Chapter 7 Miscellaneous Transportation System Considerations

7.1 Safe Routes to School (SRTS) Program

The Safe Routes to School (SRTS) Program was initiated via Section 1404 of the *Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users Act* (SAFETEA-LU), signed into law on August 10, 2005. The SRTS Program can provide reimbursement support for both behavioral and infrastructure investments that make bicycling and walking to school a safer and more attractive alternative for students in kindergarten through middle school (K-8). In general terms, the overriding purpose of the program is two-fold:

- Enable and encourage children, including those with disabilities, to walk and bicycle to school; and
- Make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age.

Funding is available to attain these objectives within the confines of the program guidelines. Montana is called a minimum apportionment state, which means the state receives $1 million dollars annually to carry out program objectives. Of this amount, up to 70 percent can be designated for infrastructure projects, with the remaining 30 percent available for non-infrastructure projects. SRTS programs and/or projects are encouraged to focus on a combination of the "five E's," which include:

- Evaluation;
- Education;
- Encouragement;
- Engineering; and
- Enforcement.

SRTS funding may be used within two miles of K-8 schools for the following purposes:

- Pedestrian and bicycle crossing improvements;
- Bicycle and pedestrian facilities;
- Community assessments of walking and bicycling facilities and programs;
- Public awareness campaigns and outreach;
- Development of community action plans;
- Traffic education and enforcement;

- Student sessions on bicycle and pedestrian safety, health, and environment;
- Safe Routes to School (SRTS) training; and
- Tracking and performance monitoring.

Chapter 9 of this Transportation Plan Update contains further information on funding availability and MDT's grant application process.

7.2 Corridor Preservation and Access Management Guidelines

Corridor preservation is the application of measures to prevent or minimize development within the right-of-way of a planned transportation facility or improvement within a defined corridor. That includes corridors, both existing and future, in which a wide array of transportation improvements may be constructed. Included here are roadways, bikeways, multi-use trails, equestrian paths, high occupancy vehicle lanes, fixed-rail lines, and more.

Corridor preservation is important because it helps to ensure that a transportation system will effectively and efficiently serve existing and future development within a local community, region or state, and will prevent costly and difficult acquisitions after the fact. Corridor preservation policies, programs, and practices provide numerous benefits to communities, taxpayers, and to the public at large. These include, but are not limited to, the following:

- Reducing transportation costs by preservation of future corridors in an undeveloped state. By acquiring or setting aside right-of-way well in advance of construction, the high cost to remove or relocate private homes or businesses is eliminated or reduced.
- Enhancing economic development by minimizing traffic congestion and improving traffic flow, thereby saving time and money. Low cost, efficient transportation helps businesses contain final costs to customers and makes them more competitive in the marketplace. Freight costs, for instance, accounts for ten percent of the value of agricultural products, the highest for any industry.
- Increasing information sharing so that landowners, developers, engineers, utility providers, and planners understand the future needs for developing corridors. An effective corridor preservation program ensures that all involved parties understand the future needs within a corridor and that state, local, and private plans are coordinated.
- Preserving arterial capacity and right-of-way in growing corridors. Corridor preservation includes the use of access management techniques to preserve the existing capacity of corridors. When it is necessary, arterial capacity can be added before it becomes cost prohibited by preserving right-of-way along growing transportation corridors.
- Minimizing disruption of private utilities and public works. Corridor preservation planning allows utilities and public works providers to know future plans for their transportation corridor and to make their decisions accordingly.

- Promoting urban and rural development compatible with local plans and regulations. Both state and local agencies must work closely together to coordinate their efforts. Effective corridor preservation will result in development along a transportation corridor that is consistent with local policies.

To effectively achieve the policies and goals listed above, corridor management techniques can be utilized. These techniques can involve the systematic application of actions that:

- Preserve the safety and efficiency of transportation facilities through **access management**; and
- Ensure that new development along planned transportation corridors is located and designed to accommodate future transportation facilities (**corridor preservation measures**).

These are discussed further below.

7.2.1 Access Management Guidelines

Access management techniques are increasingly fundamental to preserving the safety and efficiency of a transportation facility. Access control can extend the carrying capacity of a roadway, thereby reducing potential conflicts and facilitating appropriate land usage. There are six basic principles of access management that are used to achieve the desired outcome of safer and efficient roadways. These principles are:

- Limit the number of conflict points;
- Separate the different conflict points;
- Separate turning volumes from through movements;
- Locate traffic signals to facilitate traffic movement;
- Maintain a hierarchy of roadways by function; and
- Limit direct access on higher speed roads.

