Chapter 5 Transportation System Recommendations

This Plan makes various transportation system recommendations that have been identified by the Plan partners for future recommended major street network improvements. Both the specific projects and/or procedural or policy recommendations are recognized within the general confines of the following two categories:

- Major Street Network (MSN) Improvement Projects; and
- Transportation System Management (TSM) Improvement Projects.

This chapter briefly summarizes the improvement projects and presents newly identified transportation system improvement projects.

5.1 Committed Improvement Projects

A list of committed improvement projects and their status as of the development of this Plan are listed in this section. Table 5.1 shows the improvement projects that include three Major Street Network (MSN) projects by MDT and one MSN project by Lake County. One project is currently under construction, but the others have not yet started.

Table 5.1 Improvement Projects from the Plan Partners

Project ID	Location of Project	Recommendation	Commitment Time and Source	Jurisdictional Partner
1	S-354 (from RP 0.3 to 0.8)	Mill/Fill, Seal & Cover	2014 STIP	MDT
2	Skyline Drive (Off-system, from RP 1.4 to 3.0)	Safety project to install guardrail, signing, and delineation	2014 STIP	MDT
3	Skyline Drive (from RP 3.0 to 6.7)	Safety project to install signing and delineation	2011 STIP	MDT
4	Skyline Drive	Road widening	In Progress (2011) (result of TIGER grant)	Lake County

5.2 Recommended Major Street Network (MSN) Improvement Projects

During the preparation of this Plan, a number of MSN projects were identified. Estimated project costs are included for each project. These costs are "planning level" estimates and do not include possible right-of-way, utility, traffic management, or other heavily variable costs. However, they do include mandatory "incidental & indirect cost" (IDIC) factors as required by federal requirements.

Many of the recommended roadway improvements call for "urban" type roadways in areas that are currently "rural" in nature. In many cases, roadway typical sections have been identified to match existing City of Polson standard typical sections. This approach is not an effort to force urban roadway sections on all rural roadways; however, as the community grows, these corridors will likely require certain urban features as traffic volumes increase, in context with adjacent land uses.

The following list of MSN projects is **not** in any particular priority order:

MSN-1 7th Avenue (5th Street West to Hillcrest Lane)

Identified Concerns: Operational, Capacity, Safety, & Multi-Modal
Project Timeline: Long Term Implementation (>10 years)

Project Description: Improvements to 7th Avenue are recommended from 5th Street West to Hillcrest Lane. Reconstruct 7th Avenue as an "urban" collector street with curb, gutter, and sidewalks. The minimum right-of-way required is 55 feet, in accordance with the City of Polson standards. This project will improve east-west travel via improved drainage, improved non-motorized features, and better visibility for vehicles and pedestrians.

Estimated Cost: *$1,800,000*

MSN-2 US 93 and Rocky Point Road

Identified Concerns: Operational, Capacity, & Safety
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: Stripe a westbound right-turn lane on US 93 at the intersection to allow right-turning vehicles to exit the stream of traffic. Currently, the pavement is wide enough for vehicles to utilize the space as an unofficial right-turn lane. The skewed intersection provides access to several residential parcels on the west shore of Flathead Lake. Due to the skew and location of a hill to the west of the intersection, sight distance appears to be an issue. It is also recommended a speed study be completed to determine if eastbound traffic on US 93 should decrease speed.

Estimated Cost: *$65,000*

MSN-3 2nd Street East (Kootenai Avenue to 7th Avenue)

Identified Concerns: Maintenance
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: Mill and overlay this segment of 2nd Street East as funding becomes available and in accordance with the City of Polson's overall priority system. This segment of roadway experiences residential, commercial, and seasonal traffic because of the connections to Flathead Lake, the courthouse, to school, downtown, and to residential neighborhoods.

Estimated Cost: *$85,000*

MSN-4 US 93 and MT 35 (South Shore Road)

Identified Concerns: Operational & Safety
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection has several recorded crashes primarily related to westbound right-turns which may be due in part to the short distance allowed for the lane merge on the north side of the intersection. It is recommended that signal phase timing be evaluated to determine if a protected right-turn phase can be accommodated. Because the intersection to the north is in close proximity, it is not possible to reconfigure the northbound section by extending the merge lane. In the long term, the opportunity may exist to reconstruct this section to avoid the lane merge.

Estimated Cost: *$30,000*

MSN-5 1st Street East (US 93 to Skyline Drive)

Identified Concerns: Maintenance
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: Improvements to 1st Street East are recommended from US 93 to Skyline Drive. 1st Street East may be reconstructed to a standard arterial street with curb and gutter and sidewalks. The minimum right-of-way required is 60 feet, in accordance with the City of Polson standards. This project will improve north-south travel via improved drainage, improved non-motorized features, and better visibility for vehicles and pedestrians. 1st Street East is currently being used as an emergency response route.

Estimated Cost: *$2,100,000*

MSN-6 4th Avenue East (1st Street East to US 93)

Identified Concerns: Roadway Deterioration, Capacity, Safety
Project Timeline: Long Term Implementation (> 10 years)

Project Description: Improvements to 4th Avenue East are recommended from 1st Street East to US 93. Reconstruct 4th Avenue East as an "urban" collector street with curb, gutter, and sidewalks. The minimum right-of-way required is 55 feet, in accordance with the City of Polson standards. This project will improve east-west travel via improved drainage, improved road surfacing, and provision of pedestrian facilities.

Estimated Cost: *$1,125,000*

Note: Conceptual improvements to the existing US 93 through Polson is discussed in Chapter 8 of this report.

