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IMPROVEMENT OPTIONS



Prepared for:



Prepared by:



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ATTACHMENTS

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1.0 INTRODUCTION

The Montana Department of Transportation (MDT) initiated a corridor study of Montana Highway 3 (MT 3) in Billings, between the highway's intersection with Apache Trail and the East (E.) Airport Road/North (N.) 27th Street intersection. The study's purpose is to develop a comprehensive long-range plan for managing the corridor and determine what could 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 constraints, financial feasibility, constructability, and corridor context.

The intent of the *Improvement Options Report* is to identify and evaluate options for improving MT 3. Potential improvement options are intended to address issues or areas of concern defined in the *Existing and Projected Conditions Report* prepared for the study corridor. Recommended improvement options described in this report reflect input from stakeholders and the public as well as a thorough evaluation of the existing conditions within the MT 3 Billings study corridor.

1.1 Study Corridor Area

The MT 3 Billings study corridor area is in the northwest part of Billings, within Yellowstone County, Montana. The study corridor includes 5.1 miles of MT 3 between the intersection with Apache Trail (Reference Post [RP] 8.1) and the intersection with E. Airport Road and N. 27th Street (RP 3.0). The study corridor area includes a 0.25-mile buffer from the centerline of the roadway, except in portions south of the road where the Rimrocks mark the boundary. Figure 1 depicts the study corridor area and the system designation for roads in the area.

Highway system designation is established based on the functional classification of the route; the system designation is important as it affects methods and sources of funding for roadway improvements. MT 3 is designated as a national highway system (NHS) non-interstate route and connects Billings to Great Falls. Zimmerman Trail and E. Airport Road are designated as urban routes.



Roundabout at Intersection of MT 3 with E. Airport Road and N. 27th Street

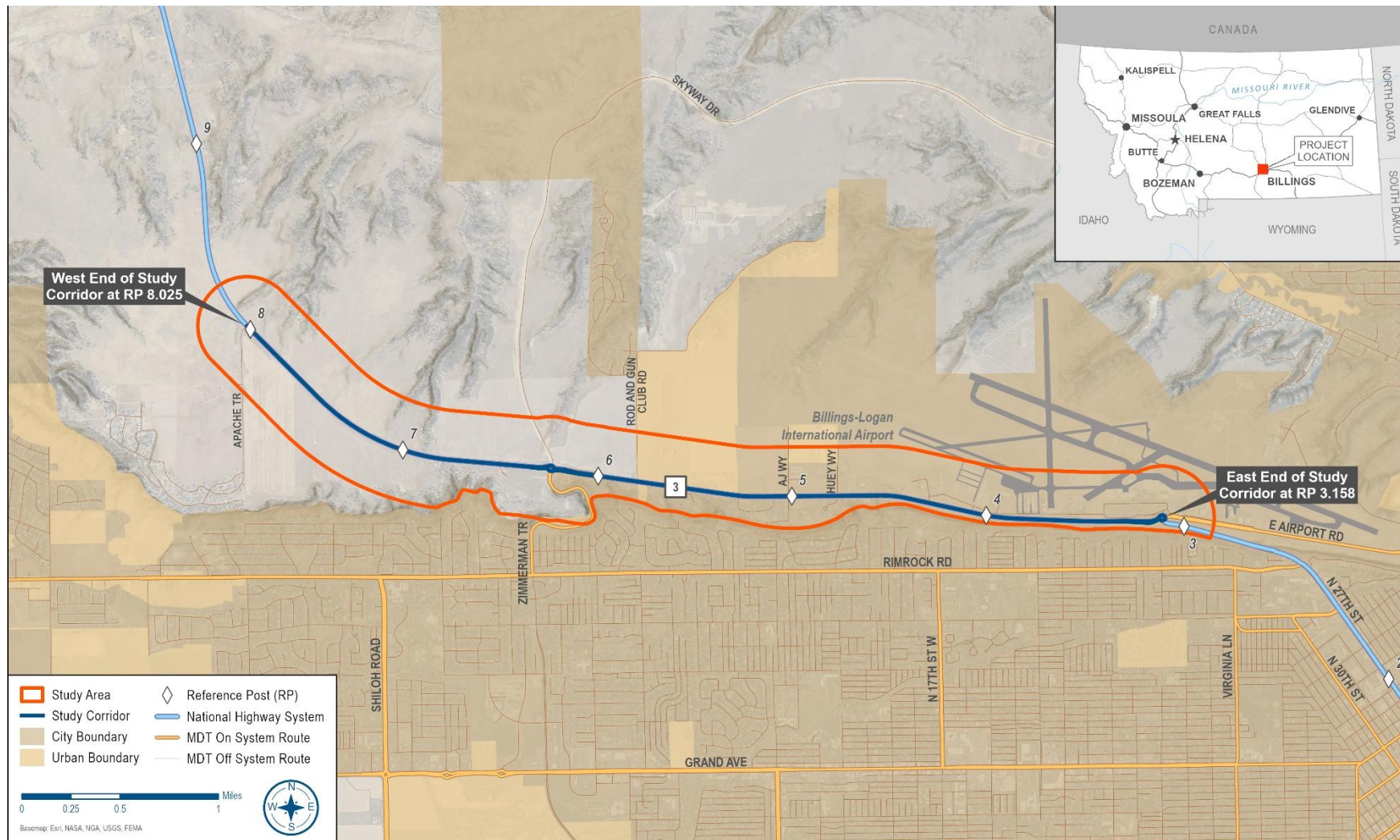


Figure 1: Study Corridor Area and System Designation

1.2 Needs and Objectives

Needs and objectives for the MT 3 corridor planning study were developed based on the social, environmental, and engineering conditions described in the *Existing and Projected Conditions Report*; input from the public, key stakeholders, and resource agencies; review of local plans; and coordination with the technical oversight committee. Improvement options identified in this report address the needs and objectives to the extent feasible within the other limiting considerations listed below. 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 fatalities and serious injuries in support of Vision Zero.
- Reduce vehicle conflicts.
- Improve safety at non-motorized crossings.

Need 2: Improve the Corridor Transportation Operations

- Accommodate existing and future travel demand.
- Improve intersection operations and level of service.
- Improve non-motorized mobility and accessibility.
- Maintain reasonable access to adjacent businesses and residences.

Other Considerations

- Impacts to environmental resources
- Drainage impacts and Storm Water Management Program requirements
- Constructability and related impacts
- Public and private utilities
- Funding availability
- Maintenance operations, responsibility, and cost
- Consistency with local plans and developments

1.3 Related Projects and Planned Developments

There is one committed and one proposed pedestrian/bicycle project in the study corridor area:

- The **Stagecoach Trail** project is active/committed and will provide an 8-foot-wide pedestrian and bicycle path on the east side of Zimmerman Trail, from Rimrock Road to MT 3. This project is currently in design and construction is planned for 2028. This connection is part of the Marathon Loop, a 26-mile multi-use paved path around Billings.
- The **Yellowjacket Trail** proposed project will provide a pedestrian and bicycle path along N. 27th Street, from the E. Airport Road roundabout to Rimrock Road. Billings TrailNet is conducting a high-level feasibility study to identify the recommended configuration for this non-motorized connection.¹

The developments listed below are planned in the study corridor area on AJ Way and Huey Way. Intersection improvement options to accommodate development traffic are detailed in this report.

- The **Billings Readiness and Innovation Campus²** (BRIC) is a planned development located on the north side of MT 3 off AJ Way. The campus will consist of training and aviation support facilities for the Montana Army National Guard. The campus will be built-out in several phases, with opening year in 2026 and full build expected in 2040. The BRIC will accommodate drill weekend trainings, which will occur seven to 12 weekends per year. At full build in 2040, up to 880 personnel are anticipated at the BRIC during drill weekends. The traffic impact analysis for the BRIC recommends a roundabout at the MT 3 and AJ Way intersection to accommodate full build development traffic volumes.
- The **Yellowstone Landing Commercial Park³** (YLCP) development is planned on the north side of MT 3 with access provided via the AJ Way and Huey Way intersections. The development will consist of nine lots with commercial and light industrial land uses; full build-out is expected by 2029 (pending the timeframe for intersection improvements at AJ Way).
- The **Billings Logan International Airport Draft Master Plan⁴** shows that development is expected at the airport including terminal expansion, an additional runway and taxiway, a new parking garage and shuttle lot, and additional general aviation hangars. Although still in the planning stage, these developments are expected to impact traffic at the Southview Drive, Overlook Drive, and Huey Way intersections.

2.0 IMPROVEMENT OPTIONS

Improvement options were developed to address the needs and objectives identified for MT 3 within the study corridor area. 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 Partners and Potential Funding Sources: Successful implementation of improvements may require cooperation and effort from multiple entities. The lead agencies 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 MT 3 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. Funding has not been identified to complete the recommended improvement options described in this report. However, the identified improvement options may qualify for funding through the programs listed below.

- National Highway Performance Program (NH, Non-Interstate)
- Surface Transportation Program Primary (STPP)
- Highway Safety Improvement Program (HSIP)
- Montana Air and Congestion Program (MACI)
- Private funding, grant funding, or other partnerships

Implementation Timeframe: An implementation timeline was identified in this report for each improvement option based on minimum level of service (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 2030)
- Mid-term: within 5 to 10 years (by 2035)
- Long-term: within 10 to 20 years (by 2045)

Cost Estimates: Planning-level cost estimates were developed for each improvement option using average bid prices from MDT's AASHTOWare Project Estimation software. MDT Cost Estimation Procedures⁵ were followed for estimating costs related to preliminary engineering, construction engineering, traffic control, mobilization, contingency/miscellaneous items, indirect costs, ROW, incidental construction/utility relocation, and inflation. The cost estimates are provided in **Attachment 1**. Each cost estimate represents cost during the construction year and represents that improvement option alone (i.e., cost estimate is independent of other improvement options). Present value (2025) 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 Systems Impact Action Process (SIAP) 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 improvement options 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 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 Quality (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) Section 106 Coordination/Consultation	Historic/Cultural Resources
Yellowstone County, City of Billings	• Local Planning Documents • Yellowstone County Floodplain Regulations	All Resources

2.1 Intersection Improvement Options

Improvement options in this section address operations, capacity, and safety concerns at intersections. AM and PM peak hour level of service (LOS) calculations were performed using SYNCHRO 12 traffic analysis software and the Highway Capacity Manual (HCM) 7th Edition methodology. Roundabouts were also analyzed in SIDRA version 9, as SYNCHRO is limited in its ability to model complex lane geometry at roundabouts. A saturation flow rate of 1,750 vehicles per hour per lane was used at all intersections (base saturation flow rate used for communities with a population under 250,000).⁶

LOS describes the quality of traffic operations and is a letter grade based on average control delay. LOS defines how well vehicle traffic flows along a street or road. LOS is graded from A to F, with LOS A representing free-flow conditions and LOS F representing severe congestion with stop-and-go flow conditions. Given the principal arterial classification and roadway context, the design year intersection LOS threshold is LOS D or better. The traffic analysis reports are provided in **Attachment 2**. Table 2 lists the delay threshold for roundabouts and two-way stop controlled (TWSC) intersections.

Table 2: LOS Criteria for Roundabouts and TWSC Intersections

LOS	Average Control Delay (Seconds / Vehicle)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Additional analysis was completed for roundabout lane configurations using the *National Cooperative Highway Research Program (NCHRP) Report 1043: Guide for Roundabouts*.⁷ This report cites that one entry lane may be sufficient if the sum of the entry volume and conflicting circulating volume is between 901 and 1,300 vehicles per hour and a two-lane entry is likely sufficient if the sum of these two volumes is between 1,301 and 1,600 vehicles per hour.

S1. Zimmerman Trail Intersection

The MT 3 and Zimmerman Trail roundabout provides access to the Heights neighborhood via Skyway Drive and access to west Billings via Zimmerman Trail. Residential areas exist south of the roundabout. The Stagecoach Trail project will provide a shared use path along the east side of Zimmerman Trail. The intersection currently operates at LOS A in the AM and PM peak hours. The intersection is forecasted to operate at LOS F in 2045. The delay during the AM peak hour is highest on the eastbound approach, while the PM peak hour delay is highest on the westbound approach.

Figure 2 depicts the existing and forecasted 2045 turning movements in the AM and PM peak hours. The *Existing and Projected Conditions Report* documents the assumptions for projecting future 2045 traffic volumes at study intersections.

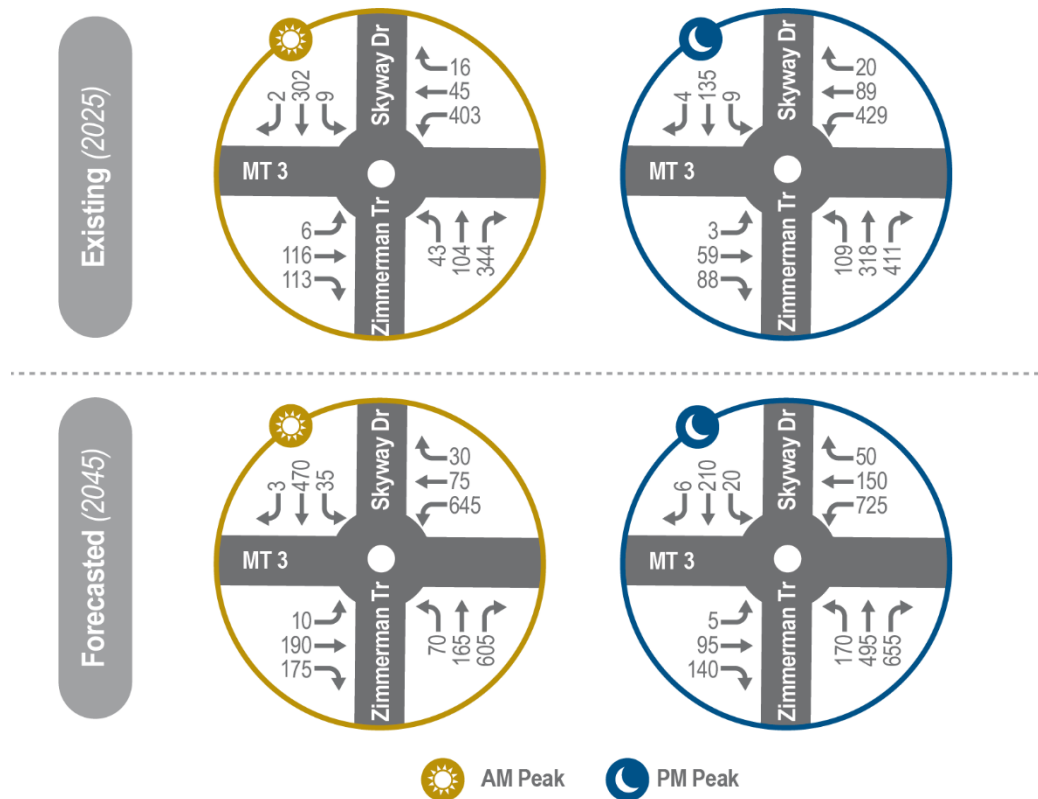


Figure 2: Zimmerman Trail Existing and Forecasted Volumes

Figure 3 depicts the existing intersection laneage, along with proposed laneage (of note, figures are conceptual, not-to-scale, and do not show roundabout geometry or splitter islands). The following improvements and timelines are recommended to improve traffic operations:

- Long-Term (by 2045): The recommended full-build configuration provides a two-lane approach on each leg of the roundabout with a single exit lane. The two-lane entry threshold is met for all approaches. Of note, this option is expected to operate at LOS E in the PM peak hour in 2045 due to the high westbound left-turn movement.

An alternative intersection configuration was considered which provided dual westbound left-turn lanes with a lane drop occurring 500 feet south of the intersection. However, this alternative was not proposed due to concerns regarding lane utilization and the feasibility of widening the south leg of the intersection.

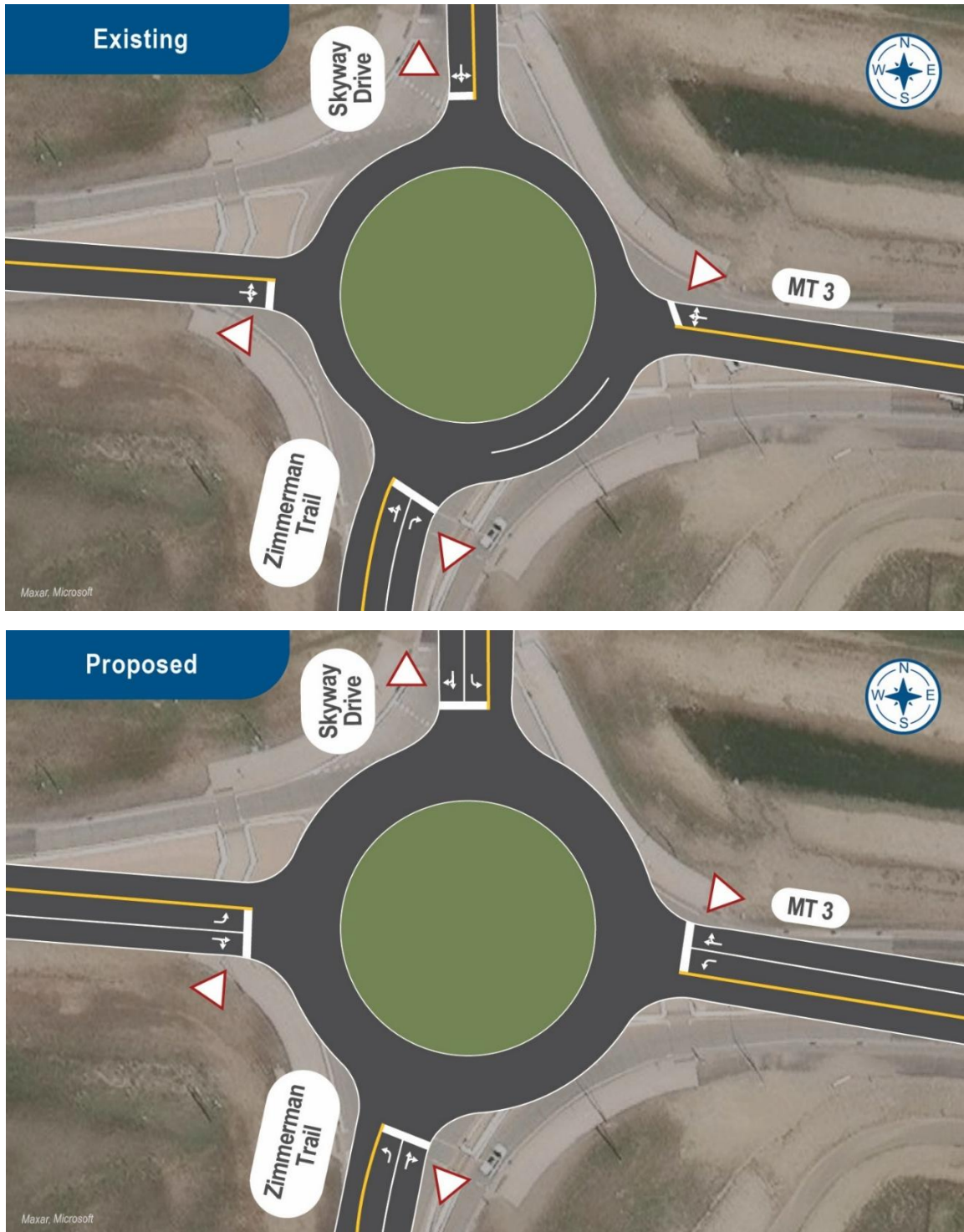


Figure 3: Zimmerman Trail Intersection Improvements

Table 3 summarizes the intersection delay (seconds per vehicle [sec/veh]) with the existing and proposed options. The two-lane approach roundabout is expected to operate at LOS E or better in the AM and PM peak hours in 2045. The highest delay expected in 2045 is for the heavy westbound left-turn movement (725 vehicles) in the PM peak hour. Roundabout metering could be considered to further improve traffic operations at the Zimmerman Trail roundabout in 2045.

Table 3: Zimmerman Trail LOS and Delay (sec/veh)

Scenario	Description	2024		2035		2045	
		AM	PM	AM	PM	AM	PM
Existing	Single-Lane Roundabout with Northbound Right	A/9	A/9	C/15	E/37	E/46	F/100
Proposed	Two-Lane Approach Roundabout	A/7	A/8	B/12	C/15	C/22	E/42

A sensitivity analysis was conducted due to uncertainty related to future traffic volumes on Skyway Drive. The existing traffic volumes on Skyway Drive are close to or exceed 5,000 vpd and the *Inner Belt Loop Corridor Study*⁸ projected 10,000 vpd on Skyway Drive in 2040 (4.6% annual traffic growth), or 13,000 vpd with an aggressive growth scenario (6.7% annual traffic growth), therefore a significant amount of growth is expected over the next 15 years. The proposed laneage would likely accommodate additional traffic expected on Skyway Drive. However, it is recommended that roundabout laneage be re-evaluated to better understand traffic patterns as development occurs on Skyway Drive.

Zimmerman Trail is expected to operate near capacity in 2045. Of note, the Molt Road/Highway 3 Connector would improve connectivity between the west end of Billings and the airport/downtown area and is expected to relieve traffic demand on Zimmerman Trail. The *Billings Long Range Transportation Plan*⁹ includes a recommendation to update the Molt Road/Highway 3 feasibility study from 2004.¹⁰

Recommendation: Provide a two-lane approach roundabout at MT 3 and Zimmerman Trail in the long-term (within 20 years).

Key Considerations:

- MT 3 / Zimmerman pedestrian and bicycle underpass (see **M1**) would be completed as part of this modification.
- Drainage modifications are required due to the change in the roundabout footprint. The detention pond in the northeast quadrant may be impacted due to the increased size of the roundabout.
- Access to Zimmerman Park west of this intersection may be impacted by construction-related activities.
- Private utilities are in the area and could include power, gas, and communications lines.
- Permits may be needed for impacts related to farmland conversion.
- ROW acquisition is expected to impact one parcel.

Implementation Partners:

MDT

Implementation Timeframe / Estimated Cost:

Long-term: \$18.7 M

Potential Funding Sources: NH, STPP, HSIP, MACI

S2. Rod and Gun Club Road Intersection

Rod and Gun Club Road is a TWSC intersection located 0.43 miles east of Zimmerman Trail. Exclusive eastbound left- and westbound right-turn lanes are provided at the intersection in the existing condition. The north leg provides access to the Rod and Gun Club and Rehberg Ranch Subdivision, while the south leg is a private residential driveway. Turning movements onto MT 3 are significantly higher in the AM peak hour, while turning movements onto Rod and Gun Club Road are significantly higher in the PM peak hour. The intersection currently operates at LOS D during the PM peak hour and is forecasted to fail in 2035 and 2045 peak hours. The delay during the AM and PM peak hours is highest on the southbound approach. Figure 4 depicts the existing and forecasted 2045 turning movements in the AM and PM peak hours.

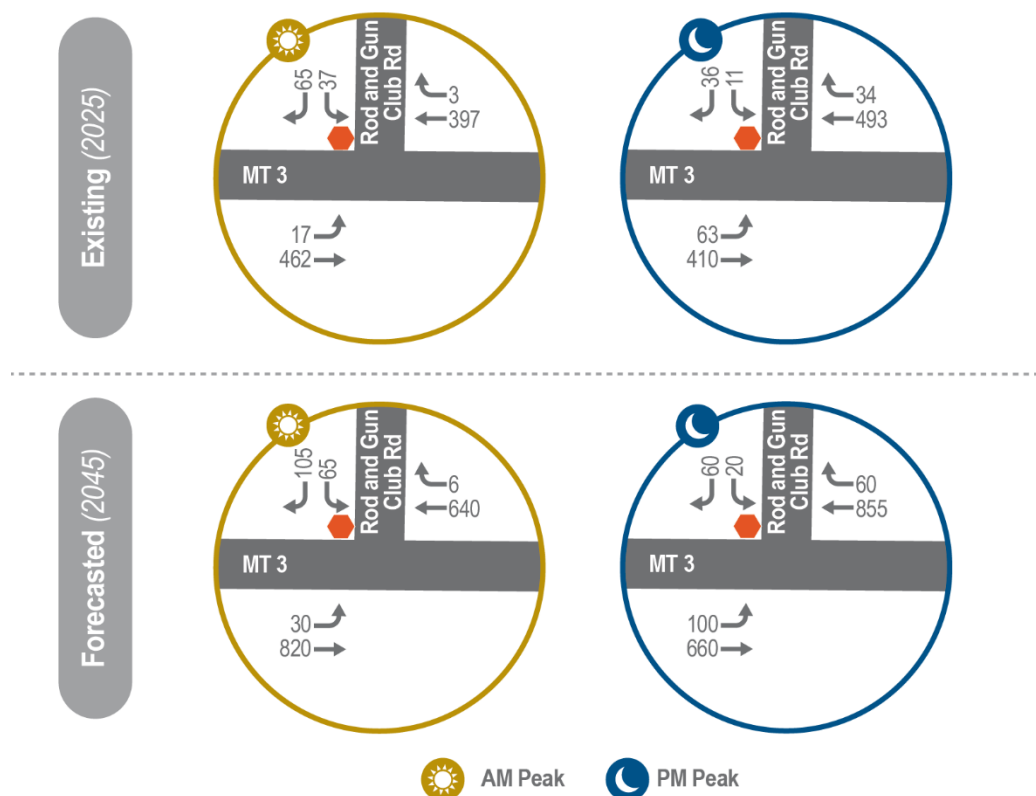


Figure 4: Rod and Gun Club Road Existing and Forecasted Traffic Volumes

Figure 5 depicts the existing and proposed intersection laneage. The following improvements are recommended to meet LOS D or better:

- **Mid- to Long-Term (by 2045):** As side street and mainline volumes increase, it is recommended that a single lane roundabout be installed. This intersection improvement option reduces delay for vehicles on the side-street approach and enhances intersection safety. Based on the sum of the entry and conflicting circulating volumes, one entry lane is expected to be sufficient on all roundabout approaches.