It is recommended that the City of Polson adopt a set of Access Management Regulations through which the need for access management principles can be evaluated on a case-by-case basis. For roadways on the State system and under the jurisdiction of the Montana Department of Transportation (MDT), access control guidelines are available which define minimum access point spacing, access geometrics, etc., for different roadway facilities. For other roadways (non-State), the adoption of an access classification system based upon the functional classification of the roadway (principal arterial, minor arterial, or major collector) is desirable. These local regulations should help govern minimum spacing of drive approaches/connections and median openings along a given roadway in an effort to fit the given roadway into the context of the adjacent land uses and the roadway purpose. A local Access

Management Ordinance should be adopted to adequately document the city's desire for standard approach spacing, widths, slopes, and type for a given roadway classification.

Different types of treatment that can assist in access control techniques are:

- Non-traversable raised medians;
- Frontage roads;
- Consolidation and/or closure of existing accesses to the roadway;
- Directional raised medians;
- Left-turn bay islands;
- Redefinition of previously uncontrolled access;
- Raised channelization islands to discourage turns; and
- Regulate number of driveways per property.

7.2.2 Corridor Preservation Measures

Another tool used to meet the policies and goals listed earlier in this chapter is that of specific corridor preservation measures. As was stated above regarding developing a local Access Management Ordinance, it is desirable to develop a Corridor Preservation Ordinance as well. Such an ordinance would accomplish the following:

- Establish criteria for new corridor preservation policies to protect future transportation corridors from development encroachment by structures, parking areas, or drainage facilities (except as may be allowed on an interim basis). Some possible criteria could include the on-site transfer of development rights and the clustering of structures.
- Establish criteria for providing right-of-way dedication and acquisition while mitigating adverse impacts on affected property owners.

7.3 Secondary Highway Designations

Secondary routes are designated by the Montana Transportation Commission, in cooperation with local governing authorities. When revisions to the system are proposed, the Transportation Commission may require when adding mileage that a reasonably equal amount of mileage be removed. Whether mileage is added, or just re-classified, a process is in place that must be followed. To add, delete, or re-classify a secondary route from the system, the process is as follows:

1. Requests for new route designations or changes in existing designations are initiated by the local government. Requests must have the support of local elected officials and local transportation committees (if applicable).

2. MDT staff reviews the requests to determine whether the routes meet eligibility requirements.

3. If a route does not meet functional classification eligibility requirements, MDT staff advises the local government about the process for requesting a formal review of the route's functional classification.

4. If necessary, MDT staff advises the local government about the Montana Transportation Commission policy that requires no significant net change in secondary highway mileage within the affected county or urban area as a result of designation changes. Local governments may have to adjust their original request to comply with this requirement.

5. If the proposal meets all eligibility requirements and complies with Transportation Commission policy, MDT staff asks the Transportation Commission to consider the request. If a functional classification revision is also required, commission approval is contingent on FHWA approval of the functional classification revision.

6. If the Transportation Commission and FHWA (when applicable) approves the request, MDT staff notifies the affected local governments and makes appropriate changes in MDT records.

7.4 Pedestrian and Bicycle Infrastructure Design Guidelines

The design of pedestrian and bicycle infrastructure is governed by many local, state, and federal standard documents. These documents include the Montana Public Works Standard Specifications, the Manual of Uniform Traffic Control Devices, the AASHTO Guide for the Development of Bicycle and Pedestrian Facilities, and the Americans with Disabilities Act Access Board (ADAAG) Guidelines. This section provides additional guidance that could benefit the Polson area with some found in the above standards, and some experimental.

7.4.1 Pedestrian Facilities

The design of the pedestrian environment will directly affect the degree to which people enjoy the walking experience. If designed appropriately, the walking environment will not only serve the people who currently walk, but will also be inviting for those who may consider walking in the future. Therefore, when considering the appropriate design of a certain location, designers should not just consider existing pedestrian use, but should also consider how the design will influence and increase walking in the future. Additionally, designers must consider the various levels of walking abilities and local, state, and federal accessibility requirements. Although these types of requirements were specifically developed for people with walking challenges, their use will result in pedestrian facilities that will benefit all people.