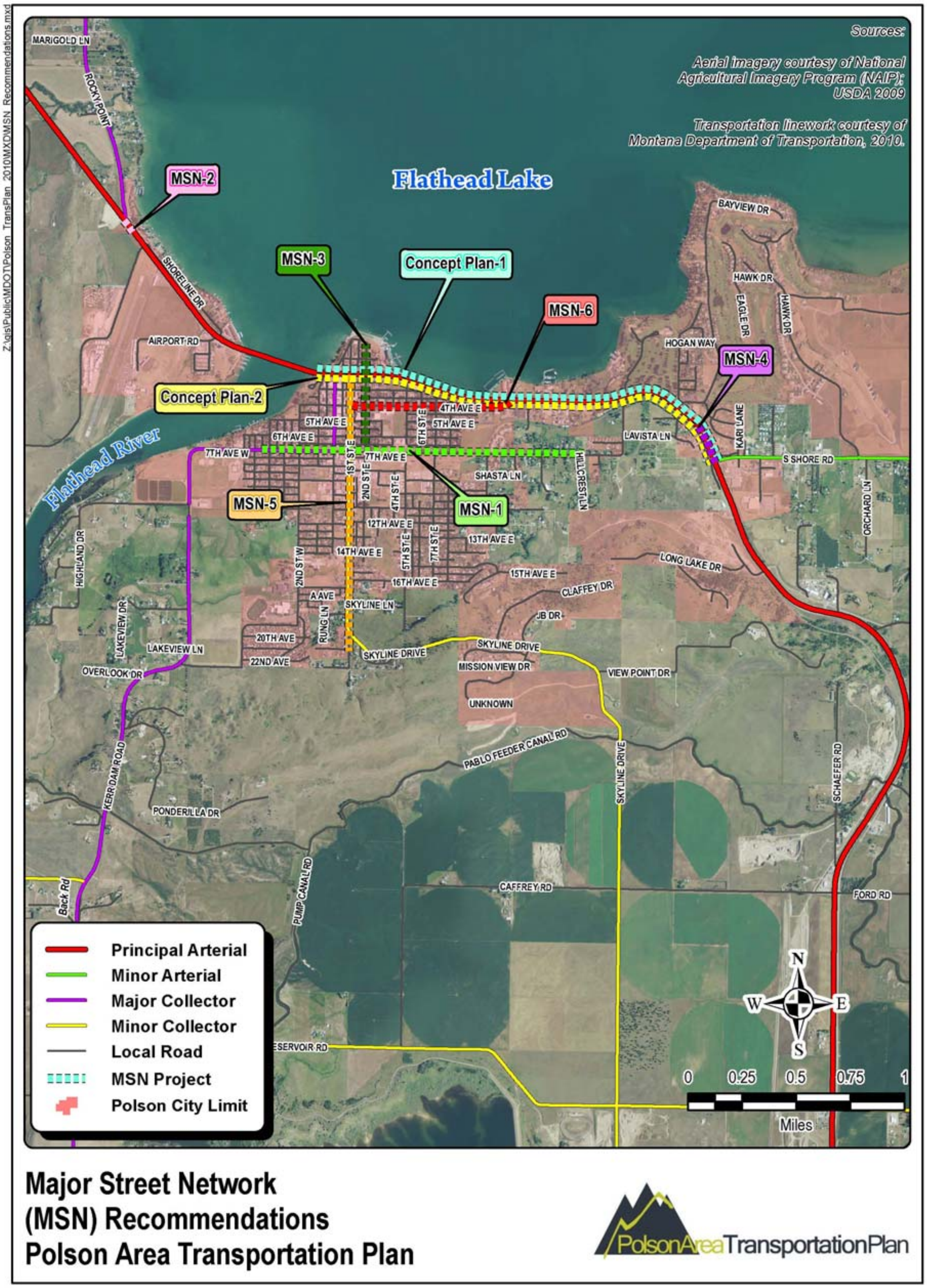

Figure 5-1 Major Street Network Recommendations

5.3 Recommended Transportation System Management (TSM) Improvement Projects

During the preparation of this Plan, a number of transportation system management (TSM) projects were identified. TSM projects typically are lower cost projects and range from simple signage up to adding turn bays at intersections. Estimated project costs for the TSM projects are included for each recommended project. These costs are "planning level" estimates and do not include possible right-of-way, utility, traffic management, or other heavily variable costs. However, the projects do include mandatory "incidental & indirect cost (IDIC)" factors as required by federal requirements.

The following list of TSM projects are **not** in any particular priority order:

TSM-1 US 93 Access Management Plan

Identified Concerns: Access Management
Project Timeline: Short Term Implementation (0 - 2 years)

Project Description: A comprehensive Access Management Plan should be completed along US 93, beginning at MT 35 (South Shore Road) to Rocky Point Road. This entire length is categorized by multiple approaches, by numerous driveway turning movements, and by vehicle stacking in the center two-way, left-turn lane (TWLTL). The result is conflicting operations because of the prevalence of driveway approaches. A formal Access Management Plan would allow for one-on-one dialogue with each property owner to devise a strategy to combine drive accesses, restrict problematic accesses, and/or to totally remove unneeded accesses. Here, the potential also exists to install raised medians in the center turn lanes at strategic locations to control access operational issues. The success of a formal Access Management Plan depends on aggressive outreach to all affected parties, plus a basic strategy on why access control will benefit both the adjacent land uses as well as the traveling public. MDT would be responsible for initiating this project, with active participation from the City of Polson, Lake County, CSKT, and from affected landowners along the corridor.