Two driveways exist on the south leg of the intersection with 65-foot spacing; it is recommended that these closely spaced driveways be consolidated with the intersection improvement.

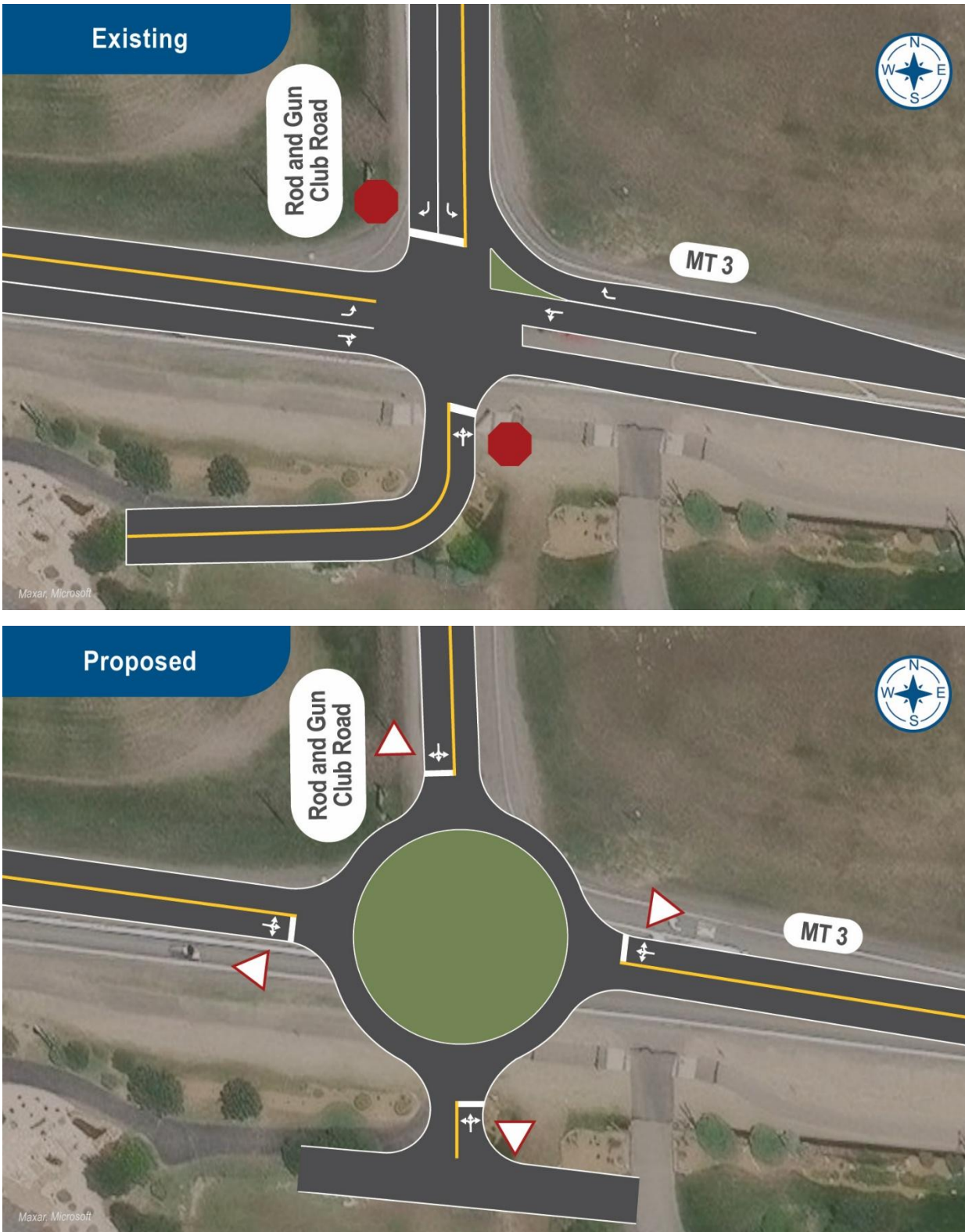


Figure 5: Rod and Gun Club Road Intersection Improvements

Table 4 summarizes the delay with the existing and proposed options. A single-lane roundabout is expected to operate at LOS B in 2045 AM and PM peak hours.

Table 4: Rod and Gun Club Road LOS and Delay (sec/veh)

Scenario	Description	2024		2035		2045	
		AM	PM	AM	PM	AM	PM
Existing	TWSC	D/26	D/31	F/56	F/60	F/253	F/201
Proposed	Single-Lane Roundabout	A/7	A/7	A/9	B/10	B/12	B/15

The peak hour volume signal warrant was analyzed based on projected peak hour traffic volumes at Rod and Gun Club Road. The peak hour volume warrant is only used in special cases, as most signals are warranted based on four to eight hours of data. However, if the peak hour warrant is met for ordinary traffic peaking conditions, it is likely the four-hour and eight-hour warrants are close to being met. Table 5 lists the volume inputs for the AM and PM peak hour signal warrant analysis. The 70% factor was used for the peak hour signal warrant analysis as the posted speed limit is 50 miles per hour (mph) on this section of MT 3. The 2035 and 2045 AM peak hour volumes are expected to exceed the peak hour signal warrant thresholds, indicating that a roundabout is warranted based on expected mainline and side street volumes. The warrant is close to being met with existing peak hour volumes.

Table 5: Peak Hour Signal Warrant Volumes at Rod and Gun Club Road

Year	Peak Period	Major Street Volume – Both Approaches (vph)	Minor Street Volume – Highest Approach (vph)	Meets Peak Hour Warrant
2035	AM	1,230	130	Yes
	PM	1,380	60	No
2045	AM	1,496	170	Yes
	PM	1,675	80	No

Recommendation: Provide a single-lane roundabout at MT 3 and Rod and Gun Club Road in the mid- to long-term (within 20 years).

Key Considerations:

- Shift roundabout north to avoid conflicts with Skyline Trail on the south side.
- Consolidation is required for the two driveways on the south leg of the roundabout.
- Drainage improvements are required due to the increase in impervious areas. These improvements are subject to water quality requirements.
- Impacts to local businesses and residences are anticipated during construction-related activities.
- Public and private utilities are in the area and could include water, sanitary sewer, storm drain, power, gas, and communications lines.
- Permits may be needed for impacts related to farmland conversion.
- ROW acquisition is expected to impact four parcels.

Implementation Partners:
MDT

Implementation Timeframe / Estimated Cost:
Mid- to Long-Term: \$14.5 M

Potential Funding Sources: NH, STPP, HSIP, MACI

S3. AJ Way Intersection

MT 3 and AJ Way is a TWSC intersection approximately 0.75 miles east of Rod and Gun Club Road. The BRIC and YLCP developments are planned on the north leg of the intersection, with AJ Way providing access to/from MT 3. Figure 6 depicts the existing and forecasted 2045 turning movements in the AM and PM peak hours. The intersection currently operates at LOS D in the AM peak hour and is forecasted to fail in the 2035 and 2045 peak hours with the existing TWSC.

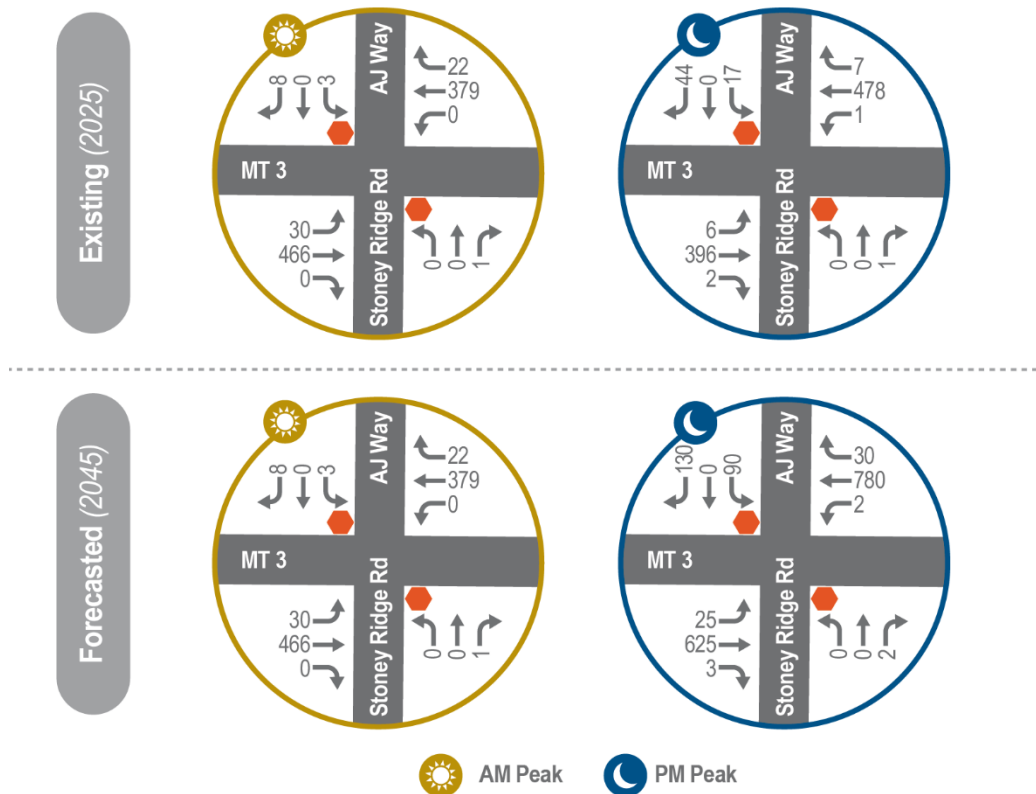


Figure 6: AJ Way Existing and Forecasted Traffic Volumes

The BRIC traffic impact study recommended a new eastbound left-turn lane and a new westbound right-turn lane at this intersection in the interim condition, with a roundabout provided to meet future traffic demand once the BRIC is fully built out. However, it is recommended that the roundabout be implemented first (without providing interim-turn lanes) to avoid constructing improvements that would be replaced soon afterward. Interim condition turn lanes could be reconsidered if development timelines change.

Figure 7 depicts the existing and proposed intersection configuration. The following improvements are recommended to meet LOS D or better:

- Mid-Term (by 2035): The proposed configuration provides a single-lane roundabout at AJ Way. The two-lane entry roundabout threshold is not met for any approach in the peak hour. A westbound right-turn lane is provided to prevent queuing due to traffic volumes associated with ingress during BRIC drill weekend trainings (occurring seven to 12 weekends per year). Without the westbound right-turn lane, the intersection is expected to operate at LOS F (83 seconds of delay) during the drill weekend ingress.

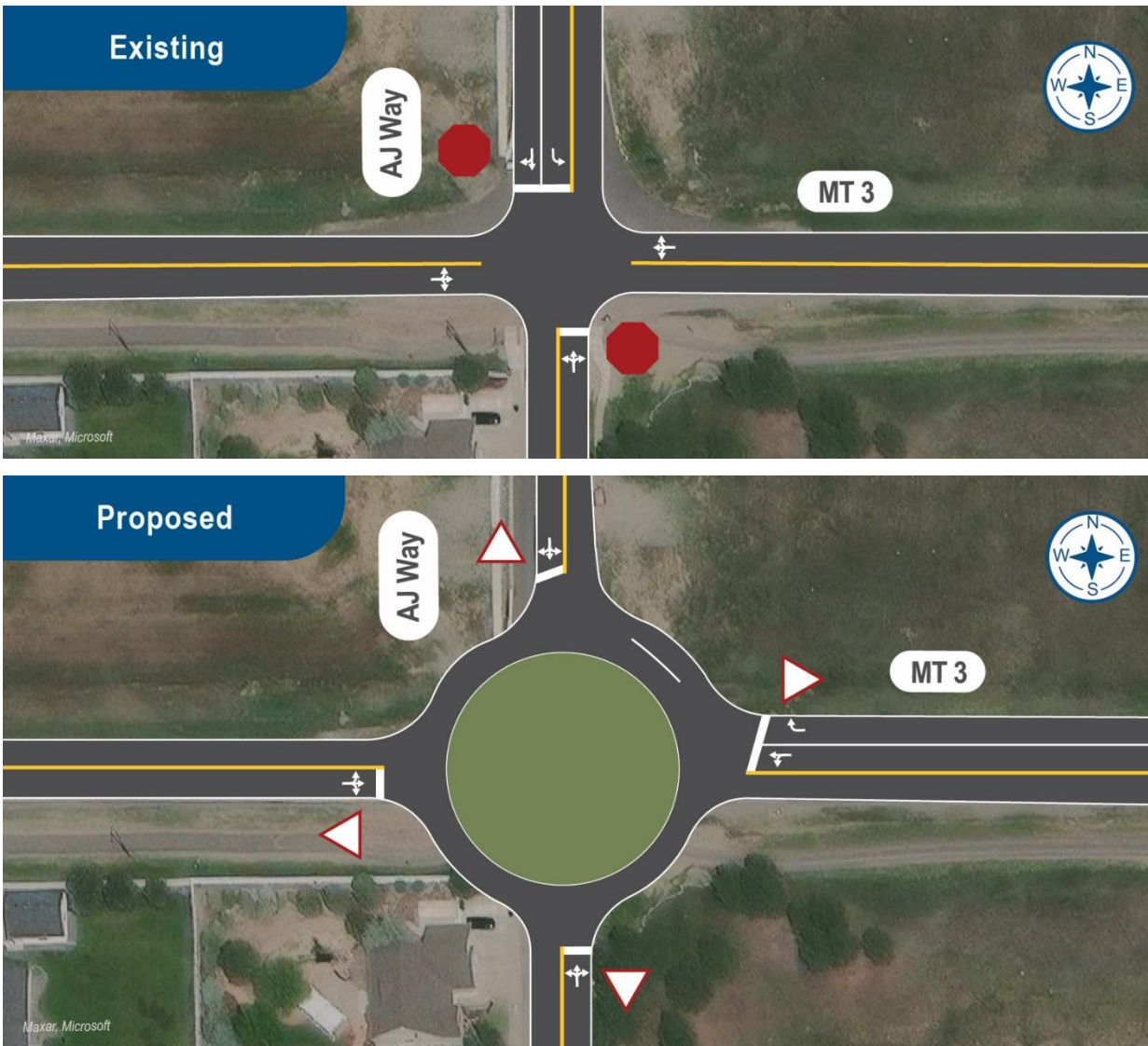


Figure 7: AJ Way Intersection Improvements

Of note, the roundabout is expected to fail on the southbound approach during drill weekend egress. However, it is expected that southbound queuing and delay can be mitigated by adjusting schedules for drill egress or re-routing some traffic to use Huey Way during drill egress. Table 6 summarizes the delay with the existing and proposed options. The roundabout is expected to operate at LOS A in the 2035 peak hours and LOS B in the 2045 peak hours.

Table 6: AJ Way LOS and Delay (sec/veh)

Scenario	Description	2024		2035		2045	
		AM	PM	AM	PM	AM	PM
Existing	TWSC	D/27	C/24	F/85	F/77	F/>300	F/>300
Proposed	Single-Lane Roundabout, with Westbound Right	A/7	A/6	A/9	A/8	B/12	B/11

The peak hour volume signal warrant was analyzed based on projected peak hour traffic volumes at AJ Way. Table 7 lists the volume inputs for the AM and PM peak hour signal warrant analysis, using the 70% factor as the posted speed limit is 50 mph on MT 3. The 2035 and 2045 PM peak hour volumes are expected to exceed the peak hour signal warrant thresholds, indicating that a roundabout is warranted based on expected mainline and side street volumes. The warrant is not met with existing peak hour volumes.

Table 7: Peak Hour Signal Warrant Volumes at AJ Way

Year	Peak Period	Major Street Volume – Both Approaches (vph)	Minor Street Volume – Highest Approach (vph)	Meets Peak Hour Warrant
2035	AM	1,310	55	No
	PM	1,204	195	Yes
2045	AM	1,575	60	No
	PM	1,465	220	Yes

Recommendation: Provide a single-lane roundabout at MT 3 and AJ Way with westbound right-turn lane in the mid-term (within 10 years).

Key Considerations:

- Shift roundabout north to avoid conflicts with Skyline Trail on the south side of MT 3.
- Masterson Circle approach west of AJ Way would require restricted right-in, right-out access due to roundabout approach median.
- Traffic exiting Huey Way could also use the AJ Way roundabout to facilitate U-turns.
- Drainage improvements are required due to the increase in impervious areas. These improvements are subject to water quality requirements.
- Impacts are anticipated to local businesses and residences including construction-related activities.
- Public and private utilities are in the area and could include water, sanitary sewer, storm drain, power, gas, and communications lines.
- Permits may be needed for impacts related to farmland conversion.
- ROW acquisition is expected to impact six parcels.

Implementation Partners:

MDT, Private

Implementation Timeframe / Estimated Cost:

Mid-Term: \$13.0 M

Potential Funding Sources: NH, STPP, HSIP, MACI, Private

S4. Huey Way Intersection

MT 3 and Huey Way is a TWSC intersection approximately 0.25 miles east of AJ Way. The BRIC and YLCP developments are expected north of the intersection, with Huey Way providing secondary access to AJ Way, given the east-west road (Supercub Way) that will connect AJ Way and Huey Way north of MT 3. Figure 8 depicts the existing and forecasted 2045 turning movements in the AM and PM peak hours. The intersection currently operates at LOS C in the peak hours and is forecasted to fail in the 2035 and 2045 peak hours with the existing TWSC.

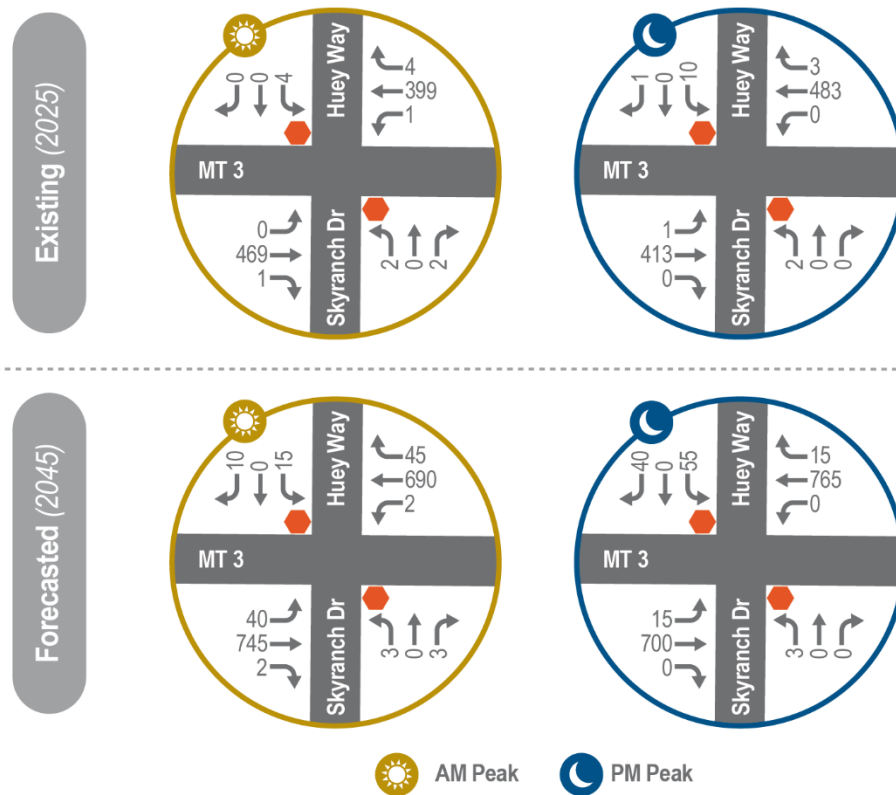


Figure 8: Huey Way Existing and Forecasted Traffic Volumes

Figure 9 depicts the existing and proposed intersection configuration. The following improvements are recommended to improve intersection safety and operations:

- Short-Term (by 2030): Eastbound left-turn (EBL) and westbound right (WBR) turn lanes are recommended at the Huey Way intersection. These turn lanes are warranted based on forecasted development traffic volumes. Left-turn and right-turn lanes improve safety and operations by removing turning vehicles from the travel lane on MT 3. Although not required by the developer, it is recommended that a westbound left (WBL) turn lane be added to provide access to the residential area on the south leg.

Table 8 summarizes the delay with the existing and proposed options. The proposed condition is expected to operate at LOS F in the 2045 AM and PM peak hours. It is important to note that traffic would re-reroute from Huey Way to use the roundabout at AJ Way when side-street delay is high. Supercub Way will provide an east-west connection, between Huey Way and AJ Way, allowing traffic to re-route to AJ Way to access MT 3.

Table 8: Huey Way LOS and Delay (sec/veh)

Scenario	Description	2024		2035		2045	
		AM	PM	AM	PM	AM	PM
Existing	TWSC	C/22	C/22	D/31	E/47	F/73	F/187
Proposed	TWSC with EBL, WBL and WBR Turn Lanes	C/22	C/22	D/30	E/46	E/48	F/132

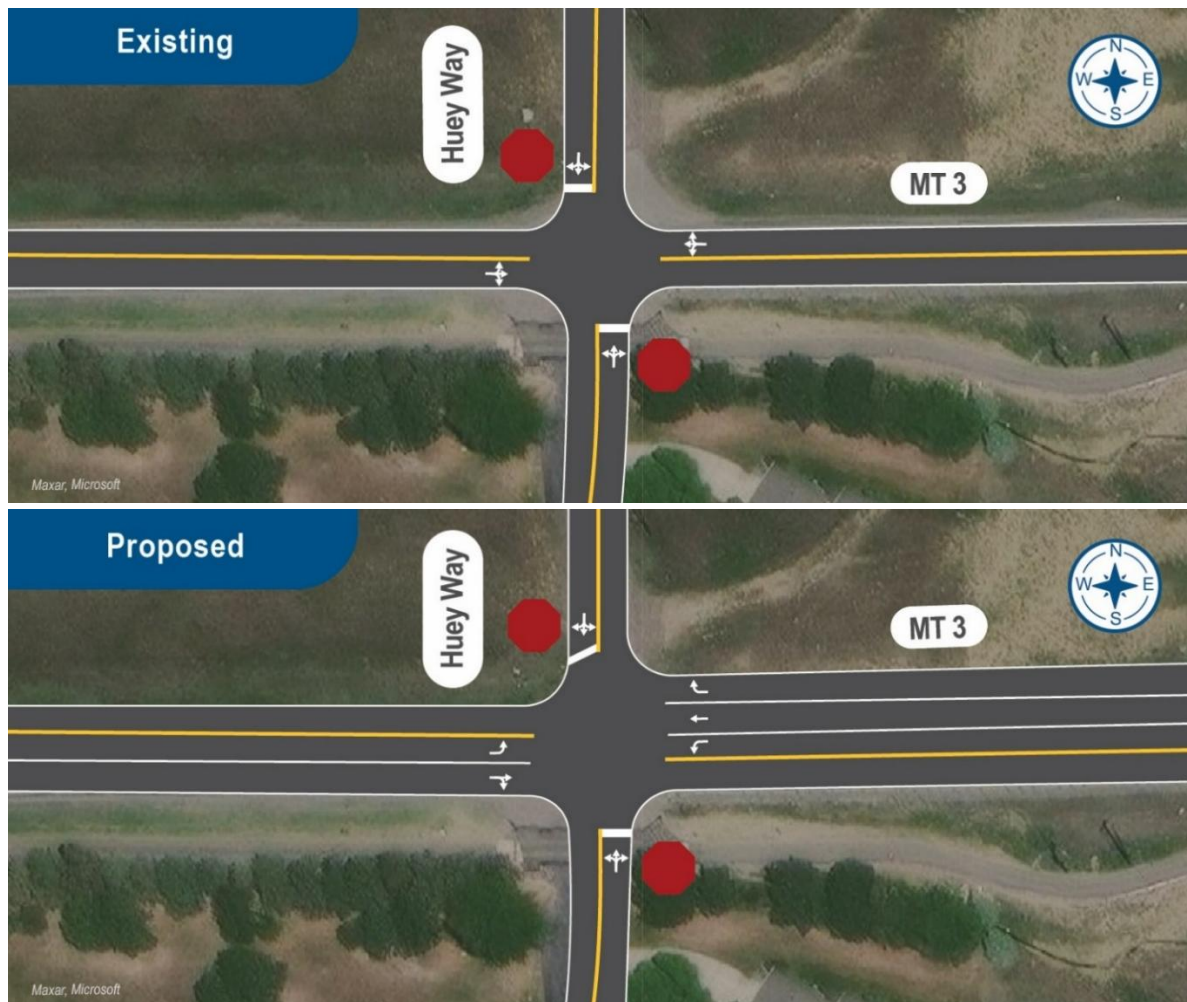


Figure 9: Huey Way Intersection Improvements

Recommendation: Add eastbound left, westbound left, and westbound right turn lanes at MT 3 and Huey Way in the short-term (within 5 years). However, the construction timeline for this improvement may be connected to the timeline for AJ Way intersection improvements.

