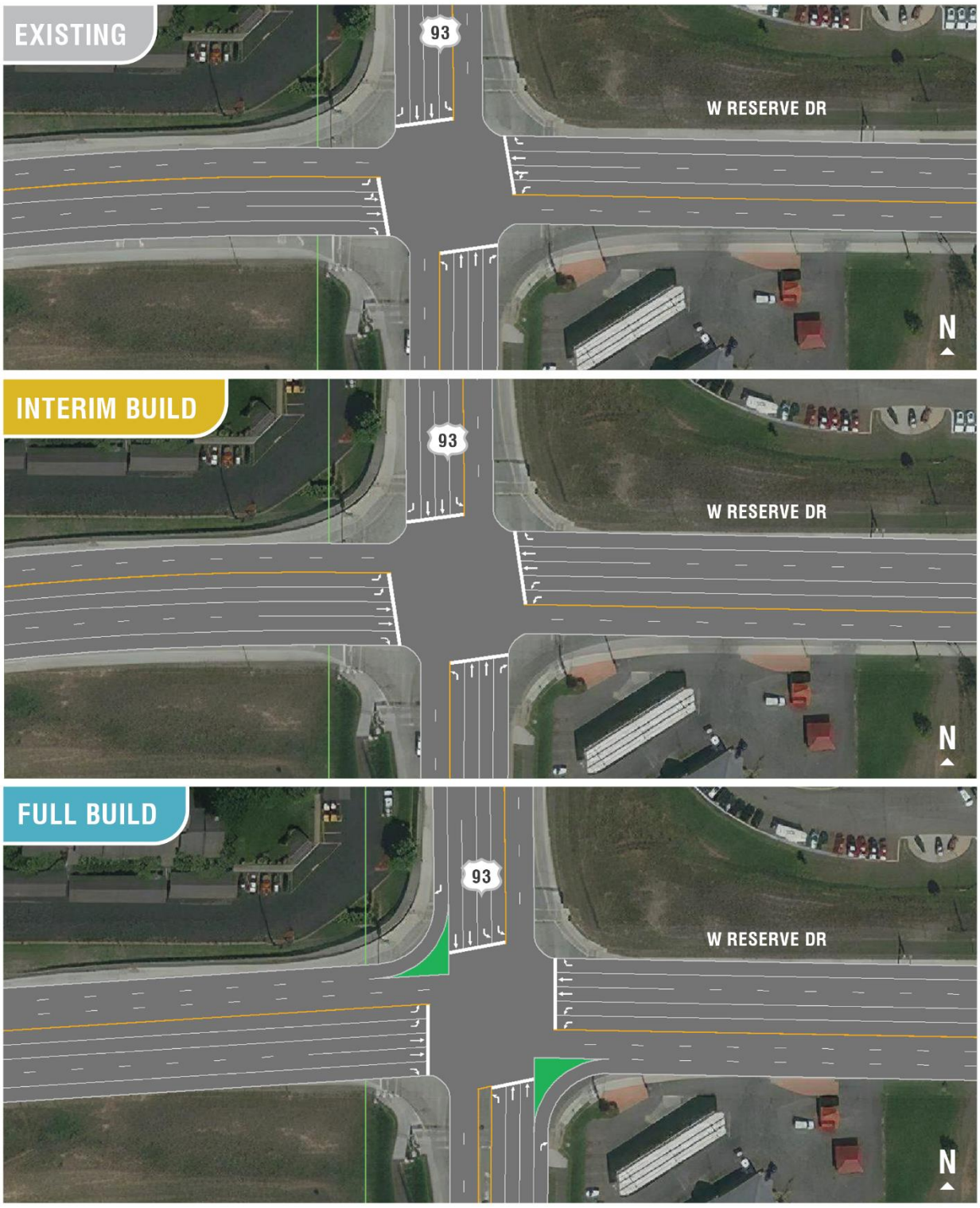


Figure 3: US 93 Intersection Improvements

Table 3 summarizes the intersection delay with the existing, interim, and full build alternatives. The interim build condition is expected to operate at LOS D in the PM peak in 2030 but fails by 2040. The full build condition is expected to operate at LOS D in the PM peak in 2040.

Table 3: US 93 LOS and Delay (sec/veh)

Scenario	2020		2030		2040	
	AM	PM	AM	PM	AM	PM
Existing	D/42	D/41	D/53	D/47	F/>100	F/>100
Interim Build	C/28	C/29	C/35	D/36	E/61	E/77
Full Build	C/27	C/27	C/32	C/35	D/43	D/55

Summary:
- Recommend interim build improvement in mid-term (within 5 to 10 years).

Key Considerations:
- Longer pedestrian crossing distance on east and west legs.
- Include sidewalk and curb ramps at all quadrants.
- Improvements could be provided within the existing right-of-way.
- Underground storage tanks are located at the gas station.
- Existing retaining wall located at the northwest quadrant.
- Drainage challenges exist at the southwest quadrant.

Implementation Agency:
- MDT

Implementation Timeframe / Estimated Cost:
- Interim Build (in mid-term): $4.5 M

Funding Sources:
- National Highway Performance Program (NH, Non-Interstate)
- Surface Transportation Program Primary (STPP)
- Highway Safety Improvement Program (HSIP)
- Montana Air and Congestion Program (MACI)

S2. Hutton Ranch Rd. Intersection

W. Reserve Dr. and Hutton Ranch Rd. is a three-leg signalized intersection on the west end of the corridor providing access to retail and an alternate route to US 93. The northbound right and westbound left are the predominant turning movements in the PM peak hour. The westbound left currently operates with protected-permissive left-turn phasing. The intersection currently operates at LOS B during the PM peak hour. The existing intersection is forecasted to operate at LOS D in the PM peak hour in 2030 and LOS F in 2040. The delay during the PM peak hour is primarily on the northbound approach. Figure 4 shows the existing and forecasted 2040 turning movements in the AM and PM peak hours.

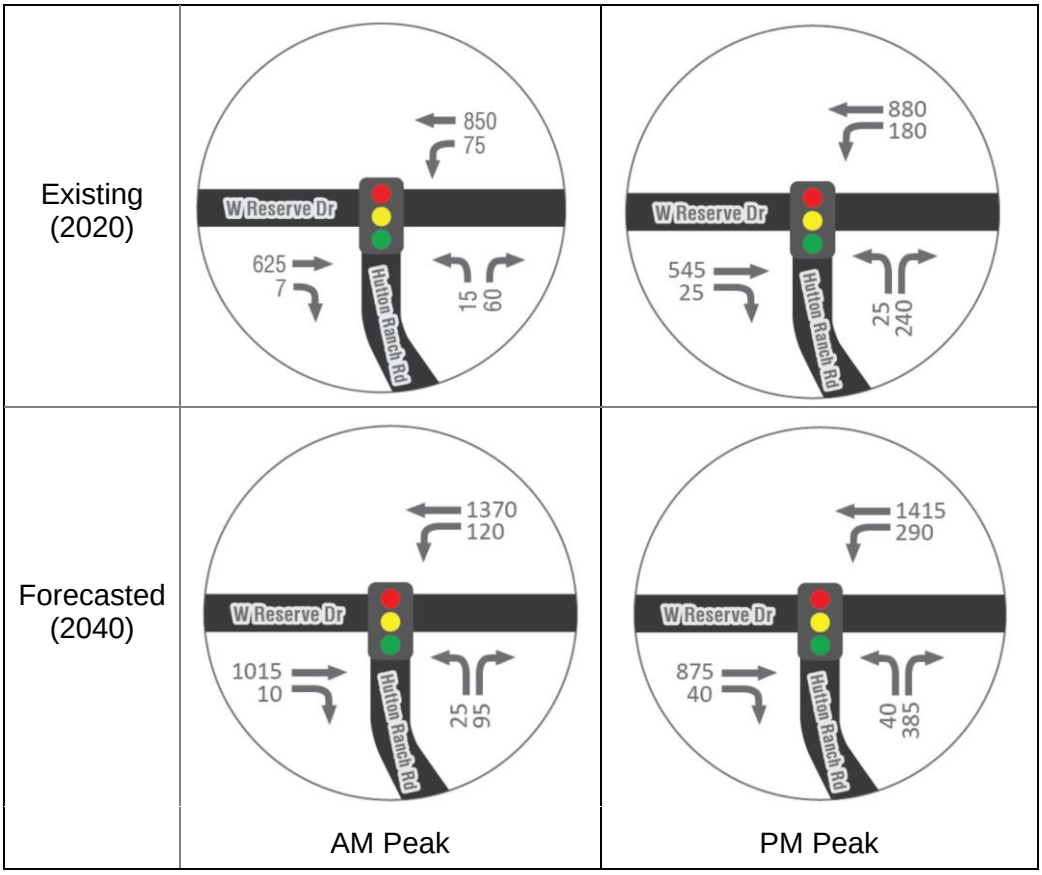


Figure 4: Hutton Ranch Rd. Existing and Forecasted Volumes

Table 4 summarizes the intersection delay with the existing and full build alternatives. The full build condition is expected to operate at LOS B in the PM peak in 2040.

Table 4: Hutton Ranch Rd. LOS and Delay (sec/veh)

Scenario	2020		2030		2040	
	AM	PM	AM	PM	AM	PM
Existing	A/6	B/14	A/8	D/40	C/23	F/>100
Full Build	A/3	A/6	A/4	A/9	A/6	B/15

Figure 5 shows the existing intersection laneage, along with the proposed full build laneage. No interim build improvement is needed at Hutton Ranch Rd. The full build configuration provides two eastbound and westbound through lanes at the intersection. This intersection improvement would be implemented along with roadway widening; therefore, a standalone cost estimate was not provided (its cost was incorporated into the corridor widening improvement option cost). Of note, coordinating the signal at Hutton Ranch Rd. with US 93 may also provide operational benefits in the future.

Figure 5: Hutton Ranch Rd. Intersection Improvements

Summary:
- Recommend full-build improvement when west end of corridor is widened.

Key Considerations:
- Stillwater River Bridge is located just east of the intersection.
- Consider water quality and stormwater requirements
- A municipal well is tentatively planned at the intersection.
- Include sidewalk, new curb ramps, and connection to existing path at implementation.

Implementation Agency:	Implementation Timeframe / Estimated Cost:
• MDT	• Implemented with corridor widening (cost is incorporated into the corridor widening cost estimate)

Funding Sources:
- Improvement would be made through corridor widening

S3. Whitefish Stage Rd. Intersection

W. Reserve Dr. and Whitefish Stage Rd. is a signalized intersection one mile east of US 93. Residential areas exist south of the intersection, while development is expected north of the intersection on Rose Crossing. In the existing condition, the eastbound and westbound left turns operate with protected permissive left-turn phasing. The intersection currently operates at LOS E in the PM peak hour. Figure 6 shows the existing and forecasted 2040 turning movements in the AM and PM peak hours.

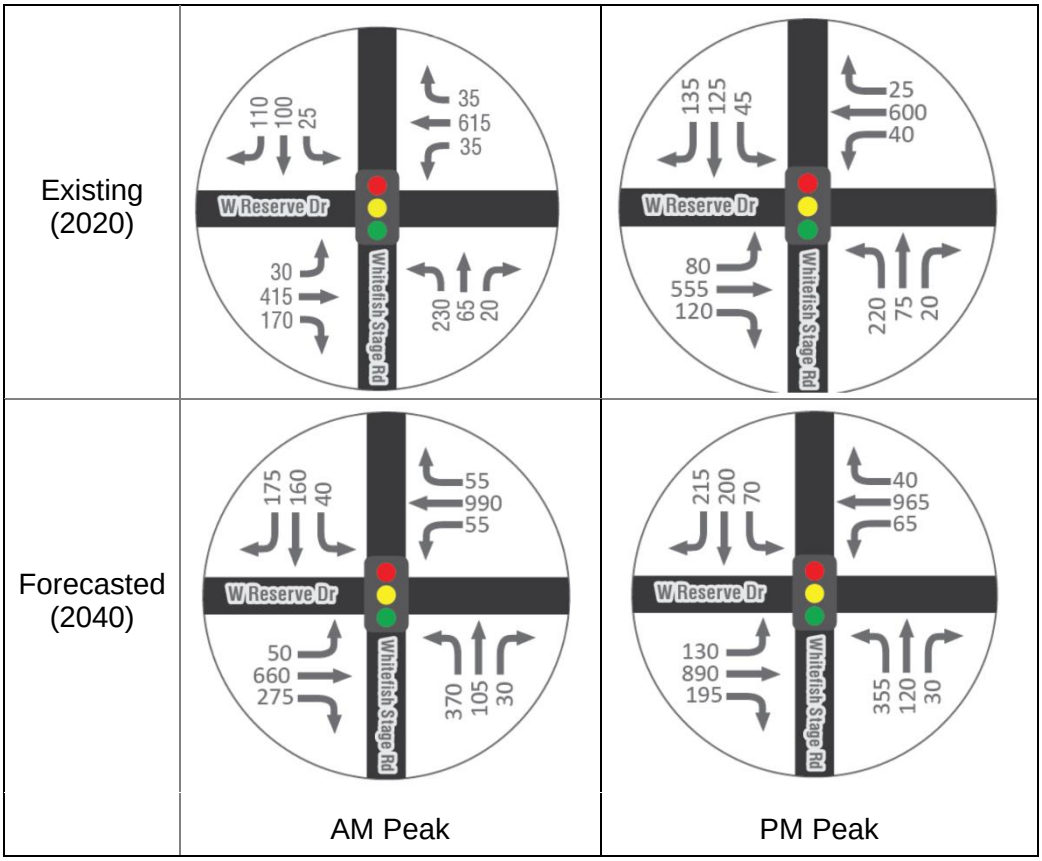


Figure 6: Whitefish Stage Rd. Existing and Forecasted Volumes

Figure 7 shows the existing intersection laneage, along with the proposed interim build and full build laneage. The interim build configuration adds exclusive northbound and southbound left-turn lanes, northbound left-turn phasing, and exclusive eastbound and southbound right turn lanes. The full build signalized configuration provides two east-west thru lanes.