Estimated Cost: $130,000

TSM-2 Development of Access Management Regulations

Identified Concerns: Access Management
Project Timeline: Short Term Implementation (0 - 2 years)

Project Description: Section 7.2 of this report offers guidance on access management principles and why access management is needed within a community. Because section 7.2 contains guidelines only, a community generally needs to adopt access management regulations both through an Access Management Ordinance and through a Corridor Preservation Ordinance. Thus, it is important MDT, Lake County, City of Polson, and CSKT land use policies and planning of accesses are complementary when land is annexed in the future.

Estimated Cost: *$15,000*

TSM-3 Polson Area Non-Motorized Transportation Plan

Identified Concerns: Multi-Modal
Project Timeline: Short Term Implementation (0 - 2 years)

Project Description: The City of Polson and Lake County should develop a Non-Motorized Transportation Plan for the community. This current Transportation Plan just begins to explore non-motorized planning in the community, and a full Non-Motorized Transportation Plan will allow the community to achieve a higher level of understanding and planning as it relates to bicyclists and pedestrians. There appears to be enough interest in the community to make non-motorized infrastructure a higher priority as the community grows.

Estimated Cost: *$25,000*

TSM-4 Downtown Parking Study

Identified Concerns: Operational & Safety
Project Timeline: Short Term Implementation (0 - 2 years)

Project Description: A parking study is suggested for downtown Polson. The potential study would cover the area north of 5th Avenue to 1st Avenue and the area east of 1st Street West to 2nd Street East. A parking study would evaluate existing parking facilities throughout the community and address the need for additional parking. The Polson community experiences an increase in traffic volumes during the summer months. The parking study would assess potential strategies to provide adequate parking and specific parking solution recommendations. Recommendations would attract tourists and locals to those downtown businesses which are otherwise avoided because of a lack of parking.

Estimated Cost: *$40,000*

TSM-5 Polson Downtown Master Plan

Identified Concerns: Operational & Multi-Modal
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: Comments from the community focused on the need for traffic to be attracted to downtown Polson. It is recommended that a Downtown Master Plan be completed that includes a detailed wayfinding and signage component. A Downtown Master Plan would be valuable to set goals on land use in the downtown, aesthetics, economics, and on infrastructure requirements. Ultimately, the Downtown Master Plan will address the question, "How does the community of Polson want to be envisioned?"

Estimated Cost: *$40,000*

TSM-6 US 93 Signal Interconnect

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: Through coordination with MDT, a hard wire or telemetry interconnect system should be constructed among the four traffic signals of US 93 and the following intersecting roads:

- *Main Street;*
- *1st Street East;*
- *4th Avenue East; and*
- *MT 35 (South Shore Road).*

These improvements may well help establish platoon flows on US 93 and increase available gaps in the traffic stream for side street turning traffic.

Estimated Cost: *$45,000*

TSM-7 US 93 and Main Street

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection is operating at an acceptable level of service; however, as development and growth occurs within the Polson community over the 20-year planning horizon, this intersection will not meet LOS standards in 2030. As traffic volumes increase, improvements should be made to both the northbound and southbound legs of the intersections. Reconfiguration of the signal as a semi-actuated signal should also be considered.

Estimated Cost: *$200,000*

TSM-8 US 93 and 1st Street East

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection currently is operating at an acceptable level of service; however, as development and growth occurs within the Polson community over the 20-year planning horizon, this intersection will not meet LOS standards in 2030. As traffic volumes increase, the eastbound, westbound, and northbound legs of the intersection will not meet acceptable levels of service. Reconfiguration of the signal to a semi-actuated condition should be considered. It is also recommended that a northbound right-turn lane be added and that on-street parking in the area be eliminated.

Estimated Cost: *$250,000*

TSM-9 US 93 and Caffrey Road

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection currently is operating at an acceptable level of service; however, as development and growth occurs within the Polson community over the 20-year planning horizon, this intersection may not meet LOS standards in 2030. As traffic volumes increase, a signal warrant analysis should be completed and when warranted, installed. Currently, a signal is not warranted, but as traffic volumes increase by 2030, heavier northbound and southbound traffic on US 93 will reduce gaps for northbound and southbound left-turning traffic, and traffic will be hindered for eastbound and westbound movements. This intersection should be monitored every three years to see if traffic signal warrants may be met. It is suggested that the City of Polson be responsible for completing this warrant analysis, either in-house or through the use of a consultant. Overall intersection improvements should be considered at the time of the signal analysis and should include a modern roundabout.

Estimated Cost: *$325,000*

TSM-10 US 93 and Bayshore Drive

Identified Concerns: Operational, Safety, & Access
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection has a large, wide open parking space in the northeast quadrant near the thrift store. With poor definition, this space creates confusion and lends to congestion. It is recommended that the intersection be reconstructed with curb and gutter for delineation and should include a westbound right-turn lane at the intersection.

Estimated Cost: *$140,000*

TSM-11 4th Avenue East and 1st Street East

Identified Concerns: Operational & Safety
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection has heavy pedestrian and vehicle traffic because of the location of the County Courthouse, Tribal Health Center, and the Post Office. Accidents are common between vehicles making a turn and vehicles backing out of a parking space. Pedestrian visibility is hindered due to traffic volumes and congestion at the intersection. Curb bulb-outs on 4th Avenue East are recommended to heighten visibility of pedestrians in the intersection and to decrease vehicle points of conflict. The bulb-out improvements should be done with sensitivity to storm drainage considerations, snow plowing operations, and to the type of traffic – including the turning radius needs of the City's fire vehicles.