Key Considerations:

- Widen to the north to avoid conflicts with Skyline Trail on the south side of MT 3.
- Consider restricting side street left and through movements when warranted in the future.
- Drainage improvements are required due to the increase in impervious areas. These improvements are subject to water quality requirements.
- Impacts are anticipated to local businesses and residences including construction-related activities.
- Public and private utilities are in the area and could include water, sanitary sewer, storm drain, power, gas, and communications lines.
- Permits may be needed for impacts related to farmland conversion.
- ROW acquisition is expected to impact six parcels.

Implementation Partners:
MDT, Private

Implementation Timeframe / Estimated Cost:
Short-Term: \$5.5 M

Potential Funding Sources: NH, STPP, HSIP, Private

Southview Drive and Overlook Drive Intersection Improvements

Eastbound left-turn lanes at Southview Drive and Overlook Drive intersections are recommended as part of the corridor widening project (R1) which adds a center turn lane and widened shoulders on MT 3 east of Rod and Gun Club Road (mid- to long-term improvement).

The Southview Drive and Overlook Drive intersections are TWSC intersections providing access to the west side of Billings Logan International Airport; the intersections are approximately 0.5 miles and 0.7 miles east of Huey Way, respectively. Traffic counts were not collected at either intersection; however, these intersections were noted as intersections of concern given their use by airport visitors and staff. It is recommended that eastbound left-turn lanes be added at the two intersections, with the proposed corridor widening project (R1) which would add a center turn lane on MT 3 east of Rod and Gun Club Road. Additional improvement options would be considered if warranted by future development at the airport; however, a traffic impact study is recommended to further analyze planned development. Figure 10 and Figure 11 depict the existing and proposed laneage with eastbound left-turn lanes.

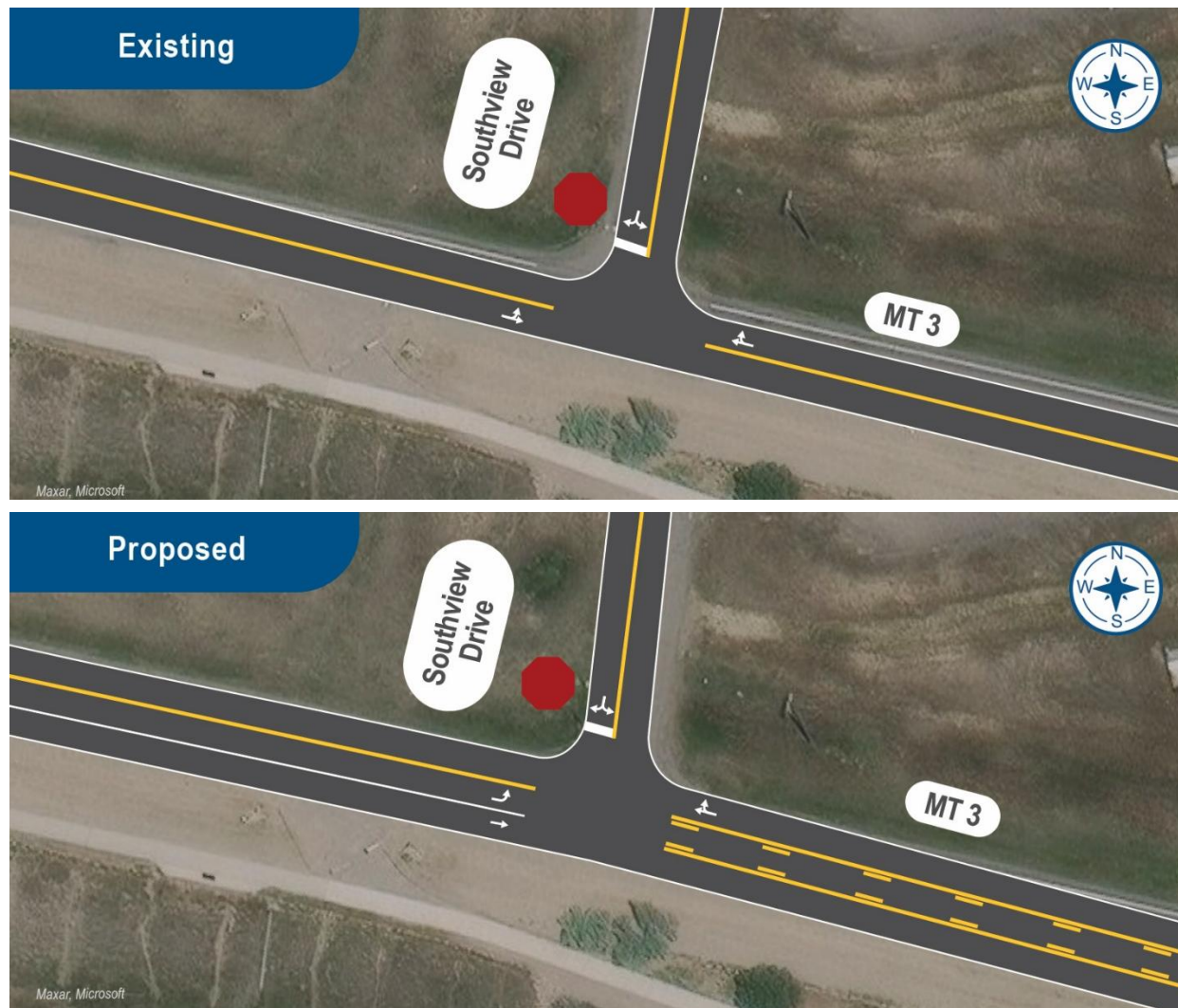


Figure 10: Southview Drive Intersection Improvements

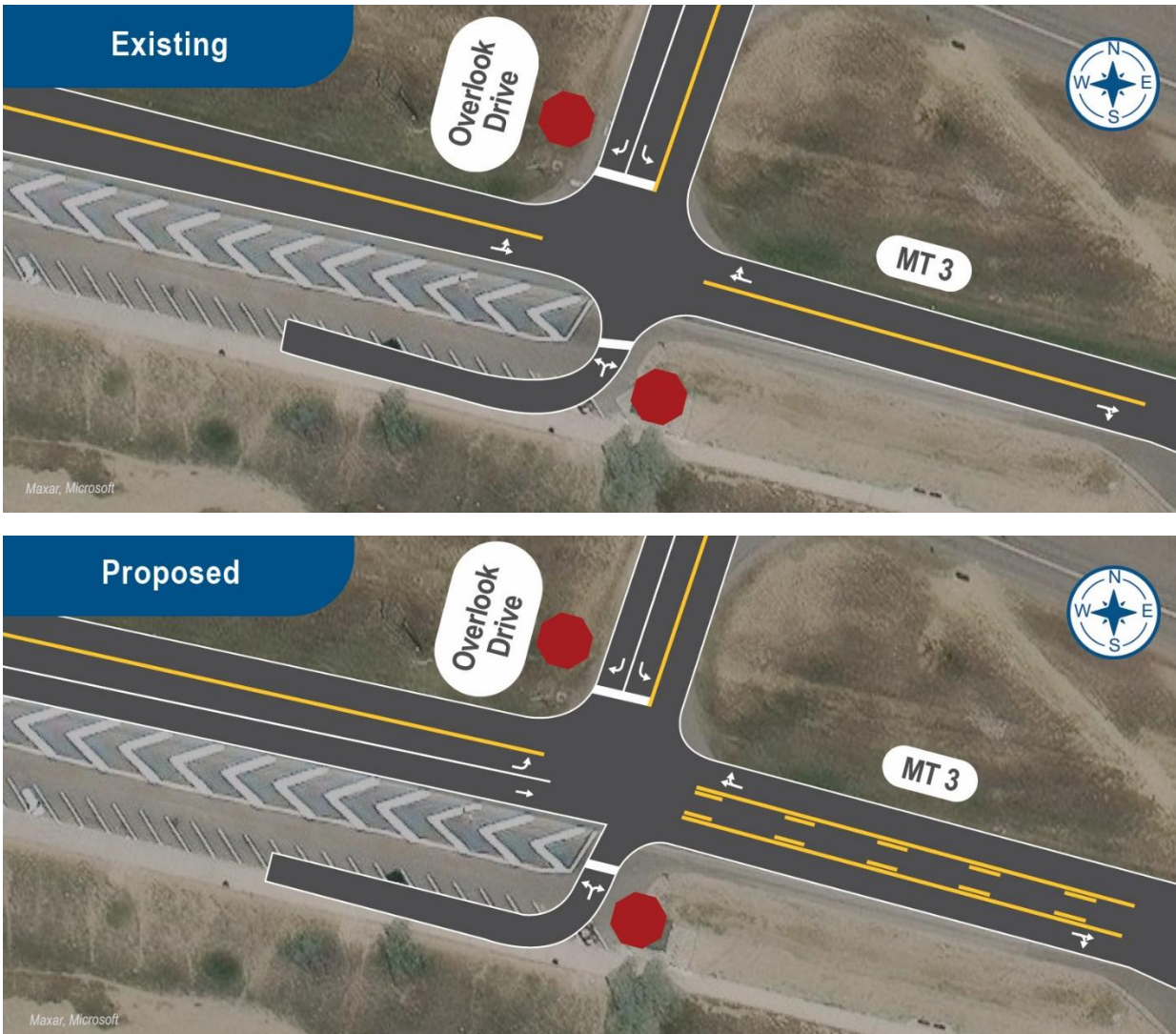


Figure 11: Overlook Drive Intersection Improvements

Summary of Intersection Improvement Options

Figure 12 depicts the existing and proposed roundabout locations, while Figure 13 depicts the 2045 AM and PM peak hour LOS and delay with the proposed intersection improvements. All study intersections are expected to operate at LOS D or better in 2045, except the Zimmerman Trail and Huey Way intersections. It is recommended that traffic counts be collected at the Southview Drive, Overlook Drive, and Zimmerman Park trailhead intersections to better understand traffic demand and the need for future improvements at these intersections.



Figure 12: Existing and Proposed Roundabouts

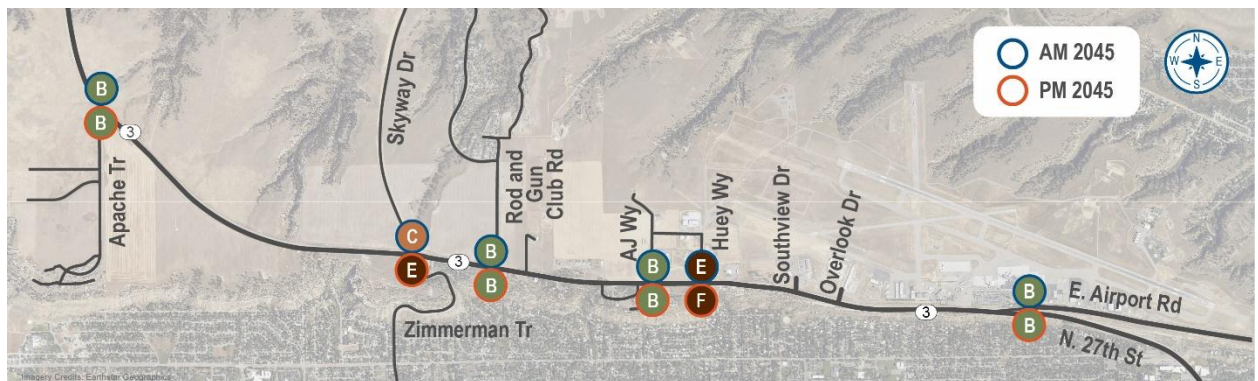


Figure 13: Intersection LOS in 2045 with Recommended Improvement Options

2.2 Roadway Widening

The following improvement option aims to increase capacity and improve traffic operations and traffic safety on MT 3 by widening to provide a center turn lane east of Rod and Gun Club Road. Reducing vehicular traffic on MT 3 is unlikely over the planning horizon, therefore roadway safety and traffic operations can be improved by increasing capacity.

R1. Widening of MT 3 East of Rod and Gun Club Road

It is recommended that the corridor be widened to provide a three-lane cross-section (one lane in each direction with a center turn lane) from Rod and Gun Club Road to west of the E. Airport Road / N. 27th Street roundabout (2.3 miles). Figure 14 depicts the extent of the corridor widening. It is recommended that the corridor be widened to the north, maintaining the existing edge of pavement on the south side of the road.

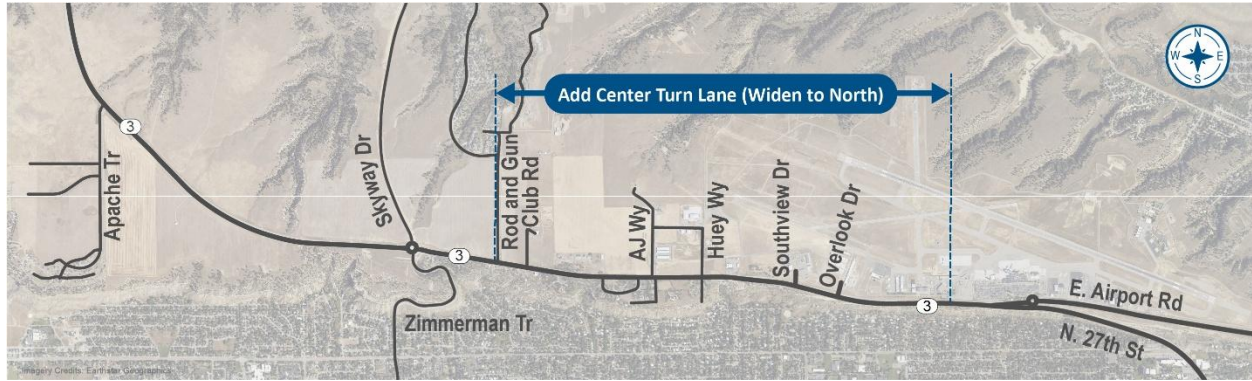


Figure 14: Extent of Corridor Widening

The adjacent land use and constraints vary along the north and south side of MT 3.

- **South Side Land Use and Constraints:** The south side of MT 3 is zoned as open space, parks, recreation, and suburban neighborhood. A shared use path and scenic pullouts exist south of MT 3 within the widening extents. Overhead powerlines exist on the south side of MT 3 from Zimmerman Trail to AJ Way. North-south overhead powerline crossings occur on MT 3 just east of Hickok Circle and just east of Huey Way.
- **North Side Land Use and Constraints:** The north side of MT 3 has agriculture, heavy commercial, public campus, public-civic, and institutional land uses. Within the widening extents, overhead powerlines exist on the north side of MT 3 from Southview Drive to about 700 feet east of Overlook Drive. Significant earthwork would be needed to accommodate widening from about 700 feet east of Overlook Drive to E. Airport Road.

Figure 15 depicts the existing cross-section laneage and shoulders. A two-lane cross-section exists from east of Rod and Gun Club Road intersection to the E. Airport Road / N. 27th Street intersection. The existing cross section has 3.5-foot-wide shoulders, which does not align with baseline design criteria for urban principal arterials. Figure 16 depicts the proposed cross-section east of Rod and Gun Club Road, which provides 6-foot shoulders with a 14-foot center two-way left-turn lane (TWLTL). Of note, the striping would vary throughout the widened section; some sections would provide designated left-turn lanes, while other sections would provide a striped median in the center turn lane to prohibit left-turn movements.

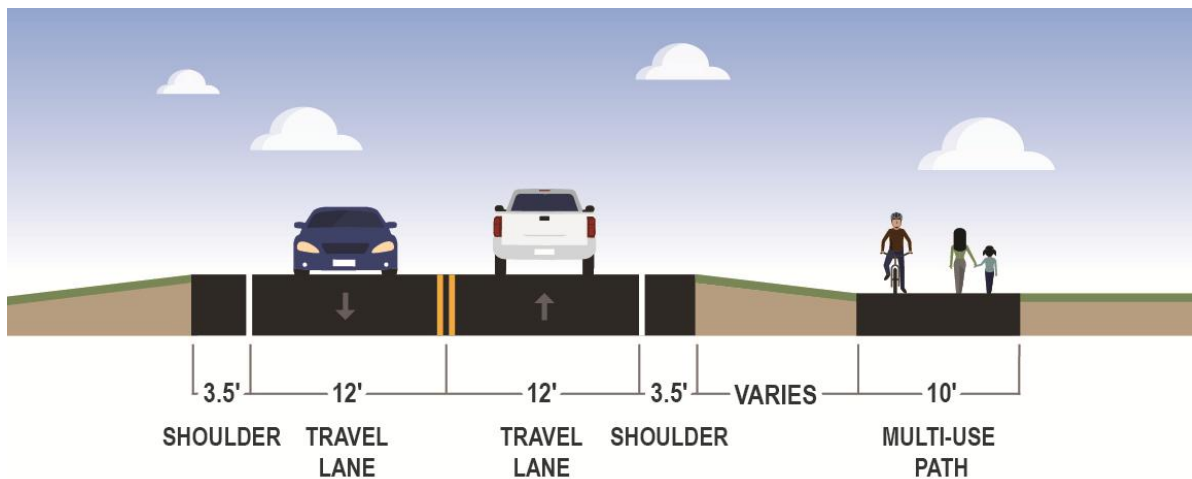


Figure 15: Existing Cross Section on MT 3, East of Rod and Gun Club Road

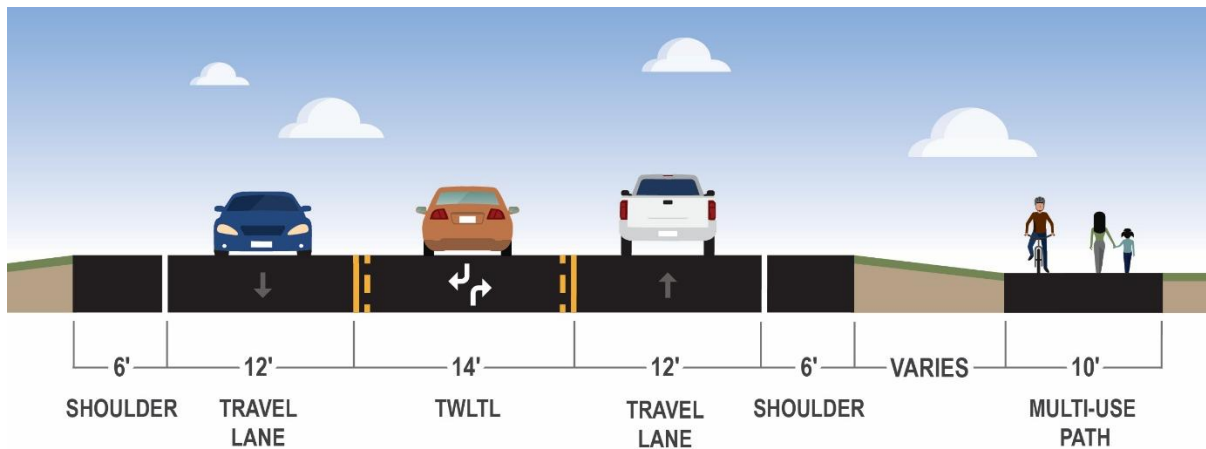


Figure 16: Proposed Cross Section on MT 3, East of Rod and Gun Club Road

Recommendation: Widen MT 3 to a three-lane cross-section from Rod and Gun Club Road to west of the E. Airport Road / N. 27th Street roundabout (2.3 miles).

Key Considerations:

- Widen to the north to reduce impacts to residential properties, multi-use path, and utilities located south of the corridor. Impacts to the multi-use path may require additional geotechnical considerations.
- Shoulder rumble strips could be considered on MT 3 to reduce roadway departure crashes, given the proximity of the roadway to the adjacent Skyline trail.
- Significant drainage improvements are required with the increased impervious areas. These improvements are subject to water quality requirements.
- Public and private utilities are in the area and could include water, sanitary sewer, storm drain, power, gas, and communications lines.
- Impacts are anticipated to local businesses and residences including temporary construction-related activities.
- Permits may be needed for impacts related to farmland conversion.
- ROW acquisition is expected to impact 19 parcels.

Implementation Partners:
MDT

Implementation Timeframe / Estimated Cost:
Mid- to Long-Term: \$39.8 M

Potential Funding Sources: NH, STPP, Local, Private

2.3 Multimodal Improvements

M1. MT 3 / Zimmerman Trail Underpass

Currently, a Rectangular Rapid Flashing Beacon (RRFB) facilitates north-south crossings on the east leg of the MT 3 and Zimmerman Trail roundabout. A pedestrian and bicycle underpass is recommended on the east leg of the roundabout to allow for uninterrupted north-south crossings, connecting the Skyline Trail to the multi-use path along Skyway Drive. This improvement aligns with recommendations in the *Billings Long Range Transportation Plan*.

The Zimmerman Trail intersection currently provides the only north-south pedestrian crossing on the project corridor. It is recommended that future north-south pedestrian crossing needs be evaluated corridor-wide, particularly as the north side of the corridor develops. Providing pedestrian crossings at roundabouts reduces the distance a pedestrian must travel to cross

safely. An east-west non-motorized connection should also be considered along the north side of MT 3 to connect Rod and Gun Club Road to the Zimmerman Trail roundabout.



Existing RRFB on the East Leg of the Zimmerman Trail Roundabout



Existing Underpass on the South Leg of the Zimmerman Trail Roundabout

Recommendation: Provide a pedestrian and bicycle underpass on the east leg of the Zimmerman Trail roundabout to improve multimodal connectivity between Skyline Trail and multi-use path along Skyway Drive.

Key Considerations:

- Implemented with two-lane roundabout at MT 3 / Zimmerman Trail (**\$1**)
- Improves connectivity between existing regional multi-use paths.
- The Stagecoach Trail project is planned for construction in 2028 and will provide an 8-foot-wide pedestrian and bicycle path on the east side of Zimmerman Trail, from Rimrock Road to MT 3. This trail would also intersect with the proposed underpass.
- Connection to Skyway Drive trail may require shifting the location of the existing detention pond. The underpass could be shifted further east of the detention pond, if there are concerns regarding the vertical drop between the path elevation and the underpass close to the intersection.

Implementation Partners:
MDT, Yellowstone County

Implementation Timeframe / Estimated Cost:
Long-Term: \$4.1 M

Potential Funding Sources: NH, STPP, HSIP

M2. Skyline Trail Crossing Improvements

There are safety concerns at the Skyline Trail crossings on the south side of MT 3, related to conflicts between vehicles and non-motorized trail users. Figure 17 depicts the ten existing bicycle/pedestrian crossings along Skyline Trail.

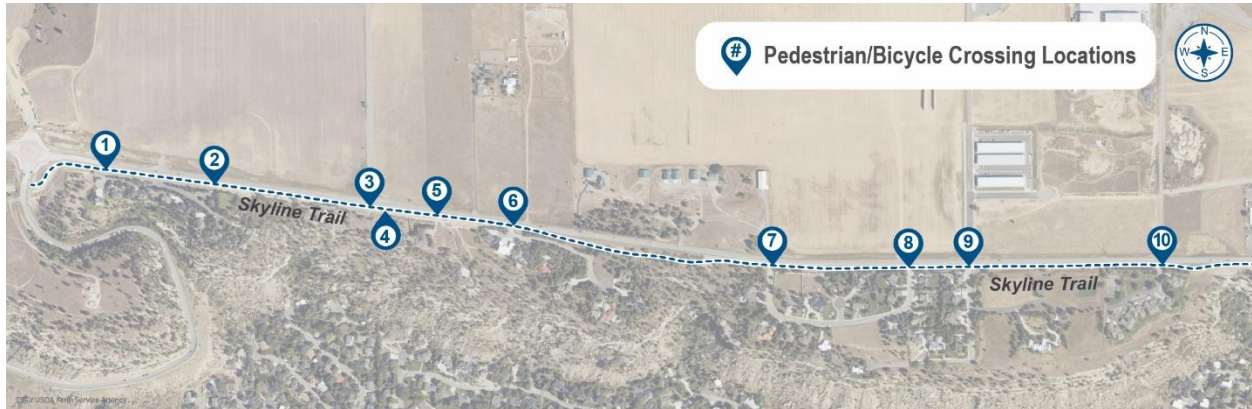


Figure 17: Bicycle/Pedestrian Crossings Along Skyline Trail

Table 9 provides additional details regarding each trail crossing side-street approach, including the number of residences served and the presence of side-street stop signs.