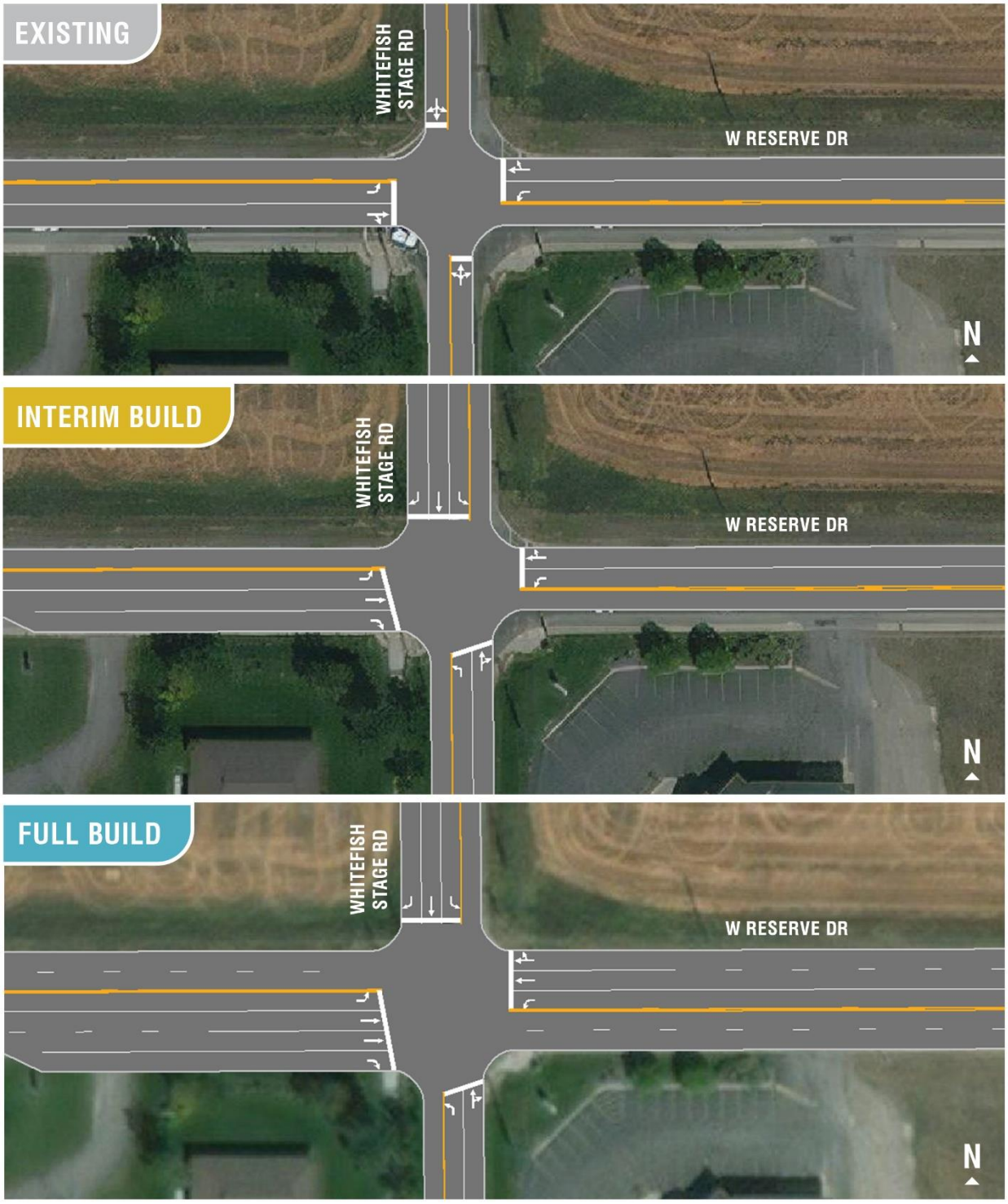


Figure 7: Whitefish Stage Rd. Signalized Improvement Options

Table 5 summarizes the intersection delay at Whitefish Stage Rd. with the existing, interim, and full build alternatives. The interim build condition is expected to operate at LOS E in the PM peak in 2030 but will operate at LOS F by 2040. The full build signal is expected to operate at LOS C in the PM peak in 2040.

Table 5: Whitefish Stage Rd. LOS and Delay (sec/veh)

Scenario	2020		2030		2040	
	AM	PM	AM	PM	AM	PM
Existing Signal	D/46	E/71	F/>100	F/>100	F/>100	F/>100
Interim Build Signal	C/21	C/24	D/42	E/65	F/>100	F/>100
Full Build Signal	B/14	B/16	C/18	C/19	C/30	C/31

Summary:

- Recommend full build signalized improvement in mid-term (within 5 to 10 years).

Key Considerations:

- Approach consolidation at the intersection would improve operations.
- Interim option does not meet the 20-year study horizon needs.
- Include sidewalk and curb ramps at all quadrants.
- Terminate curb and gutter at lane development tapers.
- Consider future storm drain needs associated with future development.

Implementation Agency:

- MDT
- Private
- Local

Implementation Timeframe / Estimated Cost:

- Full Build Signal (in mid-term): $5.3 M

Funding Sources:

- Surface Transportation Program Primary (STPP)
- Highway Safety Improvement Program (HSIP)
- Montana Air and Congestion Program (MACI)
- Private

S4. US 2 Intersection

W. Reserve Dr. and US 2 is a signalized intersection located on the east end of the corridor. In the existing condition, the eastbound left and northbound left operate with protected-permissive left-turn phasing. The intersection currently operates at LOS D during the PM peak hour. The intersection is forecasted to operate at LOS F during the PM peak hour in 2030. The highest delay occurs on the westbound approach in the existing condition. Figure 8 shows the existing and forecasted 2040 turning movements in the AM and PM peak hours.

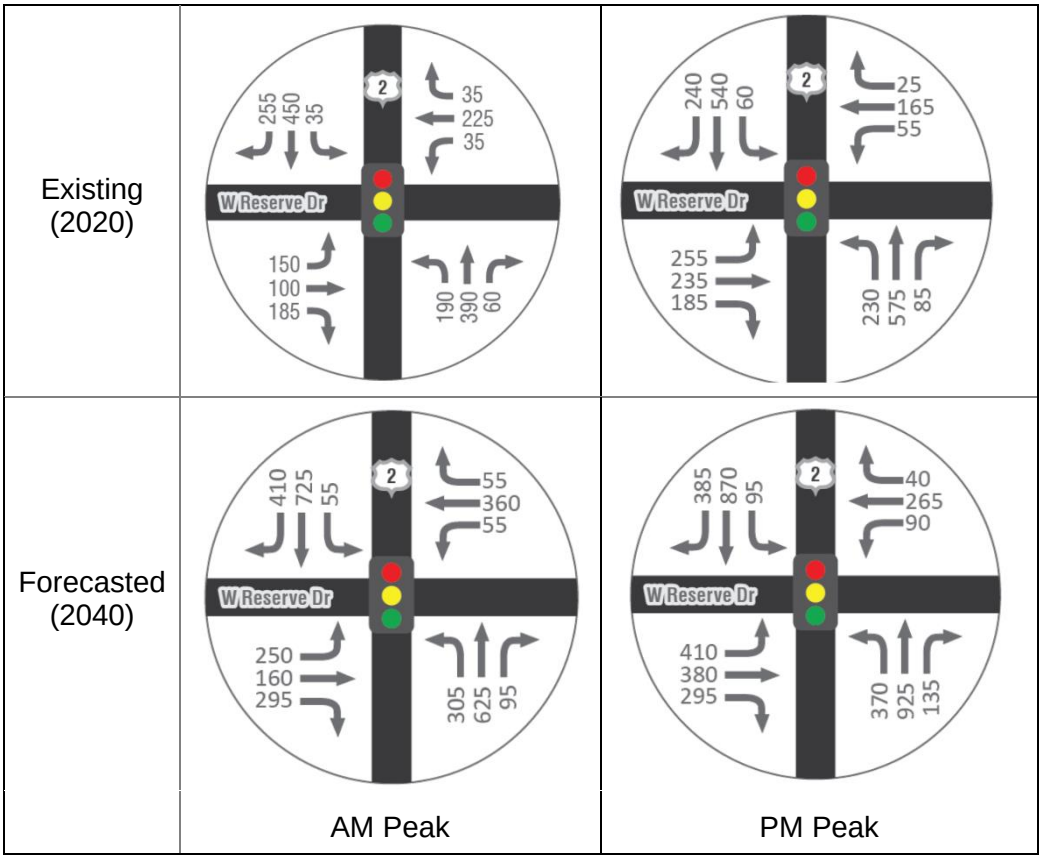


Figure 8: US 2 Existing and Forecasted Volumes

Figure 9 shows the existing intersection laneage, along with the proposed full build laneage. The full build laneage provides dual protected eastbound and northbound left-turn lanes, exclusive eastbound and southbound right-turn lanes, and an exclusive westbound left-turn lane. Protected-permissive left-turn phasing is provided on the southbound and westbound approaches.

A lane drop would occur 500 feet west of the intersection, to accommodate the dual northbound left-turn lanes if this intersection is improved prior to corridor widening. A phased implementation was considered at this intersection (a short-term project followed by a mid-term project to add dual northbound lefts with the corridor widening); however, a full build improvement option is proposed as the difference in overall footprints and cost are similar.

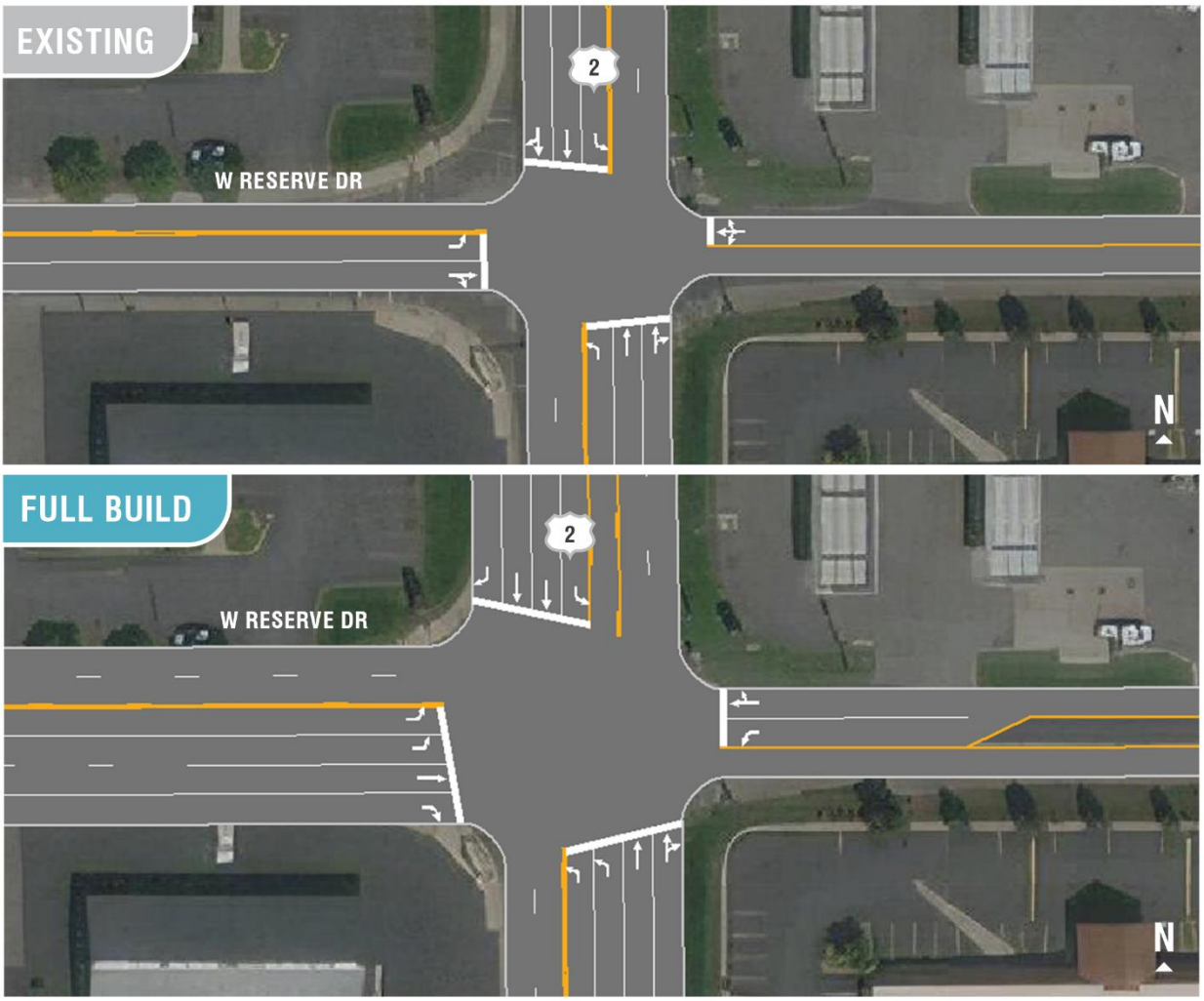


Figure 9: US 2 Intersection Improvements

Table 6 summarizes the intersection delay at US 2 with the existing and full build alternatives. The full build condition is expected to operate at LOS C in the PM peak in 2030 and LOS D in the PM peak in 2040.

Table 6: US 2 LOS and Delay (sec/veh)

Scenario	2020		2030		2040	
	AM	PM	AM	PM	AM	PM
Existing	C/29	D/45	D/48	F/92	F/>100	F/>100
Full Build	C/23	C/25	C/28	C/31	D/42	D/45

Summary:

- Recommend full build improvement in mid-term (within 5 to 10 years).

Key Considerations:

- West leg approach is widened from three lanes to six lanes, requiring significant ROW acquisition.
- The rail crossing west of the intersection is a potential constraint if corridor widening is anticipated at a later timeframe.
- Include sidewalk and curb ramps at all quadrants.
- Underground storage tanks are located at the gas station.

Implementation Agency:

- MDT

Implementation Timeframe / Estimated Cost:

- Full Build (in mid-term): $10.9 M

Funding Sources:

- National Highway Performance Program (NH, Non-Interstate)
- Surface Transportation Program Primary (STPP)
- Highway Safety Improvement Program (HSIP)
- Montana Air and Congestion Program (MACI)

Summary of Intersection Improvement Options

Figure 10 summarizes the 2040 AM and PM peak hour LOS and delay for the proposed intersection improvements. All intersections are expected to operate at LOS D or better in 2040, except US 93 which operates at LOS E.

Figure 10: Intersection LOS in 2040 with Recommended Improvement Options

2.2 Roadway Widening

The following improvement options aim to increase capacity and improve traffic operations on W. Reserve Dr. and Whitefish Stage Road. Since substantially reducing vehicular traffic is unlikely over the planning horizon, the performance and safety of the roadway can be improved by increasing capacity.

These options will require major reconstruction of the roadway and are more costly and may have greater impacts than the intersection improvement options. For this reason, the corridor has been broken up into segments based on roadway context, existing/future traffic demands, and logical project limits. It is envisioned that these improvements could be implemented over the long term when funding becomes available. There may also be opportunity to combine these options with some of the intersection improvements discussed previously.

R1 & R2. W. Reserve Dr. Widening

It is recommended that the corridor be widened to provide a five-lane cross section (two lanes in each direction with a center turn lane) between Hutton Ranch Rd. and US 2. Corridor widening necessitates widening the existing bridges at the Stillwater River and Whitefish River. The adjacent land use and constraints vary along the corridor:

- ***From US 93 to Stillwater River:*** commercial land use and utility structures exist along both sides of the corridor
- ***From Stillwater River to Whitefish River:*** residential land use exists south of the corridor with primarily undeveloped land north of the corridor
- ***From Whitefish River Bridge to US 2:*** residential or commercial development along both sides of the corridor

Of note, the draft Kalispell Area Transportation Plan, MOVE 2040, identifies two major projects that may impact future traffic on the W. Reserve Dr. corridor[3]:

- Evergreen/Grandview Connection (east-west corridor located one mile south of W. Reserve Dr.): this project provides a new roadway connection between Grandview Drive and W. Evergreen Drive and reconstructs the corridor to a minor arterial from Farm to Market Road to Whitefish Stage Rd.
- Rose Crossing (east-west corridor located one mile north of W. Reserve Dr.): this project reconstructs Rose Crossing to a minor arterial from US 93 to Helena Flats Road.

However, even with these improvements to parallel east-west routes, a five-lane cross section is still needed on W. Reserve Dr. to meet 2040 traffic demand.

Figure 11 shows the corridor widening by segment. It is recommended that the corridor be widened to the north, west of Whitefish River, and widened symmetrically east of Whitefish River. Widening the corridor to the north, west of Whitefish River, has significantly lower impacts as the land north of the corridor is primarily undeveloped between the Stillwater River and Whitefish River. Widening to the north also reduces noise impacts to the residential properties located south of the corridor (between the Stillwater and Whitefish Rivers) and allows for a boulevard for snow storage. Of note, utility poles are located north of W. Reserve Dr. between US 93 and Mission Trail Rd.; these poles will be impacted by corridor widening. Coordination with Flathead Electric Cooperative will be needed to understand potential upgrades to power lines which may impact relocation costs.

Figure 11: Corridor Widening by Segment

Phased widening could provide interim benefits if funding is constrained; however, phased widening slightly increases overall costs due to reduced efficiency. In addition, widening one segment of the corridor is expected to create a bottleneck beyond 2030.