Estimated Cost: *$30,000*

TSM-12 <u>1st Street East or West System Redesignation</u>

Identified Concerns: System Management
Project Timeline: Short Term Implementation (0-2 years)

Project Description: The current secondary route segment on Main Street no longer functions as intended. Thus, 1st Street East or West should be redesignated as a state secondary route, in conjunction with removing Main Street (between US 93 and 7th Avenue) as the current secondary route. A functional classification review of the following two segments is needed: 1) 7th Avenue from Main to 1st Street East or West and 2) 1st Street East or West from 7th Avenue to US 93. To be eligible for the State Secondary System, the roadway must be functionally classified as a major collector or minor arterial and have approval by the Transportation Commission. Any changes to functional classification require FHWA concurrence.

Estimated Cost: *No Cost*

TSM-13 <u>Sharp Left Turn Sign (Grenier Lane and 6th Street West)</u>

Identified Concerns: Safety
Project Timeline: Short Term Implementation (0-2 years)

Project Description: Install a "sharp left turn sign" at the intersection of Grenier Lane and 6th Street West.

Estimated Cost: *$1,000*

TSM-14 US 93 and 4th Avenue East

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection is operating at an acceptable level of service; however, as development and growth occurs within the Polson community over the 20-year planning horizon, this intersection will not meet LOS standards in 2030 on the northbound and southbound legs. Signal phasing and timing review should be completed every two years to ensure that the level of service is met at the intersection. It is suggested that the City of Polson be responsible for completing the signal phasing analysis, either in-house or through the use of a consultant.

Estimated Cost: *$15,000*

TSM-15 MT 35 and Heritage Lane

Identified Concerns: Operational
Project Timeline: Medium Term Implementation (2 - 5 years)

Project Description: This intersection is operating at an acceptable level of service; however, as development and growth occurs within the Polson community over the 20-year planning horizon, this intersection will not meet LOS standards in 2030 on the northbound leg. Signal phasing should be completed every two years to ensure adequate level of service is met at the intersection. It is suggested that the City of Polson be responsible for completing the signal phasing analysis, either in-house or through the use of a consultant.

Estimated Cost: *$15,000*

TSM-16 Riverside Park, 1st Street West, and US 93

Identified Concerns: Operational, Safety, & Access
Project Timeline: Short to Long Term Implementation (0 - 10 years)

Project Description: This intersection is a concern within the community due to the close proximity of the bank drive-thru access, Riverside Park access, and 1st Street West. It is suggested that the recommended improvements occur in three phases. Phase 1 (short term recommendation) is to provide a "No Left-Turn" sign leaving Riverside Park to US 93. Phase 2 (medium term recommendation) is to install a "raised pork chop island" that would allow: 1) right-turn into Riverside Park from US 93, 2) right-turn out of Riverside Park to US 93, and 3) left-turn into Riverside Park from US 93. Phase 3 (long term recommendation) would require redeveloping the roadway out of Riverside Park on the south side towards 3rd Avenue West. The redevelopment would include traffic calming features along the roadway.

Estimated Cost: *$300 – Phase 1 (short term recommendation)*
$10,000 – Phase 2 (medium term recommendation)
$60,000 – Phase 3 (long term recommendation)