Table 9: Side Street Characteristics for Crossings Along Skyline Trail

Crossing ID	Side Street Description	Number of Residences	Side Street Stop Sign
1	Private access - Gated	1	None
2	Zimmerman Place – Gated	10	Stop sign north of path
3	Private access	1	None
4	Private access	1	None
5	Private access	2	None
6	Hickok Circle	9	Stop sign south of path
7 & 8	Masterson Circle	17	Stop sign north of path
9	Stony Ridge Road	8	Stop sign south of path
10	Sky Ranch Drive (Private access)	12	None

*Highlighted rows denote public approaches with stop signs.

The City of Billings recently made improvements at these trail crossings, including striped crosswalks and “crossing ahead” warning signs / pavement markings for non-motorized users. Figure 18 depicts the existing signing and pavement markings at the crossings, based on recent updates. It is recommended that safety concerns continue to be monitored at these crossings, and that sight lines be cleared and unobstructed for both motorists and trail users, as tall vegetation and snow piles can block the visibility of approaching vehicles or trail users.

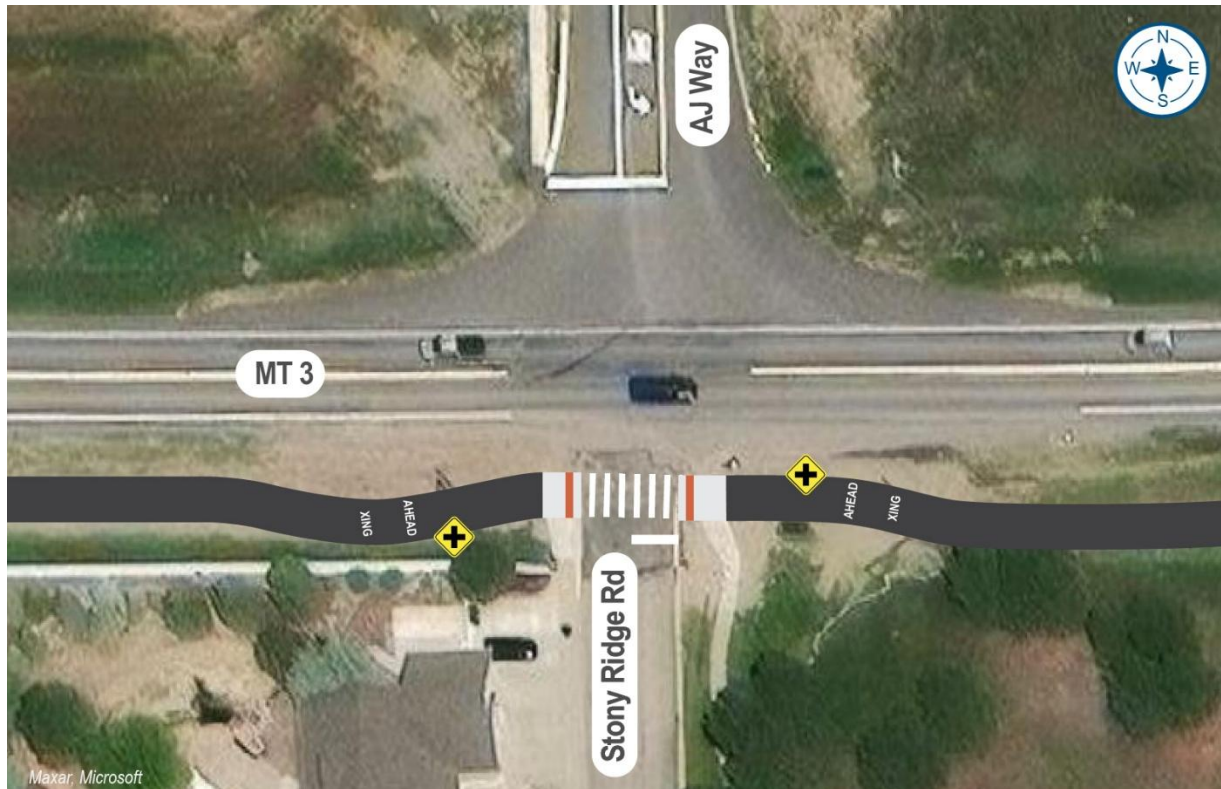


Figure 18: Existing Signing and Pavement Markings at Skyline Trail Crossings

Recommendation: Continue to monitor safety concerns and improve sight distance at the ten Skyline Trail crossings on the south side of MT 3.

Key Considerations:

- Not enough room to store a stopped vehicle north of the crosswalk, given the proximity of Skyline Trail to MT 3.
- Westbound left-turn vehicles will have a turn pocket with the future center turn lane, which would improve safety by providing a lane to stop and yield to pedestrians.
- Eastbound right-turn lanes are likely not warranted at trail crossing intersections based on existing and forecasted right-turn volumes (less than three right-turning vehicles per hour).

Implementation Partners:

MDT, City of Billings

Implementation Timeframe / Estimated Cost:

Short-Term: Variable cost

Potential Funding Sources: 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, carpooling, and non-motorized travel also reduces peak hour vehicle demand. Lastly, strategies should be developed to manage traffic during special events in the corridor (e.g., future National Guard training events or drill weekends).

Recommendation: Employ TDM strategies to reduce peak hour travel demand.	
Key Considerations: Collaborate with large employers to allow for and incentivize TDM strategies.	
Implementation Partners: City of Billings, Yellowstone County, National Guard, Private	Implementation Timeframe / Estimated Cost: Short-Term: Variable cost
Potential Funding Sources: Local, Private	

2.5 Access Management

A1. Side Street and Approach Movement Restriction

The *Access Management Plan* for the study corridor identifies locations where restricted side-street access should be considered (e.g., prohibiting left-turn or through movements from the side street). This plan should be referenced for specific recommendations regarding approach restriction.

Recommendation: Prohibit side-street through and left-turn movements at locations of concern by adding a raised median and signing.	
Key Considerations: - Reduces delay for right-turning vehicles on side street approaches and enhances intersection safety. - Lighting would be required for raised medians on side street approaches.	
Implementation Partners: MDT, City of Billings, Yellowstone County, Private	Implementation Timeframe / Estimated Cost: Short-Term: \$56,000 per approach for raised median with signing
Potential Funding Sources: Local, Private	

A2. Approach Consolidation

The *Access Management Plan* for the study corridor identifies locations where consolidation of closely spaced approaches should be considered to improve corridor safety. This plan should be referenced for specific recommendations regarding approach consolidation.

Recommendation: Recommend consolidation of closely spaced approaches on MT 3.	
Key Considerations: - Improves traffic safety by reducing the number of conflict points along the corridor. - Conflicts can arise in the TWLTL at closely spaced intersections when opposing northbound/southbound left-turn vehicles attempt to make left turns at the same time.	
Implementation Partners: City of Billings, Yellowstone County, Private	Implementation Timeframe / Estimated Cost: Short-Term: Variable cost
Potential Funding Sources: Local, Private	

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 study 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.

Frontage Road north of MT 3

A frontage road was considered along the north side of MT 3 to connect AJ Way and Rod and Gun Club Road. This option was not recommended as there are safety and operational concerns with frontage road intersections close to MT 3. In addition, this improvement option appears to conflict with the National Guard development planned north of MT 3.

Raised Median providing Right-in / Right-out or Three-Quarter Access

The 2015 *Highway 3 Corridor Planning Study*¹¹ recommended access control be considered on MT 3, with a raised or depressed median extending from Zimmerman Trail to E. Airport Road. As a result, several intersections would be limited to three-quarter access where left- and right-turn movements are allowed onto the side street, but access to MT 3 from the side street is limited to right turns only (see example depicted in Figure 19).

MT 3 has an existing Average Annual Daily Traffic (AADT) of 12,300 vehicles per day, with 19,400 vehicles per day expected in 2045. In general, the use of a raised median is considered when AADT is greater than 20,000 vehicles per day.¹² This is based on prior research from *NCHRP Report 395*, which found that raised medians result in fewer crashes, especially if the AADT is greater than 20,000 vehicles per day.¹³ A raised median is not recommended at this time, however corridor traffic volumes should be monitored to determine if a raised median would be appropriate in the future.

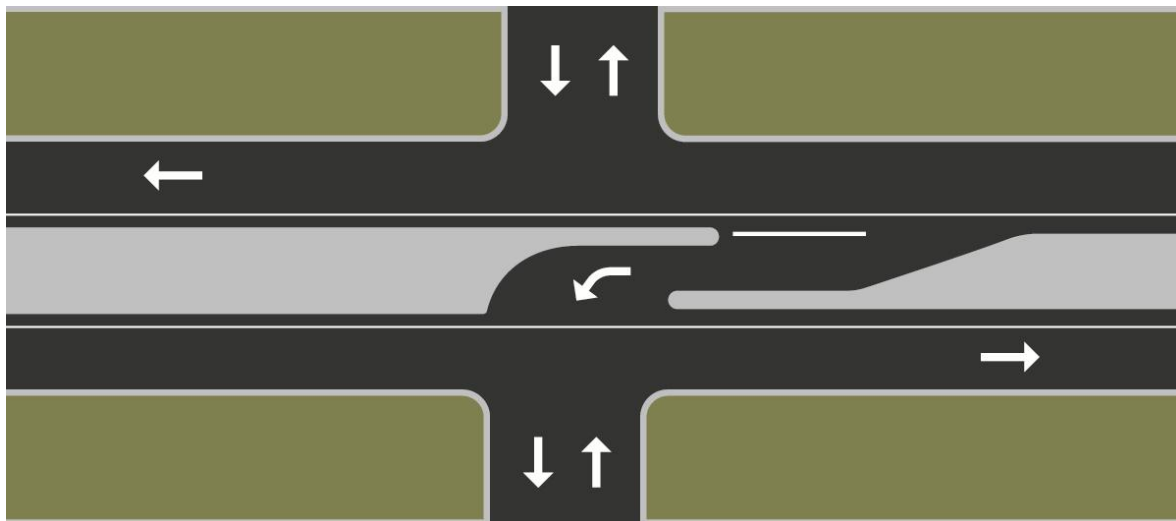


Figure 19: Example of Raised Median with Restricted Side Street Access

2.7 Summary of Recommended Improvements

This report identifies recommended improvement options within the study corridor. 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 10.

Table 10: Recommended Improvements

Improvement Option		Description	Implementation Timeframe	Potential Funding Source	Cost * Estimate
Intersection Improvements					
S1	Zimmerman Trail	Install two-lane roundabout	Long-Term	NH, STPP, HSIP, MACI	\$18.7 M
S2	Rod and Gun Club Road	Install single-lane roundabout	Mid- to Long-Term	NH, STPP, HSIP, MACI, Private	\$14.5 M
S3	AJ Way	Install single-lane roundabout with westbound right-turn lane	Mid-Term	NH, STPP, HSIP, MACI, Private	\$13.0 M
S4	Huey Way	Install eastbound left-turn, westbound right-turn, and westbound left-turn lanes	Short-Term	NH, STPP, HSIP, Private	\$5.5 M
Roadway Widening					
R1	MT 3 east of Rod and Gun Club Road	Widen MT 3 to accommodate 6-foot shoulder width and 14-foot center turn lane (2.3 miles)	Mid- to Long-Term	NH, STPP, Local, Private	\$39.8 M
Multimodal Improvements					
M1	MT 3 / Zimmerman Trail Underpass	Construct pedestrian and bicycle underpass on east leg of the Zimmerman Trail roundabout	Long-Term	NH, STPP, HSIP	\$4.1 M
M2	Skyline Trail Crossing Improvements	Monitor safety concerns and clear sight distance where Skyline Trail intersects with side-street approaches	Short-Term	HSIP, Local	Variable
Travel Demand Management					
T1	Travel Demand Management	Encourage large employers to use TDM strategies	Short-Term	Local, Private	Variable
Access Management					
A1	Side Street and Approach Movement Restriction	Restriction of side-street movements through signing or channelized islands	Short-Term	Local, Private	\$56,000 per approach
A2	Approach Consolidation	Consolidate closely spaced driveways to improve traffic operations	Mid-Term	Local, Private	Variable

*Cost estimates are not reported in current dollars and reflect costs anticipated in the year of construction.

REFERENCES

- ¹ Billings TrailNet, Yellowjacket Trail. <https://www.billingstrailnet.org/yellowjacket-trail/>
- ² Billings Readiness & Innovation Campus (BRIC) Traffic Impact Study. December 2023.
- ³ Yellowstone Landing Commercial Park (YLCP) Traffic Impact Study. April 2021.
- ⁴ Billings Logan International Airport Draft Master Plan, City of Billings. 2025.
<https://www.flybillings.com/1412/Master-Plan>
- ⁵ Cost Estimation Procedure for Highway Design Projects, MDT. November 2016.
https://www.mdt.mt.gov/other/webdata/external/cadd/report_templates_guidance/costest_procedure.pdf
- ⁶ Highway Capacity Manual 7th Edition, Transportation Research Board. 2022. Exhibit 19-11.
- ⁷ NCHRP Report 1043, Guide for Roundabouts. 2023.
<https://nap.nationalacademies.org/catalog/27069/guide-for-roundabouts>
- ⁸ Inner Belt Loop Corridor Study. November 2020.
https://www.billingsmt.gov/DocumentCenter/View/45108/2020-Inner-Belt-Loop-Corridor-Study_Final
- ⁹ Billings Urban Area Long Range Transportation Plan. July 2023.
<https://billingslrtp.com/project-documents>
- ¹⁰ Molt Road/Highway 3 Collector Road Planning Feasibility Study. June 2004.
<https://www.billingsmt.gov/DocumentCenter/View/1993/Molt-Hwy-3-Final-Study-Report>
- ¹¹ Highway 3 Corridor Study. April 2015.
<https://www.billingsmt.gov/DocumentCenter/View/26772/Hwy-3-Study>
- ¹² Development of Guidelines for Operationally Effective Raised Medians and the Use of Alternative Movements on Urban Roadways. 2013. <https://library.ctr.utexas.edu/hostedpdfs/tsu/0-6644-1.pdf>
- ¹³ NCHRP Report 395, Capacity and Operational Effects of Midblock Left-Turn Lanes. 1997.
https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_395.pdf

ATTACHMENT 1: PRELIMINARY COST ESTIMATES

INTERSECTION IMPROVEMENT OPTIONS					
Zimmerman Trail Two-Lane Roundabout (S1)			2045 construction	\$	18,700,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST	
MISCELLANEOUS WORK	UNIT	12,694.1 \$	1.25 \$	15,850.00	
EXCAVATION-UNCLASSIFIED	CUYD	34,958.0 \$	23.75 \$	830,250.00	
EXCAVATION-UNCLASS BORROW	CUYD	3,495.8 \$	21.25 \$	74,300.00	
SPECIAL BORROW-EXCAVATION	CUYD	1,747.9 \$	22.75 \$	39,750.00	
TOPSOIL-SALVAGING AND PLACING	CUYD	4,559.4 \$	10.50 \$	47,850.00	
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00	
CRUSHED AGGREGATE COURSE	CUYD	6,486.0 \$	65.25 \$	423,200.00	
COVER - TYPE 1	SQYD	14,093.0 \$	1.00 \$	14,100.00	
TRAFFIC GRAVEL	CUYD	1,334.3 \$	51.50 \$	68,700.00	
COMMERCIAL MIX - PG 58V-34	TON	3,915.9 \$	190.00 \$	744,000.00	
PCCP	SY	5,360.0 \$	175.00 \$	938,000.00	
CONCRETE 3 IN	SY	892.0 \$	150.00 \$	133,800.00	
GUARD RAIL-STEEL	LNFT	450.0 \$	30.25 \$	13,600.00	
GD RAIL-STL INT RDWY TERM SECT	LNFT	25.0 \$	90.00 \$	2,250.00	
GUARD RAIL-OPTIONAL TERM SECT	EACH	4.0 \$	4,000.00 \$	16,000.00	
FARM FENCE-TYPE F5W & F5M	LNFT	5,362.0 \$	4.75 \$	25,450.00	
SEEDING AREA NO 1	ACRE	5.0 \$	607.00 \$	3,050.00	
SEEDING AREA NO 2	ACRE	1.4 \$	1,648.00 \$	2,350.00	
SEEDING AREA NO 3	ACRE	2.0 \$	576.75 \$	1,150.00	
FERTILIZING AREA NO 1	ACRE	5.0 \$	210.75 \$	1,050.00	
FERTILIZING AREA NO 2	ACRE	1.4 \$	319.75 \$	450.00	
CONDITION SEEDBED SURFACE	ACRE	7.1 \$	166.50 \$	1,200.00	
MULCH	ACRE	1.4 \$	5,325.00 \$	7,550.00	
SIGNS - RURAL	MILE	0.51 \$	9,000.00 \$	4,550.00	
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.51 \$	9,000.00 \$	4,550.00	
DRAINAGE PIPE - RURAL	MILE	0.51 \$	90,200.00 \$	45,800.00	
LIGHTS - URBAN	MILE	0.51 \$	192,500.00 \$	97,750.00	
	Subtotal 1		\$	3,562,800.00	
TRAFFIC CONTROL			10% \$	356,280.00	
	Subtotal 2		\$	3,919,080.00	
MOBILIZATION			10% \$	391,908.00	
	Subtotal 3		\$	4,310,988.00	
CONTINGENCY			30% \$	1,293,296.00	
	Subtotal 4		\$	5,604,284.00	
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	1,681,285.00	
	Subtotal 5		\$	7,285,569.00	
TOTAL RIGHT-OF-WAY			\$	235,960.75	
	Subtotal 6		\$	7,521,529.75	
INFLATION	YEARS	20.0	3% \$	6,063,189.63	
	Subtotal 7		\$	13,584,719.38	
CONSTRUCTION ENGINEERING (CE)			10% \$	1,358,471.94	
PRELIMINARY ENGINEERING (PE)			15% \$	2,037,707.91	
	Subtotal 8		\$	16,980,899.23	
INDIRECT COSTS (IDC)			9.90% \$	1,681,109.02	
TOTAL			\$	18,662,008.25	

INTERSECTION IMPROVEMENT OPTIONS				
Rod and Gun Club Road Roundabout (S2)		2045 construction		\$ 14,500,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST
MISCELLANEOUS WORK	UNIT	8,759.5 \$	1.25 \$	10,950.00
EXCAVATION-UNCLASSIFIED	CUYD	21,739.0 \$	23.75 \$	516,300.00
EXCAVATION-UNCLASS BORROW	CUYD	2,173.9 \$	21.25 \$	46,200.00
SPECIAL BORROW-EXCAVATION	CUYD	1,087.0 \$	22.75 \$	24,750.00
TOPSOIL-SALVAGING AND PLACING	CUYD	3,146.2 \$	10.50 \$	33,050.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00
CRUSHED AGGREGATE COURSE	CUYD	4,127.0 \$	65.25 \$	269,300.00
COVER - TYPE 1	SQYD	12,258.0 \$	1.00 \$	12,250.00
TRAFFIC GRAVEL	CUYD	8,761.0 \$	51.50 \$	451,200.00
COMMERCIAL MIX - PG 58V-34	TON	2,434.0 \$	190.00 \$	462,450.00
PCCP	SY	3,620.0 \$	175.00 \$	633,500.00
CONCRETE 3 IN	SY	1,494.0	150.00 \$	224,100.00
FARM FENCE-TYPE F5W & F5M	LNFT	3,700.0 \$	4.75 \$	17,600.00
SEEDING AREA NO 1	ACRE	3.5 \$	607.00 \$	2,100.00
SEEDING AREA NO 2	ACRE	1.0 \$	1,648.00 \$	1,600.00
SEEDING AREA NO 3	ACRE	1.4 \$	576.75 \$	800.00
FERTILIZING AREA NO 1	ACRE	3.5 \$	210.75 \$	750.00
FERTILIZING AREA NO 2	ACRE	1.0 \$	319.75 \$	300.00
CONDITION SEEDBED SURFACE	ACRE	4.9 \$	166.50 \$	800.00
MULCH	ACRE	1.0 \$	5,325.00 \$	5,200.00
SIGNS - RURAL	MILE	0.35 \$	9,000.00 \$	3,150.00
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.35 \$	9,000.00 \$	3,150.00
DRAINAGE PIPE - RURAL	MILE	0.35 \$	90,200.00 \$	31,600.00
LIGHTS - URBAN	MILE	0.35 \$	192,500.00 \$	67,450.00
	Subtotal 1		\$	2,824,800.00
TRAFFIC CONTROL			10% \$	282,480.00
	Subtotal 2		\$	3,107,280.00
MOBILIZATION			10% \$	310,728.00
	Subtotal 3		\$	3,418,008.00
CONTINGENCY			30% \$	1,025,402.00
	Subtotal 4		\$	4,443,410.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	1,333,023.00
	Subtotal 5		\$	5,776,433.00
TOTAL RIGHT-OF-WAY			\$	38,489.28
	Subtotal 6		\$	5,814,922.28
INFLATION	YEARS	20.0	3% \$	4,687,474.18
	Subtotal 7		\$	10,502,396.46
CONSTRUCTION ENGINEERING (CE)			10% \$	1,050,239.65
PRELIMINARY ENGINEERING (PE)			15% \$	1,575,359.47
	Subtotal 8		\$	13,127,995.57
INDIRECT COSTS (IDC)			9.90% \$	1,299,671.56
	TOTAL		\$	14,427,667.14

INTERSECTION IMPROVEMENT OPTIONS				
AJ Way Roundabout (S3)		2035 construction		\$ 13,000,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST
MISCELLANEOUS WORK	UNIT	10,061.6 \$	1.25 \$	12,600.00
EXCAVATION-UNCLASSIFIED	CUYD	30,190.0 \$	23.75 \$	717,000.00
EXCAVATION-UNCLASS BORROW	CUYD	3,019.0 \$	21.25 \$	64,150.00
SPECIAL BORROW-EXCAVATION	CUYD	1,509.5 \$	22.75 \$	34,350.00
TOPSOIL-SALVAGING AND PLACING	CUYD	3,613.9 \$	10.50 \$	37,950.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00
CRUSHED AGGREGATE COURSE	CUYD	12,062.0 \$	65.25 \$	787,050.00
COVER - TYPE 1	SQYD	13,337.0 \$	1.00 \$	13,350.00
TRAFFIC GRAVEL	CUYD	996.7 \$	51.50 \$	51,350.00
COMMERCIAL MIX - PG 58V-34	TON	3,705.0 \$	190.00 \$	703,950.00
PCCP	SY	2,748.0 \$	175.00 \$	480,900.00
CONCRETE 3 IN	SY	981.0 \$	150.00 \$	147,150.00
FARM FENCE-TYPE F5W & F5M	LNFT	4,250.0 \$	4.75 \$	20,200.00
SEEDING AREA NO 1	ACRE	4.0 \$	607.00 \$	2,450.00
SEEDING AREA NO 2	ACRE	1.1 \$	1,648.00 \$	1,850.00
SEEDING AREA NO 3	ACRE	1.6 \$	576.75 \$	900.00
FERTILIZING AREA NO 1	ACRE	4.0 \$	210.75 \$	850.00
FERTILIZING AREA NO 2	ACRE	1.1 \$	319.75 \$	350.00
CONDITION SEEDBED SURFACE	ACRE	5.6 \$	166.50 \$	950.00
MULCH	ACRE	1.1 \$	5,325.00 \$	5,950.00
SIGNS - RURAL	MILE	0.40 \$	9,000.00 \$	3,600.00
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.40 \$	9,000.00 \$	3,600.00
DRAINAGE PIPE - RURAL	MILE	0.40 \$	90,200.00 \$	36,300.00
LIGHTS - URBAN	MILE	0.40 \$	192,500.00 \$	77,450.00
	Subtotal 1		\$	3,210,500.00
TRAFFIC CONTROL			10% \$	321,050.00
	Subtotal 2		\$	3,531,550.00
MOBILIZATION			10% \$	353,155.00
	Subtotal 3		\$	3,884,705.00
CONTINGENCY			30% \$	1,165,412.00
	Subtotal 4		\$	5,050,117.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	1,515,035.00
	Subtotal 5		\$	6,565,152.00
TOTAL RIGHT-OF-WAY			\$	446,501.52
	Subtotal 6		\$	7,011,653.52
INFLATION	YEARS	10.0	3% \$	2,411,422.49
	Subtotal 7		\$	9,423,076.01
CONSTRUCTION ENGINEERING (CE)			10% \$	942,307.60
PRELIMINARY ENGINEERING (PE)			15% \$	1,413,461.40
	Subtotal 8		\$	11,778,845.01
INDIRECT COSTS (IDC)			9.90% \$	1,166,105.66
	TOTAL		\$	12,944,950.67