Crosswalks

Crosswalks are a critical element of the pedestrian network. It is of little use to have a complete sidewalk system if pedestrians cannot safely and conveniently cross intervening streets. Safe crosswalks

support other transportation modes as well. Transit riders, motorists, and bicyclists all may need to cross the street as pedestrians at some point in their trip.

Frequency

In general, people will not travel out of direction unless it is necessary. This behavior is observed in pedestrians, who will cross the street wherever they feel it is convenient. The distance between comfortable opportunities to cross a street should be related to the frequency of uses along the street that generate crossings (shops, High Pedestrian Use areas, etc.). In areas with many such generators, like High Pedestrian Use areas, opportunities to cross should be very frequent. In areas where generators are less frequent, good crossing opportunities may also be provided with less frequency.

Table 7.1 Crosswalk Spacing Guidance

Where	Generally Not Further Apart Then	Generally Not Closer Together Than
High Pedestrian Use Areas	200 – 300 feet (60 – 90 m) where blocks are longer than 400 feet (120 m)	150 feet (45 m)
Local Street Walkways and low Pedestrian Use Areas	Varies, based on adjacent uses. Do not prohibit crossing for more than 400 feet (120 m)	150 feet (45 m)

Crosswalk Pavement Markings

Marked crosswalks indicate to pedestrians the appropriate route across traffic, facilitate crossing by the visually impaired, and remind turning drivers of potential conflicts with pedestrians. Crosswalk pavement markings should generally be located to align with the Through Pedestrian Zone of the Sidewalk Corridor.

Marked crosswalks should be used:

- At signalized intersections, all crosswalks should be marked.
- At unsignalized intersections, crosswalks should be marked when they
  - help orient pedestrians in finding their way across a complex intersection, or
  - help show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts, or
  - help position pedestrians where they can best be seen by oncoming traffic.
- At mid-block locations, crosswalks are marked where

- there is a demand for crossing, and
- there are no nearby marked crosswalks.

Three common types of crosswalk striping are currently used in Montana and include the Piano Key, the Ladder, and the standard Transverse crosswalk. Types of textured or colored concrete surfacing may also be used in appropriate locations where it helps establish a sense of place such as at shopping centers and downtown Polson. Figure 7-1 shows these types of crosswalks.

Ladder or piano key crosswalk markings are recommended for most high use crosswalks in the Polson area that are not on the Federal Highway urban aid system. This includes school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and where the crosswalk crosses a street not controlled by signals or stop signs. Note that on MDT routes, ladder or piano key crosswalks are usually reserved for school crossing locations only. A piano key pavement marking consists of 2 ft (610 mm) wide bars spaced 2 ft apart and should be located such that the wheels of vehicles pass between the white stripes. A ladder pavement marking consists of 2 ft (610 mm) wide bars spaced 2 ft apart and located between 1 ft wide parallel stripes that are 10 ft apart.

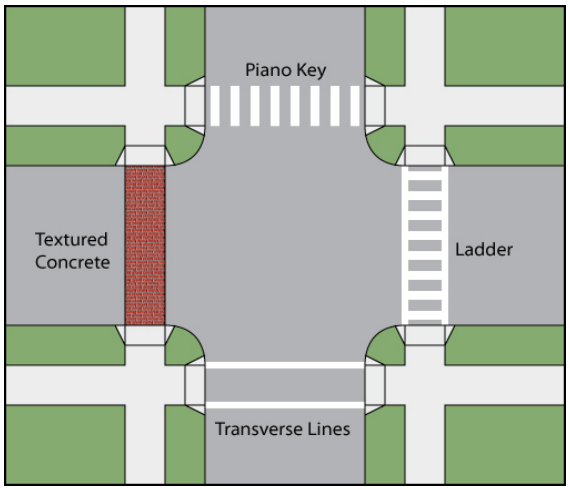


Figure 7-1 Types of Crosswalks

Curb Extensions

Curb extensions (sometimes called curb bulbs or bulb-outs) have many benefits for pedestrians. They shorten the crossing distance, provide additional space at the corner (simplifying the placement of elements like curb ramps), and allow pedestrians to see and be seen before entering the crosswalk. Curb extensions can also provide an area for accessible transit stops and other pedestrian amenities and street furnishings.

Curb extensions are advisable for local or collector roadways and may be used at any corner location, or at any mid-block location where there is a marked crosswalk, provided there is a parking lane into which

the curb may be extended. Curb extensions are not generally used where there is no parking lane because of the potential hazard to bicycle travel. Under no circumstances should a curb extension block a bike lane if one exists.