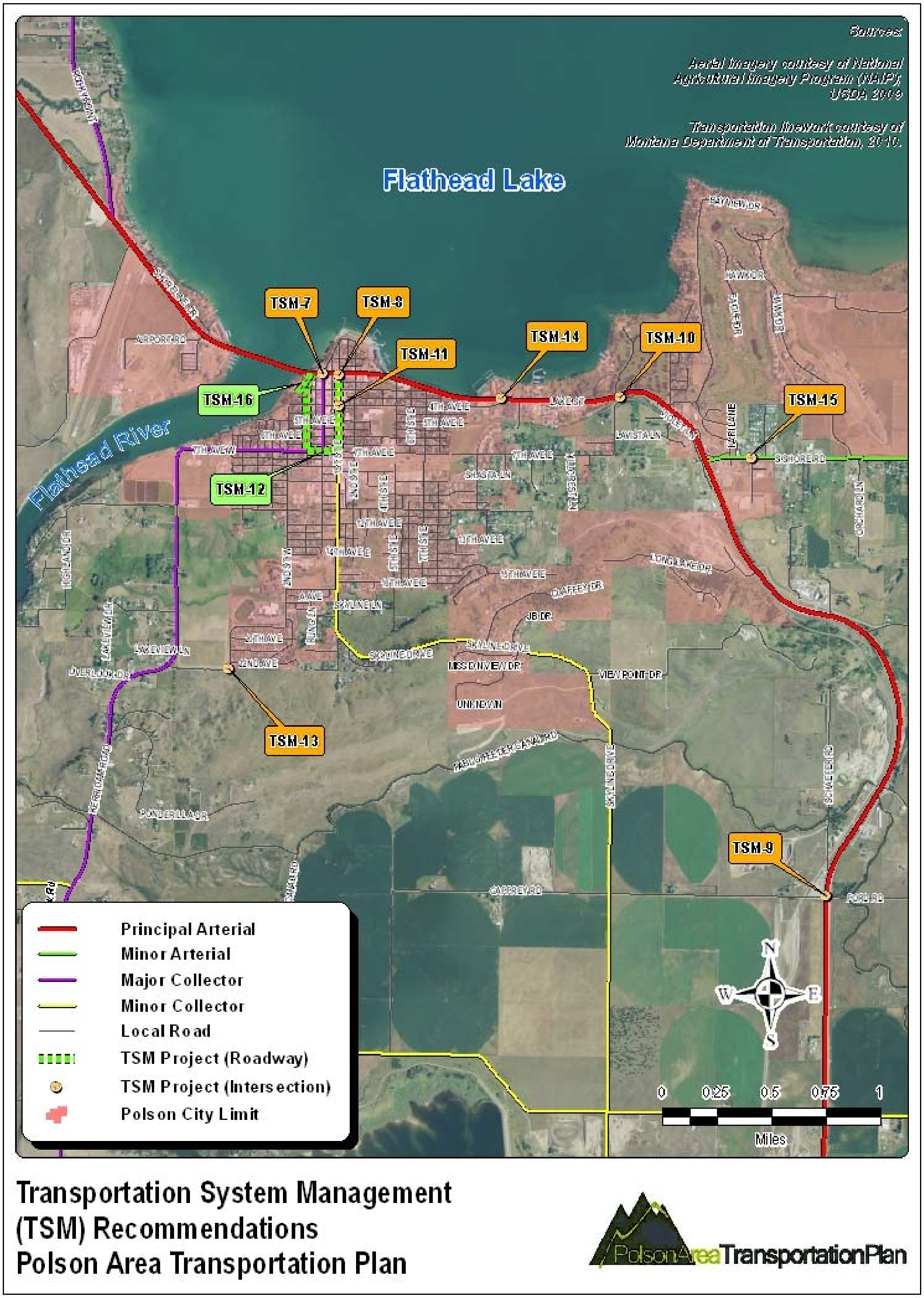

Figure 5-2 Transportation System Management (TSM) Recommendations

5.4 Recommended Non-Motorized Network and Considerations

Non-motorized travel refers to travel by pedestrians and bicyclists within the Polson community and can be further supplemented by equestrian users, skateboarders, by unicyclists, and others. The Polson community has not previously done any planning for non-motorized transportation. The information contained here is the first attempt to plan a non-motorized transportation network within the community. The focus of this planning is to create a non-motorized network that will provide continuity through the community and connect logical destinations. Thus, recommendations have to be balanced with the needs of other travel modes.

Bicycle facilities vary dramatically from simple signage to separated paved facilities along exclusive rights-of-way. The projects in Table 5.2 have been identified through community involvement, existing and anticipated future travel demand, significant destinations for bicycles, and the existing bicycle network. Detailed engineering cost estimates should be developed at the time of project implement for each project.

5.4.1 Bicycle Lanes

A bicycle lane provides a striped and stenciled lane for one-way travel on a street or highway. Many of the identified bicycle lanes could be completed through roadway improvements funded if and when new development is constructed. Some of the identified projects could be completed by the City of Polson, Lake County, or MDT through retrofit or as part of maintenance activities (striping and signage only). Bicycle lanes can provide the following benefits:

For Pedestrians:

- Greater separation from traffic, especially in the absence of on-street parking or a planter strip, increasing comfort and safety. This approach is important to young children walking, playing, or riding their bikes on curbside sidewalks.
- Reduced splash from vehicles passing through puddles (a total elimination of splash where puddles are completely contained within the bike lane).
- An area for people in wheelchairs to travel where there are no sidewalks, or where sidewalks are in poor repair or do not meet ADA standards.
- A space for wheelchair users to turn on and off curb cut ramps away from moving traffic.
- The opportunity to use tighter corner radii, which reduces intersection crossing distance and tends to slow turning vehicles.
- In dry climates, a reduction in dust raised by passing vehicles, as they drive further from unpaved surfaces.

For Motorists:

- Greater ease and more opportunities to exit from driveways due to improved sight distance.
- Greater effective turning radius at corners and driveways, allowing large vehicles to turn into side streets without off-tracking onto the curb.
- A buffer for parked cars, making it easier for motorists to park, enter, and exit vehicles safely and efficiently. This requires a wide enough bike lane so that bicyclists are not "doored."
- Less wear and tear of the pavement, if bike lanes are restriped by moving travel lanes (heavier motor vehicles no longer travel in the same well-worn ruts).

For Other Modes:

- Transit: A place to pull over next to the curb out of the traffic stream.
- Emergency vehicles: Additional pavement area to maneuver around stopped traffic, when compared to roadway sections without bicycle lanes, thereby decreasing response time.
- Bicyclists: Greater acceptance of people bicycling on the road, as motorists are reminded that they are not the only roadway users.
- Non-motorized modes: An increase in use, by increasing comfort to both pedestrians and bicyclists (this could leave more space for motorists driving and parking).

For the Community (Livability factors):

- A traffic calming effect when bike lanes are striped by narrowing travel lanes.
- Better definition of travel lanes where road is wide (lessens the "sea of asphalt" look).
- An improved buffer to trees, allowing greater plantings of green canopies, which also has a traffic calming effect.

Opportunities for bicycle lanes are contained in Table 5.2.

Table 5.2 Recommended Bicycle Lanes

Street	From	To	Notes*
US 93	MT 35 (South Shore Road)	Flathead River Bridge (west end)	Install on-street bicycle lanes on both sides of US 93 when improvements are made to the highway

Street	From	To	Notes*
7th Avenue	11th Street East	Kerr Dam Road	Install on-street bicycle lanes on both sides of 7th Avenue when the roadway is developed to a residential collector

**Proposed bicycle lanes on MDT routes will require MDT approval.*

5.4.2 Shared Roadways

Shared roadways are any on-street facility where bicycles share the travel lanes with automobiles. Typically, these facilities occur on local roadways or on roadways with low traffic volumes and speeds. Treatments most often include "Share the Road" signs and pavement markings. In addition, wayfinding signage, traffic diverters, and other types of traffic calming can be used in urban environments. The level of treatment varies among facilities and is dictated by traffic conditions and safety.