Currently, a three-lane cross section including a center turn lane exists from Hutton Ranch Rd. to the US 2 intersection. Figure 12 shows the existing cross section laneage, shoulders and sidewalk. The sidewalk exists primarily on the south side of the corridor, but changes to the north side east of the Whitefish River bridge.

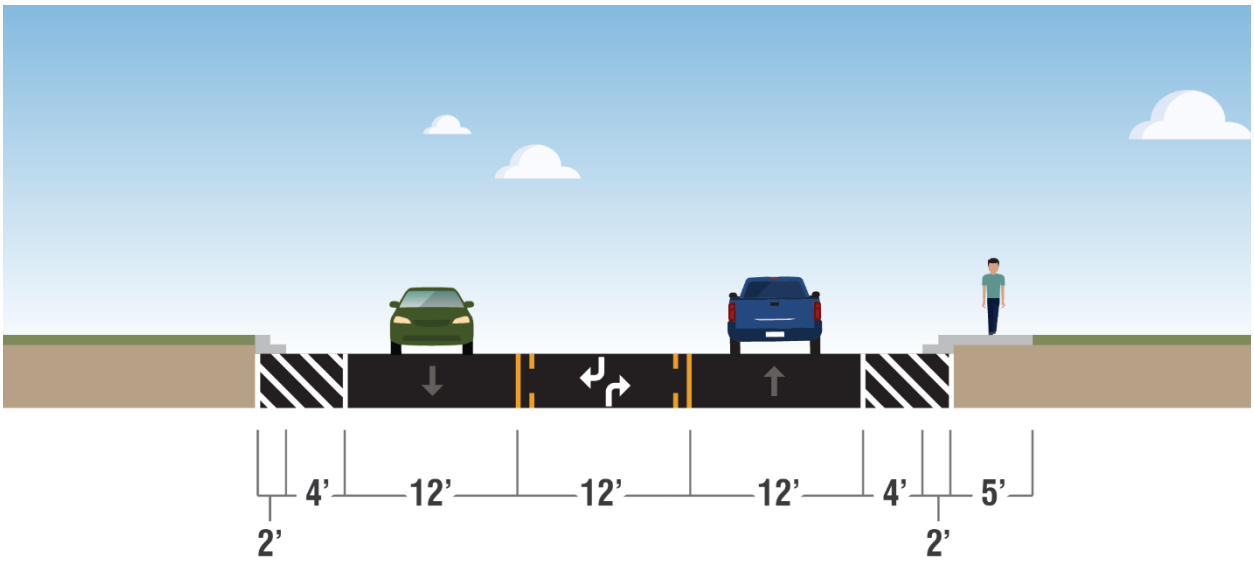


Figure 12: Existing Cross Section on W. Reserve Drive, east of Hutton Ranch Rd.

The proposed cross section from Hutton Ranch Rd. to Mission Trail Rd. provides six-foot boulevards on both sides of the corridor, providing a buffer between pedestrians and traffic and allowing space for snow storage. This cross section includes a five-foot sidewalk on the south side and an eight-foot sidewalk on the north side (acting as a separated multimodal facility). This improvement option is in alignment with the draft Kalispell Pedestrian and Bicycle Plan, which cites a separated facility on W. Reserve Dr. from Hutton Ranch Rd. to Mountain View Dr. as a high priority improvement. A maintenance agreement will need to be established to identify the agency responsible for operation and maintenance of sidewalks. Six-foot shoulders are provided with this cross section along with a fourteen-foot wide center turn lane. Figure 13 shows the proposed cross section between Hutton Ranch Rd. and Mission Trail Rd.

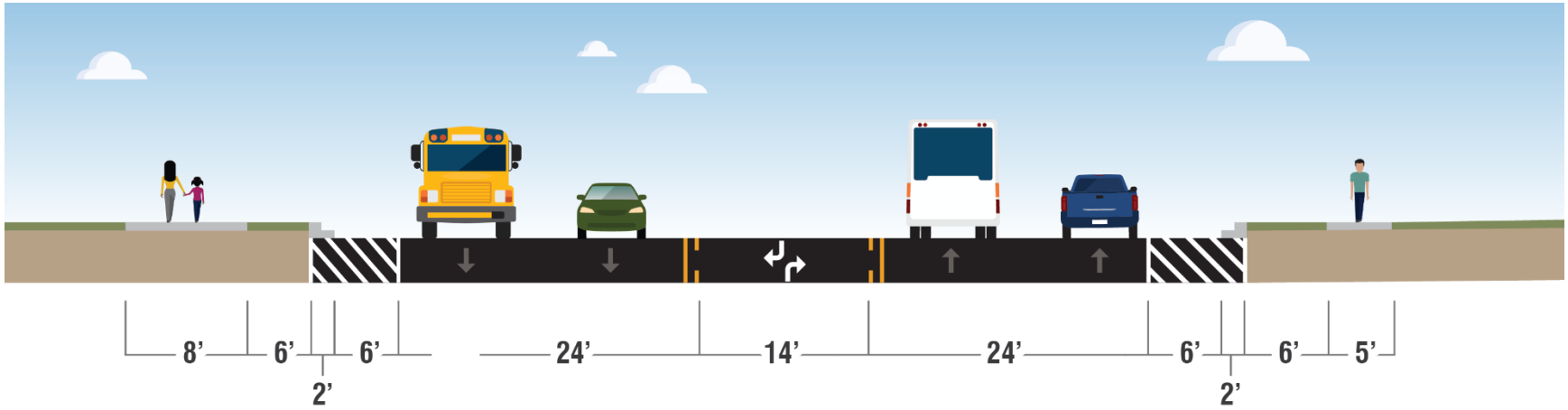


Figure 13: Cross Section of W. Reserve Dr. between Hutton Ranch Rd. and Mission Trail Rd.

From Mission Trail Rd. to the intersection with US 2, a different cross section is proposed with a narrower center turn lane and shoulders. This cross section still provides six-foot boulevards on both sides of the corridor, providing a buffer between pedestrians and traffic and allowing space for snow storage. This cross section includes a five-foot sidewalk on the south side and an eight-foot sidewalk on the north side (acting as a separated multimodal facility). Four-foot shoulders are provided with this cross section along with a twelve-foot wide center turn lane. Figure 14 shows the cross section between Mission Trail Rd. and US 2.

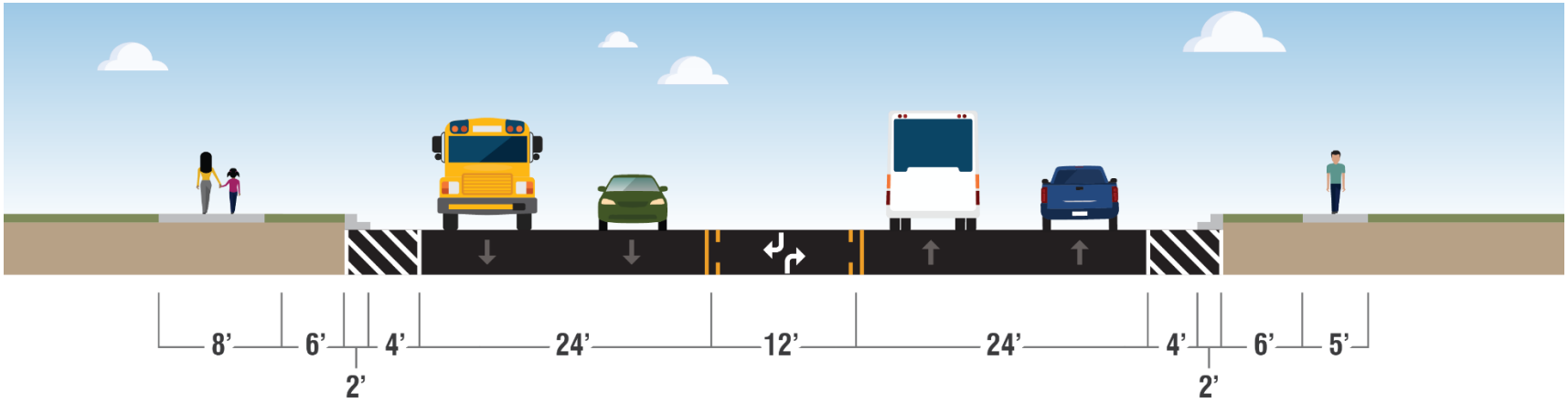


Figure 14: Cross Section of W. Reserve Dr. between Mission Trail Rd. and US 2

Summary:

- Recommend roadway widening to a five-lane section in mid-term (within 5 to 10 years).

Key Considerations:

- Widening may be completed in segments in conjunction with intersection improvements as funding becomes available.
- Assume roadway will be widened to the north from Hutton Ranch Rd. to Mission Trail Rd. to reduce impacts to residential properties located south of the corridor.
- Assume roadway will be widened symmetrically from Mission Trail Rd. to US 2.
- Two specific cross sections are assumed with a transition at Mission Trail Rd.
- A maintenance agreement will need to be established to identify agency responsibilities for operation and maintenance of sidewalks.
- Full replacement of the Stillwater and Whitefish River bridges is assumed.
- Significant drainage improvements are required with the increased impervious areas. These improvements are subject to water quality requirements.
- Several public and private utilities are located in the corridor including power, gas, and fiber optic communication lines.
- Impacts are anticipated to local businesses and residences including short-term construction-related activities.
- The rail crossing located west of US 2 will require coordination with BNSF to widen and provide accessibility improvements.
- Permits will likely need to be obtained for impacts related to bridge widening and farmland conversion.
- Relocation assistance is anticipated for several properties east of the Whitefish River.
- ROW acquisition is expected to impact 42 parcels (including four structures), primarily on the east end of the corridor.

Implementation Agency:

- MDT
- City of Kalispell
- Flathead County
- Private

Implementation Timeframe / Estimated Cost:

- R1. Hutton Ranch Rd. to Whitefish Stage Rd. including Stillwater River bridge (in mid-term): $17.2 M
- R2. Whitefish Stage Rd. to US 2 including Whitefish River Bridge (in mid-term): $24.8 M

Corridor Widening Funding Sources:

- Surface Transportation Program Primary (STPP)
- Surface Transportation Program Bridge (STPB)
- National Highway Performance Program (NH, Non-Interstate)
- Local

Note: The cost estimates developed for this improvement option considers the cost of right-of-way including relocation and property impacts, utility relocation, bridge replacement at both the Whitefish and Stillwater Rivers, and other incidentals identified in preliminary layout.

R3 & R4. Whitefish Stage Rd. Widening

North of W. Reserve Dr., the Whitefish Stage Rd. corridor consists of a rural typical section with one travel lane in each direction, narrow shoulders, and roadside ditches. There is an existing MDT project which plans to add four-foot shoulders and flatten side slopes on Whitefish Stage Rd. from 0.5 miles north of W. Reserve Dr. to Montana 40 (8.8 miles).

Both a rural and urban cross section were considered, with the urban cross section adding curb and gutter and a center turn lane. In the mid-term, an improved rural cross section with four-foot shoulders and flattened side slopes is recommended. This safety improvement reduces the occurrence of roadway departure crashes on Whitefish Stage Rd. by allowing for vehicle recovery. An urban three-lane cross section is recommended in the long-term to align with improvements along Whitefish Stage Rd. due to future development. A storm drain system is anticipated with the new Rose Crossing development. This system would need to be considered in the long-term recommendation to improve Whitefish Stage Rd. to an urban cross section.

Summary:

- Recommend implementation of rural cross section in mid-term (within 5 to 10 years).
- Recommend implementation of urban cross section in long-term (within 10 to 20 years).

Key Considerations:

- The funding source for this improvement option is dependent on the Kalispell Urban area identifying it as an urban priority project.
- Adjacent private development may include dedicated storm drain facility improvement and share the cost of improving Whitefish Stage Rd. to an urban cross section.
- Improvements need to consider local planning documents related to stormwater, long-term transportation and multimodal planning.
- Private utilities, including parallel overhead power, will require relocation.
- Permits will likely need to be obtained for impacts related to farmland conversion.

Implementation Agency:

- MDT
- Flathead County
- City of Kalispell
- Private

Estimated Cost within Project Limits (0.5 miles):

- R3. Rural Cross Section (in mid-term): $2.2 M
- R4. Urban Cross Section (in long-term): $3.5 M

Funding Sources:

- Surface Transportation Program Urban (STPU)
- Local, Private

Whitefish Stage Rd., north of W. Reserve Dr.

2.3 Multimodal Improvements

M1. Pedestrian Crossing Treatment Study near Drake Dr.

Figure 15 shows the present sidewalk on W. Reserve Dr. Sidewalk only exists on the south side of the corridor from the Stillwater River Bridge to the Whitefish River Bridge. Just east of the Whitefish River Bridge, the sidewalk moves from the south side to the north side of W. Reserve Dr. without a dedicated crosswalk and continues to the US 2 intersection.

It is recommended that a follow-up study be conducted to analyze existing pedestrian volumes at this unmarked crossing, located near Drake Dr., and that a pedestrian crossing treatment be considered as a short-term multimodal improvement.

Figure 15: Existing Sidewalk on W. Reserve Dr.

It is recommended that future pedestrian crossing needs be considered corridor-wide, particularly as the north side of the corridor develops. For example, providing pedestrian crossings every quarter mile reduces the distance a pedestrian must travel to cross safely.

Summary: • Recommend a follow-up study in the short-term (within 0 to 5 years) to analyze pedestrian volumes at the unmarked pedestrian crossing located near Drake Dr. to determine if a potential pedestrian crossing treatment is warranted.	
Key Considerations: • Improves connectivity of existing pedestrian facilities in the short-term.	
Implementation Agency: • MDT • Flathead County	**Implementation Timeframe / Estimated Cost:** • $20,000 (in short-term) for follow-up study to analyze pedestrian volumes and identify potential crossing treatment
Funding Sources: • Highway Safety Improvement Program (HSIP) • Local	

2.4 Travel Demand Management

T1. Travel Demand Management Strategies

Travel demand management (TDM) strategies are recommended to improve corridor traffic operations. The overarching goal of TDM is to reduce peak hour vehicle trips on the corridor. TDM strategies could include encouraging employers to allow flexible work hours, compressed work weeks, and telecommuting. In addition, encouraging transit and non-motorized travel also reduces peak hour vehicle demand. Some example workplace strategies to promote non-motorized travel include internal commute challenges, incentives or raffles, and collecting/sharing data on employee commute behavior.

Summary: • Recommend employing TDM strategies to reduce peak hour travel demand.	
Key Considerations: • Work with large employers to allow for and incentivize TDM strategies.	
Implementation Agency: • City of Kalispell • Flathead County	**Implementation Timeframe / Estimated Cost:** • Variable cost (in short-term)
Funding Sources: • Local, Private	

2.5 Access Management

A1. Corridor Access Management Plan

It is recommended that a corridor access management plan be developed for W. Reserve Dr. The plan would provide guidelines for the number and spacing of access points along the corridor, the location of turn lanes and raised median, and the application of turn restrictions. Subsequent sections highlight specific locations where access management issues have been identified along with spot improvement options; however, this section does not provide a comprehensive assessment of all access management issues on the corridor.

Summary: • Recommend developing corridor wide access management plan in the short-term (within 0 to 5 years).	
Key Considerations: • Establishes guidelines for access to future development on the corridor.	
Implementation Agency: • MDT • City of Kalispell • Flathead County	**Implementation Timeframe / Estimated Cost:** • $50,000 (in short-term) to develop access management plan for W. Reserve Dr.
Funding Sources: • Surface Transportation Program Primary (STPP)	

A2. Side Street and Approach Movement Restriction

Home Depot Driveway

The Home Depot driveway is a two-way, stop-controlled intersection located 700 feet east of US 93. Exclusive eastbound and westbound left turn pockets are provided at the driveway entrance. The north leg provides access to a gas station and liquor store, while the south leg provides access to Home Depot and other retail. Driveway-related turning movements are substantially higher in the PM peak hour. The intersection currently operates at LOS D during the PM peak hour and is forecasted to operate at LOS F during peak hours in year 2040. The delay is mainly attributed to side street through and left-turning movements. Figure 16 shows the existing and forecasted 2040 turning movements in the AM and PM peak hours.