INTERSECTION IMPROVEMENT OPTIONS				
Huey Way Turn Lanes (S4)		2030 construction		\$ 5,500,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST
MISCELLANEOUS WORK	UNIT	8,000.0 \$	1.25 \$	10,000.00
EXCAVATION-UNCLASSIFIED	CUYD	7,999.4 \$	23.75 \$	190,000.00
EXCAVATION-UNCLASS BORROW	CUYD	799.9 \$	21.25 \$	17,000.00
SPECIAL BORROW-EXCAVATION	CUYD	400.0 \$	22.75 \$	9,100.00
TOPSOIL-SALVAGING AND PLACING	CUYD	2,873.4 \$	10.50 \$	30,150.00
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00
CRUSHED AGGREGATE COURSE	CUYD	7,585.5 \$	65.25 \$	494,950.00
COVER - TYPE 1	SQYD	8,636.0 \$	1.00 \$	8,650.00
TRAFFIC GRAVEL	CUYD	575.7 \$	51.50 \$	29,650.00
COMMERCIAL MIX - PG 58V-34	TON	2,980.8 \$	190.00 \$	566,350.00
GUARD RAIL-STEEL	LNFT	850.0 \$	30.25 \$	25,700.00
GD RAIL-STL INT RDWY TERM SECT	LNFT	50.0 \$	90.00 \$	4,500.00
GUARD RAIL-OPTIONAL TERM SECT	EACH	2.0 \$	4,000.00 \$	8,000.00
FARM FENCE-TYPE F5W & F5M	LNFT	3,379.2 \$	4.75 \$	16,050.00
SEEDING AREA NO 1	ACRE	3.2 \$	607.00 \$	1,950.00
SEEDING AREA NO 2	ACRE	0.9 \$	1,648.00 \$	1,450.00
SEEDING AREA NO 3	ACRE	1.3 \$	576.75 \$	750.00
FERTILIZING AREA NO 1	ACRE	3.2 \$	210.75 \$	650.00
FERTILIZING AREA NO 2	ACRE	0.9 \$	319.75 \$	300.00
CONDITION SEEDBED SURFACE	ACRE	4.5 \$	166.50 \$	750.00
MULCH	ACRE	0.9 \$	5,325.00 \$	4,750.00
SIGNS - RURAL	MILE	0.32 \$	9,000.00 \$	2,900.00
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.32 \$	9,000.00 \$	2,900.00
DRAINAGE PIPE - RURAL	MILE	0.32 \$	90,200.00 \$	28,850.00
	Subtotal 1		\$	1,461,600.00
TRAFFIC CONTROL			10% \$	146,160.00
	Subtotal 2		\$	1,607,760.00
MOBILIZATION			10% \$	160,776.00
	Subtotal 3		\$	1,768,536.00
CONTINGENCY			30% \$	530,561.00
	Subtotal 4		\$	2,299,097.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	689,729.00
	Subtotal 5		\$	2,988,826.00
TOTAL RIGHT-OF-WAY			\$	433,907.52
	Subtotal 6		\$	3,422,733.52
INFLATION	YEARS	5.0	3% \$	545,152.71
	Subtotal 7		\$	3,967,886.23
CONSTRUCTION ENGINEERING (CE)			10% \$	396,788.62
PRELIMINARY ENGINEERING (PE)			15% \$	595,182.94
	Subtotal 8		\$	4,959,857.79
INDIRECT COSTS (IDC)			9.90% \$	491,025.92
	TOTAL		\$	5,450,883.71

ROADWAY WIDENING IMPROVEMENT OPTIONS

Widen MT 3 to provide Center Turn Lane and 6-foot Shoulders (R1)	2045 construction	\$	39,800,000.00
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TYPE	UNITS	QUANTITY	UNIT PRICE	COST
MISCELLANEOUS WORK	UNIT	56,250.0 \$	1.25 \$	70,300.00
EXCAVATION-UNCLASSIFIED	CUYD	22,846.7 \$	23.75 \$	542,600.00
EXCAVATION-UNCLASS BORROW	CUYD	2,284.7 \$	21.25 \$	48,500.00
SPECIAL BORROW-EXCAVATION	CUYD	1,142.3 \$	22.75 \$	26,000.00
TOPSOIL-SALVAGING AND PLACING	CUYD	20,203.6 \$	10.50 \$	212,100.00
TEMPORARY EROSION CONTROL	UNIT	15,000.0 \$	1.25 \$	18,800.00
CRUSHED AGGREGATE COURSE	CUYD	45,927.9 \$	65.25 \$	2,996,800.00
COVER - TYPE 1	SQYD	48,708.0 \$	1.00 \$	48,700.00
TRAFFIC GRAVEL	CUYD	3,247.2 \$	51.50 \$	167,200.00
COMMERCIAL MIX - PG 58V-34	TON	17,099.8 \$	190.00 \$	3,249,000.00
GUARD RAIL-STEEL	LNFT	1,300.0 \$	30.25 \$	39,300.00
GD RAIL-STL INT RDWY TERM SECT	LNFT	50.0 \$	90.00 \$	4,500.00
GUARD RAIL-OPTIONAL TERM SECT	EACH	4.0 \$	4,000.00 \$	16,000.00
FARM FENCE-TYPE F5W & F5M	LNFT	23,760.0 \$	4.75 \$	112,900.00
SEEDING AREA NO 1	ACRE	22.4 \$	607.00 \$	13,600.00
SEEDING AREA NO 2	ACRE	6.3 \$	1,648.00 \$	10,300.00
SEEDING AREA NO 3	ACRE	8.9 \$	576.75 \$	5,200.00
FERTILIZING AREA NO 1	ACRE	22.4 \$	210.75 \$	4,700.00
FERTILIZING AREA NO 2	ACRE	6.3 \$	319.75 \$	2,000.00
CONDITION SEEDBED SURFACE	ACRE	31.3 \$	166.50 \$	5,200.00
MULCH	ACRE	6.3 \$	5,325.00 \$	33,300.00
SIGNS - RURAL	MILE	2.25 \$	9,000.00 \$	20,300.00
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	2.25 \$	9,000.00 \$	20,300.00
DRAINAGE PIPE - RURAL	MILE	2.25 \$	90,200.00 \$	203,000.00
	Subtotal 1		\$	7,870,600.00
TRAFFIC CONTROL			5% \$	393,530.00
	Subtotal 2		\$	8,264,130.00
MOBILIZATION			10% \$	826,413.00
	Subtotal 3		\$	9,090,543.00
CONTINGENCY			30% \$	2,727,163.00
	Subtotal 4		\$	11,817,706.00
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	3,545,312.00
	Subtotal 5		\$	15,363,018.00
TOTAL RIGHT-OF-WAY			\$	653,830.07
	Subtotal 6		\$	16,016,848.07
INFLATION	YEARS	20.0	3% \$	12,911,361.17
	Subtotal 7		\$	28,928,209.24
CONSTRUCTION ENGINEERING (CE)			10% \$	2,892,820.92
PRELIMINARY ENGINEERING (PE)			15% \$	4,339,231.39
	Subtotal 8		\$	36,160,261.55
INDIRECT COSTS (IDC)			9.90% \$	3,579,865.89
TOTAL			\$	39,740,127.45

MULTIMODAL IMPROVEMENT OPTIONS

Underpass on East Leg of Zimmerman Trail Roundabout (M1)					2045 construction	\$	4,100,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST			
MISCELLANEOUS WORK	UNIT	473.5 \$	1.25 \$	592.00			
EXCAVATION-UNCLASSIFIED	CUYD	1,100.4 \$	23.75 \$	26,135.00			
EXCAVATION-UNCLASS BORROW	CUYD	110.0 \$	21.25 \$	2,338.00			
SPECIAL BORROW-EXCAVATION	CUYD	55.0 \$	22.75 \$	1,252.00			
TOPSOIL-SALVAGING AND PLACING	CUYD	170.1 \$	10.50 \$	1,786.00			
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00			
CRUSHED AGGREGATE COURSE	CUYD	133.8 \$	65.25 \$	8,728.00			
FARM FENCE-TYPE F5W & F5M	LNFT	200.0 \$	4.75 \$	950.00			
SEEDING AREA NO 1	ACRE	0.2 \$	607.00 \$	114.00			
SEEDING AREA NO 2	ACRE	0.1 \$	1,648.00 \$	87.00			
SEEDING AREA NO 3	ACRE	0.1 \$	576.75 \$	43.00			
FERTILIZING AREA NO 1	ACRE	0.2 \$	210.75 \$	40.00			
FERTILIZING AREA NO 2	ACRE	0.1 \$	319.75 \$	17.00			
CONDITION SEEDBED SURFACE	ACRE	0.3 \$	166.50 \$	44.00			
MULCH	ACRE	0.1 \$	5,325.00 \$	281.00			
SIGNS - RURAL	MILE	0.02 \$	9,000.00 \$	170.00			
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	0.02 \$	9,000.00 \$	170.00			
DRAINAGE PIPE - RURAL	MILE	0.02 \$	90,200.00 \$	1,708.00			
PEDESTRIAN UNDERPASS - EAST LEG	LNFT	120.0 \$	3,800.00 \$	456,000.00			
	Subtotal 1		\$	506,705.00			
TRAFFIC CONTROL			5%	25,335.00			
	Subtotal 2		\$	532,040.00			
MOBILIZATION			10%	53,204.00			
	Subtotal 3		\$	585,244.00			
CONTINGENCY			30%	175,573.00			
	Subtotal 4		\$	760,817.00			
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30%	228,245.00			
	Subtotal 5		\$	989,062.00			
TOTAL RIGHT-OF-WAY				653,830.07			
	Subtotal 6		\$	1,642,892.07			
INFLATION	YEARS	20.0	3%	1,324,353.75			
	Subtotal 7		\$	2,967,245.82			
CONSTRUCTION ENGINEERING (CE)			10%	296,724.58			
PRELIMINARY ENGINEERING (PE)			15%	445,086.87			
	Subtotal 8		\$	3,709,057.28			
INDIRECT COSTS (IDC)			9.90%	367,196.67			
	TOTAL		\$	4,076,253.95			

ACCESS MANAGEMENT IMPROVEMENT OPTIONS

Side Street Approach Movement Restriction (per approach) (A1)		2030 construction		\$	56,000.00
TYPE	UNITS	QUANTITY	UNIT PRICE	COST	
MISCELLANEOUS WORK	UNIT	118.4 \$	1.25 \$	148.00	
EXCAVATION-UNCLASSIFIED	CUYD	7.2 \$	23.75 \$	171.00	
EXCAVATION-UNCLASS BORROW	CUYD	0.7 \$	21.25 \$	15.00	
SPECIAL BORROW-EXCAVATION	CUYD	0.4 \$	22.75 \$	9.00	
TOPSOIL-SALVAGING AND PLACING	CUYD	42.5 \$	10.50 \$	446.00	
TEMPORARY EROSION CONTROL	UNIT	5,000.0 \$	1.25 \$	6,250.00	
CRUSHED AGGREGATE COURSE	CUYD	19.1 \$	65.25 \$	1,246.00	
COVER - TYPE 1	SQYD	88.0 \$	1.00 \$	88.00	
TRAFFIC GRAVEL	CUYD	5.8 \$	51.50 \$	299.00	
COMMERCIAL MIX - PG 58V-34	TON	9.3 \$	190.00 \$	1,767.00	
SIDEWALK-CONCRETE 4"	SQYD	22.2 \$	117.75 \$	2,614.00	
CURB AND GUTTER-CONC	LNFT	50.0 \$	53.25 \$	2,663.00	
SEEDING AREA NO 1	ACRE	0.047 \$	607.00 \$	29.00	
SEEDING AREA NO 2	ACRE	0.013 \$	1,648.00 \$	22.00	
SEEDING AREA NO 3	ACRE	0.019 \$	576.75 \$	11.00	
FERTILIZING AREA NO 1	ACRE	0.047 \$	210.75 \$	10.00	
FERTILIZING AREA NO 2	ACRE	0.013 \$	319.75 \$	4.00	
CONDITION SEEDBED SURFACE	ACRE	0.066 \$	166.50 \$	11.00	
MULCH	ACRE	0.013 \$	5,325.00 \$	70.00	
SIGNS - URBAN	MILE	0.005 \$	57,000.00 \$	270.00	
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	0.005 \$	52,000.00 \$	246.00	
DRAINAGE PIPE - URBAN	MILE	0.005 \$	264,000.00 \$	1,250.00	
LIGHTS - URBAN	MILE	0.005 \$	192,500.00 \$	912.00	
	Subtotal 1		\$	18,551.00	
TRAFFIC CONTROL			5% \$	928.00	
	Subtotal 2		\$	19,479.00	
MOBILIZATION			10% \$	1,948.00	
	Subtotal 3		\$	21,427.00	
CONTINGENCY			30% \$	6,428.00	
	Subtotal 4		\$	27,855.00	
INCIDENTAL CONSTRUCTION (IC) - UTILITIES			30% \$	8,357.00	
	Subtotal 5		\$	36,212.00	
TOTAL RIGHT-OF-WAY			\$	-	
	Subtotal 5		\$	36,212.00	
INFLATION	YEARS	5.0	3% \$	5,767.63	
	Subtotal 6		\$	41,979.63	
CONSTRUCTION ENGINEERING (CE)			10% \$	4,197.96	
PRELIMINARY ENGINEERING (PE)			10% \$	4,197.96	
	Subtotal 7		\$	50,375.56	
INDIRECT COSTS (IDC)			9.90% \$	4,987.18	
	TOTAL		\$	55,362.74	

**ATTACHMENT 2: IMPROVEMENT OPTIONS OPERATIONAL
ANALYSIS**

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	9.7				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	270	533	564	359	
Demand Flow Rate, veh/h	291	569	575	367	
Vehicles Circulating, veh/h	842	179	171	601	
Vehicles Exiting, veh/h	126	164	962	147	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	15.5	9.0	5.9	12.0	
Approach LOS	C	A	A	B	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	291	569	172	403	367
Cap Entry Lane, veh/h	585	1150	1159	1167	748
Entry HV Adj Factor	0.928	0.937	0.981	0.980	0.978
Flow Entry, veh/h	270	533	169	395	359
Cap Entry, veh/h	543	1077	1137	1144	731
V/C Ratio	0.498	0.495	0.148	0.345	0.491
Control Delay, s/veh	15.5	9.0	4.5	6.5	12.0
LOS	C	A	A	A	B
95th %tile Queue, veh	3	3	1	2	3

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	9.2				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	155	554	864	152	
Demand Flow Rate, veh/h	178	563	872	156	
Vehicles Circulating, veh/h	598	443	92	654	
Vehicles Exiting, veh/h	212	89	684	352	
Ped Vol Crossing Leg, #/h	0	0	1	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	8.4	14.5	6.2	7.8	
Approach LOS	A	B	A	A	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	178	563	440	432	156
Cap Entry Lane, veh/h	750	878	1256	1260	708
Entry HV Adj Factor	0.869	0.985	1.000	0.980	0.976
Flow Entry, veh/h	155	554	440	424	152
Cap Entry, veh/h	652	865	1256	1235	691
V/C Ratio	0.237	0.641	0.350	0.343	0.220
Control Delay, s/veh	8.4	14.5	6.2	6.1	7.8
LOS	A	B	A	A	A
95th %tile Queue, veh	1	5	2	2	1

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	16.2				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	331	663	744	449	
Demand Flow Rate, veh/h	358	708	759	461	
Vehicles Circulating, veh/h	1046	216	241	742	
Vehicles Exiting, veh/h	157	230	1163	182	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	33.1	12.6	8.2	22.1	
Approach LOS	D	B	A	C	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	358	708	205	554	461
Cap Entry Lane, veh/h	475	1107	1079	1091	647
Entry HV Adj Factor	0.924	0.936	0.979	0.980	0.973
Flow Entry, veh/h	331	663	201	543	449
Cap Entry, veh/h	439	1037	1056	1070	630
V/C Ratio	0.754	0.640	0.190	0.508	0.712
Control Delay, s/veh	33.1	12.6	5.2	9.3	22.1
LOS	D	B	A	A	C
95th %tile Queue, veh	6	5	1	3	6

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	27.8				
Intersection LOS	D				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	194	794	1103	195	
Demand Flow Rate, veh/h	224	806	1114	201	
Vehicles Circulating, veh/h	820	555	121	899	
Vehicles Exiting, veh/h	279	117	924	462	
Ped Vol Crossing Leg, #/h	0	0	1	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	12.9	63.1	7.7	12.3	
Approach LOS	B	F	A	B	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	224	806	551	563	201
Cap Entry Lane, veh/h	598	783	1220	1225	552
Entry HV Adj Factor	0.866	0.985	1.000	0.980	0.973
Flow Entry, veh/h	194	794	551	552	195
Cap Entry, veh/h	518	771	1219	1200	537
V/C Ratio	0.375	1.029	0.452	0.460	0.364
Control Delay, s/veh	12.9	63.1	7.6	7.8	12.3
LOS	B	F	A	A	B
95th %tile Queue, veh	2	19	2	2	2

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	69.6				
Intersection LOS	F				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	430	861	965	583	
Demand Flow Rate, veh/h	465	919	985	599	
Vehicles Circulating, veh/h	1359	287	307	967	
Vehicles Exiting, veh/h	207	296	1517	239	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	208.3	29.7	12.5	120.6	
Approach LOS	F	D	B	F	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	465	919	276	709	599
Cap Entry Lane, veh/h	345	1030	1009	1020	515
Entry HV Adj Factor	0.925	0.937	0.979	0.980	0.974
Flow Entry, veh/h	430	861	270	695	583
Cap Entry, veh/h	319	964	987	1000	501
V/C Ratio	1.348	0.892	0.274	0.695	1.164
Control Delay, s/veh	208.3	29.7	6.4	14.8	120.6
LOS	F	D	A	B	F
95th %tile Queue, veh	21	13	1	6	21

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	82.1				
Intersection LOS	F				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	247	954	1360	243	
Demand Flow Rate, veh/h	285	969	1374	250	
Vehicles Circulating, veh/h	998	690	156	1092	
Vehicles Exiting, veh/h	344	151	1127	567	
Ped Vol Crossing Leg, #/h	0	0	1	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	21.7	215.7	10.2	20.6	
Approach LOS	C	F	B	C	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	285	969	685	689	250
Cap Entry Lane, veh/h	499	683	1177	1183	453
Entry HV Adj Factor	0.866	0.985	1.000	0.980	0.971
Flow Entry, veh/h	247	954	685	675	243
Cap Entry, veh/h	432	672	1177	1160	440
V/C Ratio	0.572	1.419	0.582	0.582	0.552
Control Delay, s/veh	21.7	215.7	10.1	10.2	20.6
LOS	C	F	B	B	C
95th %tile Queue, veh	3	43	4	4	3

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection									
Intersection Delay, s/veh	8.2								
Intersection LOS	A								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		2		2		
Conflicting Circle Lanes	2		2		2		2		
Adj Approach Flow, veh/h	270		533		564		359		
Demand Flow Rate, veh/h	291		569		575		367		
Vehicles Circulating, veh/h	842		179		171		601		
Vehicles Exiting, veh/h	126		567		962		147		
Ped Vol Crossing Leg, #/h	0		0		0		0		
Ped Cap Adj	1.000		1.000		1.000		1.000		
Approach Delay, s/veh	11.3		7.2		7.0		9.3		
Approach LOS	B		A		A		A		
Lane	Left	Right	Left	Right	Left	Right	Left	Right	
Designated Moves	L	TR	L	TR	L	TR	L	TR	
Assumed Moves	L	TR	L	TR	L	TR	L	TR	
RT Channelized									
Lane Util	0.024	0.976	0.838	0.162	0.089	0.911	0.030	0.970	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.667	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.645	4.328	
A (Intercept)	1350	1420	1350	1420	1350	1420	1350	1420	
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	
Entry Flow, veh/h	7	284	477	92	51	524	11	356	
Cap Entry Lane, veh/h	622	694	1145	1220	1153	1228	777	852	
Entry HV Adj Factor	1.000	0.926	0.971	0.762	0.961	0.982	0.909	0.981	
Flow Entry, veh/h	7	263	463	70	49	515	10	349	
Cap Entry, veh/h	622	643	1111	930	1108	1206	706	835	
V/C Ratio	0.011	0.409	0.417	0.075	0.044	0.427	0.014	0.418	
Control Delay, s/veh	5.9	11.5	7.6	4.6	3.6	7.3	5.2	9.5	
LOS	A	B	A	A	A	A	A	A	
95th %tile Queue, veh	0	2	2	0	0	2	0	2	

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection									
Intersection Delay, s/veh	9.2								
Intersection LOS	A								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		2		2		
Conflicting Circle Lanes	2		2		2		2		
Adj Approach Flow, veh/h	163		584		911		161		
Demand Flow Rate, veh/h	188		594		920		165		
Vehicles Circulating, veh/h	632		467		97		690		
Vehicles Exiting, veh/h	223		550		723		371		
Ped Vol Crossing Leg, #/h	0		0		1		0		
Ped Cap Adj	1.000		1.000		0.999		1.000		
Approach Delay, s/veh	7.5		10.2		9.3		6.7		
Approach LOS	A		B		A		A		
Lane	Left	Right	Left	Right	Left	Right	Left	Right	
Designated Moves	L	TR	L	TR	L	TR	L	TR	
Assumed Moves	L	TR	L	TR	L	TR	L	TR	
RT Channelized									
Lane Util	0.016	0.984	0.793	0.207	0.128	0.872	0.067	0.933	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.667	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.645	4.328	
A (Intercept)	1350	1420	1350	1420	1350	1420	1350	1420	
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	
Entry Flow, veh/h	3	185	471	123	118	802	11	154	
Cap Entry Lane, veh/h	755	830	878	955	1235	1308	716	790	
Entry HV Adj Factor	1.000	0.864	0.989	0.961	1.000	0.989	0.909	0.981	
Flow Entry, veh/h	3	160	466	118	118	793	10	151	
Cap Entry, veh/h	755	717	869	917	1233	1292	650	775	
V/C Ratio	0.004	0.223	0.536	0.129	0.096	0.614	0.015	0.195	
Control Delay, s/veh	4.8	7.6	11.5	5.1	3.7	10.2	5.7	6.7	
LOS	A	A	B	A	A	B	A	A	
95th %tile Queue, veh	0	1	3	0	0	4	0	1	

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	16.2				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	331	663	744	449	
Demand Flow Rate, veh/h	358	708	759	461	
Vehicles Circulating, veh/h	1046	216	241	742	
Vehicles Exiting, veh/h	157	230	1163	182	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	33.1	12.6	8.2	22.1	
Approach LOS	D	B	A	C	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	358	708	205	554	461
Cap Entry Lane, veh/h	475	1107	1079	1091	647
Entry HV Adj Factor	0.924	0.936	0.979	0.980	0.973
Flow Entry, veh/h	331	663	201	543	449
Cap Entry, veh/h	439	1037	1056	1070	630
V/C Ratio	0.754	0.640	0.190	0.508	0.712
Control Delay, s/veh	33.1	12.6	5.2	9.3	22.1
LOS	D	B	A	A	C
95th %tile Queue, veh	6	5	1	3	6

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	38.8				
Intersection LOS	E				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	206	837	1164	206	
Demand Flow Rate, veh/h	238	851	1176	212	
Vehicles Circulating, veh/h	866	586	129	949	
Vehicles Exiting, veh/h	295	125	975	488	
Ped Vol Crossing Leg, #/h	0	0	1	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	14.5	93.4	8.2	13.8	
Approach LOS	B	F	A	B	
Lane	Left	Left	Left	Bypass	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT		LTR
RT Channelized				Yield	
Lane Util	1.000	1.000	1.000		1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	238	851	582	594	212
Cap Entry Lane, veh/h	571	759	1210	1215	524
Entry HV Adj Factor	0.867	0.984	1.000	0.980	0.973
Flow Entry, veh/h	206	837	582	582	206
Cap Entry, veh/h	495	747	1210	1191	510
V/C Ratio	0.417	1.121	0.481	0.489	0.404
Control Delay, s/veh	14.5	93.4	8.1	8.3	13.8
LOS	B	F	A	A	B
95th %tile Queue, veh	2	24	3	3	2