All public roadways in Montana are available for pedestrian and bicycle travel. "Share the Road" activities within urban settings should be limited to roadways within lower speed limits, 30 mph or lower. The use of "Share the Road" signs in rural conditions needs to be carefully considered and planned. The use of signs may give the bicycle rider a false sense of security as they may be interpreted as defining a "safe" place for bicyclists to travel. Conversely, the expense and resources of adding "Share the Road" signs may be excessive for some municipal budgets, and as such careful consideration is needed.

Suggested shared roadways are identified in Table 5.3.

Table 5.3 Suggested Shared Roadways

Street	From	To	Notes*
Kerr Dam Road	7th Avenue	Back Road (Kerr Dam Road)	This roadway should be signed as a "share-the-road" facility
Pablo Feeder Canal Road	Kerr Dam Road	Skyline Drive	This roadway should be signed as a "share-the-road" facility

**Proposed shared roadway signage on MDT routes will require MDT approval.*

5.4.3 Roadway Shoulders

Roadway shoulders can offer many of the benefits of bicycle lanes without the same level of infrastructure cost associated with bicycle lane stencils and signage. Roadway shoulders are ideal for rural roadways where bicyclists are present. Roadway shoulders should be a minimum of 4 feet wide. If a rumble strip is necessary, it should be as close to the white (fog) line as possible and have regular skips to allow bicyclists to leave the shoulder to avoid obstructions or obstacles if necessary.

The American Association of State Highway and Transportation Officials (AASHTO) acknowledge the following benefits of shoulder bikeways in three important areas: safety, capacity, and maintenance.

Safety – highways with paved shoulders have lower accident rates with the following benefits:

- Provide space to make evasive maneuvers
- Accommodate driver error
- Add a recovery area to regain control of a vehicle, as well as lateral clearance to roadside objects such as guardrail, signs, and poles (highways require a "clear zone," and paved shoulders give the best recoverable surface)
- Provide space for disabled vehicles to stop or drive slowly
- Provide increased sight distance for through vehicles and for vehicles entering the roadway
- Contribute to driving ease and reduced driver strain
- Reduce passing conflicts between motor vehicles and bicyclists and pedestrians
- Make the crossing pedestrian more visible to motorists
- Provide for storm water discharge farther from the travel lanes, thus reducing hydroplaning and splash and spray to following vehicles, pedestrians, and to bicyclists.

Capacity – highways with paved shoulders can carry more traffic with the following benefits:

- Provide more intersection and safe stopping sight distance
- Allow for easier exiting from travel lanes to side streets and roads (also a safety benefit)
- Provide greater effective turning radius for trucks
- Provide space for off-tracking of truck's rear wheels in curved sections
- Provide space for disabled vehicles, mail delivery, and bus stops
- Provide space for bicyclists to ride at their own pace

Maintenance – highways with paved shoulders are easier to maintain with the following benefits:

- Provide structural support to the pavement
- Discharge water further from the travel lanes, thereby reducing the undermining of the base and subgrade
- Provide space for maintenance operations and snow storage

- Provide space for portable maintenance signs

Roadways within the study area boundary that are recommended for shoulder bikeways are listed in Table 5.4.

Table 5.4 Recommended Expanded Shoulder (Minimum of 4-feet)

Street	From	To	Notes
US 93	Flathead River Bridge (west end)	Rocky Point Road	MDT facility – any future shoulder widening would be coordinated/approved by MDT

5.4.4 Shared-Use Paths

A shared-use path provides bicycle travel on a rideable surface within a right-of-way completely separated from any street or highway. Shared-use paths should be designed to be ten feet wide, or wider if necessitated by local bicycle/pedestrian volumes with consideration to peak summer volumes. Table 5.5 lists the recommended shared-use paths to complement the existing network. Although not shown in Table 5.5, the community of Polson favors a shared-use path along US 93.

Table 5.5 Recommended Shared-Use Paths

Street/Route	From	To	Notes*
Caffrey Road Skyline Drive 1st Street East	US 93 Caffrey Road Skyline Drive	Skyline Drive 1st Street East 14th Avenue East	This shared-use path is part of the TIGER Grant currently under development
7th Avenue East 7th Street East 9th Avenue East 4th Street East 11th Avenue Polson Sports Complex	End of existing path 7th Avenue East 7th Street East 9th Avenue East 4th Street East Polson Sports Complex	7th Street East 9th Avenue East 4th Street East 11th Avenue East Polson Sports Complex Beginning of existing path	City of Polson envision connecting shared use paths – from end of railroad grade to Kerr Dam Road
2nd Street West	11th Avenue	17th Avenue	City of Polson envisions connecting path
17th Avenue 2nd Street West 19th Avenue 6th Street West Grenier Lane	2nd Street West 17th Avenue West 2nd Street West 19th Avenue 6th Street West	1st Street East 19th Avenue West 6th Street West Grenier Lane Kerr Dam Road	City of Polson envisions connecting path to TIGER Grant path
Salish Point	5th Street East (KwaTaqNuk Resort)	Riverside Park	

**Proposed shared-use paths on MDT routes will require MDT approval.*

Figure 5-3 shows the existing and potential non-motorized network for the greater Polson community.

