

SECTION 8 STREETS

8.1 Roadways and Walkways.

Roadway systems shall be designed, constructed, and tested in accordance with the current editions of the Engineering Standards for the City of Whitefish, Montana, the Montana Public Works Standard Specifications and The Subdivision Regulations of the City of Whitefish. All roads within a proposed subdivision shall be designed by a licensed professional engineer and approved by the City Engineer and upon completion of construction shall be certified by a licensed professional engineer that they are in compliance with these standards.

Traffic Analysis. Developments which can contribute two hundred (200) or more vehicle trips per day to the City Street System shall have a Traffic Analysis submitted by a professional engineer. Such analysis shall indicate the expected increase in traffic movement on existing roadways serving the development, and shall determine existing traffic conditions on roadways to be impacted by the development.

Cul-De-Sacs. Dead-end streets are strongly discouraged and all dead-end streets must terminate in an approved cul-de-sac. Cul-de-sacs are only allowed in extraordinary circumstances when the City's transportation plan shows no opportunity for future connection. Where a future street extension is proposed, a temporary cul-de-sac of adequate size as approved by the Fire Chief and City Engineer shall be provided. Roadways that terminate at a cul-de-sac shall have a maximum length of one thousand (1000) feet. The paved turnaround radius shall be a minimum of fifty (50) feet. If the development along this roadway consists of buildings three stories or higher, the minimum turn around radius of the cul-de-sac shall be sixty (60) feet to accommodate the need for a Whitefish Fire Department ladder truck unless approved by the Fire Department. A landscaped area is acceptable in the center of the cul-de-sac. The maximum allowed slope across a cul-de-sac shall be 5%.

Horizontal Alignment. Horizontal alignment of streets must ensure adequate sight distances. When street center lines deflect more than five (5) degrees, construction shall be made by horizontal curves.

Signage and Striping Plan Requirements. The Developer shall provide and install the necessary Traffic Control in accordance with the latest edition of Manual on Uniform Traffic Control Devices. Plans shall show locations of all signs, light poles, trees, etc. Street name signs shall be installed at each intersection. All street name signs are to meet City requirements. (See Standard Details 16-18).

Traffic Signals and Widening of U.S. 93. A copy of the Traffic Analysis submitted to the City may be forwarded to the Montana Department of Transportation for their review and recommendations. The Montana Department of Transportation's recommendations for traffic signals and widening along U.S. 93 for acceleration/deceleration lanes will become a City

requirement. When widening is necessary or traffic signals or electronic warning devices are required, on-site or off-site, it shall be the Developer's responsibility, at the Developer's expense, to install such signals or devices.

Walkways. All developments shall have delineated walkways which will allow pedestrians to safely travel from any part of the development to the boundaries of the development. Developments abutting existing or proposed roadways will be required to have walkways within the public right-of-way parallel with the roadways. The minimum width of a walkway shall be five (5) feet. Unless approved by the City Engineer sidewalks are required on both sides of the street in all residential and commercial subdivisions, residential sidewalks shall be separated from the street by a boulevard or open space with a minimum width of six feet (eight feet is the preferred width for boulevard tree planting). ADA compliant handicap ramps shall be installed at pedestrian crossings, see SD-14.

Recycled Material in Pavement Mix. The Public Works Department may allow the use of crushed, recycled glass in pavement mix if the design engineer can show that the section's strength and density is equivalent to the standard asphalt section. Asphalt specifications and density requirements are listed in the Montana Public Works Standard Specifications Section 02510.

TABLE 8 -1

ROAD DESIGN STANDARDS FOR LOCAL SUBDIVISION STREETS

<u>DESIGN STANDARDS</u>	<u>ARTERIAL</u>	<u>COLLECTOR</u>	<u>LOCAL</u>	<u>LID/ RURAL¹</u>	<u>PRIVATE LOCAL</u>
Minimum Right-of-Way ²	80 ft.	60 ft.	60 ft.	60 ft.	50 ft.
Minimum Asphalt Width	³	³	24 ft. ⁴	20 ft. ⁵	20 ft.
Maximum Grade	6%	8%	9%	9%	9%
Cul-de-sac turn around:					
a. Outside Asphalt Radius			50 ft.	50 ft.	50 ft.
b. Minimum Outside Right-of-Way Radius ⁶			60 ft.	60 ft.	55 ft.
c. Length			See Table 2		

¹ Average net residential density of 1 acre or less. Low Impact Design requires approval by the City Engineer.