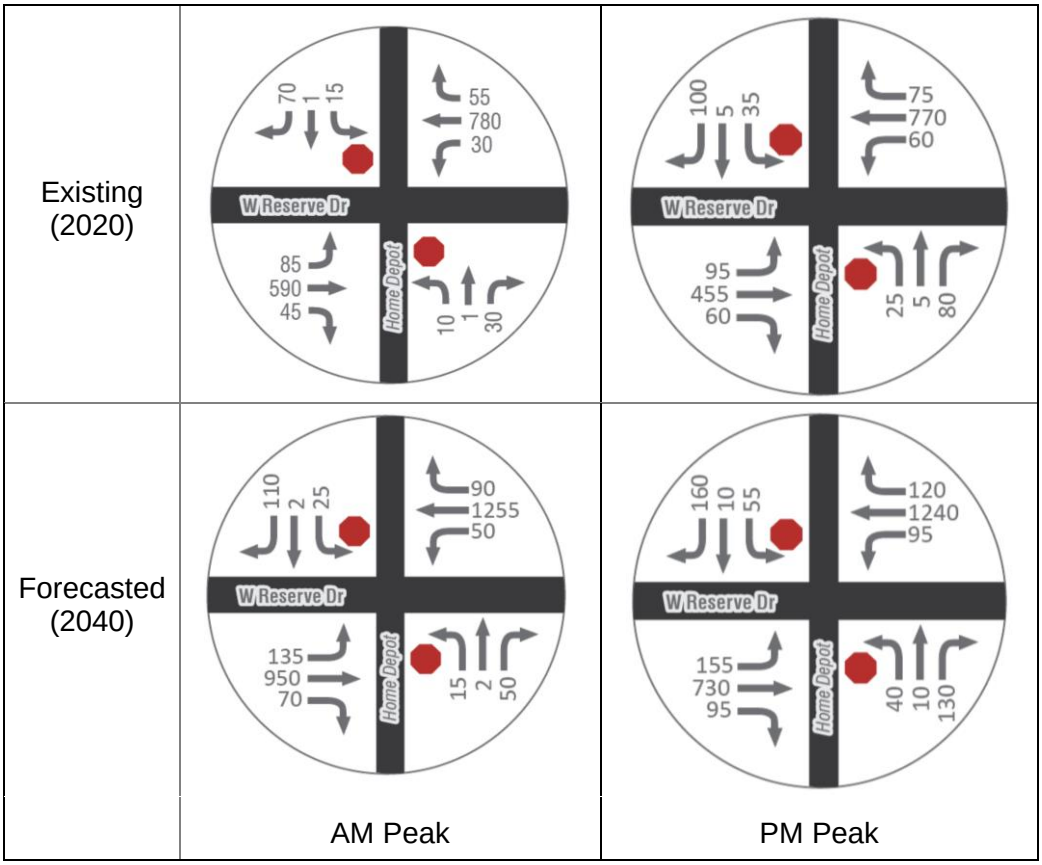


Figure 16: Home Depot Existing and Forecasted Volumes

As side street volumes increase, it is recommended that the side street through and left-turning movements be prohibited via signage or directional raised island, only allowing a right-turn out of the driveway. This modification reduces delay for vehicles on the side street approaches and enhances safety at the driveway. It would provide an inconvenience to vehicles leaving Home Depot on the south leg and Town Pump / Liquor Store on the north leg. However, these vehicles will naturally be forced to re-route as the left-turning movement becomes a more difficult maneuver due to high traffic volumes on W. Reserve Dr.

Country Way and Country Way North

Country Way and Country Way North are stop-controlled intersections that access the neighborhood south of W. Reserve Dr. Figure 17 shows the existing turning movements at the intersections. The northbound left at Country Way is the highest side street movement, with 30 vehicles in the AM peak hour. These vehicles will naturally re-route as this left-turning movement becomes more difficult due to high traffic volumes. Discouraging cut-through traffic via signage (local traffic only signs) is recommended on Country Way, preserving the intended functionality of the neighborhood street.

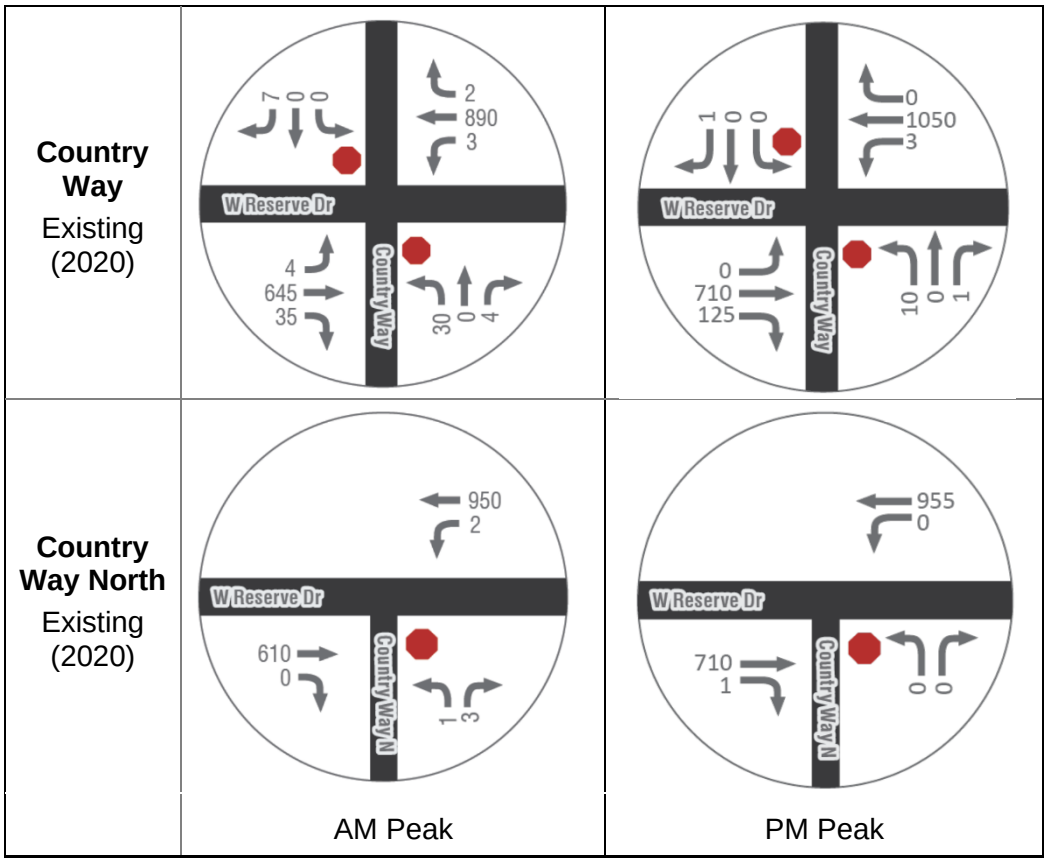


Figure 17: Country Way & Country Way North Existing Volumes

Summary:

- Recommend prohibiting side street thru and left-turn movements at key intersections (e.g., Home Depot, Country Way, and Country Way North) via signage when needed.

Key Considerations:

- Reduces delay for vehicles on the side street approaches and enhances safety.
- Consider recommendations presented in a future corridor access management plan.

Implementation Agency:

- City of Kalispell
- Flathead County

Implementation Timeframe / Estimated Cost:

- Varies from $500 per sign to $61,000 per approach (when needed) for channelizing island

Funding Sources:

- Local
- Private

A3. Approach Consolidation Near Whitefish Stage Rd.

There are several existing driveways adjacent to the W. Reserve Dr. and Whitefish Stage Rd. intersection, which impact traffic operations. Nearby driveways are shown in Figure 18 and are listed below:

- Daycare on W. Reserve Dr. (460 feet west of Whitefish Stage Rd.)
- Veterinary clinic on W. Reserve Dr. (160 feet west of Whitefish Stage Rd.)
- Bank on W. Reserve Dr. (170 feet east of Whitefish Stage Rd.)

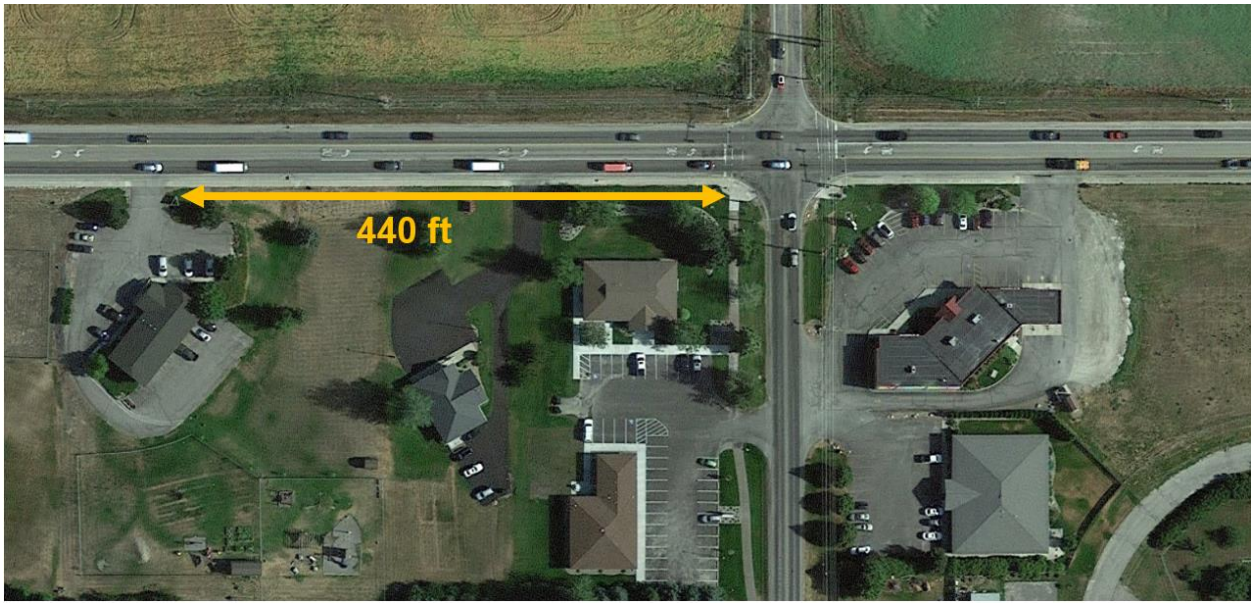


Figure 18: Driveways Adjacent to Whitefish Stage Rd. Intersection

Consolidation of the two driveways on the west side could improve traffic operations at the Whitefish Stage Rd. intersection. MDT Access Guidelines[4] recommends 440 foot spacing between driveways on facilities with a 45-mph posted speed limit. Driveway consolidation would be achieved by paving a cross-parcel access road between adjacent properties.

<table>
<tr><td colspan="2">Summary:
Recommend consolidation of driveways near Whitefish Stage Rd. in the short-term.</td></tr>
<tr><td colspan="2">Key Considerations:
Improves traffic operations at the signalized intersection on Whitefish Stage Rd.
Right-of-way/easement acquisition substantially increases project cost and complexity.
Consider recommendations presented in a future corridor access management plan.</td></tr>
<tr><td>Implementation Agency:
City of Kalispell
Flathead County
Private</td><td>Implementation Timeframe / Estimated Cost:
$120,000 (short-term) for costs associated with consolidating driveways (e.g., paving cross-parcel access between properties)</td></tr>
<tr><td colspan="2">Funding Sources:
Local
Private</td></tr>
</table>

2.6 Options Eliminated from Further Consideration

The intent of the study is to provide feasible improvement options that meet the needs and objectives within the 20-year planning horizon. Many improvement options were considered through the process with the intent of addressing the needs and objectives of the corridor. Through review of these improvement options with stakeholders and the public and comparison of performance and ability to meet the needs and objectives of the corridor, some options were eliminated from the study. The following provides background for the options that were considered but are not recommended for further consideration.

US 93 Continuous Flow Intersection (CFI)

A continuous flow intersection (CFI) was considered at the intersection of US 93 and W. Reserve Dr. but is not forwarded for further consideration. The high volume of left turn movements at the US 93 intersection could benefit from a CFI arrangement. This configuration displaces the left-hand turn movement beyond the opposing through lanes to allow for free movement.

While the intersection is efficient at handling large left-turn volumes, its footprint is considerable and comes at a high cost. The CFI alternative has significantly higher capacity than a standard signalized intersection with left-turn phasing, but the CFI also has a much larger footprint and would require more right-of-way acquisition. Performance benefits of this intersection type did not overcome its exorbitant cost and right-of-way impact as compared to traditional signalized arrangements.

US 93 Full Build Intersection

The full build intersection configuration was considered at US 93 and W. Reserve Dr. but is not forwarded for further consideration. This configuration would provide free northbound and southbound channelized right-turn lanes to accommodate heavy right-turn volumes. The channelized right-turn lanes would require dedicated receiving lanes on the east and west legs. On the east leg, the third lane would drop at the Home Depot driveway; on the west leg, the lane would drop about 500 feet west of the intersection. The full build configuration would also provide dual southbound left-turn lanes, to mitigate delay associated with the heavy northbound through movement in the PM peak hour.

While this intersection configuration would accommodate anticipated 2040 traffic volumes, its footprint would create significant right-of-way impacts at a high overall cost. Further, future improvements to other corridors in the transportation network may positively affect this intersection's performance. The high overall cost of this configuration did not overcome its performance benefits.

Whitefish Stage Rd. Roundabout

A two-lane roundabout alternative was analyzed at Whitefish Stage Rd. A two-lane roundabout is expected to operate at LOS D in the PM peak hour in 2040. However, the signalized improvement option would provide more gaps in traffic on W. Reserve Dr. This benefits traffic at adjacent driveways trying to enter the W. Reserve Dr. corridor.

The footprint for a two-lane roundabout was also considered, requiring more right-of-way and cost while not providing additional capacity benefit. The roundabout would also need to be offset to the north to minimize right-of-way needs at the detriment to its east/west approach geometry.

Overall, the signalized improvement is recommended over the roundabout improvement, given the site characteristics.

Sidewalk and Bicycle Lane Options

Cross section options were reviewed for the W. Reserve Dr. corridor widening to determine a footprint that accommodated all users of the corridor while considering the various needs and objectives. These options included curb sidewalk without boulevards and on-street bicycle lanes. Through discussion with stakeholders it was determined that a boulevard should be included for snow storage and a wider sidewalk provided on the north to accommodate bicyclists and other users. The recommended cross section is consistent with local planning efforts while considering snow storage needs, bicyclists, and other roadway users.

Raised Median

A raised median improvement option was considered between Hutton Ranch Rd. and Mission Trail Rd. As the north side of the corridor develops, a raised median would help to prohibit certain movements at driveways and side streets to maintain traffic operations and safety along W. Reserve Dr. Raised median is an effective means to provide access management and could be considered in the future.

This improvement option is removed as a recommendation because a corridor access management plan would provide better guidance and specific recommendations for raised median implementation or other access management strategies. In general, this option may be accommodated through restriping of the roadway to provide room for the median. The recommended cross section from Hutton Ranch Rd. to Mission Trail Dr. is wide enough to include a four-foot wide raised median if it is deemed necessary.