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection									
Intersection Delay, s/veh	22.9								
Intersection LOS	C								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		2		2		
Conflicting Circle Lanes	2		2		2		2		
Adj Approach Flow, veh/h	408		816		913		552		
Demand Flow Rate, veh/h	441		872		932		567		
Vehicles Circulating, veh/h	1286		272		292		917		
Vehicles Exiting, veh/h	198		952		1435		227		
Ped Vol Crossing Leg, #/h	0		0		0		0		
Ped Cap Adj	1.000		1.000		1.000		1.000		
Approach Delay, s/veh	51.5		13.1		16.1		27.3		
Approach LOS	F		B		C		D		
Lane	Left	Right	Left	Right	Left	Right	Left	Right	
Designated Moves	L	TR	L	TR	L	TR	L	TR	
Assumed Moves	L	TR	L	TR	L	TR	L	TR	
RT Channelized									
Lane Util	0.025	0.975	0.828	0.172	0.086	0.914	0.076	0.924	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.667	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.645	4.328	
A (Intercept)	1350	1420	1350	1420	1350	1420	1350	1420	
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	
Entry Flow, veh/h	11	430	722	150	80	852	43	524	
Cap Entry Lane, veh/h	414	476	1051	1127	1032	1108	581	651	
Entry HV Adj Factor	1.000	0.923	0.971	0.768	0.950	0.983	0.884	0.981	
Flow Entry, veh/h	11	397	701	115	76	837	38	514	
Cap Entry, veh/h	414	439	1020	865	980	1089	513	639	
V/C Ratio	0.027	0.904	0.687	0.133	0.078	0.769	0.074	0.805	
Control Delay, s/veh	9.1	52.7	14.3	5.5	4.4	17.2	7.9	28.7	
LOS	A	F	B	A	A	C	A	D	
95th %tile Queue, veh	0	10	6	0	0	8	0	8	

HCM 7th Roundabout
2: Zimmerman Tr/Skyway Dr & MT 3

08/12/2025

Intersection									
Intersection Delay, s/veh	53.4								
Intersection LOS	F								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		2		2		
Conflicting Circle Lanes	2		2		2		2		
Adj Approach Flow, veh/h	260		1005		1435		257		
Demand Flow Rate, veh/h	300		1021		1449		265		
Vehicles Circulating, veh/h	1054		728		164		1152		
Vehicles Exiting, veh/h	363		885		1190		597		
Ped Vol Crossing Leg, #/h	0		0		0		0		
Ped Cap Adj	1.000		1.000		1.000		1.000		
Approach Delay, s/veh	16.7		85.6		44.5		14.2		
Approach LOS	C		F		E		B		
Lane	Left	Right	Left	Right	Left	Right	Left	Right	
Designated Moves	L	TR	L	TR	L	TR	L	TR	
Assumed Moves	L	TR	L	TR	L	TR	L	TR	
RT Channelized									
Lane Util	0.017	0.983	0.780	0.220	0.128	0.872	0.094	0.906	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.667	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.645	4.328	
A (Intercept)	1350	1420	1350	1420	1350	1420	1350	1420	
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	9.199e-4	8.501e-4	
Entry Flow, veh/h	5	295	796	225	185	1264	25	240	
Cap Entry Lane, veh/h	512	580	691	765	1161	1235	468	533	
Entry HV Adj Factor	1.000	0.865	0.990	0.964	1.000	0.989	0.880	0.981	
Flow Entry, veh/h	5	255	788	217	185	1250	22	235	
Cap Entry, veh/h	512	501	684	737	1161	1222	412	523	
V/C Ratio	0.010	0.509	1.152	0.294	0.159	1.023	0.053	0.450	
Control Delay, s/veh	7.2	16.9	106.9	8.4	4.5	50.4	9.5	14.6	
LOS	A	C	F	A	A	F	A	B	
95th %tile Queue, veh	0	3	25	1	1	23	0	2	

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	462	0	0	397	3	0	0	0	37	0	65
Future Vol, veh/h	17	462	0	0	397	3	0	0	0	37	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	92	92	88	88	92	92	92	88	92	88
Heavy Vehicles, %	27	4	2	2	7	0	2	2	2	3	2	2
Mvmt Flow	19	525	0	0	451	3	0	0	0	42	0	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	525	0	0	1015	1015	525	1015	-	451
Stage 1	-	-	-	-	-	-	564	564	-	451	-	-
Stage 2	-	-	-	-	-	-	451	451	-	564	-	-
Critical Hdwy	4.37	-	-	4.12	-	-	7.12	6.52	6.22	7.13	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.13	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.13	-	-
Follow-up Hdwy	2.443	-	-	2.218	-	-	3.518	4.018	3.318	3.527	-	3.318
Pot Cap-1 Maneuver	989	-	-	1042	-	0	217	238	552	216	0	608
Stage 1	-	-	-	-	-	0	511	509	-	586	0	-
Stage 2	-	-	-	-	-	0	588	571	-	509	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	989	-	-	1042	-	-	187	234	552	212	-	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	234	-	212	-	-
Stage 1	-	-	-	-	-	-	501	499	-	586	-	-
Stage 2	-	-	-	-	-	-	516	571	-	499	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.31	0	0	16.97
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	989	-	-	1042	-	212	608
HCM Lane V/C Ratio	-	0.02	-	-	-	-	0.199	0.121
HCM Ctrl Dly (s/v)	0	8.7	-	-	0	-	26.2	11.7
HCM Lane LOS	A	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	0.7	0.4

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	410	0	0	493	34	0	0	0	11	0	36
Future Vol, veh/h	63	410	0	0	493	34	0	0	0	11	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	92	92	87	87	92	92	92	87	92	87
Heavy Vehicles, %	2	5	2	2	1	0	2	2	2	10	2	0
Mvmt Flow	72	471	0	0	567	39	0	0	0	13	0	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	567	0	0	471	0	0	1183	1183	471	1183	-	567
Stage 1	-	-	-	-	-	-	616	616	-	567	-	-
Stage 2	-	-	-	-	-	-	567	567	-	616	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.2	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.2	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.2	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.59	-	3.3
Pot Cap-1 Maneuver	1005	-	-	1091	-	0	166	189	593	160	0	527
Stage 1	-	-	-	-	-	0	478	482	-	495	0	-
Stage 2	-	-	-	-	-	0	509	507	-	465	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	1005	-	-	1091	-	-	142	176	593	149	-	527
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	176	-	149	-	-
Stage 1	-	-	-	-	-	-	443	447	-	495	-	-
Stage 2	-	-	-	-	-	-	469	507	-	431	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.18	0	0	16.86
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1005	-	-	1091	-	149	527
HCM Lane V/C Ratio	-	0.072	-	-	-	-	0.085	0.079
HCM Ctrl Dly (s/v)	0	8.9	-	-	0	-	31.4	12.4
HCM Lane LOS	A	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	0.3	0.3

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	680	0	0	525	5	0	0	0	50	0	80
Future Vol, veh/h	20	680	0	0	525	5	0	0	0	50	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	27	4	0	0	7	0	0	0	0	3	0	2
Mvmt Flow	22	739	0	0	571	5	0	0	0	54	0	87

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	739	0	0	1353	1353	739	1353	-	571
Stage 1	-	-	-	-	-	-	783	783	-	571	-	-
Stage 2	-	-	-	-	-	-	571	571	-	783	-	-
Critical Hdwy	4.37	-	-	4.1	-	-	7.1	6.5	6.2	7.13	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	-	-
Follow-up Hdwy	2.443	-	-	2.2	-	-	3.5	4	3.3	3.527	-	3.318
Pot Cap-1 Maneuver	889	-	-	876	-	0	128	151	421	126	0	521
Stage 1	-	-	-	-	-	0	390	408	-	504	0	-
Stage 2	-	-	-	-	-	0	510	508	-	386	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	889	-	-	876	-	-	104	147	421	123	-	521
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	147	-	123	-	-
Stage 1	-	-	-	-	-	-	381	398	-	504	-	-
Stage 2	-	-	-	-	-	-	424	508	-	376	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.26	0	0	29.52
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	889	-	-	876	-	123	521
HCM Lane V/C Ratio	-	0.024	-	-	-	-	0.441	0.167
HCM Ctrl Dly (s/v)	0	9.2	-	-	0	-	55.5	13.3
HCM Lane LOS	A	A	-	-	A	-	F	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	1.9	0.6

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	540	0	0	710	50	0	0	0	15	0	45
Future Vol, veh/h	80	540	0	0	710	50	0	0	0	15	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	0	0	1	0	0	0	0	10	0	0
Mvmt Flow	87	587	0	0	772	54	0	0	0	16	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	772	0	0	587	0	0	1533	1533	587	1533	-	772
Stage 1	-	-	-	-	-	-	761	761	-	772	-	-
Stage 2	-	-	-	-	-	-	772	772	-	761	-	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.2	7.2	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	-	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.5	4	3.3	3.59	-	3.3
Pot Cap-1 Maneuver	843	-	-	998	-	0	96	118	513	91	0	403
Stage 1	-	-	-	-	-	0	401	417	-	381	0	-
Stage 2	-	-	-	-	-	0	395	412	-	386	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	843	-	-	998	-	-	76	106	513	82	-	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	106	-	82	-	-
Stage 1	-	-	-	-	-	-	360	374	-	381	-	-
Stage 2	-	-	-	-	-	-	347	412	-	346	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.26	0	0	26.27
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	843	-	-	998	-	82	403
HCM Lane V/C Ratio	-	0.103	-	-	-	-	0.199	0.121
HCM Ctrl Dly (s/v)	0	9.8	-	-	0	-	59.6	15.2
HCM Lane LOS	A	A	-	-	A	-	F	C
HCM 95th %tile Q(veh)	-	0.3	-	-	0	-	0.7	0.4

Intersection

Int Delay, s/veh 11.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	820	0	0	640	6	0	0	0	65	0	105
Future Vol, veh/h	30	820	0	0	640	6	0	0	0	65	0	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	92	92	88	88	92	92	92	88	92	88
Heavy Vehicles, %	27	4	2	2	7	0	2	2	2	3	2	2
Mvmt Flow	34	932	0	0	727	7	0	0	0	74	0	119

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	727	0	0	932	0	0	1727	1727	932	1727	-	727
Stage 1	-	-	-	-	-	-	1000	1000	-	727	-	-
Stage 2	-	-	-	-	-	-	727	727	-	1000	-	-
Critical Hdwy	4.37	-	-	4.12	-	-	7.12	6.52	6.22	7.13	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.13	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.13	-	-
Follow-up Hdwy	2.443	-	-	2.218	-	-	3.518	4.018	3.318	3.527	-	3.318
Pot Cap-1 Maneuver	772	-	-	734	-	0	70	89	323	~ 69	0	424
Stage 1	-	-	-	-	-	0	293	321	-	414	0	-
Stage 2	-	-	-	-	-	0	415	429	-	292	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	772	-	-	734	-	-	48	85	323	~ 66	-	424
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	85	-	~ 66	-	-
Stage 1	-	-	-	-	-	-	280	307	-	414	-	-
Stage 2	-	-	-	-	-	-	298	429	-	279	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.35	0	0	107.19
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	772	-	-	734	-	66	424
HCM Lane V/C Ratio	-	0.044	-	-	-	-	1.117	0.282
HCM Ctrl Dly (s/v)	0	9.9	-	-	0	-	253.2	16.8
HCM Lane LOS	A	A	-	-	A	-	F	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	5.8	1.1

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s
 +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	100	660	0	0	855	60	0	0	0	20	0	60
Future Vol, veh/h	100	660	0	0	855	60	0	0	0	20	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	570	-	-	-	-	100	-	-	-	225	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	5	0	0	1	0	0	0	0	10	0	0
Mvmt Flow	115	759	0	0	983	69	0	0	0	23	0	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	983	0	0	759	0	0	1971	1971	759	1971	-	983
Stage 1	-	-	-	-	-	-	989	989	-	983	-	-
Stage 2	-	-	-	-	-	-	983	983	-	989	-	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.2	7.2	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	-	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.5	4	3.3	3.59	-	3.3
Pot Cap-1 Maneuver	703	-	-	862	-	0	47	63	410	44	0	305
Stage 1	-	-	-	-	-	0	300	328	-	290	0	-
Stage 2	-	-	-	-	-	0	302	330	-	287	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	703	-	-	862	-	-	31	53	410	37	-	305
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	53	-	37	-	-
Stage 1	-	-	-	-	-	-	251	274	-	290	-	-
Stage 2	-	-	-	-	-	-	234	330	-	240	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.46	0	0	65.45
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	703	-	-	862	-	37	305
HCM Lane V/C Ratio	-	0.164	-	-	-	-	0.618	0.226
HCM Ctrl Dly (s/v)	0	11.1	-	-	0	-	201.1	20.2
HCM Lane LOS	A	B	-	-	A	-	F	C
HCM 95th %tile Q(veh)	-	0.6	-	-	0	-	2.2	0.9

HCM 7th Roundabout
3: MT 3 & Rod and Gun Club Rd

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Intersection				
Intersection Delay, s/veh	6.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	544	454	0	116
Demand Flow Rate, veh/h	570	486	0	118
Vehicles Circulating, veh/h	43	24	613	483
Vehicles Exiting, veh/h	558	589	0	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	6.3	0.0	5.7
Approach LOS	A	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	570	486	0	118
Cap Entry Lane, veh/h	1321	1346	738	843
Entry HV Adj Factor	0.954	0.935	1.000	0.983
Flow Entry, veh/h	544	454	0	116
Cap Entry, veh/h	1260	1259	738	829
V/C Ratio	0.432	0.361	0.000	0.140
Control Delay, s/veh	7.2	6.3	4.9	5.7
LOS	A	A	A	A
95th %tile Queue, veh	2	2	0	0

HCM 7th Roundabout
3: MT 3 & Rod and Gun Club Rd

08/12/2025

Intersection				
Intersection Delay, s/veh	7.3			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	543	606	0	54
Demand Flow Rate, veh/h	568	612	0	55
Vehicles Circulating, veh/h	14	73	582	573
Vehicles Exiting, veh/h	614	509	0	112
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.8	7.8	0.0	5.5
Approach LOS	A	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	568	612	0	55
Cap Entry Lane, veh/h	1360	1281	762	769
Entry HV Adj Factor	0.957	0.991	1.000	0.982
Flow Entry, veh/h	543	606	0	54
Cap Entry, veh/h	1301	1269	762	755
V/C Ratio	0.418	0.478	0.000	0.072
Control Delay, s/veh	6.8	7.8	4.7	5.5
LOS	A	A	A	A
95th %tile Queue, veh	2	3	0	0

Intersection				
Intersection Delay, s/veh	9.0			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	761	576	0	141
Demand Flow Rate, veh/h	797	616	0	145
Vehicles Circulating, veh/h	56	28	853	611
Vehicles Exiting, veh/h	700	825	0	33
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.4	7.6	0.0	7.2
Approach LOS	B	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	797	616	0	145
Cap Entry Lane, veh/h	1303	1341	578	740
Entry HV Adj Factor	0.955	0.935	1.000	0.972
Flow Entry, veh/h	761	576	0	141
Cap Entry, veh/h	1245	1254	578	720
V/C Ratio	0.612	0.459	0.000	0.196
Control Delay, s/veh	10.4	7.6	6.2	7.2
LOS	B	A	A	A
95th %tile Queue, veh	4	2	0	1

HCM 7th Roundabout
3: MT 3 & Rod and Gun Club Rd

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Intersection				
Intersection Delay, s/veh	10.0			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	674	826	0	65
Demand Flow Rate, veh/h	705	834	0	67
Vehicles Circulating, veh/h	18	89	723	780
Vehicles Exiting, veh/h	829	634	0	143
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	11.6	0.0	7.2
Approach LOS	A	B	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	705	834	0	67
Cap Entry Lane, veh/h	1355	1260	660	623
Entry HV Adj Factor	0.956	0.991	1.000	0.970
Flow Entry, veh/h	674	826	0	65
Cap Entry, veh/h	1295	1248	660	604
V/C Ratio	0.520	0.662	0.000	0.108
Control Delay, s/veh	8.4	11.6	5.5	7.2
LOS	A	B	A	A
95th %tile Queue, veh	3	5	0	0

HCM 7th Roundabout
3: MT 3 & Rod and Gun Club Rd

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Intersection				
Intersection Delay, s/veh	12.4			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	924	703	0	185
Demand Flow Rate, veh/h	969	752	0	189
Vehicles Circulating, veh/h	73	42	1042	745
Vehicles Exiting, veh/h	861	1000	0	49
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	15.2	9.5	0.0	9.5
Approach LOS	C	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	969	752	0	189
Cap Entry Lane, veh/h	1281	1322	477	645
Entry HV Adj Factor	0.954	0.935	1.000	0.979
Flow Entry, veh/h	924	703	0	185
Cap Entry, veh/h	1222	1236	477	632
V/C Ratio	0.757	0.569	0.000	0.293
Control Delay, s/veh	15.2	9.5	7.6	9.5
LOS	C	A	A	A
95th %tile Queue, veh	8	4	0	1

HCM 7th Roundabout
3: MT 3 & Rod and Gun Club Rd

08/12/2025

Intersection				
Intersection Delay, s/veh	14.7			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	826	994	0	87
Demand Flow Rate, veh/h	864	1003	0	89
Vehicles Circulating, veh/h	24	111	888	938
Vehicles Exiting, veh/h	1003	777	0	176
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.9	18.4	0.0	9.2
Approach LOS	B	C	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	864	1003	0	89
Cap Entry Lane, veh/h	1346	1232	558	530
Entry HV Adj Factor	0.956	0.991	1.000	0.978
Flow Entry, veh/h	826	994	0	87
Cap Entry, veh/h	1287	1221	558	518
V/C Ratio	0.642	0.814	0.000	0.168
Control Delay, s/veh	10.9	18.4	6.5	9.2
LOS	B	C	A	A
95th %tile Queue, veh	5	10	0	1

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	466	0	0	379	22	0	0	1	3	0	8
Future Vol, veh/h	30	466	0	0	379	22	0	0	1	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	7	4	0	0	6	5	0	0	0	33	0	43
Mvmt Flow	35	542	0	0	441	26	0	0	1	3	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	466	0	0	542	0	0	1052	1078	542	1065	1065	453
Stage 1	-	-	-	-	-	-	612	612	-	453	453	-
Stage 2	-	-	-	-	-	-	441	466	-	612	612	-
Critical Hdwy	4.17	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.63
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.263	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.687
Pot Cap-1 Maneuver	1069	-	-	1037	-	-	206	221	544	175	224	530
Stage 1	-	-	-	-	-	-	484	487	-	531	573	-
Stage 2	-	-	-	-	-	-	599	566	-	432	487	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1069	-	-	1037	-	-	193	210	544	167	214	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	210	-	167	214	-
Stage 1	-	-	-	-	-	-	461	464	-	531	573	-
Stage 2	-	-	-	-	-	-	589	566	-	411	464	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.51	0	11.63	16.05
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	544	109	-	-	1037	-	-	167	530
HCM Lane V/C Ratio	0.002	0.033	-	-	-	-	-	0.021	0.018
HCM Ctrl Dly (s/v)	11.6	8.5	0	-	0	-	-	27.1	11.9
HCM Lane LOS	B	A	A	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1	0.1

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	396	2	1	478	7	0	0	1	17	0	44
Future Vol, veh/h	6	396	2	1	478	7	0	0	1	17	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	455	2	1	549	8	0	0	1	20	0	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	557	0	0	457	0	0	1022	1030	456	1025	1027	553
Stage 1	-	-	-	-	-	-	470	470	-	556	556	-
Stage 2	-	-	-	-	-	-	552	560	-	469	471	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1023	-	-	1114	-	-	216	235	608	215	236	536
Stage 1	-	-	-	-	-	-	578	563	-	519	516	-
Stage 2	-	-	-	-	-	-	522	514	-	579	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1023	-	-	1114	-	-	194	233	608	213	234	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	233	-	213	234	-
Stage 1	-	-	-	-	-	-	573	558	-	518	515	-
Stage 2	-	-	-	-	-	-	472	513	-	572	558	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.13			0.02			10.93			15.54		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	608	27	-	-	4	-	-	213	536
HCM Lane V/C Ratio	0.002	0.007	-	-	0.001	-	-	0.092	0.094
HCM Ctrl Dly (s/v)	10.9	8.5	0	-	8.2	0	-	23.6	12.4
HCM Lane LOS	B	A	A	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3	0.3

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	105	620	0	0	485	100	0	0	0	25	0	30
Future Vol, veh/h	105	620	0	0	485	100	0	0	0	25	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	4	0	0	6	5	0	0	0	33	0	43
Mvmt Flow	114	674	0	0	527	109	0	0	0	27	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	674	0	0	1429	1538	674	1484	1484	582
Stage 1	-	-	-	-	-	-	902	902	-	582	582	-
Stage 2	-	-	-	-	-	-	527	636	-	902	902	-
Critical Hdwy	4.17	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.63
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.263	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.687
Pot Cap-1 Maneuver	924	-	-	927	-	-	114	117	458	88	126	444
Stage 1	-	-	-	-	-	-	335	359	-	449	503	-
Stage 2	-	-	-	-	-	-	538	475	-	293	359	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	924	-	-	927	-	-	84	94	458	70	101	444
Mov Cap-2 Maneuver	-	-	-	-	-	-	84	94	-	70	101	-
Stage 1	-	-	-	-	-	-	269	288	-	449	503	-
Stage 2	-	-	-	-	-	-	499	475	-	235	288	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.37	0	0	46.21
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	261	-	-	927	-	-	70	444
HCM Lane V/C Ratio	-	0.124	-	-	-	-	-	0.386	0.073
HCM Ctrl Dly (s/v)	0	9.4	0	-	0	-	-	85.2	13.7
HCM Lane LOS	A	A	A	-	A	-	-	F	B
HCM 95th %tile Q(veh)	-	0.4	-	-	0	-	-	1.5	0.2

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	25	510	3	0	640	25	0	0	0	80	0	115
Future Vol, veh/h	25	510	3	0	640	25	0	0	0	80	0	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	27	554	3	0	696	27	0	0	0	87	0	125

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	723	0	0	558	0	0	1306	1333	556	1318	1321	709
Stage 1	-	-	-	-	-	-	610	610	-	709	709	-
Stage 2	-	-	-	-	-	-	696	723	-	609	612	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	889	-	-	1023	-	-	138	155	534	136	158	437
Stage 1	-	-	-	-	-	-	485	488	-	428	440	-
Stage 2	-	-	-	-	-	-	435	434	-	486	487	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	889	-	-	1023	-	-	94	149	534	130	151	437
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	149	-	130	151	-
Stage 1	-	-	-	-	-	-	463	466	-	428	440	-
Stage 2	-	-	-	-	-	-	311	434	-	464	465	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.43	0	0	41.11
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	84	-	-	1023	-	-	130	437
HCM Lane V/C Ratio	-	0.031	-	-	-	-	-	0.671	0.286
HCM Ctrl Dly (s/v)	0	9.2	0	-	0	-	-	76.5	16.5
HCM Lane LOS	A	A	A	-	A	-	-	F	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	3.6	1.2

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	115	760	0	0	595	105	0	0	2	25	0	35
Future Vol, veh/h	115	760	0	0	595	105	0	0	2	25	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	7	4	0	0	6	5	0	0	0	33	0	43
Mvmt Flow	134	884	0	0	692	122	0	0	2	29	0	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	814	0	0	884	0	0	1843	1965	884	1904	1904	753
Stage 1	-	-	-	-	-	-	1151	1151	-	753	753	-
Stage 2	-	-	-	-	-	-	692	814	-	1151	1151	-
Critical Hdwy	4.17	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.63
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.263	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.687
Pot Cap-1 Maneuver	792	-	-	774	-	-	58	64	347	43	70	350
Stage 1	-	-	-	-	-	-	243	275	-	358	420	-
Stage 2	-	-	-	-	-	-	438	394	-	210	275	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	792	-	-	774	-	-	34	43	347	~ 29	46	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	34	43	-	~ 29	46	-
Stage 1	-	-	-	-	-	-	162	184	-	358	420	-
Stage 2	-	-	-	-	-	-	387	394	-	139	184	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.38	0	15.43	165.08
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	347	237	-	-	774	-	-	29	350
HCM Lane V/C Ratio	0.007	0.169	-	-	-	-	-	1.014	0.116
HCM Ctrl Dly (s/v)	15.4	10.5	0	-	0	-	-	\$ 372.9	16.6
HCM Lane LOS	C	B	A	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0	0.6	-	-	0	-	-	3.3	0.4

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s
 +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	22.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	25	625	3	2	780	30	0	0	2	90	0	130
Future Vol, veh/h	25	625	3	2	780	30	0	0	2	90	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	340	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	29	718	3	2	897	34	0	0	2	103	0	149

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	931	0	0	722	0	0	1679	1713	720	1694	1698	914
Stage 1	-	-	-	-	-	-	778	778	-	918	918	-
Stage 2	-	-	-	-	-	-	901	936	-	776	779	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	743	-	-	889	-	-	76	91	431	~ 74	93	334
Stage 1	-	-	-	-	-	-	393	410	-	328	353	-
Stage 2	-	-	-	-	-	-	335	347	-	393	409	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	743	-	-	889	-	-	39	85	431	~ 69	87	334
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	85	-	~ 69	87	-
Stage 1	-	-	-	-	-	-	367	383	-	326	351	-
Stage 2	-	-	-	-	-	-	184	345	-	366	383	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.38	0.02	13.39	174.35
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	431	69	-	-	4	-	-	69	334
HCM Lane V/C Ratio	0.005	0.039	-	-	0.003	-	-	1.506	0.448
HCM Ctrl Dly (s/v)	13.4	10	0	-	9.1	0	-	\$ 391.2	24.2
HCM Lane LOS	B	B	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	8.8	2.2