² Terrain and design constraints may dictate greater right-of-way.

³ Design approved by the City Engineer.

⁴ Where parking is required on both sides of street, 34 feet minimum roadway width is needed.

Note: Where density exceeds 8 units/net acre, parking is required on both sides of street unless overflow/visitor parking demands are met elsewhere.

⁵ No parking allowed on 20 feet rural street.

⁶ Right-of-way radius is intended to accommodate sidewalk & boulevard requirements.

TABLE 8 - 2
MINOR STREET STANDARDS

Loop and Cul-de-sac Street Standards

<u>Length</u> ¹	<u>Units</u>	<u>R/W</u>	<u>Travel Surface</u>
0-300'	1 - 3	50' ²	20
0-300'	4 - 10	50' ²	24
0-300'	10 +	60'	24
301-1000'	1 - 3	50' ²	20
301-1000'	4 +	60'	24

¹ Length of cul-de-sac shall be measured from the edge of the right-of-way of the intersecting street to the furthest edge of the right-of-way of the turn around.

² No further development potential for area served (verified by plat restriction).

Street Intersections. Street intersections shall meet the following requirements:

- Streets shall intersect at 90° angles, except where topography precludes and in no case shall the angle of intersection be less than 75° for a minimum distance of 60 feet as measured along the centerline.
- Two streets meeting a third street from opposite sides shall meet the same point, or their centerlines shall be offset at least 125 feet for local roads and 300 feet for arterials or collectors.
- No more than two streets may intersect at one point.
- Intersections of local streets with major arterials shall be kept to a minimum.
- Hilltop intersections are only permitted if reasonable alternatives exist do not exist. Intersections on local streets within 100 feet of a hilltop are prohibited. Intersections on arterial or collector streets within 200 feet of a hilltop are prohibited.
- Maximum grade of approach to any intersection shall not exceed five percent for a distance of 60 feet as measured from edge of travel ways to provide for adequate starting, stopping and stacking distances.
- Names of new streets aligned with existing streets shall be the same as those of existing streets. Proposed street names shall not duplicate or cause confusion with existing street names and shall be approved by the City Clerk.
- Location of collector and arterial streets shall comply with the Whitefish City-County Master Plan or any other major street and highway plan adopted by the Board of County Commissioners and/or the City of Whitefish.

8.2 Chip Sealing.

All new roads shall be chip sealed in accordance with the most recent version of the Montana Public Works Standard Specifications. Chip sealing must be completed during the projects 2-year warranty period. The Subdivision Improvement Agreement must include the cost of chip sealing the newly constructed streets.

8.3 Driveways.

Driveways onto arterial streets shall be discouraged. Driveways onto collector streets shall be separated by at least forty (40) feet and be at least (80) feet from the edge of pavement an intersecting street unless approved by the Public Works Director. The nearest edge of any driveway on all other streets shall be not less than thirty-five (35) feet to the edge of the pavement of the nearest intersecting street. The maximum slope for driveways is 9%.

The following standards must be followed in design of residential driveways:

- Paved hard surface driveways are required except as provided for in the zoning regulations. Driveways are limited to a maximum width of 22-feet except as provided below.
- Primary lots with less than 75 feet of road (street) frontage shall have only one access (driveway) not to exceed 22 feet in width within the right-of-way. Sublots with less than 40 feet frontage shall be limited to one driveway per lot not to exceed 11 feet in width. (Shared driveways for sublots are preferred with widths not exceeding 22 feet.)
- Driveways for adjoining lots in cul-de-sacs shall be shared when the lots have less than 50 feet of frontage. Shared approaches when required shall be designated on the subdivision plat.
- Driveways shall be a minimum of 35 feet from the edge of pavement of any local street intersection.
- Driveway limitations shall appear on the plat.
- In no case shall residential driveway widths exceed 33% of the lot width within any public right-of-way.
- Permits from the Public Works Department are required for all driveway construction (refer to standard approach detail SD15).

8.4 Utilities and Easements.

Easements for public utilities which cross private property shall be delineated and dedicated on the final plat. Water, sewer and storm sewer easements shall be twenty (20) feet wide for a single pipeline with the pipe centerline five (5) feet from one easement edge. With two pipelines, the minimum width shall be twenty-five (25) feet with each pipe centerline five (5) feet from the easement edge. Easements for all other utilities, not adjacent to right-of-ways, shall be twenty (20) feet wide unless specified otherwise by the utility company.