2.7 Summary of Recommended Improvements

This memorandum identifies recommended corridor improvement options within the study limits. These improvement options were developed to meet the needs and objectives of the corridor considering the 20-year study horizon. While the recommended improvements have been considered independently, it may be feasible to combine options if funding becomes available. This may result in cost savings and other efficiencies in the project delivery process. A summary of recommended improvement options is provided in Table 7.

Table 7: Summary of Recommended Improvements

	Improvement Option	Description	Implementation Timeframe	Potential Funding Source	Cost Estimate
	Intersection Improvements				
S1	US 93	Interim: Add dual left-turn lanes on east- and westbound approaches	Mid-term	NH, STPP, HSIP, MACI	$4.5 M
S2	Hutton Ranch Rd.	Add east- and westbound thru lanes to the intersection	Mid-term	STPP	(with widening)
S3	Whitefish Stage Rd.	Full: Provides two east-west thru lanes, north- and southbound left-turn lanes, east- and southbound right turn lanes	Mid-term	STPP, HSIP, MACI, Private	$5.3 M
S4	US 2	Dual protected east- and northbound left-turn lanes, exclusive east- and southbound right-turn lanes, exclusive westbound left-turn lane	Mid-term	NH, STPP, HSIP, MACI	$10.9 M
	Roadway Widening				
R1	W. Reserve Dr. (Hutton Ranch Rd. to Whitefish Stage Rd.)	Widen from 3 to 5 lanes, including Stillwater Bridge; add 6' boulevards with 8' sidewalk on north and 5' sidewalk on south	Mid-term	STPP, STPB, NH, Local	$17.2 M
R2	W. Reserve Dr. (Whitefish Stage Rd. to US 2)	Widen from 3 to 5 lanes, including Whitefish Bridge; add 6' boulevards with 8' sidewalk on north and 5' sidewalk on south	Mid-term	STPP, STPB, NH, Local	$24.8 M
R3 **R4**	Whitefish Stage Rd. (W. Reserve Dr. to 0.5 miles north)	Rural: Add 4' shoulders and flatten side slopes Urban: Add curb and gutter to rural section	Mid-term Long-term	STPU, Local, Private	$2.2 M $3.5 M
	Multimodal Improvements				
M1	Pedestrian Crossing Treatment Study near Drake Dr.	Study pedestrian volumes at crossing near Drake Dr. and identify crossing treatment	Short-term	HSIP, Local	$20,000
	Travel Demand Management				
T1	Travel Demand Management	Encourage large employers to use TDM strategies	Short-term	Local, Private	Variable
	Access Management				
A1	Corridor Access Management Plan	Develop corridor wide access management plan	Short-term	STPP	$50,000
A2	Side Street and Approach Movement Restriction	Consider restriction of movements at Home Depot, and Country Way through signage or channelized islands.	When needed	Local, Private	$61,000 per driveway
A3	Approach Consolidation near Whitefish Stage Rd.	Consolidate driveways to improve traffic operations	Short-term	Local, Private	$120,000

REFERENCES

[1] CTA Architects, Traffic Impact Study for Kalispell North Town Center, April 21, 2017.

[2] Montana Department of Transportation, Cost Estimation Procedure for Highway Design Projects, November 2016. https://www.mdt.mt.gov/other/webdata/external/cadd/report_templates_guidance/costest_procedure.pdf

[3] Kalispell Area Technical Advisory Committee Meeting Minutes, November 5, 2020, https://www.kalispell.com/AgendaCenter/ViewFile/Item/451?fileID=2761

[4] Montana Department of Transportation, Right of Way & Utilities Operations Manual, March 2007. https://www.mdt.mt.gov/other/webdata/external/ROW/manual/chapter_8.pdf

APPENDIX 1: PRELIMINARY COST ESTIMATES

INTERSECTION IMPROVEMENT OPTIONS

S1. US 93 Intersection — **2030 construction** — **$ 4,500,000.00**

TYPE	UNITS	QUANTITY	UNIT PRICE	Cost
MISCELLANEOUS WORK	UNIT	7,244.3	$ 1.01	$ 7,317.00
EXCAVATION-UNCLASSIFIED	CUYD	1,242.7	$ 21.00	$ 26,097.00
EXCAVATION-UNCLASS BORROW	CUYD	124.3	$ 25.00	$ 3,108.00
SPECIAL BORROW-EXCAVATION	CUYD	62.1	$ 25.00	$ 1,553.00
TOPSOIL-SALVAGING AND PLACING	CUYD	2,602.0	$ 4.55	$ 11,839.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$ 1.10	$ 5,500.00
CRUSHED AGGREGATE COURSE	CUYD	7,006.7	$ 27.99	$ 196,118.00
COVER - TYPE 1	SQYD	13,334.0	$ 0.81	$ 10,801.00
TRAFFIC GRAVEL	CUYD	888.9	$ 10.72	$ 9,529.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	3,569.4	$ 35.39	$ 126,321.00
HYDRATED LIME	TON	50.0	$ 196.49	$ 9,825.00
ASPHALT CEMENT PG 64-28	TON	192.8	$ 492.82	$ 95,016.00
EMULS ASPHALT CRS-2P	TON	23.8	$ 511.86	$ 12,182.00
SIDEWALK-CONCRETE 4"	SQYD	1,360.0	$ 114.70	$ 155,992.00
SIDEWALK-CONCRETE 6"	SQYD	340.0	$ 136.93	$ 46,556.00
CURB AND GUTTER-CONC	LNFT	3,060.0	$ 53.01	$ 162,211.00
SEEDING AREA NO 1	ACRE	2.9	$ 352.48	$ 1,022.00
SEEDING AREA NO 2	ACRE	0.8	$ 1,312.45	$ 1,050.00
SEEDING AREA NO 3	ACRE	1.2	$ 336.92	$ 404.00
FERTILIZING AREA NO 1	ACRE	2.9	$ 74.89	$ 217.00
FERTILIZING AREA NO 2	ACRE	0.8	$ 179.56	$ 144.00
CONDITION SEEDBED SURFACE	ACRE	4.0	$ 93.03	$ 372.00
MULCH	ACRE	0.8	$ 3,780.77	$ 3,025.00
SIGNS - URBAN	MILE	0.3	$ 57,000.00	$ 17,100.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.3	$ 52,000.00	$ 15,600.00
DRAINAGE PIPE - URBAN	MILE	0.3	$ 264,000.00	$ 79,200.00
SIGNALS	LS	1.0	$ 247,500.00	$ 247,500.00
LIGHTS - URBAN	MILE	0.3	$ 192,500.00	$ 57,750.00
Subtotal 1				$ 1,303,349.00
TRAFFIC CONTROL			5%	$ 65,167.00
Subtotal 2				$ 1,368,516.00
MOBILIZATION			10%	$ 136,852.00
Subtotal 3				$ 1,505,368.00
CONTINGENCY			30%	$ 451,610.00
Subtotal 4				$ 1,956,978.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	$ 587,093.00
Subtotal 5				$ 2,544,071.00
TOTAL RIGHT-OF-WAY				$ -
Subtotal 6				$ 2,544,071.00
INFLATION	% PER YEAR	10.0	3%	$ 874,947.69
Subtotal 7				$ 3,419,018.69
CONSTRUCTION ENGINEERING (CE)			10%	$ 341,901.87
PRELIMINARY ENGINERING (PE)			10%	$ 341,901.87
Subtotal 8				$ 4,102,822.42
INDIRECT COSTS (IDC)			9.66%	$ 396,332.65
TOTAL				**$ 4,499,155.07**

INTERSECTION IMPROVEMENT OPTIONS

S3. Whitefish Stage Rd. Intersection — **2030 construction** — **$ 5,300,000.00**

TYPE	UNITS	QUANTITY		UNIT PRICE		Cost
MISCELLANEOUS WORK	UNIT	9,730.1	$	1.01	$	9,827.00
EXCAVATION-UNCLASSIFIED	CUYD	5,125.7	$	21.00	$	107,640.00
EXCAVATION-UNCLASS BORROW	CUYD	512.6	$	25.00	$	12,815.00
SPECIAL BORROW-EXCAVATION	CUYD	256.3	$	25.00	$	6,408.00
TOPSOIL-SALVAGING AND PLACING	CUYD	3,494.8	$	4.55	$	15,901.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$	1.10	$	5,500.00
CRUSHED AGGREGATE COURSE	CUYD	5,984.0	$	27.99	$	167,492.00
COVER - TYPE 1	SQYD	11,055.0	$	0.81	$	8,955.00
TRAFFIC GRAVEL	CUYD	737.0	$	10.72	$	7,901.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	2,959.4	$	35.39	$	104,733.00
HYDRATED LIME	TON	42.0	$	196.49	$	8,253.00
ASPHALT CEMENT PG 64-28	TON	159.8	$	492.82	$	78,753.00
EMULS ASPHALT CRS-2P	TON	19.8	$	511.86	$	10,135.00
SIDEWALK-CONCRETE 4"	SQYD	1,826.7	$	114.70	$	209,522.00
SIDEWALK-CONCRETE 6"	SQYD	456.7	$	136.93	$	62,536.00
CURB AND GUTTER-CONC	LNFT	4,110.0	$	53.01	$	217,871.00
SEEDING AREA NO 1	ACRE	3.9	$	352.48	$	1,375.00
SEEDING AREA NO 2	ACRE	1.1	$	1,312.45	$	1,444.00
SEEDING AREA NO 3	ACRE	1.5	$	336.92	$	505.00
FERTILIZING AREA NO 1	ACRE	3.9	$	74.89	$	292.00
FERTILIZING AREA NO 2	ACRE	1.1	$	179.56	$	198.00
CONDITION SEEDBED SURFACE	ACRE	5.4	$	93.03	$	502.00
MULCH	ACRE	1.1	$	3,780.77	$	4,159.00
SIGNS - URBAN	MILE	0.4	$	57,000.00	$	22,800.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.4	$	52,000.00	$	20,800.00
DRAINAGE PIPE - URBAN	MILE	0.4	$	264,000.00	$	105,600.00
SIGNALS	LS	1.0	$	247,500.00	$	247,500.00
LIGHTS - URBAN	MILE	0.4	$	192,500.00	$	77,000.00
Subtotal 1					$	1,516,417.00
TRAFFIC CONTROL				5%	$	75,821.00
Subtotal 2					$	1,592,238.00
MOBILIZATION				10%	$	159,224.00
Subtotal 3					$	1,751,462.00
CONTINGENCY				30%	$	525,439.00
Subtotal 4					$	2,276,901.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES				30%	$	683,070.00
Subtotal 5					$	2,959,971.00
Agricultural Property	ACRE	0.85		25,000	$	21,250.00
Residential property	ACRE	0.05		230,000	$	11,500.00
TOTAL RIGHT-OF-WAY					$	32,750.00
Subtotal 6					$	2,992,721.00
INFLATION	% PER YEAR	10.0		3%	$	1,029,245.77
Subtotal 7					$	4,021,966.77
CONSTRUCTION ENGINEERING (CE)				10%	$	402,196.68
PRELIMINARY ENGINERING (PE)				10%	$	402,196.68
Subtotal 8					$	4,826,360.12
INDIRECT COSTS (IDC)				9.66%	$	466,226.39
TOTAL					**$**	**5,292,586.51**

INTERSECTION IMPROVEMENT OPTIONS

S4. US 2 Intersection — **2030 construction** — **$ 10,900,000.00**

TYPE	UNITS	QUANTITY	UNIT PRICE	Cost
MISCELLANEOUS WORK	UNIT	16,429.9	$ 1.01	$ 16,594.00
EXCAVATION-UNCLASSIFIED	CUYD	7,826.7	$ 21.00	$ 164,361.00
EXCAVATION-UNCLASS BORROW	CUYD	782.7	$ 25.00	$ 19,568.00
SPECIAL BORROW-EXCAVATION	CUYD	391.3	$ 25.00	$ 9,783.00
TOPSOIL-SALVAGING AND PLACING	CUYD	5,901.2	$ 4.55	$ 26,850.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$ 1.10	$ 5,500.00
CRUSHED AGGREGATE COURSE	CUYD	13,541.9	$ 27.99	$ 379,038.00
COVER - TYPE 1	SQYD	25,542.0	$ 0.81	$ 20,689.00
TRAFFIC GRAVEL	CUYD	1,702.8	$ 10.72	$ 18,254.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	6,837.7	$ 35.39	$ 241,986.00
HYDRATED LIME	TON	96.0	$ 196.49	$ 18,863.00
ASPHALT CEMENT PG 64-28	TON	369.2	$ 492.82	$ 181,949.00
EMULS ASPHALT CRS-2P	TON	45.6	$ 511.86	$ 23,341.00
SIDEWALK-CONCRETE 4"	SQYD	3,084.4	$ 114.70	$ 353,781.00
SIDEWALK-CONCRETE 6"	SQYD	771.1	$ 136.93	$ 105,587.00
CURB AND GUTTER-CONC	LNFT	6,940.0	$ 53.01	$ 367,889.00
SEEDING AREA NO 1	ACRE	6.5	$ 352.48	$ 2,291.00
SEEDING AREA NO 2	ACRE	1.8	$ 1,312.45	$ 2,362.00
SEEDING AREA NO 3	ACRE	2.6	$ 336.92	$ 876.00
FERTILIZING AREA NO 1	ACRE	6.5	$ 74.89	$ 487.00
FERTILIZING AREA NO 2	ACRE	1.8	$ 179.56	$ 323.00
CONDITION SEEDBED SURFACE	ACRE	9.1	$ 93.03	$ 847.00
MULCH	ACRE	1.8	$ 3,780.77	$ 6,805.00
SIGNS - URBAN	MILE	0.7	$ 57,000.00	$ 39,900.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.7	$ 52,000.00	$ 36,400.00
DRAINAGE PIPE - URBAN	MILE	0.7	$ 264,000.00	$ 184,800.00
SIGNALS	LS	1.0	$ 247,500.00	$ 247,500.00
LIGHTS - URBAN	MILE	0.7	$ 192,500.00	$ 134,750.00
Subtotal 1				$ 2,611,374.00
TRAFFIC CONTROL			5%	$ 130,569.00
Subtotal 2				$ 2,741,943.00
MOBILIZATION			10%	$ 274,194.00
Subtotal 3				$ 3,016,137.00
CONTINGENCY			30%	$ 904,841.00
Subtotal 4				$ 3,920,978.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	$ 1,176,293.00
Subtotal 5				$ 5,097,271.00
Commercial Property	ACRE	0.75	500,000	$ 375,000.00
Gas Station Property	ACRE	0.15	4,600,000	$ 690,000.00
TOTAL RIGHT-OF-WAY				$ 1,065,000.00
Subtotal 6				$ 6,162,271.00
INFLATION	% PER YEAR	10.0	3%	$ 2,119,305.93
Subtotal 7				$ 8,281,576.93
CONSTRUCTION ENGINEERING (CE)			10%	$ 828,157.69
PRELIMINARY ENGINERING (PE)			10%	$ 828,157.69
Subtotal 8				$ 9,937,892.32
INDIRECT COSTS (IDC)			9.66%	$ 960,000.40
TOTAL				**$ 10,897,892.71**

ROADWAY WIDENING IMPROVEMENT OPTIONS

R1. W. Reserve Dr. (Hutton Ranch Rd. to Whitefish Stage Rd.) **2030 construction** **$ 17,200,000.00**