In high pedestrian use areas such as downtown Polson, curb extensions are a preferred element for corner reconstruction except where there are extenuating design considerations such as the turning radius of the design vehicle, or transit and on-street parking factors.

Curb extensions can be compatible with snow removal operations provided that they are visibly marked for crews. Where drainage is an issue, curb extensions can be designed with storm drain inlets, or pass through channels for water.

It is important to note that curb extensions must be designed to accommodate the required turning radii of the vehicle to be encountered along a given facility. For example, on MDT routes, curb extensions are required to allow a large semi-truck (commonly referred to as a WB-67 design vehicle) to maneuver around the curb extension without traversing the raised curb. In residential or commercial areas, a smaller design vehicle may be allowed, thereby increasing the potential size of the island. The turning radii of the appropriate design vehicle must always be checked prior to installation of curb extensions.

Refuge Islands

Refuge islands allow pedestrians to cross one segment of the street to a relatively safe location out of the travel lanes, and then continue across the next segment in a separate gap. At unsignalized crosswalks on a two-way street, a median refuge island allows the crossing pedestrian to tackle each direction of traffic separately. This strategy can significantly reduce the time a pedestrian must wait for an adequate gap in the traffic stream.

7.4.2 Bicycle Facilities

Similar to pedestrian facilities, the overall safety and usability of the bicycle network lies in the details of design. The following guidelines provide useful design considerations that fill in the gaps from the standard manuals such as the MUTCD and the AASHTO Guide for the Development of Bicycle Facilities.

Shared-Use Paths / Bike Paths

Facilitates two-way, off-street bicycle and pedestrian traffic, which also may be used by skaters, wheelchair users, by joggers, and by other non-motorized users. These facilities are frequently found in parks and in greenbelts, or along rivers, railroads, or utility corridors where there are few conflicts with motorized vehicles. Shared use facilities can also include amenities such as lighting, signage, and fencing (where appropriate). In Montana, design of shared-use facilities should follow guidance in the AASHTO Guide for the Development of Bicycle Facilities. Chapter 5 of this Plan contains several long-term conceptual locations for shared-use pathways, including a river recreational trail, and a future trail that uses the existing Montana Rail Link (MRL) track easement. Both will be subject to private landowner participation.

General Design Practices

Shared-use paths can provide a good facility, particularly for novice riders, for recreational trips, and for cyclists of all skill levels who prefer separation from traffic. Shared-use paths should generally provide directional travel opportunities not provided by existing roadways. Some of the elements that enhance off-street path design include:

- Implementing frequent access points from the local road network -- if access points are spaced too far apart, users will have to travel out of direction to enter or exit the path, which will discourage use;
- Placing adequate signage for cyclists -- including stop signs at trail crossings and directional signs to direct users to and from the path;
- Building to a standard high enough to allow heavy maintenance equipment to use the path without causing it to deteriorate;
- Limiting the number of at-grade crossings with streets or driveways;
- Terminating the path where it is easily accessible to and from the street system -- preferably at a controlled intersection or at the beginning of a dead-end street. Poorly designed paths can put pedestrians and cyclists in a position where motor vehicle drivers do not expect them when the path joins the street system.

At-Grade Crossings

When a grade-separated crossing cannot be provided, the optimum at-grade crossing has either light traffic or a traffic signal that trail users can activate. If a signal is provided, signal loop detectors may be placed in the pavement to detect bicycles if they can provide advance detection, and a pedestrian-actuated button provided (placed such that cyclists can press it without dismounting). A trail sized stop sign (R1-1) should be placed about 5 feet before the intersection with an accompanying stop line. Direction flow should be treated either with physical separation or a centerline approaching the intersection for the last 100 feet. Additional design considerations that can slow bicyclists as they approach the crossing include chicanes, bollards, and pavement markings.

If the street is above four or more lanes or two/three lanes without adequate gaps, a median refuge should be considered in the middle of the street crossed. The refuge should be 8 feet at a minimum, but 10 feet is desired. Another potential design option for street crossings is to slow motor vehicle traffic approaching the crossing by means of speed bumps in advance of the crossing, a table-top crossing, or a painted or textured crosswalk.