Notes	
~: Volume exceeds capacity	\$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	6.5				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	577	467	1	12	
Demand Flow Rate, veh/h	601	494	1	17	
Vehicles Circulating, veh/h	4	37	605	467	
Vehicles Exiting, veh/h	480	569	0	37	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	7.0	5.8	4.8	6.2	
Approach LOS	A	A	A	A	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Free		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609		2.609	2.609
Critical Headway, s	4.976	4.976		4.976	4.976
A (Intercept)	1380	1380		1380	1380
B (Slope)	1.02e-3	1.02e-3		1.02e-3	1.02e-3
Entry Flow, veh/h	601	467	27	1	17
Cap Entry Lane, veh/h	1374	1329	1838	744	857
Entry HV Adj Factor	0.961	0.943	0.952	1.000	0.706
Flow Entry, veh/h	577	441	26	1	12
Cap Entry, veh/h	1320	1254	1750	744	605
V/C Ratio	0.437	0.351	0.015	0.001	0.020
Control Delay, s/veh	7.0	6.2	0.0	4.8	6.2
LOS	A	A	A	A	A
95th %tile Queue, veh	2	2	0	0	0

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	6.2				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	464	558	1	71	
Demand Flow Rate, veh/h	487	563	1	71	
Vehicles Circulating, veh/h	21	7	505	555	
Vehicles Exiting, veh/h	605	499	3	7	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	6.2	6.4	4.4	5.5	
Approach LOS	A	A	A	A	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Free		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609		2.609	2.609
Critical Headway, s	4.976	4.976		4.976	4.976
A (Intercept)	1380	1380		1380	1380
B (Slope)	1.02e-3	1.02e-3		1.02e-3	1.02e-3
Entry Flow, veh/h	487	555	8	1	71
Cap Entry Lane, veh/h	1351	1370	1750	824	783
Entry HV Adj Factor	0.953	0.990	1.000	1.000	1.000
Flow Entry, veh/h	464	550	8	1	71
Cap Entry, veh/h	1287	1356	1750	824	783
V/C Ratio	0.361	0.405	0.005	0.001	0.091
Control Delay, s/veh	6.2	6.5	0.0	4.4	5.5
LOS	A	A	A	A	A
95th %tile Queue, veh	2	2	0	0	0

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	8.7				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	788	636	1	60	
Demand Flow Rate, veh/h	823	673	1	83	
Vehicles Circulating, veh/h	36	122	859	559	
Vehicles Exiting, veh/h	606	738	0	122	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	10.4	6.7	6.3	7.7	
Approach LOS	B	A	A	A	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Free		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609		2.609	2.609
Critical Headway, s	4.976	4.976		4.976	4.976
A (Intercept)	1380	1380		1380	1380
B (Slope)	1.02e-3	1.02e-3		1.02e-3	1.02e-3
Entry Flow, veh/h	823	559	114	1	83
Cap Entry Lane, veh/h	1330	1218	1838	575	780
Entry HV Adj Factor	0.958	0.943	0.952	1.000	0.723
Flow Entry, veh/h	788	527	109	1	60
Cap Entry, veh/h	1274	1149	1750	575	564
V/C Ratio	0.619	0.459	0.062	0.002	0.106
Control Delay, s/veh	10.4	8.1	0.0	6.3	7.7
LOS	B	A	A	A	A
95th %tile Queue, veh	5	2	0	0	0

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	8.2				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	584	723	0	212	
Demand Flow Rate, veh/h	612	730	0	212	
Vehicles Circulating, veh/h	87	27	696	703	
Vehicles Exiting, veh/h	828	669	3	27	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	8.2	8.0	0.0	9.4	
Approach LOS	A	A	-	A	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Free		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609		2.609	2.609
Critical Headway, s	4.976	4.976		4.976	4.976
A (Intercept)	1380	1380		1380	1380
B (Slope)	1.02e-3	1.02e-3		1.02e-3	1.02e-3
Entry Flow, veh/h	612	703	27	0	212
Cap Entry Lane, veh/h	1263	1342	1750	679	674
Entry HV Adj Factor	0.955	0.990	1.000	1.000	1.000
Flow Entry, veh/h	584	696	27	0	212
Cap Entry, veh/h	1206	1329	1750	679	674
V/C Ratio	0.485	0.524	0.015	0.000	0.315
Control Delay, s/veh	8.2	8.3	0.0	5.3	9.4
LOS	A	A	A	A	A
95th %tile Queue, veh	3	3	0	0	1

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	12.0				
Intersection LOS	B				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	951	761	2	65	
Demand Flow Rate, veh/h	993	806	2	90	
Vehicles Circulating, veh/h	36	134	1029	686	
Vehicles Exiting, veh/h	740	897	0	134	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	14.4	9.2	7.5	9.0	
Approach LOS	B	A	A	A	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Yield		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	993	686	120	2	90
Cap Entry Lane, veh/h	1330	1204	1204	483	685
Entry HV Adj Factor	0.958	0.943	0.952	1.000	0.722
Flow Entry, veh/h	951	647	114	2	65
Cap Entry, veh/h	1274	1135	1146	483	495
V/C Ratio	0.747	0.570	0.099	0.004	0.131
Control Delay, s/veh	14.4	10.1	4.0	7.5	9.0
LOS	B	B	A	A	A
95th %tile Queue, veh	7	4	0	0	0

HCM 7th Roundabout
4: Stoney Ridge Rd/AJ Wy & MT 3

08/12/2025

Intersection					
Intersection Delay, s/veh	10.6				
Intersection LOS	B				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	709	883	2	239	
Demand Flow Rate, veh/h	743	891	2	239	
Vehicles Circulating, veh/h	100	27	838	858	
Vehicles Exiting, veh/h	997	813	5	27	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	10.4	10.3	6.2	12.7	
Approach LOS	B	B	A	B	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT		LTR	LTR
RT Channelized			Yield		
Lane Util	1.000	1.000		1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
A (Intercept)	1380	1380	1380	1380	1380
B (Slope)	1.02e-3	1.02e-3	1.02e-3	1.02e-3	1.02e-3
Entry Flow, veh/h	743	858	33	2	239
Cap Entry Lane, veh/h	1246	1342	1342	587	575
Entry HV Adj Factor	0.954	0.990	1.000	1.000	1.000
Flow Entry, veh/h	709	850	33	2	239
Cap Entry, veh/h	1189	1329	1342	587	575
V/C Ratio	0.596	0.639	0.025	0.003	0.416
Control Delay, s/veh	10.4	10.6	2.9	6.2	12.7
LOS	B	B	A	A	B
95th %tile Queue, veh	4	5	0	0	2

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	469	1	1	399	4	2	0	2	4	0	0
Future Vol, veh/h	0	469	1	1	399	4	2	0	2	4	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	0	552	1	1	469	5	2	0	2	5	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	474	0	0	553	0	0	1024	1029	552	1026	1027	472
Stage 1	-	-	-	-	-	-	552	552	-	474	474	-
Stage 2	-	-	-	-	-	-	472	476	-	552	553	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1098	-	-	1027	-	-	216	236	537	215	236	596
Stage 1	-	-	-	-	-	-	521	518	-	575	561	-
Stage 2	-	-	-	-	-	-	577	560	-	522	518	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1098	-	-	1027	-	-	215	235	537	214	236	596
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	235	-	214	236	-
Stage 1	-	-	-	-	-	-	521	518	-	574	560	-
Stage 2	-	-	-	-	-	-	576	559	-	519	518	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.02	16.9	22.23
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1098	-	-	4	-	-	214
HCM Lane V/C Ratio	0.015	-	-	-	0.001	-	-	0.022
HCM Ctrl Dly (s/v)	16.9	0	-	-	8.5	0	-	22.2
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	413	0	0	483	3	2	0	0	10	0	1
Future Vol, veh/h	1	413	0	0	483	3	2	0	0	10	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	1	464	0	0	543	3	2	0	0	11	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	546	0	0	464	0	0	1009	1012	464	1011	1011	544
Stage 1	-	-	-	-	-	-	466	466	-	544	544	-
Stage 2	-	-	-	-	-	-	543	546	-	466	466	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	672	-	-	1108	-	-	221	241	602	210	242	543
Stage 1	-	-	-	-	-	-	581	566	-	507	522	-
Stage 2	-	-	-	-	-	-	528	521	-	560	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	1108	-	-	220	240	602	209	241	543
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	240	-	209	241	-
Stage 1	-	-	-	-	-	-	579	564	-	507	522	-
Stage 2	-	-	-	-	-	-	527	521	-	559	564	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.03			0			21.55			22.18		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	220	4	-	-	1108	-	-	222				
HCM Lane V/C Ratio	0.01	0.002	-	-	-	-	-	0.056				
HCM Ctrl Dly (s/v)	21.6	10.4	0	-	0	-	-	22.2				
HCM Lane LOS	C	B	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2				

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	610	0	0	570	40	3	0	3	15	0	10
Future Vol, veh/h	35	610	0	0	570	40	3	0	3	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	38	663	0	0	620	43	3	0	3	16	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	663	0	0	663	0	0	1359	1402	663	1380	1380	641
Stage 1	-	-	-	-	-	-	739	739	-	641	641	-
Stage 2	-	-	-	-	-	-	620	663	-	739	739	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	935	-	-	935	-	-	127	141	465	123	146	478
Stage 1	-	-	-	-	-	-	412	427	-	466	472	-
Stage 2	-	-	-	-	-	-	479	462	-	412	427	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	935	-	-	116	132	465	114	136	478
Mov Cap-2 Maneuver	-	-	-	-	-	-	116	132	-	114	136	-
Stage 1	-	-	-	-	-	-	386	399	-	466	472	-
Stage 2	-	-	-	-	-	-	468	462	-	383	399	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.49			0			25.06			31.25		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	186	98	-	-	935	-	-	164				
HCM Lane V/C Ratio	0.035	0.041	-	-	-	-	-	0.166				
HCM Ctrl Dly (s/v)	25.1	9	0	-	0	-	-	31.3				
HCM Lane LOS	D	A	A	-	A	-	-	D				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.6				

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	580	0	0	625	15	3	0	0	50	0	40
Future Vol, veh/h	10	580	0	0	625	15	3	0	0	50	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	11	630	0	0	679	16	3	0	0	54	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	696	0	0	630	0	0	1332	1348	630	1340	1340	688
Stage 1	-	-	-	-	-	-	652	652	-	688	688	-
Stage 2	-	-	-	-	-	-	679	696	-	652	652	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	576	-	-	962	-	-	133	152	485	124	154	450
Stage 1	-	-	-	-	-	-	460	467	-	422	450	-
Stage 2	-	-	-	-	-	-	444	446	-	442	467	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	576	-	-	962	-	-	116	148	485	120	150	450
Mov Cap-2 Maneuver	-	-	-	-	-	-	116	148	-	120	150	-
Stage 1	-	-	-	-	-	-	447	454	-	422	450	-
Stage 2	-	-	-	-	-	-	402	446	-	429	454	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.19	0	36.81	47.18
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	116	31	-	-	962	-	-	179
HCM Lane V/C Ratio	0.028	0.019	-	-	-	-	-	0.548
HCM Ctrl Dly (s/v)	36.8	11.4	0	-	0	-	-	47.2
HCM Lane LOS	E	B	A	-	A	-	-	E
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	2.8

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	745	2	2	690	45	3	0	3	15	0	10
Future Vol, veh/h	40	745	2	2	690	45	3	0	3	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	47	876	2	2	812	53	4	0	4	18	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	865	0	0	879	0	0	1788	1841	878	1814	1816	838
Stage 1	-	-	-	-	-	-	972	972	-	843	843	-
Stage 2	-	-	-	-	-	-	816	869	-	971	973	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	787	-	-	777	-	-	64	76	350	61	79	369
Stage 1	-	-	-	-	-	-	306	333	-	361	382	-
Stage 2	-	-	-	-	-	-	374	372	-	307	333	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	787	-	-	777	-	-	54	67	350	53	69	369
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	67	-	53	69	-
Stage 1	-	-	-	-	-	-	271	294	-	359	380	-
Stage 2	-	-	-	-	-	-	360	370	-	268	294	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.5	0.03	46.44	73
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	94	91	-	-	5	-	-	81
HCM Lane V/C Ratio	0.075	0.06	-	-	0.003	-	-	0.364
HCM Ctrl Dly (s/v)	46.4	9.9	0	-	9.6	0	-	73
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	1.4

Intersection												
Int Delay, s/veh	11.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	700	0	0	765	15	3	0	0	55	0	40
Future Vol, veh/h	15	700	0	0	765	15	3	0	0	55	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	17	787	0	0	860	17	3	0	0	62	0	45
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	876	0	0	787	0	0	1680	1697	787	1688	1688	868
Stage 1	-	-	-	-	-	-	820	820	-	868	868	-
Stage 2	-	-	-	-	-	-	860	876	-	820	820	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	478	-	-	842	-	-	76	93	395	70	95	355
Stage 1	-	-	-	-	-	-	372	392	-	335	372	-
Stage 2	-	-	-	-	-	-	354	369	-	356	392	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	478	-	-	842	-	-	62	88	395	66	89	355
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	88	-	66	89	-
Stage 1	-	-	-	-	-	-	349	367	-	335	372	-
Stage 2	-	-	-	-	-	-	309	369	-	334	367	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.27			0			66.15			186.57		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	62	38	-	-	842	-	-	100				
HCM Lane V/C Ratio	0.054	0.035	-	-	-	-	-	1.063				
HCM Ctrl Dly (s/v)	66.1	12.8	0	-	0	-	-	186.6				
HCM Lane LOS	F	B	A	-	A	-	-	F				
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	6.7				

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	469	1	1	399	4	2	0	2	4	0	0
Future Vol, veh/h	0	469	1	1	399	4	2	0	2	4	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	0	552	1	1	469	5	2	0	2	5	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	474	0	0	553	0	0	1024	1029	552	1024	1025	469
Stage 1	-	-	-	-	-	-	552	552	-	472	472	-
Stage 2	-	-	-	-	-	-	472	476	-	552	553	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1098	-	-	1027	-	-	216	236	537	216	237	598
Stage 1	-	-	-	-	-	-	521	518	-	577	562	-
Stage 2	-	-	-	-	-	-	577	560	-	522	518	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1098	-	-	1027	-	-	215	235	537	215	237	598
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	235	-	215	237	-
Stage 1	-	-	-	-	-	-	521	518	-	576	562	-
Stage 2	-	-	-	-	-	-	576	559	-	519	518	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0			0.02			16.9			22.16		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1098	-	-	1027	-	-	215
HCM Lane V/C Ratio	0.015	-	-	-	0.001	-	-	0.022
HCM Ctrl Dly (s/v)	16.9	0	-	-	8.5	-	-	22.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	413	0	0	483	3	2	0	0	10	0	1
Future Vol, veh/h	1	413	0	0	483	3	2	0	0	10	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	1	464	0	0	543	3	2	0	0	11	0	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	546	0	0	464	0	0	1009	1012	464	1009	1009	543
Stage 1	-	-	-	-	-	-	466	466	-	543	543	-
Stage 2	-	-	-	-	-	-	543	546	-	466	466	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	672	-	-	1108	-	-	221	241	602	211	242	544
Stage 1	-	-	-	-	-	-	581	566	-	508	523	-
Stage 2	-	-	-	-	-	-	528	521	-	560	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	1108	-	-	220	241	602	210	242	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	241	-	210	242	-
Stage 1	-	-	-	-	-	-	580	565	-	508	523	-
Stage 2	-	-	-	-	-	-	527	521	-	559	565	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.03			0			21.54			22.12		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	220	672	-	-	1108	-	-	223				
HCM Lane V/C Ratio	0.01	0.002	-	-	-	-	-	0.056				
HCM Ctrl Dly (s/v)	21.5	10.4	-	-	0	-	-	22.1				
HCM Lane LOS	C	B	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2				

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	610	1	1	570	40	3	0	3	15	0	10
Future Vol, veh/h	35	610	1	1	570	40	3	0	3	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	38	663	1	1	620	43	3	0	3	16	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	663	0	0	664	0	0	1361	1405	664	1361	1362	620
Stage 1	-	-	-	-	-	-	740	740	-	622	622	-
Stage 2	-	-	-	-	-	-	622	665	-	739	740	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	935	-	-	934	-	-	127	141	464	127	149	492
Stage 1	-	-	-	-	-	-	412	426	-	478	482	-
Stage 2	-	-	-	-	-	-	478	461	-	412	426	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	934	-	-	119	135	464	121	143	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	135	-	121	143	-
Stage 1	-	-	-	-	-	-	395	409	-	477	482	-
Stage 2	-	-	-	-	-	-	467	460	-	393	409	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.49			0.01			24.73			29.7		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	189	935	-	-	934	-	-	173
HCM Lane V/C Ratio	0.035	0.041	-	-	0.001	-	-	0.157
HCM Ctrl Dly (s/v)	24.7	9	-	-	8.9	-	-	29.7
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.5

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	580	0	0	625	15	3	0	0	50	0	40
Future Vol, veh/h	10	580	0	0	625	15	3	0	0	50	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	11	630	0	0	679	16	3	0	0	54	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	696	0	0	630	0	0	1332	1348	630	1332	1332	679
Stage 1	-	-	-	-	-	-	652	652	-	679	679	-
Stage 2	-	-	-	-	-	-	679	696	-	652	652	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	576	-	-	962	-	-	133	152	485	126	156	455
Stage 1	-	-	-	-	-	-	460	467	-	427	454	-
Stage 2	-	-	-	-	-	-	444	446	-	442	467	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	576	-	-	962	-	-	118	149	485	123	153	455
Mov Cap-2 Maneuver	-	-	-	-	-	-	118	149	-	123	153	-
Stage 1	-	-	-	-	-	-	451	458	-	427	454	-
Stage 2	-	-	-	-	-	-	402	446	-	434	458	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.19	0	36.44	45.48
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	118	576	-	-	962	-	-	182
HCM Lane V/C Ratio	0.028	0.019	-	-	-	-	-	0.536
HCM Ctrl Dly (s/v)	36.4	11.4	-	-	0	-	-	45.5
HCM Lane LOS	E	B	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	2.8

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	745	2	2	690	45	3	0	3	15	0	10
Future Vol, veh/h	40	745	2	2	690	45	3	0	3	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	43	810	2	2	750	49	3	0	3	16	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	799	0	0	812	0	0	1652	1701	811	1651	1653	750
Stage 1	-	-	-	-	-	-	898	898	-	754	754	-
Stage 2	-	-	-	-	-	-	754	803	-	897	899	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	833	-	-	823	-	-	79	93	383	80	99	415
Stage 1	-	-	-	-	-	-	337	361	-	404	420	-
Stage 2	-	-	-	-	-	-	404	399	-	337	360	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	833	-	-	823	-	-	73	88	383	75	94	415
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	88	-	75	94	-
Stage 1	-	-	-	-	-	-	319	342	-	403	419	-
Stage 2	-	-	-	-	-	-	393	398	-	317	342	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.49			0.03			35.95			47.63		
HCM LOS							E			E		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	123	833	-	-	823	-	-	111				
HCM Lane V/C Ratio	0.053	0.052	-	-	0.003	-	-	0.245				
HCM Ctrl Dly (s/v)	35.9	9.6	-	-	9.4	-	-	47.6				
HCM Lane LOS	E	A	-	-	A	-	-	E				
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	0.9				

Intersection												
Int Delay, s/veh	8.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	700	0	0	765	15	3	0	0	55	0	40
Future Vol, veh/h	15	700	0	0	765	15	3	0	0	55	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	405	-	-	505	-	505	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	100	6	0	0	2	0	0	0	0	11	0	0
Mvmt Flow	16	761	0	0	832	16	3	0	0	60	0	43
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	848	0	0	761	0	0	1625	1641	761	1625	1625	832
Stage 1	-	-	-	-	-	-	793	793	-	832	832	-
Stage 2	-	-	-	-	-	-	832	848	-	793	793	-
Critical Hdwy	5.1	-	-	4.1	-	-	7.1	6.5	6.2	7.21	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.21	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	3.5	4	3.3	3.599	4	3.3
Pot Cap-1 Maneuver	492	-	-	860	-	-	83	101	409	78	103	372
Stage 1	-	-	-	-	-	-	385	403	-	351	387	-
Stage 2	-	-	-	-	-	-	367	380	-	369	403	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	492	-	-	860	-	-	71	98	409	76	100	372
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	98	-	76	100	-
Stage 1	-	-	-	-	-	-	372	390	-	351	387	-
Stage 2	-	-	-	-	-	-	324	380	-	356	390	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.26			0			58.21			131.67		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	71	492	-	-	860	-	-	114				
HCM Lane V/C Ratio	0.046	0.033	-	-	-	-	-	0.908				
HCM Ctrl Dly (s/v)	58.2	12.6	-	-	0	-	-	131.7				
HCM Lane LOS	F	B	-	-	A	-	-	F				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	5.6				

MOVEMENT SUMMARY

 **Site: 101 [2024 AM Peak Zimmerman Tr/MT 3 (Site Folder: General)]**

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	43	5.0	49	5.0	0.142	4.3	LOS A	0.6	15.2	0.31	0.18	0.31	26.2
8	T1	104	1.0	120	1.0	0.142	4.2	LOS A	0.6	15.2	0.31	0.18	0.31	23.6
18	R2	344	2.0	395	2.0	0.241	4.1	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		491	2.1	564	2.1	0.241	4.2	LOS A	0.6	15.2	0.09	0.05	0.09	24.7
East: MT 3														
1	L2	403	3.0	463	3.0	0.495	8.9	LOS A	3.1	81.4	0.49	0.34	0.49	33.8
6	T1	45	40.0	52	40.0	0.495	10.1	LOS B	3.1	81.4	0.49	0.34	0.49	33.3
16	R2	16	7.0	18	7.0	0.495	9.1	LOS A	3.1	81.4	0.49	0.34	0.49	32.0
Approach		464	6.7	533	6.7	0.495	9.1	LOS A	3.1	81.4	0.49	0.34	0.49	33.7
North: Skyway Drive														
7	L2	9	13.0	10	13.0	0.493	12.6	LOS B	3.3	82.8	0.73	0.84	1.03	33.4
4	T1	302	2.0	347	2.0	0.493	12.1	LOS B	3.3	82.8	0.73	0.84	1.03	33.1
14	R2	2	0.0	2	0.0	0.493	12.0	LOS B	3.3	82.8	0.73	0.84	1.03	31.9
Approach		313	2.3	360	2.3	0.493	12.1	LOS B	3.3	82.8	0.73	0.84	1.03	33.1
West: MT 3														
5	L2	6	0.0	7	0.0	0.499	15.1	LOS C	2.8	73.1	0.76	0.87	1.17	35.4
2	T1	116	15.0	133	15.0	0.499	16.0	LOS C	2.8	73.1	0.76	0.87	1.17	33.5
12	R2	113	1.0	130	1.0	0.499	15.2	LOS C	2.8	73.1	0.76	0.87	1.17	33.8
Approach		235	7.9	270	7.9	0.499	15.6	LOS C	2.8	73.1	0.76	0.87	1.17	33.7
All Vehicles		1503	4.5	1728	4.5	0.499	9.1	LOS A	3.3	82.8	0.45	0.43	0.58	30.1

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2024 PM Peak Zimmerman Tr/MT 3 (Site Folder: General)]**

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	109	0.0	112	0.0	0.337	5.8	LOS A	1.9	46.6	0.28	0.14	0.28	25.8
8	T1	318	0.0	328	0.0	0.337	5.8	LOS A	1.9	46.6	0.28	0.14	0.28	23.3
18	R2	411	2.0	424	2.0	0.258	4.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		838	1.0	864	1.0	0.337	5.0	LOS A	1.9	46.6	0.14	0.07	0.14	24.4
East: MT 3														
1	L2	429	1.0	442	1.0	0.641	14.5	LOS B	7.0	176.3	0.79	0.95	1.31	33.3
6	T1	88	5.0	91	5.0	0.641	14.6	LOS B	7.0	176.3	0.79	0.95	1.31	32.8
16	R2	20	0.0	21	0.0	0.641	14.4	LOS B	7.0	176.3	0.79	0.95	1.31	32.2
Approach		537	1.6	554	1.6	0.641	14.5	LOS B	7.0	176.3	0.79	0.95	1.31	33.2
North: Skyway Drive														
7	L2	9	13.0	9	13.0	0.221	8.3	LOS A	0.9	23.4	0.63	0.63	0.63	36.1
4	T1	135	2.0	139	2.0	0.221	7.8	LOS A	0.9	23.4	0.63	0.63	0.63	37.7
14	R2	4	0.0	4	0.0	0.221	7.7	LOS A	0.9	23.4	0.63	0.63	0.63	36.2
Approach		148	2.6	153	2.6	0.221	7.8	LOS A	0.9	23.4	0.63	0.63	0.63	37.5
West: MT 3														
5	L2	3	0.0	3	0.0	0.238	7.7	LOS A	0.9	24.9	0.61	0.60	0.61	39.8
2	T1	59	30.0	61	30.0	0.238	9.2	LOS A	0.9	24.9	0.61	0.60	0.61	35.6
12	R2	88	6.0	91	6.0	0.238	8.0	LOS A	0.9	24.9	0.61	0.60	0.61	37.1
Approach		150	15.3	155	15.3	0.238	8.5	LOS A	0.9	24.9	0.61	0.60	0.61	36.5
All Vehicles		1673	2.6	1725	2.6	0.641	8.6	LOS A	7.0	176.3	0.43	0.45	0.60	28.6