TYPE	UNITS	QUANTITY	UNIT PRICE	Cost
MISCELLANEOUS WORK	UNIT	17,500.4	$ 1.01	$ 17,675.00
EXCAVATION-UNCLASSIFIED	CUYD	11,880.3	$ 21.00	$ 249,487.00
EXCAVATION-UNCLASS BORROW	CUYD	1,188.0	$ 25.00	$ 29,701.00
SPECIAL BORROW-EXCAVATION	CUYD	502.2	$ 25.00	$ 12,554.00
TOPSOIL-SALVAGING AND PLACING	CUYD	6,285.7	$ 4.55	$ 28,600.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$ 1.10	$ 5,500.00
CRUSHED AGGREGATE COURSE	CUYD	15,000.8	$ 27.99	$ 419,871.00
COVER - TYPE 1	SQYD	28,359.0	$ 0.81	$ 22,971.00
TRAFFIC GRAVEL	CUYD	1,890.6	$ 10.72	$ 20,267.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	7,591.9	$ 35.39	$ 268,677.00
HYDRATED LIME	TON	107.0	$ 196.49	$ 21,024.00
ASPHALT CEMENT PG 64-28	TON	410.0	$ 492.82	$ 202,038.00
EMULS ASPHALT CRS-2P	TON	50.7	$ 511.86	$ 25,951.00
GUARD RAIL-STL/BR APPR-TY 1	EACH	4.0	$ 3,261.59	$ 13,046.00
GUARD RAIL-OPTIONAL TERM SECT	EACH	4.0	$ 2,779.14	$ 11,117.00
SIDEWALK-CONCRETE 4"	SQYD	3,285.4	$ 114.70	$ 376,836.00
SIDEWALK-CONCRETE 6"	SQYD	821.4	$ 136.93	$ 112,468.00
CURB AND GUTTER-CONC	LNFT	7,392.2	$ 53.01	$ 391,859.00
SEEDING AREA NO 1	ACRE	7.0	$ 352.48	$ 2,453.00
SEEDING AREA NO 2	ACRE	1.9	$ 1,312.45	$ 2,557.00
SEEDING AREA NO 3	ACRE	2.8	$ 336.92	$ 938.00
FERTILIZING AREA NO 1	ACRE	7.0	$ 74.89	$ 521.00
FERTILIZING AREA NO 2	ACRE	1.9	$ 179.56	$ 350.00
CONDITION SEEDBED SURFACE	ACRE	9.7	$ 93.03	$ 906.00
MULCH	ACRE	1.9	$ 3,780.77	$ 7,366.00
SIGNS - URBAN	MILE	0.7	$ 57,000.00	$ 39,901.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.7	$ 52,000.00	$ 36,401.00
DRAINAGE PIPE - URBAN	MILE	0.7	$ 264,000.00	$ 184,804.00
NEW BRIDGE LARGER THAN 100 LINEAL FEET	SQFT	15,131.4	$ 125.00	$ 1,891,419.00
REMOVE LARGE MULTIPLE SPAN BRIDGE	LS	1.0	$ 145,200.00	$ 145,200.00
SIGNALS	LS	1.0	$ 247,500.00	$ 247,500.00
LIGHTS - URBAN	MILE	0.7	$ 192,500.00	$ 134,753.00
Subtotal 1				$ 4,924,711.00
TRAFFIC CONTROL			5%	$ 246,236.00
Subtotal 2				$ 5,170,947.00
MOBILIZATION			10%	$ 517,095.00
Subtotal 3				$ 5,688,042.00
CONTINGENCY			30%	$ 1,706,413.00
Subtotal 4				$ 7,394,455.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	$ 2,218,337.00
Subtotal 5				$ 9,612,792.00
Agricultural Property	ACRE	4.00	25,000	$ 100,000.00
TOTAL RIGHT-OF-WAY				$ 100,000.00
Subtotal 6				$ 9,712,792.00
INFLATION	% PER YEAR	10.0	3%	$ 3,340,388.26
Subtotal 7				$ 13,053,180.26
CONSTRUCTION ENGINEERING (CE)			10%	$ 1,305,318.03
PRELIMINARY ENGINERING (PE)			10%	$ 1,305,318.03
Subtotal 8				$ 15,663,816.31
INDIRECT COSTS (IDC)			9.66%	$ 1,513,124.66
TOTAL				**$ 17,176,940.97**

ROADWAY WIDENING IMPROVEMENT OPTIONS

R2. W. Reserve Dr. (Whitefish Stage Rd. to US 2) **2030 construction** **$ 24,800,000.00**

TYPE	UNITS	QUANTITY	UNIT PRICE	Cost
MISCELLANEOUS WORK	UNIT	32,086.4	$ 1.01	$ 32,407.00
EXCAVATION-UNCLASSIFIED	CUYD	19,801.3	$ 21.00	$ 415,827.00
EXCAVATION-UNCLASS BORROW	CUYD	1,980.1	$ 25.00	$ 49,503.00
SPECIAL BORROW-EXCAVATION	CUYD	837.0	$ 25.00	$ 20,924.00
TOPSOIL-SALVAGING AND PLACING	CUYD	11,524.6	$ 4.55	$ 52,437.00
TEMPORARY EROSION CONTROL	UNIT	10,000.0	$ 1.10	$ 11,000.00
CRUSHED AGGREGATE COURSE	CUYD	26,439.3	$ 27.99	$ 740,037.00
COVER - TYPE 1	SQYD	49,867.0	$ 0.81	$ 40,392.00
TRAFFIC GRAVEL	CUYD	3,324.5	$ 10.72	$ 35,638.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	13,349.8	$ 35.39	$ 472,448.00
HYDRATED LIME	TON	187.0	$ 196.49	$ 36,744.00
ASPHALT CEMENT PG 64-28	TON	720.9	$ 492.82	$ 355,268.00
EMULS ASPHALT CRS-2P	TON	89.1	$ 511.86	$ 45,607.00
GUARD RAIL-STL/BR APPR-TY 1	EACH	4.0	$ 3,261.59	$ 13,046.00
GUARD RAIL-OPTIONAL TERM SECT	EACH	4.0	$ 2,779.14	$ 11,117.00
SIDEWALK-CONCRETE 4"	SQYD	6,023.7	$ 114.70	$ 690,916.00
SIDEWALK-CONCRETE 6"	SQYD	1,505.9	$ 136.93	$ 206,206.00
CURB AND GUTTER-CONC	LNFT	13,553.3	$ 53.01	$ 718,459.00
SEEDING AREA NO 1	ACRE	12.8	$ 352.48	$ 4,497.00
SEEDING AREA NO 2	ACRE	3.6	$ 1,312.45	$ 4,688.00
SEEDING AREA NO 3	ACRE	5.1	$ 336.92	$ 1,719.00
FERTILIZING AREA NO 1	ACRE	12.8	$ 74.89	$ 955.00
FERTILIZING AREA NO 2	ACRE	3.6	$ 179.56	$ 641.00
CONDITION SEEDBED SURFACE	ACRE	17.9	$ 93.03	$ 1,662.00
MULCH	ACRE	3.6	$ 3,780.77	$ 13,505.00
SIGNS - URBAN	MILE	1.3	$ 57,000.00	$ 73,157.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	1.3	$ 52,000.00	$ 66,740.00
DRAINAGE PIPE - URBAN	MILE	1.3	$ 264,000.00	$ 338,832.00
NEW BRIDGE LARGER THAN 100 LINEAL FEET	SQFT	9,415.0	$ 125.00	$ 1,176,872.00
REMOVE LARGE MULTIPLE SPAN BRIDGE	LS	1.0	$ 145,200.00	$ 145,200.00
LIGHTS - URBAN	MILE	1.3	$ 192,500.00	$ 247,065.00
RAIL ROAD CROSSING	LS	1.0	$ 350,000.00	$ 350,000.00
Subtotal 1				$ 6,373,509.00
TRAFFIC CONTROL			5%	$ 318,675.00
Subtotal 2				$ 6,692,184.00
MOBILIZATION			10%	$ 669,218.00
Subtotal 3				$ 7,361,402.00
CONTINGENCY			30%	$ 2,208,421.00
Subtotal 4				$ 9,569,823.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	$ 2,870,947.00
Subtotal 5				$ 12,440,770.00
Agricultural Property	ACRE	2.40	25,000	$ 60,000.00
Residential property	ACRE	2.95	230,000	$ 678,500.00
Cost to Cure - Garage	EACH	2.0	100,000	$ 200,000.00
Cost to Cure - House	EACH	2.0	225,000	$ 450,000.00
Cost to Cure - Parking Area	LS	1.0	150,000	$ 150,000.00
TOTAL RIGHT-OF-WAY				$ 1,538,500.00
Subtotal 6				$ 13,979,270.00
INFLATION	% PER YEAR	10.0	3%	$ 4,807,699.92
Subtotal 7				$ 18,786,969.92
CONSTRUCTION ENGINEERING (CE)			10%	$ 1,878,696.99
PRELIMINARY ENGINERING (PE)			10%	$ 1,878,696.99
Subtotal 8				$ 22,544,363.91
INDIRECT COSTS (IDC)			9.66%	$ 2,177,785.55
TOTAL				**$ 24,722,149.46**

ROADWAY WIDENING IMPROVEMENT OPTIONS

R3. Whitefish Stage Rd. - Rural Cross Section (Mid-Term) — **2030 construction** — **$ 2,200,000.00**

TYPE	UNITS	QUANTITY		UNIT PRICE		Cost
MISCELLANEOUS WORK	UNIT	12,500.0	$	1.01	$	12,625.00
EXCAVATION-UNCLASSIFIED	CUYD	12,840.5	$	21.00	$	269,651.00
EXCAVATION-UNCLASS BORROW	CUYD	1,284.1	$	25.00	$	32,103.00
SPECIAL BORROW-EXCAVATION	CUYD	642.0	$	25.00	$	16,050.00
TOPSOIL-SALVAGING AND PLACING	CUYD	4,489.7	$	4.55	$	20,428.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$	1.10	$	5,500.00
CRUSHED AGGREGATE COURSE	CUYD	3,517.6	$	27.99	$	98,458.00
COVER - TYPE 1	SQYD	2,347.0	$	0.81	$	1,901.00
TRAFFIC GRAVEL	CUYD	156.4	$	10.72	$	1,677.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	852.4	$	35.39	$	30,166.00
HYDRATED LIME	TON	12.0	$	196.49	$	2,358.00
ASPHALT CEMENT PG 64-28	TON	46.0	$	492.82	$	22,670.00
EMULS ASPHALT CRS-2P	TON	4.2	$	511.86	$	2,150.00
GUARD RAIL-OPTIONAL TERM SECT	EACH	0.4	$	2,779.14	$	1,112.00
SEEDING AREA NO 1	ACRE	5.0	$	352.48	$	1,762.00
SEEDING AREA NO 2	ACRE	1.4	$	1,312.45	$	1,837.00
SEEDING AREA NO 3	ACRE	2.0	$	336.92	$	674.00
FERTILIZING AREA NO 1	ACRE	5.0	$	74.89	$	374.00
FERTILIZING AREA NO 2	ACRE	1.4	$	179.56	$	251.00
CONDITION SEEDBED SURFACE	ACRE	7.0	$	93.03	$	651.00
MULCH	ACRE	1.4	$	3,780.77	$	5,293.00
SIGNS - RURAL	MILE	0.5	$	9,000.00	$	4,500.00
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.5	$	9,000.00	$	4,500.00
DRAINAGE PIPE - RURAL	MILE	0.5	$	90,200.00	$	45,100.00
Subtotal 1					$	581,791.00
TRAFFIC CONTROL				5%	$	29,090.00
Subtotal 2					$	610,881.00
MOBILIZATION				10%	$	61,088.00
Subtotal 3					$	671,969.00
CONTINGENCY				30%	$	201,591.00
Subtotal 4					$	873,560.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES				30%	$	262,068.00
Subtotal 5					$	1,135,628.00
Agricultural Property	ACRE	2.40		25,000	$	60,000.00
TOTAL RIGHT-OF-WAY					$	60,000.00
Subtotal 6					$	1,195,628.00
INFLATION	% PER YEAR	10.0		3%	$	411,196.05
Subtotal 7					$	1,606,824.05
CONSTRUCTION ENGINEERING (CE)				10%	$	160,682.41
PRELIMINARY ENGINERING (PE)				10%	$	160,682.41
Subtotal 8					$	1,928,188.86
INDIRECT COSTS (IDC)				9.66%	$	186,263.04
TOTAL					**$**	**2,114,451.91**

ROADWAY WIDENING IMPROVEMENT OPTIONS

R4. Whitefish Stage Rd. - Urban Cross Section (Long-Term) **2040 construction** **$ 3,500,000.00**

TYPE	UNITS	QUANTITY	UNIT PRICE	Cost
MISCELLANEOUS WORK	UNIT	12,500.0	$ 1.01	$ 12,625.00
TOPSOIL-SALVAGING AND PLACING	CUYD	4,489.7	$ 4.55	$ 20,428.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0	$ 1.10	$ 5,500.00
COVER - TYPE 1	SQYD	8,507.0	$ 0.81	$ 6,891.00
TRAFFIC GRAVEL	CUYD	567.1	$ 10.72	$ 6,079.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	1,639.7	$ 35.39	$ 58,028.00
HYDRATED LIME	TON	23.0	$ 196.49	$ 4,519.00
ASPHALT CEMENT PG 64-28	TON	88.5	$ 492.82	$ 43,635.00
EMULS ASPHALT CRS-2P	TON	15.2	$ 511.86	$ 7,780.00
CURB AND GUTTER-CONC	LNFT	5,280.0	$ 53.01	$ 279,893.00
SEEDING AREA NO 1	ACRE	5.0	$ 352.48	$ 1,752.00
SEEDING AREA NO 2	ACRE	1.4	$ 1,312.45	$ 1,826.00
SEEDING AREA NO 3	ACRE	2.0	$ 336.92	$ 670.00
FERTILIZING AREA NO 1	ACRE	5.0	$ 74.89	$ 372.00
FERTILIZING AREA NO 2	ACRE	1.4	$ 179.56	$ 250.00
CONDITION SEEDBED SURFACE	ACRE	7.0	$ 93.03	$ 647.00
MULCH	ACRE	1.4	$ 3,780.77	$ 5,261.00
SIGNS - URBAN	MILE	0.5	$ 57,000.00	$ 28,500.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.5	$ 52,000.00	$ 26,000.00
DRAINAGE PIPE - URBAN	MILE	0.5	$ 264,000.00	$ 132,000.00
LIGHTS - URBAN	MILE	0.5	$ 192,500.00	$ 96,250.00
Subtotal 1				$ 738,906.00
TRAFFIC CONTROL			5%	$ 36,945.00
Subtotal 2				$ 775,851.00
MOBILIZATION			10%	$ 77,585.00
Subtotal 3				$ 853,436.00
CONTINGENCY			30%	$ 256,031.00
Subtotal 4				$ 1,109,467.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	$ 332,840.00
Subtotal 5				$ 1,442,307.00
TOTAL RIGHT-OF-WAY				$ -
Subtotal 6				$ 1,442,307.00
INFLATION	% PER YEAR	20.0	3%	$ 1,162,659.88
Subtotal 7				$ 2,604,966.88
CONSTRUCTION ENGINEERING (CE)			10%	$ 260,496.69
PRELIMINARY ENGINERING (PE)			10%	$ 260,496.69
Subtotal 8				$ 3,125,960.25
INDIRECT COSTS (IDC)			9.66%	$ 301,967.76
TOTAL				**$ 3,427,928.01**

ACCESS MANAGEMENT IMPROVEMENT OPTIONS

A2. Side Street and Approach Movement Restriction (per approach) **2030 construction** **$ 61,000.00**