Grade Separated Crossings

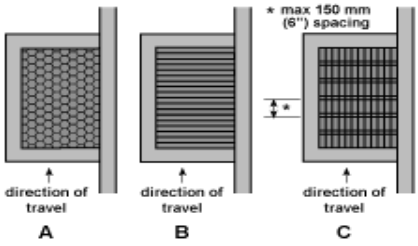
When the decision to construct an off-street multi-use path has been made, grade separation should be considered for all crossings of major thoroughfares. At-grade crossings introduce conflict points. The greatest conflicts occur where paths cross roadway driveways or entrance and exit ramps. Motor vehicle drivers using these ramps are seeking opportunities to merge with other motor vehicles; they are not expecting bicyclists and pedestrians to appear at these locations. However, grade-separated crossings should minimize the burden for the user, and not, for example, require a steep uphill and/or winding climb. Undercrossings should be lighted if in high use areas or if longer than 75 feet.

Bicycle Lanes

Bicycle lanes are defined as a portion of the roadway that has been designated by striping, signage, and by pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes are generally found on major arterial and collector roadways and should be 5 feet or wider, to provide enough separation to prevent “dooring”. Bicycle lanes should be designed following AASHTO guidelines.

Additional Considerations

Poorly designed or placed drainage grates can often be hazardous to bicyclists. Drainage grates with large slits can catch bicycle tires. Poorly placed drainage grates may also be hazardous, and can cause bicyclists to veer into the auto travel lane.



Bicycle-Friendly Drainage Grates

Figure 7-2 Bicycle-Friendly Drainage Grates

Bicycle Friendly Rumble Strips

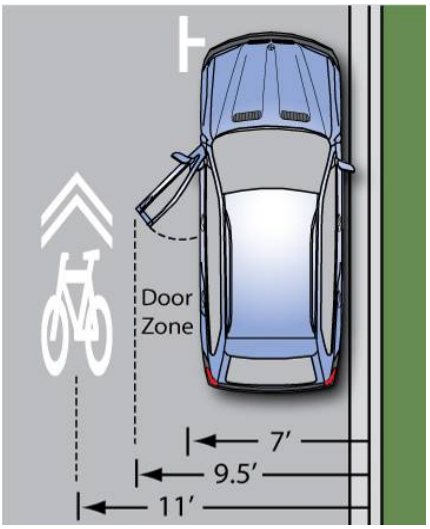
Rumble Strips can hamper bicycling by presenting obstacles through trapped debris on the far right of the road shoulder and the rumble strip to the left. Consequently, special care needs to be exercised for bicyclists when this treatment for motorist safety is planned and built, with a robust maintenance schedule put into place. Rumble strip design and placement are also important; placing the rumble strip as close to the fog line as possible will leave the maximum shoulder area available for cyclists. Certain rumble strip designs are safer for bicyclists to cross and will still provide the desired warning effect for motorists.

FHWA studied the design of rumble strips in 2000 and reviewed reviewing different techniques of installation and various studies by ten state DOT's from the point of view of motorists and bicyclists. Information provided by the FHWA study recommended that design for a rumble strip should be of a milled design rather than rolled and should be 1 foot (300mm) wide with 5/16 ± 1/16 in (8 ± 1.5 mm) in depth. Rumble strips are recommended to be installed only on roadways with shoulders in excess of 5 feet (1.5 m). Bicyclists prefer a shallow depth of the milled portions of the rumble strips. Since the roadway shoulder can become cluttered with debris, it is recommended to include a skip (or gap) in the rumble strip to allow bicyclists to cross from the shoulder to the travel lane when encountering debris. This skip pattern is recommended to be 12 feet (3.7 m) in length with intervals of 40 or 60 feet (12.2 or 18.3 m) between skips.

It is anticipated MDT will be using rumble strips in much of the Polson area, but with limited use in areas of substantial development. Placement of rumble strips farther from the edge of travel will be developed under certain conditions. This would accommodate bicyclists' safety and reduce noise adjacent to development.

Shared Lane Markings (SLM's)

Recently, Shared Lane Marking (SLM's) stencils (also called "Sharrows") have been introduced for use in the United States as an additional treatment for shared roadway facilities. The stencil can serve a number of purposes, such as making motorists aware of bicycles potentially in their lane, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions. Shared Lane Markings would be valuable additions to the proposed bicycle routes in Chapter 5.



Recommended SLM placement.

Figure 7-3 Recommended Shared Lane Marking (SLM) placement