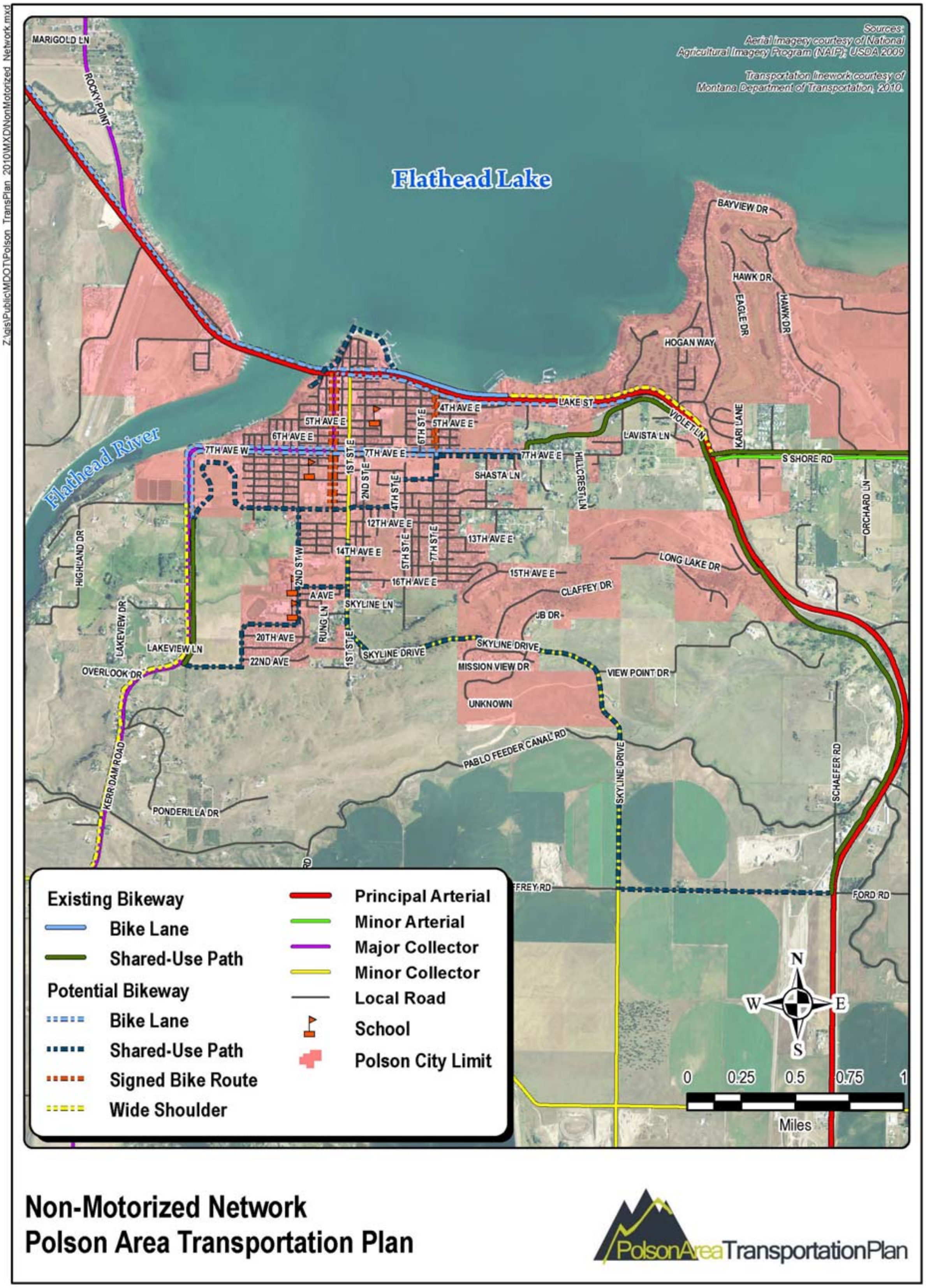

Figure 5-3 Non-Motorized Network

5.5 Recommended Policies & Procedures

As a general rule, a community Transportation Plan is an advisory document and as such does not "set" policy. However, the Plan can recommend policies through language that local elected officials can evaluate for further consideration. This section of Chapter 5 suggests several policies and procedures for consideration by the local elected officials. The first and perhaps most important of these policies is the setting of a "level of service" standard, as discussed in Section 5.5.1.

5.5.1 Level of Service Standard

Level of service (LOS) is a qualitative measure developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. It provides a scale that is intended to match the perception by motorists of the operation of the intersection. Level of Service provides a means for identifying intersections that are experiencing operational difficulties, as well as providing a scale to compare intersections with each other. The level of service scale represents the full range of operating conditions. The scale is based on the ability of an intersection or street segment to accommodate the amount of traffic using it. LOS values range from an "A" which is the best performing value and has free flow characteristics, to an "F" which represents the worst performing value and has traffic that flows at extremely slow speeds and is considered to be in a forced or breakdown state.

Roadway LOS vs. Intersection LOS

Roadway LOS

In order to calculate the LOS of a roadway, a number of characteristics must be examined. Factors such as lane widths, lateral clearances, access frequency, terrain, heavy vehicle traffic, and driver population characteristics are used to establish base conditions for a roadway. Once these factors are determined, the free-flow speed can be determined. The free-flow speed is the mean speed of traffic on the road when the flow rates are low. After the free-flow speed is determined, the flow rate can be calculated. To determine the flow rate, the highest volume in a 24-hour period (peak-hour volume) is used, with adjustments being made for hourly variation, for heavy vehicle traffic, and for driver characteristics. Once these parameters are defined, the LOS for the roadway can be calculated by using an additional set of calculated factors.

The primary factor for calculating roadway LOS is percent time delay. Percent time delay is defined as the average percent of the total travel time that all motorists are delayed while traveling in platoons due to the inability to pass. Multi-lane highways have a demand for passing that increases as the traffic volume increases. However, the opportunities for passing decrease as the traffic volume increases. This effect causes the LOS to decrease as the traffic levels increase. The secondary factors that go into LOS calculations are average travel speed and capacity utilization. Average travel speed is used to determine the mobility of the roadway. Capacity utilization represents accessibility to the roadway and is defined as the ratio of the demand flow rate to the capacity of the facility. Other factors that go into LOS calculations include terrain type, land and shoulder widths, heavy vehicle traffic, and the peak hour factor. All of these parameters are used to calculate a single LOS that is used to represent the overall characteristic of the roadway.