It shall be the responsibility of the Developer to construct all roadways and utilities from the existing facilities to the far property line of the development or such point within the development that may be specified by the City Engineer. All utilities shall be within a public right-of-way or easement to permit free and unobstructed access.

It is the Developer's responsibility to obtain and provide the City with all easements and right-of-ways necessary to extend roadways and utilities to the far property line of the development. The Developer shall obtain written approval from the Whitefish Public Works Department stating they have reviewed and approved the location of easements for the future extension of roadways and utilities which shall be submitted with the final plat. The written approval shall be submitted along with an 11" by 17" legible copy of the approved final plat showing the utility and/or easement locations. The easement language on the final plat shall state that no landscaping (other than lawn), buildings, or other obstruction is allowed within street and utility easements.

Only water, sanitary sewer, storm sewers and street lighting elements may be placed within the street right-of-way. No underground utilities, except service sweeps from the utility trench to utility boxes, pedestals, vaults or transformers shall be placed in the boulevard between the back of curb and sidewalk or within a sidewalk itself. No utility boxes, pedestals, vaults or transformers shall be placed within the boulevard, the radial extension of an easement, proposed roadway, access way to any City facility, or within 10-feet of fire hydrants or curb boxes unless approved by the Public Works Department.

There shall be reserved along the front lot line and side street lot line of each residential lot a ten foot (10') wide utility easement along, contiguous and adjacent to the lot line to provide an area between the sidewalk and easement line for the placement of privately owner underground utilities, including power, phone, gas, cable, etc. No private utilities shall be located in water or sewer trenches. Utilities must maintain a minimum of 5' of undisturbed soil between water or sewer utility trenches. If approval is obtained in advance from both the appropriate utility companies and the public works director, electric, phone and cable facilities may be placed under the sidewalk. In this case a five foot wide utility easement would be required along the front lot line for the installation of natural gas lines.

Utility lines shall be designed by a licensed professional engineer or by the utility firms in cooperation with the subdivider. All applicable laws, rules and regulations of appropriate regulatory authority having jurisdiction over such facilities shall be observed. Location of all proposed utilities must be shown on the construction plans that are reviewed and approved by the Public Works Department.

If TV, telephone or natural gas is not installed at the time of development, provisions shall be made for installation at a later date without the cutting of paved roadways.

8.5 Bicycle/Pedestrian Paths.

Bicycle paths that are part of the City's Bicycle Master Plan shall be a minimum of 10-feet with a cross slope of 2% and a 1-foot wide gravel border along each edge. This minimum width shall be reduced to 8-feet when constructed through critical areas. The minimum width may also be reduced to 8-feet with approval of the Public Works and Planning and Building Department Directors. The path bed shall be excavated to a minimum depth of 11.5 inches. The path bed shall consist of a minimum 9 inches of crushed gravel compacted to 95% of maximum density as determined by AASHTO T99, unless otherwise dictated by sub-soil type materials being compacted to road standard. The overlay shall consist of 2.5 inches of asphalt compacted to 93% of maximum density, as determined by ASTM D-2041. Construction seal shall be applied at 0.08 gallons/square yard after installation.

Concrete paths shall have a base that consists of a minimum of 3 inches of crushed gravel compacted to 95% of maximum density as determined by AASHTO T-99. Concrete shall be a minimum of 6 inches of M4000 reinforced with 1.5 lbs. per cubic yard of Fiber mesh. Where terrain allows, slope of the path should not exceed 12:1. Bike path construction should be in accordance with Standard Detail 48. Alternative materials, such as; porous pavement, pavers or porous concrete, may be substituted for asphalt or concrete upon approval by the Public Works Director.

8.6 Parking.

Parking spaces shall be a minimum of 20 feet from crosswalks and a minimum of 8 feet from adjacent driveways. It is recommended that stabilization fabric be installed under the parking lot asphalt/gravel base section (MIFAFI 600X, AMOCO CEF 2004 or approved equal).