TYPE	UNITS	QUANTITY		UNIT PRICE		Cost
MISCELLANEOUS WORK	UNIT	118.4	$	1.01	$	120.00
EXCAVATION-UNCLASSIFIED	CUYD	7.8	$	21.00	$	164.00
EXCAVATION-UNCLASS BORROW	CUYD	0.8	$	25.00	$	20.00
SPECIAL BORROW-EXCAVATION	CUYD	0.4	$	25.00	$	10.00
TOPSOIL-SALVAGING AND PLACING	CUYD	42.5	$	4.55	$	193.00
TEMPORARY EROSION CONTROL	UNIT	100.0	$	1.10	$	110.00
CRUSHED AGGREGATE COURSE	CUYD	14.2	$	27.99	$	397.00
COVER - TYPE 1	SQYD	63.0	$	0.81	$	51.00
TRAFFIC GRAVEL	CUYD	4.1	$	10.72	$	44.00
PLANT MIX BIT SURF GR S-1/2 IN	TON	6.7	$	35.39	$	237.00
HYDRATED LIME	TON	1.0	$	196.49	$	196.00
ASPHALT CEMENT PG 64-28	TON	0.4	$	492.82	$	197.00
EMULS ASPHALT CRS-2P	TON	0.2	$	511.86	$	102.00
SIDEWALK-CONCRETE 4"	SQYD	32.2	$	114.70	$	3,693.00
CURB AND GUTTER-CONC	LNFT	105.0	$	53.01	$	5,566.00
SEEDING AREA NO 1	ACRE	0.1	$	352.48	$	35.00
SEEDING AREA NO 2	ACRE	0.1	$	1,312.45	$	131.00
SEEDING AREA NO 3	ACRE	0.1	$	336.92	$	34.00
FERTILIZING AREA NO 1	ACRE	0.1	$	74.89	$	7.00
FERTILIZING AREA NO 2	ACRE	0.1	$	179.56	$	18.00
CONDITION SEEDBED SURFACE	ACRE	0.1	$	93.03	$	9.00
MULCH	ACRE	0.1	$	3,780.77	$	378.00
SIGNS - URBAN	MILE	0.1	$	57,000.00	$	5,700.00
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.1	$	52,000.00	$	5,200.00
Subtotal 1					$	22,612.00
TRAFFIC CONTROL				5%	$	1,131.00
Subtotal 2					$	23,743.00
MOBILIZATION				10%	$	2,374.00
Subtotal 3					$	26,117.00
CONTINGENCY				30%	$	7,835.00
Subtotal 4					$	33,952.00
TOTAL RIGHT-OF-WAY					$	-
Subtotal 5					$	33,952.00
INFLATION	% PER YEAR	10.0		3%	$	11,676.65
Subtotal 6					$	45,628.65
CONSTRUCTION ENGINEERING (CE)				10%	$	4,562.86
PRELIMINARY ENGINERING (PE)				10%	$	4,562.86
Subtotal 7					$	54,754.38
INDIRECT COSTS (IDC)				9.66%	$	5,289.27
TOTAL					**$**	**60,043.65**

ACCESS MANAGEMENT IMPROVEMENT OPTIONS

A3. Approach Consolidation Near Whitefish Stage Rd. **2030 construction** **$ 120,000.00**

TYPE		UNITS	QUANTITY		UNIT PRICE		Cost
MISCELLANEOUS WORK		UNIT	710.2	$	1.01	$	717.00
EXCAVATION-UNCLASSIFIED		CUYD	71.4	$	21.00	$	1,499.00
EXCAVATION-UNCLASS BORROW		CUYD	7.1	$	25.00	$	178.00
SPECIAL BORROW-EXCAVATION		CUYD	3.6	$	25.00	$	90.00
TOPSOIL-SALVAGING AND PLACING		CUYD	255.1	$	4.55	$	1,161.00
TEMPORARY EROSION CONTROL		UNIT	100.0	$	1.10	$	110.00
CRUSHED AGGREGATE COURSE		CUYD	81.0	$	27.99	$	2,267.00
COVER - TYPE 1		SQYD	350.0	$	0.81	$	284.00
TRAFFIC GRAVEL		CUYD	23.3	$	10.72	$	250.00
PLANT MIX BIT SURF GR S-1/2 IN		TON	37.5	$	35.39	$	1,327.00
HYDRATED LIME		TON	1.0	$	196.49	$	196.00
ASPHALT CEMENT PG 64-28		TON	2.0	$	492.82	$	986.00
EMULS ASPHALT CRS-2P		TON	0.7	$	511.86	$	358.00
SEEDING AREA NO 1		ACRE	0.3	$	352.48	$	106.00
SEEDING AREA NO 2		ACRE	0.1	$	1,312.45	$	131.00
SEEDING AREA NO 3		ACRE	0.1	$	336.92	$	34.00
FERTILIZING AREA NO 1		ACRE	0.3	$	74.89	$	22.00
FERTILIZING AREA NO 2		ACRE	0.1	$	179.56	$	18.00
CONDITION SEEDBED SURFACE		ACRE	0.4	$	93.03	$	37.00
MULCH		ACRE	0.1	$	3,780.77	$	378.00
	Subtotal 1					$	10,149.00
TRAFFIC CONTROL					5%	$	507.00
	Subtotal 2					$	10,656.00
MOBILIZATION					10%	$	1,066.00
	Subtotal 3					$	11,722.00
CONTINGENCY					30%	$	3,517.00
	Subtotal 4					$	15,239.00
Commercial Property		ACRE	0.10		500,000	$	50,000.00
TOTAL RIGHT-OF-WAY						$	50,000.00
	Subtotal 5					$	65,239.00
INFLATION		% PER YEAR	10.0		3%	$	22,436.76
	Subtotal 6					$	87,675.76
CONSTRUCTION ENGINEERING (CE)					10%	$	8,767.58
PRELIMINARY ENGINERING (PE)					10%	$	8,767.58
	Subtotal 7					$	105,210.91
INDIRECT COSTS (IDC)					9.66%	$	10,163.37
	TOTAL					**$**	**115,374.29**

APPENDIX 2: IMPROVEMENT OPTIONS OPERATIONAL ANALYSIS

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.5	0.0	1.5	1.7	0.9
Total Del/Veh (s)	61.9	41.0	35.7	29.5	42.3

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.4	0.0
Total Del/Veh (s)	6.6	1.8	20.2	19.8	5.1

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.9	0.1
Total Del/Veh (s)	5.3	5.8	10.9	5.9

4: Country Way & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.9	2.8	34.3	11.3	4.0

5: Country Way N & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	2.5	4.1	10.6	3.5

6: Whitefish Stage Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.6	0.3	0.2
Total Del/Veh (s)	31.4	42.0	96.3	25.5	45.6

7: LaSalle US 2 & W Reserve Dr/Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.4	1.1	0.3	0.5
Total Del/Veh (s)	27.7	50.4	19.4	29.2	28.9

Total Network Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	65.5

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.7	0.0	1.3	1.8	1.0
Total Del/Veh (s)	49.9	45.9	40.4	32.8	41.4

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.3	1.0	0.1
Total Del/Veh (s)	4.0	2.7	20.8	28.7	6.3

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.1
Total Del/Veh (s)	9.4	16.5	13.9	14.0

4: Country Way & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1
Total Del/Veh (s)	5.5	3.2	43.2	11.3	4.4

5: Country Way N & W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.3	4.1	3.8

6: Whitefish Stage Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.0	0.1	6.6	0.4	1.5
Total Del/Veh (s)	43.3	46.0	227.0	33.2	70.8

7: LaSalle US 2 & W Reserve Dr/Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.3	1.0	0.4	0.6
Total Del/Veh (s)	38.6	105.3	27.2	51.5	45.2

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	77.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	0.0	1.5	1.7	1.2
Total Del/Veh (s)	37.8	32.2	20.6	20.8	28.4

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	7.0	1.7	15.3	16.7	5.0

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.0	0.1
Total Del/Veh (s)	4.6	5.5	10.9	5.4

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.8	2.7	28.1	8.5	3.7

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	2.4	4.1	6.4	3.4

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	2.9	2.4	0.8
Total Del/Veh (s)	10.9	25.9	25.5	23.9	20.6

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.8	1.1	1.4	0.9
Total Del/Veh (s)	20.1	34.6	14.1	14.4	18.4

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	42.7

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.1	0.0	1.3	1.7	1.2
Total Del/Veh (s)	36.1	35.6	24.0	22.9	28.8

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.7	3.0	0.3
Total Del/Veh (s)	4.8	2.8	26.1	40.7	8.0

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.6	0.1
Total Del/Veh (s)	8.4	13.4	13.4	11.9

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1
Total Del/Veh (s)	5.6	3.1	45.7	14.4	4.4

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.9	3.9	3.5

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	2.8	2.4	0.9
Total Del/Veh (s)	16.2	28.6	27.4	26.5	23.6

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	1.1	0.9	1.2	0.9
Total Del/Veh (s)	33.4	39.2	16.5	19.5	23.9

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	45.8

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.5	1.6	0.7
Total Del/Veh (s)	34.5	33.2	17.7	20.4	27.4

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	5.9	1.7	5.8	6.4	3.8

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.0	0.1
Total Del/Veh (s)	3.2	2.9	8.9	3.3

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.2	1.6	15.6	5.2	2.1

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	2.7	5.0	2.2

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.9	2.4	0.8
Total Del/Veh (s)	11.1	14.8	17.7	17.2	14.3

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	1.1	1.4	0.9
Total Del/Veh (s)	24.9	36.2	27.5	14.0	23.4

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	40.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.3	1.8	0.9
Total Del/Veh (s)	34.2	33.5	21.7	20.4	26.6

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0
Total Del/Veh (s)	5.9	2.7	5.0	6.9	4.3

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.6	0.1
Total Del/Veh (s)	6.0	5.8	9.7	6.4

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.6	1.7	22.0	10.3	2.2

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	2.9	2.1

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.8	2.4	0.8
Total Del/Veh (s)	13.0	17.0	19.5	18.4	16.2

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.3	0.9	1.2	0.9
Total Del/Veh (s)	32.4	35.6	25.7	16.4	25.3

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	39.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	0.0	1.5	1.7	0.9
Total Del/Veh (s)	90.4	40.2	31.9	39.6	52.5

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	1.8	0.1
Total Del/Veh (s)	8.4	2.2	35.4	36.8	7.7

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.8	0.1
Total Del/Veh (s)	7.7	7.1	14.3	7.7

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	5.4	3.0	87.4	12.1	6.1

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.0
Total Del/Veh (s)	32.1	4.8	40.3	16.6

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	12.6	5.2	25.5	0.3	10.5
Total Del/Veh (s)	97.0	218.6	253.0	25.5	159.4

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.4	1.1	0.4	0.5
Total Del/Veh (s)	42.8	93.3	59.7	24.3	48.4

Total Network Performance

Denied Del/Veh (s)	4.8
Total Del/Veh (s)	126.8

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.7	0.0	1.3	1.7	1.0
Total Del/Veh (s)	59.2	49.1	47.6	35.8	46.7

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	11.4	71.1	6.8
Total Del/Veh (s)	6.0	3.7	70.4	109.0	17.4

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	1.5	0.7	0.9
Total Del/Veh (s)	19.4	58.8	19.2	40.3

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	7.6	3.1	0.1	0.1	5.2
Total Del/Veh (s)	27.1	16.7	523.0	305.5	25.5

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	5.2	0.0	2.4
Total Del/Veh (s)	156.8	4.6	73.7

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	91.6	0.1	248.9	0.4	73.2
Total Del/Veh (s)	125.3	114.1	473.1	33.8	157.8

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	5.1	90.2	0.5	32.1
Total Del/Veh (s)	63.8	191.8	148.9	27.5	92.2

Total Network Performance

Denied Del/Veh (s)	40.8
Total Del/Veh (s)	156.5

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	0.0	1.4	1.6	1.2
Total Del/Veh (s)	44.8	36.5	26.4	30.2	35.3

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	9.6	0.5
Total Del/Veh (s)	9.8	2.5	30.8	72.2	9.8

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.9	0.1
Total Del/Veh (s)	6.8	9.1	14.5	8.5

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	5.1	3.5	143.4	23.9	7.3

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.0	5.2	8.5	4.3

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	2.9	2.4	0.8
Total Del/Veh (s)	16.8	47.6	76.7	45.1	42.0

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.9	1.1	1.3	0.9
Total Del/Veh (s)	31.2	49.8	22.6	23.7	28.6

Total Network Performance

Denied Del/Veh (s)	1.7
Total Del/Veh (s)	63.8

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.1	0.0	1.3	1.8	1.3
Total Del/Veh (s)	44.7	44.1	32.4	29.1	36.4

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.4	278.6	24.4
Total Del/Veh (s)	6.3	3.8	72.8	171.6	22.3

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	2.7	0.6	1.6
Total Del/Veh (s)	16.3	81.1	17.8	51.4

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	46.6	26.4		25.7
Total Del/Veh (s)	8.1	75.1	1254.2		52.6

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	4.2	6.1	5.3

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	10.2	2.5	2.1
Total Del/Veh (s)	27.2	103.2	105.0	31.7	64.9

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	1.2	0.9	1.2	0.9
Total Del/Veh (s)	42.0	54.5	24.1	31.1	33.7

Total Network Performance

Denied Del/Veh (s)	16.7
Total Del/Veh (s)	97.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.5	1.6	0.7
Total Del/Veh (s)	38.9	38.5	23.1	25.8	32.4

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	7.1	2.5	7.9	8.7	4.9

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.0	0.1
Total Del/Veh (s)	4.3	3.9	10.0	4.3

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.9	2.0	40.5	9.2	3.2

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.7	3.4	7.3	2.7

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.9	2.5	0.8
Total Del/Veh (s)	10.3	18.7	29.3	18.5	17.7

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	1.0	1.4	0.9
Total Del/Veh (s)	28.3	43.0	28.0	22.5	28.2

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	48.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.3	1.8	0.9
Total Del/Veh (s)	42.7	42.8	30.1	28.0	35.0

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0
Total Del/Veh (s)	7.1	3.7	6.8	10.2	5.6

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.6	0.1
Total Del/Veh (s)	9.0	8.7	12.0	9.3

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.0
Total Del/Veh (s)	3.8	2.3	45.3	3.6	3.2

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.5	3.5	2.6

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	2.8	2.4	0.8
Total Del/Veh (s)	13.3	21.3	30.2	19.2	19.4

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.2	1.0	1.2	0.9
Total Del/Veh (s)	35.9	41.6	30.2	23.1	30.5

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	49.4

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	500.6	0.0	1.5	382.6	271.1
Total Del/Veh (s)	284.8	46.2	41.5	197.8	153.0

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.8	0.0	119.6	530.1	38.9
Total Del/Veh (s)	44.3	2.4	295.9	270.1	41.2

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	3.9	0.1	1.0	1.7
Total Del/Veh (s)	37.0	10.2	42.0	22.7

4: Country Way & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	26.8	0.0	25.0	0.1	12.5
Total Del/Veh (s)	93.2	3.3	272.8	20.2	50.8

5: Country Way N & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1
Total Del/Veh (s)	220.2	4.7	146.9	97.8

6: Whitefish Stage Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	38.5	21.9	913.3	0.4	212.6
Total Del/Veh (s)	124.7	396.6	465.2	38.8	262.5

7: LaSalle US 2 & W Reserve Dr/Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	485.8	887.7	0.5	360.1
Total Del/Veh (s)	76.1	307.1	278.4	43.0	139.7

Total Network Performance

Denied Del/Veh (s)	387.2
Total Del/Veh (s)	306.1

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	32.5	0.0	291.0	405.7	225.8
Total Del/Veh (s)	230.9	48.5	167.1	190.2	163.8

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.5	0.0	819.7	1089.9	178.4
Total Del/Veh (s)	29.6	3.3	383.2	375.5	46.5

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	7.6	7.3	312.6	64.3
Total Del/Veh (s)	52.7	69.6	340.8	105.0

4: Country Way & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	110.3	42.1	55.0	0.1	73.2
Total Del/Veh (s)	108.4	55.0	1068.7	300.6	87.0