The Highway Capacity Manual – 2000 defines the LOS categories for roadways as follows:

- LOS A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or to pedestrian is excellent. (Free flow)
- LOS B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior. (Reasonably free flow)
- LOS C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level. (Stable flow)
- LOS D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level. (Approaching unstable flow)
- LOS E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because even small increases in flow or minor perturbations within the traffic stream will cause breakdowns. (Unstable flow)
- LOS F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse it and queues begin to form. Operations within the queue are characterized by stopping and starting. Over and over, vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop. LOS F is used to describe operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases once free of the queue, traffic may resume to normal conditions quite rapidly. (Forced or breakdown flow)

Intersection LOS

The current practice to analyze intersection LOS is to use average vehicle delay to determine the LOS of the intersection as a whole. Individual LOS values can also be determined for each approach leg and turning lane for intersections based on the average vehicle delay on that lane. There are multiple types of intersections, all of which receive a LOS value based on vehicle delay.

Signalized intersections are considered to be ones that have a signal control for every leg of the intersection. This type of intersection takes an average of the delay for each vehicle that uses the intersection and determines the LOS based on that average vehicle delay. An unsignalized intersection is one that does not have traffic signal control at the intersection. These intersections use the average vehicle delay for the entire intersection to determine the LOS (for four-way stop-controlled). Two-way stop-controlled (TWSC) intersections utilize stop control on the minor legs of the intersection while allowing free flow characteristics on the major legs. TWSC intersections take the average vehicle delay for the entire intersection, to determine the LOS of the intersection. This can cause problems at intersections with high volumes of traffic along the uncontrolled major legs. Left turns off of the minor approach legs may be difficult at these intersections and may cause high delay values and poor levels of service. The LOS for this type of intersection is based on the LOS for the worst case minor approach leg. Under these traffic conditions, the worst case minor approach leg can easily have a high delay from a low number of vehicles wanting to make a left-turn onto the major approach and may result in a poor LOS for the entire intersection.

A description and average delay range for each LOS value for signalized and unsignalized intersections, as defined by the Highway Capacity Manual (HCM) 2000, is found in Table 5.6.

Table 5.6 Intersection Level of Service Criteria

LOS	Unsignalized Intersections		Signalized Intersections	
	Description	Average Delay (sec/veh)	Description	Average Delay (sec/veh)
A	Little or no conflicting traffic for minor street approach.	< 10	Uncongested operations; all queues clear in a single cycle.	< 10
B	Minor street approach begins to notice presence of available gaps.	10 – 15	Very light congestion; an occasional phase is fully utilized.	10 – 20

LOS	Unsignalized Intersections		Signalized Intersections	
	Description	Average Delay (sec/veh)	Description	Average Delay (sec/veh)
C	Minor street approach begins experiencing delay while waiting for available gaps.	15 – 25	Light congestion; occasional queues on approaches.	20 – 35
D	Minor street approach experiences queuing due to a reduction in available gaps.	25 – 35	Significant congestion on critical approaches, but intersection is functional.	35 – 55
E	Extensive minor street queuing due to insufficient gaps.	35 – 50	Severe congestion with some longstanding queues on critical approaches.	55 - 80
F	Insufficient gaps of sufficient size to allow minor street traffic to safely cross through major traffic stream.	> 50	Total breakdown, stop-and-go operation.	> 80

Recommended LOS Standard

A LOS standard for the greater Polson area is suggested and defined in this section of the Transportation Plan. These standards should be used to determine if there are sufficient transportation improvements being made to meet the requirements for proposed developments. LOS values shall be determined by using the methods defined by the Highway Capacity Manual – 2000. A development shall be approved only if the LOS requirements are met by the developer through mitigation measures. In general, LOS will decline at area intersections given normal growth without mitigation to prevent the decline. Accordingly, a list of suggested LOS standards is presented below:

- Signalized intersections shall have a minimum acceptable LOS of “C” for the intersection as a whole; individual movement and approach leg LOS lower than “C” shall be allowed such that the total intersection LOS is a “C” or higher.

- Unsignalized intersections shall have a minimum acceptable LOS of “C” for the intersection as a whole for four-way stop controlled; individual movement and approach leg LOS lower than “C” shall be allowed such that the total intersection LOS is “C” or higher.

- Two-way stop-controlled (TWSC) intersections shall have a minimum acceptable LOS of “C” or higher for the stop-controlled, minor legs.
- An intersection with a roundabout shall have a minimum acceptable LOS of “C” or higher for the intersection as a whole.

It is recommended that the entire intersection LOS be the controlling factor in determining if an intersection performs at a proper level for all intersections except a “two-way, stop-controlled (TWSC)” intersection. In the TWSC scenario, the intersection LOS should be for the stop-controlled minor legs.

It is recommended, however, that individual movement and approach LOS still be calculated and presented in the various traffic impact studies to determine if the network as a whole functions properly and if additional steps need to be examined.

It should be noted that these standards should be applied to the peak hour periods of consideration because these periods are typically the “worst case” operational periods on the transportation system. This period typically coincides with the AM peak hour period (between 7:00 and 9:00 am) and the PM peak hour period (4:00 and 6:00 pm). For MDT facilities, these levels of service standards are already defined in the MDT Traffic Engineering Manual.