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2035 AM Peak Zimmerman Trail/MT 3 (Site Folder: General)]**

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	55	5.0	60	5.0	0.180	4.9	LOS A	0.8	19.6	0.38	0.26	0.38	26.0
8	T1	130	1.0	141	1.0	0.180	4.8	LOS A	0.8	19.6	0.38	0.26	0.38	23.5
18	R2	500	2.0	543	2.0	0.331	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		685	2.1	745	2.1	0.331	5.2	LOS A	0.8	19.6	0.10	0.07	0.10	24.7
East: MT 3														
1	L2	525	3.0	571	3.0	0.640	12.5	LOS B	6.7	177.0	0.64	0.56	0.81	33.6
6	T1	60	40.0	65	40.0	0.640	13.7	LOS B	6.7	177.0	0.64	0.56	0.81	30.2
16	R2	25	7.0	27	7.0	0.640	12.6	LOS B	6.7	177.0	0.64	0.56	0.81	32.0
Approach		610	6.8	663	6.8	0.640	12.6	LOS B	6.7	177.0	0.64	0.56	0.81	33.2
North: Skyway Drive														
7	L2	30	13.0	33	13.0	0.713	22.7	LOS C	6.7	171.6	0.87	1.13	1.75	29.5
4	T1	380	2.0	413	2.0	0.713	22.1	LOS C	6.7	171.6	0.87	1.13	1.75	30.6
14	R2	3	0.0	3	0.0	0.713	22.0	LOS C	6.7	171.6	0.87	1.13	1.75	29.6
Approach		413	2.8	449	2.8	0.713	22.2	LOS C	6.7	171.6	0.87	1.13	1.75	30.5
West: MT 3														
5	L2	10	0.0	11	0.0	0.755	32.5	LOS D	5.7	152.3	0.86	1.15	2.01	27.8
2	T1	155	15.0	168	15.0	0.755	33.6	LOS D	5.7	152.3	0.86	1.15	2.01	26.7
12	R2	140	1.0	152	1.0	0.755	32.6	LOS D	5.7	152.3	0.86	1.15	2.01	26.9
Approach		305	8.1	332	8.1	0.755	33.1	LOS D	5.7	152.3	0.86	1.15	2.01	26.8
All Vehicles		2013	4.6	2188	4.6	0.755	15.1	LOS C	6.7	177.0	0.54	0.60	0.94	28.4

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.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\dowl.com\Projects\71\12635-01\40Study\05 Traffic & Transportation Analysis\SIDRA\Future Conditions_No_Build.sip9

MOVEMENT SUMMARY

 **Site: 101 [2035 PM Peak Zimmerman Trail/MT 3 (Site Folder: General)]**

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	135	0.0	147	0.0	0.460	7.6	LOS A	3.0	74.1	0.39	0.23	0.39	25.3
8	T1	400	0.0	435	0.0	0.460	7.6	LOS A	3.0	74.1	0.39	0.23	0.39	22.9
18	R2	535	2.0	582	2.0	0.354	5.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		1070	1.0	1163	1.0	0.460	6.4	LOS A	3.0	74.1	0.19	0.12	0.19	24.1
East: MT 3														
1	L2	600	1.0	652	1.0	1.120	93.0	LOS F	52.2	1322.4	1.00	2.60	6.39	16.0
6	T1	125	5.0	136	5.0	1.120	93.2	LOS F	52.2	1322.4	1.00	2.60	6.39	15.8
16	R2	45	0.0	49	0.0	1.120	92.9	LOS F	52.2	1322.4	1.00	2.60	6.39	15.7
Approach		770	1.6	837	1.6	1.120	93.0	LOS F	52.2	1322.4	1.00	2.60	6.39	15.9
North: Skyway Drive														
7	L2	15	13.0	16	13.0	0.373	12.8	LOS B	1.7	44.6	0.72	0.77	0.90	33.8
4	T1	170	2.0	185	2.0	0.373	12.1	LOS B	1.7	44.6	0.72	0.77	0.90	35.2
14	R2	5	0.0	5	0.0	0.373	12.0	LOS B	1.7	44.6	0.72	0.77	0.90	33.9
Approach		190	2.8	207	2.8	0.373	12.1	LOS B	1.7	44.6	0.72	0.77	0.90	35.0
West: MT 3														
5	L2	4	0.0	4	0.0	0.388	12.1	LOS B	1.7	47.2	0.70	0.76	0.91	36.9
2	T1	75	30.0	82	30.0	0.388	13.8	LOS B	1.7	47.2	0.70	0.76	0.91	33.2
12	R2	110	6.0	120	6.0	0.388	12.4	LOS B	1.7	47.2	0.70	0.76	0.91	34.6
Approach		189	15.4	205	15.4	0.388	13.0	LOS B	1.7	47.2	0.70	0.76	0.91	34.1
All Vehicles		2219	2.6	2412	2.6	1.120	37.4	LOS E	52.2	1322.4	0.56	1.09	2.47	21.3

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.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\dowl.com\j\Projects\71\12635-01\40Study\05 Traffic & Transportation Analysis\SIDRA\Future Conditions_No_Build.sip9

MOVEMENT SUMMARY

 Site: 101 [2045 AM Peak Zimmerman Trail/MT 3 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	70	5.0	76	5.0	0.233	5.5	LOS A	1.0	26.3	0.40	0.29	0.40	25.8
8	T1	165	1.0	179	1.0	0.233	5.4	LOS A	1.0	26.3	0.40	0.29	0.40	23.3
18	R2	608	2.0	661	2.0	0.403	6.1	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		843	2.1	916	2.1	0.403	6.0	LOS A	1.0	26.3	0.11	0.08	0.11	24.6
East: MT 3														
1	L2	645	3.0	701	3.0	0.832	22.9	LOS C	21.4	564.3	0.92	1.20	1.97	29.4
6	T1	75	40.0	82	40.0	0.832	24.1	LOS C	21.4	564.3	0.92	1.20	1.97	26.8
16	R2	30	7.0	33	7.0	0.832	23.0	LOS C	21.4	564.3	0.92	1.20	1.97	28.2
Approach		750	6.9	815	6.9	0.832	23.0	LOS C	21.4	564.3	0.92	1.20	1.97	29.1
North: Skyway Drive														
7	L2	35	13.0	38	13.0	1.047	80.7	LOS F	25.6	654.2	1.00	2.15	5.14	17.1
4	T1	470	2.0	511	2.0	1.047	79.9	LOS F	25.6	654.2	1.00	2.15	5.14	17.4
14	R2	3	0.0	3	0.0	1.047	79.8	LOS F	25.6	654.2	1.00	2.15	5.14	17.1
Approach		508	2.7	552	2.7	1.047	80.0	LOS F	25.6	654.2	1.00	2.15	5.14	17.4
West: MT 3														
5	L2	10	0.0	11	0.0	1.163	133.0	LOS F	27.9	743.3	1.00	2.37	6.81	12.5
2	T1	190	15.0	207	15.0	1.163	134.4	LOS F	27.9	743.3	1.00	2.37	6.81	12.3
12	R2	175	1.0	190	1.0	1.163	133.0	LOS F	27.9	743.3	1.00	2.37	6.81	12.3
Approach		375	8.1	408	8.1	1.163	133.7	LOS F	27.9	743.3	1.00	2.37	6.81	12.3
All Vehicles		2476	4.6	2691	4.6	1.163	45.6	LOS E	27.9	743.3	0.67	1.19	2.72	20.8

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.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\dowl.com\Projects\71\12635-01\40Study\05 Traffic & Transportation Analysis\SIDRA\Future Conditions_No_Build.sip9

MOVEMENT SUMMARY

 **Site: 101 [2045 PM Peak Zimmerman Trail/MT 3 (Site Folder: General)]**

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	170	0.0	185	0.0	0.591	10.1	LOS B	4.6	114.0	0.53	0.36	0.53	24.6
8	T1	495	0.0	538	0.0	0.591	10.1	LOS B	4.6	114.0	0.53	0.36	0.53	22.3
18	R2	655	2.0	712	2.0	0.434	6.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach		1320	1.0	1435	1.0	0.591	8.2	LOS A	4.6	114.0	0.27	0.18	0.27	23.8
East: MT 3														
1	L2	725	1.0	788	1.0	1.556	275.4	LOS F	128.9	3262.7	1.00	4.54	13.88	7.2
6	T1	150	5.0	163	5.0	1.556	275.6	LOS F	128.9	3262.7	1.00	4.54	13.88	7.2
16	R2	50	0.0	54	0.0	1.556	275.3	LOS F	128.9	3262.7	1.00	4.54	13.88	7.2
Approach		925	1.6	1005	1.6	1.556	275.4	LOS F	128.9	3262.7	1.00	4.54	13.88	7.2
North: Skyway Drive														
7	L2	20	13.0	22	13.0	0.439	13.7	LOS B	2.3	59.5	0.74	0.82	1.02	33.4
4	T1	210	2.0	228	2.0	0.439	13.0	LOS B	2.3	59.5	0.74	0.82	1.02	34.7
14	R2	6	0.0	7	0.0	0.439	12.9	LOS B	2.3	59.5	0.74	0.82	1.02	33.4
Approach		236	2.9	257	2.9	0.439	13.1	LOS B	2.3	59.5	0.74	0.82	1.02	34.5
West: MT 3														
5	L2	5	0.0	5	0.0	0.482	14.1	LOS B	2.5	69.5	0.73	0.84	1.11	35.7
2	T1	95	30.0	103	30.0	0.482	15.9	LOS C	2.5	69.5	0.73	0.84	1.11	32.3
12	R2	140	6.0	152	6.0	0.482	14.5	LOS B	2.5	69.5	0.73	0.84	1.11	33.5
Approach		240	15.4	261	15.4	0.482	15.0	LOS C	2.5	69.5	0.73	0.84	1.11	33.1
All Vehicles		2721	2.6	2958	2.6	1.556	100.0	LOS F	128.9	3262.7	0.60	1.78	5.04	13.6

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.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\dowl.com\j\Projects\71\12635-01\40Study\05 Traffic & Transportation Analysis\SIDRA\Future Conditions_No_Build.sip9

MOVEMENT SUMMARY

Site: 1 [2024 AM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	43	5.0	47	5.0	0.042	3.6	LOS A	0.2	3.9	0.27	0.14	0.27	24.4
8	T1	104	1.0	113	1.0	0.401	6.9	LOS A	2.1	54.0	0.37	0.24	0.37	24.1
18	R2	344	2.0	374	2.0	0.401	6.9	LOS A	2.1	54.0	0.37	0.24	0.37	23.4
Approach		491	2.1	534	2.1	0.401	6.6	LOS A	2.1	54.0	0.36	0.23	0.36	23.7
East: MT 3														
1	L2	403	3.0	438	3.0	0.367	6.6	LOS A	1.8	46.9	0.36	0.24	0.36	35.5
6	T1	45	40.0	49	40.0	0.075	5.1	LOS A	0.2	6.9	0.28	0.16	0.28	34.9
16	R2	16	7.0	17	7.0	0.075	4.0	LOS A	0.2	6.9	0.28	0.16	0.28	38.1
Approach		464	6.7	504	6.7	0.367	6.4	LOS A	1.8	46.9	0.35	0.23	0.35	35.5
North: Skyway Drive														
7	L2	9	13.0	10	13.0	0.014	5.2	LOS A	0.0	1.2	0.49	0.36	0.49	33.1
4	T1	302	2.0	328	2.0	0.385	8.7	LOS A	1.8	46.7	0.60	0.63	0.68	35.6
14	R2	2	0.0	2	0.0	0.385	8.6	LOS A	1.8	46.7	0.60	0.63	0.68	34.8
Approach		313	2.3	340	2.3	0.385	8.6	LOS A	1.8	46.7	0.60	0.62	0.67	35.5
West: MT 3														
5	L2	6	0.0	7	0.0	0.010	5.7	LOS A	0.0	0.9	0.56	0.44	0.56	36.4
2	T1	116	15.0	126	15.0	0.373	10.8	LOS B	1.6	42.5	0.65	0.69	0.81	34.9
12	R2	113	1.0	123	1.0	0.373	10.1	LOS B	1.6	42.5	0.65	0.69	0.81	35.6
Approach		235	7.9	255	7.9	0.373	10.3	LOS B	1.6	42.5	0.65	0.69	0.80	35.3
All Vehicles		1503	4.5	1634	4.5	0.401	7.5	LOS A	2.1	54.0	0.45	0.38	0.49	30.6

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2024 PM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	109	0.0	118	0.0	0.096	3.7	LOS A	0.4	9.7	0.21	0.10	0.21	24.4
8	T1	318	0.0	346	0.0	0.613	10.1	LOS B	4.9	123.7	0.42	0.23	0.42	23.4
18	R2	411	2.0	447	2.0	0.613	10.2	LOS B	4.9	123.7	0.42	0.23	0.42	22.7
Approach		838	1.0	911	1.0	0.613	9.3	LOS A	4.9	123.7	0.39	0.21	0.39	23.2
East: MT 3														
1	L2	429	1.0	466	1.0	0.493	9.9	LOS A	3.3	83.6	0.63	0.68	0.84	34.0
6	T1	89	5.0	97	5.0	0.140	5.7	LOS A	0.5	13.5	0.49	0.42	0.49	39.2
16	R2	20	0.0	22	0.0	0.140	5.5	LOS A	0.5	13.5	0.49	0.42	0.49	38.6
Approach		538	1.6	585	1.6	0.493	9.1	LOS A	3.3	83.6	0.60	0.63	0.77	34.9
North: Skyway Drive														
7	L2	9	13.0	10	13.0	0.015	5.9	LOS A	0.0	1.3	0.53	0.42	0.53	32.8
4	T1	135	2.0	147	2.0	0.195	6.8	LOS A	0.7	18.4	0.56	0.56	0.56	36.8
14	R2	4	0.0	4	0.0	0.195	6.7	LOS A	0.7	18.4	0.56	0.56	0.56	35.8
Approach		148	2.6	161	2.6	0.195	6.7	LOS A	0.7	18.4	0.56	0.56	0.56	36.5
West: MT 3														
5	L2	3	0.0	3	0.0	0.004	4.8	LOS A	0.0	0.4	0.51	0.34	0.51	36.9
2	T1	59	30.0	64	30.0	0.223	8.2	LOS A	0.7	20.8	0.55	0.54	0.55	34.6
12	R2	88	6.0	96	6.0	0.223	7.1	LOS A	0.7	20.8	0.55	0.54	0.55	36.5
Approach		150	15.3	163	15.3	0.223	7.5	LOS A	0.7	20.8	0.55	0.54	0.55	35.8
All Vehicles		1674	2.6	1820	2.6	0.613	8.8	LOS A	4.9	123.7	0.49	0.41	0.54	28.0

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 1 [2035 AM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]**

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	55	5.0	60	5.0	0.058	4.0	LOS A	0.2	5.4	0.33	0.21	0.33	24.3
8	T1	130	1.0	141	1.0	0.603	10.8	LOS B	5.4	137.3	0.59	0.55	0.71	23.1
18	R2	500	2.0	543	2.0	0.603	10.9	LOS B	5.4	137.3	0.59	0.55	0.71	22.5
Approach		685	2.1	745	2.1	0.603	10.3	LOS B	5.4	137.3	0.57	0.52	0.68	22.8
East: MT 3														
1	L2	525	3.0	571	3.0	0.497	8.7	LOS A	2.9	73.2	0.48	0.35	0.48	34.4
6	T1	60	40.0	65	40.0	0.109	5.6	LOS A	0.3	10.1	0.32	0.21	0.32	34.7
16	R2	25	7.0	27	7.0	0.109	4.5	LOS A	0.3	10.1	0.32	0.21	0.32	37.8
Approach		610	6.8	663	6.8	0.497	8.2	LOS A	2.9	73.2	0.46	0.33	0.46	34.5
North: Skyway Drive														
7	L2	30	13.0	33	13.0	0.054	6.6	LOS A	0.2	4.6	0.55	0.51	0.55	32.5
4	T1	380	2.0	413	2.0	0.562	13.7	LOS B	3.8	97.3	0.73	0.88	1.21	33.1
14	R2	3	0.0	3	0.0	0.562	13.6	LOS B	3.8	97.3	0.73	0.88	1.21	32.3
Approach		413	2.8	449	2.8	0.562	13.2	LOS B	3.8	97.3	0.72	0.85	1.16	33.0
West: MT 3														
5	L2	10	0.0	11	0.0	0.021	7.2	LOS A	0.1	1.8	0.62	0.58	0.62	35.5
2	T1	155	15.0	168	15.0	0.595	19.4	LOS C	3.4	90.0	0.76	0.92	1.41	30.8
12	R2	140	1.0	152	1.0	0.595	18.6	LOS C	3.4	90.0	0.76	0.92	1.41	31.4
Approach		305	8.1	332	8.1	0.595	18.6	LOS C	3.4	90.0	0.76	0.91	1.38	31.2
All Vehicles		2013	4.6	2188	4.6	0.603	11.5	LOS B	5.4	137.3	0.59	0.59	0.82	28.8

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 1 [2035 PM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]**

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	135	0.0	147	0.0	0.122	4.0	LOS A	0.5	12.6	0.25	0.14	0.25	24.3
8	T1	400	0.0	435	0.0	0.808	17.6	LOS C	13.6	343.2	0.76	0.57	0.86	21.7
18	R2	535	2.0	582	2.0	0.808	17.6	LOS C	13.6	343.2	0.76	0.57	0.86	21.1
Approach		1070	1.0	1163	1.0	0.808	15.9	LOS C	13.6	343.2	0.69	0.51	0.78	21.7
East: MT 3														
1	L2	600	1.0	652	1.0	0.763	20.2	LOS C	10.1	255.4	0.87	1.17	1.88	29.6
6	T1	125	5.0	136	5.0	0.243	7.5	LOS A	0.9	24.4	0.57	0.56	0.57	38.0
16	R2	45	0.0	49	0.0	0.243	7.3	LOS A	0.9	24.4	0.57	0.56	0.57	37.5
Approach		770	1.6	837	1.6	0.763	17.4	LOS C	10.1	255.4	0.80	1.04	1.59	31.1
North: Skyway Drive														
7	L2	15	13.0	16	13.0	0.033	7.6	LOS A	0.1	2.7	0.60	0.56	0.60	32.0
4	T1	170	2.0	185	2.0	0.306	9.8	LOS A	1.2	30.4	0.66	0.68	0.73	35.0
14	R2	5	0.0	5	0.0	0.306	9.7	LOS A	1.2	30.4	0.66	0.68	0.73	34.2
Approach		190	2.8	207	2.8	0.306	9.7	LOS A	1.2	30.4	0.65	0.67	0.72	34.7
West: MT 3														
5	L2	4	0.0	4	0.0	0.007	6.0	LOS A	0.0	0.6	0.57	0.45	0.57	36.2
2	T1	75	30.0	82	30.0	0.342	11.7	LOS B	1.3	35.5	0.64	0.68	0.77	32.9
12	R2	110	6.0	120	6.0	0.342	10.5	LOS B	1.3	35.5	0.64	0.68	0.77	34.6
Approach		189	15.4	205	15.4	0.342	10.9	LOS B	1.3	35.5	0.64	0.67	0.77	34.0
All Vehicles		2219	2.6	2412	2.6	0.808	15.4	LOS C	13.6	343.2	0.72	0.72	1.06	26.1

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 1 [2045 AM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]**

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	70	5.0	76	5.0	0.077	4.4	LOS A	0.3	7.3	0.37	0.26	0.37	24.2
8	T1	165	1.0	179	1.0	0.769	17.1	LOS C	15.5	392.7	0.82	1.20	1.56	21.7
18	R2	605	2.0	658	2.0	0.769	17.2	LOS C	15.5	392.7	0.82	1.20	1.56	21.2
Approach		840	2.1	913	2.1	0.769	16.1	LOS C	15.5	392.7	0.78	1.12	1.46	21.5
East: MT 3														
1	L2	645	3.0	701	3.0	0.641	12.2	LOS B	7.3	187.6	0.64	0.64	0.93	32.7
6	T1	75	40.0	82	40.0	0.142	6.2	LOS A	0.4	13.3	0.37	0.27	0.37	34.3
16	R2	30	7.0	33	7.0	0.142	5.1	LOS A	0.4	13.3	0.37	0.27	0.37	37.4
Approach		750	6.9	815	6.9	0.641	11.3	LOS B	7.3	187.6	0.60	0.59	0.85	33.0
North: Skyway Drive														
7	L2	35	13.0	38	13.0	0.074	7.9	LOS A	0.2	6.2	0.60	0.60	0.60	31.9
4	T1	470	2.0	511	2.0	0.804	28.7	LOS D	8.5	215.3	0.88	1.26	2.22	27.2
14	R2	3	0.0	3	0.0	0.804	28.6	LOS D	8.5	215.3	0.88	1.26	2.22	26.7
Approach		508	2.7	552	2.7	0.804	27.3	LOS D	8.5	215.3	0.86	1.21	2.11	27.5
West: MT 3														
5	L2	10	0.0	11	0.0	0.026	9.1	LOS A	0.1	2.1	0.70	0.70	0.70	34.6
2	T1	190	15.0	207	15.0	0.903	53.0	LOS F	9.2	246.5	0.92	1.46	3.17	21.2
12	R2	175	1.0	190	1.0	0.903	52.0	LOS F	9.2	246.5	0.92	1.46	3.17	21.4
Approach		375	8.1	408	8.1	0.903	51.4	LOS F	9.2	246.5	0.92	1.43	3.11	21.5
All Vehicles		2473	4.6	2688	4.6	0.903	22.3	LOS C	15.5	392.7	0.76	1.02	1.66	25.4

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.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 1 [2045 PM Zimmerman Trail and MT 3 Two-Lane Approach (Site Folder: General)]**

Roundabout with 2-lane approaches and circulating road, and 1-lane exits
MUTCD (FHWA 2009) example number: 3C-5
Roundabout Guide (TRB 2010) example number: A-6
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Zimmerman Trail														
3	L2	170	0.0	185	0.0	0.159	4.5	LOS A	0.7	16.8	0.30	0.18	0.30	24.2
8	T1	495	0.0	538	0.0	1.026	51.2	LOS F	85.1	2148.0	1.00	2.39	3.00	16.4
18	R2	655	2.0	712	2.0	1.026	51.2	LOS F	85.1	2148.0	1.00	2.39	3.00	16.1
Approach		1320	1.0	1435	1.0	1.026	45.2	LOS E	85.1	2148.0	0.91	2.11	2.65	17.0
East: MT 3														
1	L2	725	1.0	788	1.0	1.032	64.2	LOS F	33.6	845.8	1.00	2.16	5.14	19.1
6	T1	150	5.0	163	5.0	0.323	9.6	LOS A	1.3	34.0	0.63	0.65	0.68	36.7
16	R2	50	0.0	54	0.0	0.323	9.3	LOS A	1.3	34.0	0.63	0.65	0.68	36.3
Approach		925	1.6	1005	1.6	1.032	52.4	LOS F	33.6	845.8	0.92	1.83	4.18	21.2
North: Skyway Drive														
7	L2	20	13.0	22	13.0	0.051	9.2	LOS A	0.2	4.2	0.66	0.66	0.66	31.4
4	T1	210	2.0	228	2.0	0.441	14.1	LOS B	2.0	51.4	0.74	0.83	1.07	32.9
14	R2	6	0.0	7	0.0	0.441	14.0	LOS B	2.0	51.4	0.74	0.83	1.07	32.1
Approach		236	2.9	257	2.9	0.441	13.7	LOS B	2.0	51.4	0.73	0.81	1.04	32.7
West: MT 3														
5	L2	5	0.0	5	0.0	0.010	7.0	LOS A	0.0	0.9	0.61	0.53	0.61	35.7
2	T1	95	30.0	103	30.0	0.500	17.2	LOS C	2.3	64.3	0.71	0.84	1.19	30.5
12	R2	140	6.0	152	6.0	0.500	15.8	LOS C	2.3	64.3	0.71	0.84	1.19	32.0
Approach		240	15.4	261	15.4	0.500	16.2	LOS C	2.3	64.3	0.71	0.83	1.18	31.5
All Vehicles		2721	2.6	2958	2.6	1.032	42.3	LOS E	85.1	2148.0	0.88	1.79	2.90	20.0

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Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.