5: Country Way N & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	26.3	0.0	0.1	11.3
Total Del/Veh (s)	253.7	5.5	1255.8	117.9

6: Whitefish Stage Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	140.4	23.1	1103.8	0.5	267.0
Total Del/Veh (s)	130.8	271.5	628.9	65.3	221.4

7: LaSalle US 2 & W Reserve Dr/Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	40.3	906.7	366.7	466.9
Total Del/Veh (s)	44.7	187.0	226.9	232.3	181.4

Total Network Performance

Denied Del/Veh (s)	444.0
Total Del/Veh (s)	317.2

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	13.5	0.0	1.4	1.7	4.5
Total Del/Veh (s)	111.0	45.8	36.4	42.0	61.3

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	43.1	565.3	32.4
Total Del/Veh (s)	15.3	3.2	240.1	280.7	26.2

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.4	1.0	0.3
Total Del/Veh (s)	7.2	18.6	33.7	14.7

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	323.8	0.1	7.1
Total Del/Veh (s)	7.0	5.3	818.3	61.6	20.8

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1
Total Del/Veh (s)	4.5	6.2	75.3	5.6

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	17.8	211.2	2.4	43.2
Total Del/Veh (s)	25.1	295.5	315.8	79.9	178.9

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	2.3	1.1	1.4	1.1
Total Del/Veh (s)	47.6	97.0	37.0	44.1	50.1

Total Network Performance

Denied Del/Veh (s)	32.3
Total Del/Veh (s)	150.0

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.1	0.0	15.5	6.8	7.2
Total Del/Veh (s)	55.7	52.1	106.6	77.4	77.3

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	765.1	946.1	147.4
Total Del/Veh (s)	8.3	3.6	313.2	279.4	37.1

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	8.2	1.0	4.2
Total Del/Veh (s)	11.6	85.8	96.3	62.9

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	140.6	228.8	0.1	74.6
Total Del/Veh (s)	10.7	116.6	2142.3	1184.6	76.6

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.6	0.4
Total Del/Veh (s)	8.5	25.2	17.5

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	9.0	37.3	456.7	2.5	90.4
Total Del/Veh (s)	49.4	400.1	442.0	49.8	219.6

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	28.1	1.1	1.3	3.6
Total Del/Veh (s)	57.0	205.1	63.0	55.6	72.6

Total Network Performance

Denied Del/Veh (s)	90.8
Total Del/Veh (s)	196.9

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.4	1.8	0.8
Total Del/Veh (s)	48.7	50.0	32.1	37.7	43.1

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.0
Total Del/Veh (s)	10.3	3.8	14.8	15.9	7.4

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.0	0.1
Total Del/Veh (s)	6.5	5.8	13.0	6.4

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.1	0.0
Total Del/Veh (s)	4.2	2.6	101.4	12.4	5.2

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	2.1	4.3	14.5	3.4

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.9	2.4	0.8
Total Del/Veh (s)	14.5	27.0	70.1	25.3	29.9

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.4	1.1	1.4	1.0
Total Del/Veh (s)	35.5	80.8	39.2	32.3	41.7

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	67.9

1: US 93 & US 93 ALT/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.4	1.9	0.9
Total Del/Veh (s)	63.8	65.4	53.4	40.0	54.7

2: Home Depot/Town Pump & W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.4	0.1
Total Del/Veh (s)	10.8	5.2	12.2	25.8	9.2

3: Hutton Ranch Rd & W Reserve Dr Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.1
Total Del/Veh (s)	9.1	16.0	25.3	15.3

4: Country Way & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	4.4	3.4	119.1	22.7	4.6

5: Country Way N & Reserve Dr/W Reserve Dr Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.8	4.6	3.4

6: Whitefish Stage Rd & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	2.7	2.4	0.8
Total Del/Veh (s)	22.4	33.3	41.0	36.8	31.0

7: LaSalle US 2 & Reserve Dr Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.2	1.1	1.3	0.9
Total Del/Veh (s)	48.2	82.4	42.8	34.1	45.1

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	74.4

MOVEMENT SUMMARY

Site: 101 [AM 2020 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	250	2.0	0.294	7.5	LOS A	1.3	32.2	0.58	0.56	24.2
8	T1	71	11.0	0.115	5.8	LOS A	0.4	11.0	0.51	0.45	23.5
18	R2	22	0.0	0.115	5.3	LOS A	0.4	11.0	0.51	0.45	24.1
Approach		342	3.7	0.294	7.0	LOS A	1.3	32.2	0.56	0.53	24.1
East: W Reserve Dr WB											
1	L2	38	0.0	0.385	7.8	LOS A	1.8	47.8	0.54	0.47	35.2
6	T1	668	5.0	0.385	8.0	LOS A	1.8	47.8	0.54	0.47	34.8
16	R2	38	6.0	0.385	8.0	LOS A	1.8	47.7	0.54	0.47	33.6
Approach		745	4.8	0.385	8.0	LOS A	1.8	47.8	0.54	0.47	34.7
North: Whitefish Stage Rd SB											
7	L2	25	22.0	0.054	8.4	LOS A	0.2	4.5	0.61	0.61	31.6
4	T1	101	3.0	0.379	12.2	LOS B	1.7	43.2	0.71	0.77	32.7
14	R2	111	2.0	0.379	12.1	LOS B	1.7	43.2	0.71	0.77	31.5
Approach		237	4.6	0.379	11.8	LOS B	1.7	43.2	0.70	0.76	32.0
West: W Reserve Dr EB											
5	L2	33	10.0	0.289	6.0	LOS A	1.4	35.3	0.35	0.23	36.1
2	T1	451	5.0	0.289	5.8	LOS A	1.4	35.5	0.35	0.23	35.8
12	R2	185	4.0	0.289	5.8	LOS A	1.4	35.5	0.35	0.23	34.5
Approach		668	5.0	0.289	5.8	LOS A	1.4	35.5	0.35	0.23	35.5
All Vehicles		1993	4.6	0.385	7.5	LOS A	1.8	47.8	0.50	0.43	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM 2020 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	239	1.0	0.335	9.2	LOS A	1.5	37.4	0.66	0.69	23.8
8	T1	82	1.0	0.144	6.6	LOS A	0.5	13.7	0.59	0.59	23.3
18	R2	22	0.0	0.144	6.6	LOS A	0.5	13.7	0.59	0.59	23.8
Approach		342	0.9	0.335	8.4	LOS A	1.5	37.4	0.64	0.66	23.7
East: W Reserve Dr WB											
1	L2	43	0.0	0.374	7.8	LOS A	1.8	46.0	0.57	0.51	35.2
6	T1	652	1.0	0.374	7.8	LOS A	1.8	46.0	0.57	0.51	34.9
16	R2	27	0.0	0.374	7.8	LOS A	1.8	46.0	0.57	0.51	33.8
Approach		723	0.9	0.374	7.8	LOS A	1.8	46.0	0.57	0.51	34.9
North: Whitefish Stage Rd SB											
7	L2	45	4.0	0.079	7.1	LOS A	0.3	6.9	0.61	0.61	32.5
4	T1	126	3.0	0.445	13.2	LOS B	2.3	57.4	0.73	0.82	32.3
14	R2	136	1.0	0.445	13.1	LOS B	2.3	57.4	0.73	0.82	31.1
Approach		308	2.3	0.445	12.2	LOS B	2.3	57.4	0.71	0.79	31.8
West: W Reserve Dr EB											
5	L2	87	1.0	0.357	6.6	LOS A	1.9	47.0	0.43	0.31	35.5
2	T1	603	1.0	0.357	6.6	LOS A	1.9	47.1	0.43	0.31	35.3
12	R2	130	0.0	0.357	6.6	LOS A	1.9	47.1	0.43	0.31	34.2
Approach		821	0.8	0.357	6.6	LOS A	1.9	47.1	0.43	0.31	35.1
All Vehicles		2194	1.1	0.445	8.1	LOS A	2.3	57.4	0.55	0.50	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM 2030 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	315	2.0	0.422	10.4	LOS B	2.3	57.5	0.68	0.78	23.5
8	T1	87	11.0	0.162	7.0	LOS A	0.6	15.5	0.57	0.56	23.2
18	R2	27	0.0	0.162	6.5	LOS A	0.6	15.5	0.57	0.56	23.8
Approach		429	3.7	0.422	9.5	LOS A	2.3	57.5	0.65	0.72	23.5
East: W Reserve Dr WB											
1	L2	49	0.0	0.534	11.1	LOS B	4.0	103.4	0.67	0.77	33.5
6	T1	848	5.0	0.534	11.3	LOS B	4.0	103.4	0.67	0.77	33.1
16	R2	49	6.0	0.534	11.3	LOS B	4.0	103.2	0.67	0.77	32.0
Approach		946	4.8	0.534	11.3	LOS B	4.0	103.4	0.67	0.77	33.1
North: Whitefish Stage Rd SB											
7	L2	30	22.0	0.082	11.0	LOS B	0.2	6.7	0.70	0.70	30.5
4	T1	126	3.0	0.608	23.2	LOS C	3.4	85.4	0.84	1.02	28.3
14	R2	141	2.0	0.608	23.1	LOS C	3.4	85.4	0.84	1.02	27.4
Approach		298	4.5	0.608	21.9	LOS C	3.4	85.4	0.83	0.99	28.1
West: W Reserve Dr EB											
5	L2	43	10.0	0.382	7.3	LOS A	1.9	50.5	0.43	0.31	35.3
2	T1	571	5.0	0.382	7.1	LOS A	2.0	50.9	0.43	0.31	35.1
12	R2	234	4.0	0.382	7.1	LOS A	2.0	50.9	0.43	0.31	33.8
Approach		848	5.0	0.382	7.1	LOS A	2.0	50.9	0.43	0.31	34.8
All Vehicles		2521	4.6	0.608	10.8	LOS B	4.0	103.4	0.61	0.63	30.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM 2030 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	304	1.0	0.510	14.7	LOS B	2.9	73.0	0.76	0.94	22.6
8	T1	103	1.0	0.218	8.8	LOS A	0.8	20.7	0.65	0.65	22.8
18	R2	27	0.0	0.218	8.7	LOS A	0.8	20.7	0.65	0.65	23.3
Approach		435	0.9	0.510	12.9	LOS B	2.9	73.0	0.72	0.85	22.7
East: W Reserve Dr WB											
1	L2	54	0.0	0.522	11.1	LOS B	3.8	96.6	0.69	0.81	33.5
6	T1	826	1.0	0.522	11.1	LOS B	3.8	96.6	0.69	0.81	33.2
16	R2	33	0.0	0.522	11.1	LOS B	3.8	96.5	0.69	0.81	32.2
Approach		913	0.9	0.522	11.1	LOS B	3.8	96.6	0.69	0.81	33.2
North: Whitefish Stage Rd SB											
7	L2	56	4.0	0.121	9.5	LOS A	0.4	10.4	0.69	0.69	31.5
4	T1	162	3.0	0.711	28.0	LOS D	4.8	122.5	0.87	1.13	26.7
14	R2	172	1.0	0.711	27.9	LOS D	4.8	122.5	0.87	1.13	25.9
Approach		389	2.3	0.711	25.3	LOS D	4.8	122.5	0.84	1.07	26.9
West: W Reserve Dr EB											
5	L2	109	1.0	0.475	8.6	LOS A	2.8	69.8	0.55	0.44	34.4
2	T1	766	1.0	0.475	8.6	LOS A	2.8	69.9	0.55	0.44	34.2
12	R2	163	0.0	0.475	8.6	LOS A	2.8	69.9	0.55	0.44	33.3
Approach		1038	0.8	0.475	8.6	LOS A	2.8	69.9	0.55	0.44	34.1
All Vehicles		2775	1.1	0.711	12.5	LOS B	4.8	122.5	0.66	0.71	30.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM 2040 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	402	2.0	0.633	18.1	LOS C	4.6	117.9	0.80	1.11	21.9
8	T1	114	11.0	0.246	9.4	LOS A	0.9	23.5	0.64	0.64	22.7
18	R2	33	0.0	0.246	8.7	LOS A	0.9	23.5	0.64	0.64	23.2
Approach		549	3.8	0.633	15.7	LOS C	4.6	117.9	0.76	0.98	22.1
East: W Reserve Dr WB											
1	L2	60	0.0	0.760	21.1	LOS C	9.5	246.5	0.86	1.23	29.3
6	T1	1076	5.0	0.760	21.3	LOS C	9.5	246.5	0.86	1.23	29.0
16	R2	60	6.0	0.760	21.4	LOS C	9.5	246.2	0.86	1.23	28.1
Approach		1196	4.8	0.760	21.3	LOS C	9.5	246.5	0.86	1.23	29.0
North: Whitefish Stage Rd SB											
7	L2	40	22.0	0.149	16.3	LOS C	0.4	11.7	0.79	0.79	28.6
4	T1	162	3.0	1.047	100.1	LOS F	15.5	395.3	1.00	2.00	14.5
14	R2	177	2.0	1.047	99.9	LOS F	15.5	395.3	1.00	2.00	14.2
Approach		379	4.6	1.047	91.1	LOS F	15.5	395.3	0.98	1.87	15.2
West: W Reserve Dr EB											
5	L2	54	10.0	0.506	9.5	LOS A	2.9	74.8	0.55	0.43	34.2
2	T1	717	5.0	0.506	9.4	LOS A	2.9	75.4	0.55	0.43	34.0
12	R2	299	4.0	0.506	9.3	LOS A	2.9	75.4	0.55	0.44	32.8
Approach		1071	5.0	0.506	9.4	LOS A	2.9	75.4	0.55	0.44	33.6
All Vehicles		3194	4.7	1.047	24.6	LOS C	15.5	395.3	0.75	1.00	26.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM 2040 Whitefish Stage Rd Two-Lane Roundabout]

W Reserve Dr & Whitefish Stage Rd
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Whitefish Stage Rd NB											
3	L2	386	1.0	0.813	37.0	LOS E	7.0	176.8	0.91	1.48	18.7
8	T1	130	1.0	0.343	13.2	LOS B	1.4	35.5	0.75	0.82	21.9
18	R2	33	0.0	0.343	13.1	LOS B	1.4	35.5	0.75	0.82	22.3
Approach		549	0.9	0.813	29.9	LOS D	7.0	176.8	0.86	1.29	19.5
East: W Reserve Dr WB											
1	L2	71	0.0	0.757	21.4	LOS C	9.0	226.9	0.88	1.23	29.2
6	T1	1049	1.0	0.757	21.5	LOS C	9.0	226.9	0.88	1.23	28.9
16	R2	43	0.0	0.757	21.4	LOS C	9.0	226.9	0.88	1.23	28.1
Approach		1163	0.9	0.757	21.5	LOS C	9.0	226.9	0.88	1.23	28.9
North: Whitefish Stage Rd SB											
7	L2	71	4.0	0.206	14.3	LOS B	0.7	17.3	0.79	0.79	29.7
4	T1	202	3.0	1.200	147.6	LOS F	30.9	784.4	1.00	2.72	11.1
14	R2	217	1.0	1.200	147.4	LOS F	30.9	784.4	1.00	2.72	11.0
Approach		490	2.3	1.200	128.2	LOS F	30.9	784.4	0.97	2.44	12.2
West: W Reserve Dr EB											
5	L2	141	1.0	0.627	12.1	LOS B	7.1	179.3	0.69	0.75	32.7
2	T1	967	1.0	0.627	12.1	LOS B	7.1	179.6	0.69	0.75	32.6
12	R2	212	0.0	0.627	12.1	LOS B	7.1	179.6	0.70	0.75	31.7
Approach		1321	0.8	0.627	12.1	LOS B	7.1	179.6	0.70	0.75	32.4
All Vehicles		3523	1.1	1.200	34.1	LOS D	30.9	784.4	0.82	1.23	23.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.