8.7 Alleys.

Public owned and maintained alleys shall not be designed as the primary access for lots and shall be paved to a width of no less than 10 feet or no more than 16 feet. A minimum of 5 feet of right-of-way shall be provided for snow storage between the edge of pavement and property lines. Alley approaches for parking or garages shall be limited to no more than 50% of the lot frontage and shall be at least 2 feet from an adjoining property line. No plantings (trees or shrubs) or structures shall be located in the alley right-of-way within 5 feet of the edge of pavement.

8.8 Mail Boxes.

Where the United States Postal Service (USPS) requires group mail box pull outs on public streets, it shall be the responsibility of the property owners to maintain access as required or requested by the USPS. Individual mail boxes located in the public right-of-way are the maintenance responsibility of the property owner, no permanent structures are allowed. No individual mail boxes shall be allowed on collector streets where the pavement width is less than 32 feet.

8.9 Traffic Impact Studies.

Development generating 200 or more Average Daily Trips (ADT) to the City Street System shall complete a Traffic Impact Study (TIS), developed by a Professional Engineer. If a project is going to be reviewed through the public hearing process, (i.e., subdivision, planned unit development, conditional use permit) it shall be part of a complete application submittal to the Planning Department. If a project is simply applying for a building permit, the TIS shall be reviewed and approved by the Public Works Department prior to the issuance of a building permit.

Prior to submitting a TIS, the applicant and/or engineer shall have a scoping meeting with Public Works. Sufficient detail should be provided so the reviewer is able to follow the path and methodology of the study. Assumptions should be documented and published sources referenced, as necessary. The TIS must be stamped by a Professional Engineer. At a minimum all the items described below shall be included and any other items identified through the scoping process.

- Narrative (description of the project, phasing plan)
- Site Plan (showing proposed access points, nearby intersections, neighboring access points/driveways)
- Study Area (as identified through the scoping process)
- Vicinity Map
- Existing Conditions (roadway classification and design, sidewalks, bike lanes, trails, other approved projects nearby with associated trip generation, crash analysis, capacity analysis, intersection Level of Service, transportation improvements)
- Development Traffic (number of trips generated using the latest edition of the *ITE Trip Generation Manual*, distribution of trips)
- Impact on City Transportation Network (analysis of impacts on roadways and intersections)
- Access Management
- Traffic Calming (if needed, to deter cut through traffic and reduce speeds)
- Mitigation Measures

8.10 Boulevard Landscaping.

A minimum of 4" of topsoil is required within the boulevard. The finished surface of topsoil shall provide adequate drainage from the top of the sidewalk to the top of the curb. Areas of topsoil that settle during the warranty period shall be refinished. Topsoil shall be fertile, natural loam surface soil, free of clay, weeds, roots or stones larger than one inch in any dimension. The boulevard shall either be sodded or seeded in accordance with the MPWSS. The Contractor is responsible during the warranty period to maintain the seed or sod until it is well established. The minimum allowed boulevard width is six (6) feet. Noxious weed control of boulevard areas is required for new developments.

8.11 Traffic Calming.

This section provides some guidelines to help incorporate traffic calming principles into a new development. There are no traffic calming requirements provided. Instead guidance is provided for integrating traffic calming into a project. Traffic calming refers to a number of methods used to reduce vehicle speeds, improve safety, and enhance the quality of life. In the simplest definition, it is changing the physical environment to reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for pedestrians and other non-motorized street users. Recognizing the role that traffic calming may be able to play in addressing neighborhood and regional traffic concerns.

Traffic calming techniques cannot be used with the same degree of success on all roadway facilities. Traffic calming is rarely seen on roadway facilities higher than a collector roadway functional classification. This is primarily due to roadways functionally classified higher than a collector having the primary purpose of moving traffic, whereas for collector and local roadways the primary purpose tends to shift more towards serving adjacent land uses and infiltration into neighborhoods. In some circumstances, traffic calming can be applied to a minor arterial roadway with low traffic volumes.

Traffic calming is comprised of the three “E’s,” Education, Enforcement and Engineering. The Institute of Transportation Engineers (ITE) defines traffic calming as a “combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.” It is used on local streets to discourage non-local traffic. Non-local traffic is not invested in the neighborhood, and therefore has less respect for speed limits, and the non-vehicular elements of the street environment. Certain, limited traffic calming measures are appropriate for slowing traffic on collectors or minor arterials as well.

Because traffic calming includes an educational or enforcement campaign, or an engineering study, it can result in the physical construction of traffic elements designed to reinforce the perceived need for caution by the users of the transportation system. The need for physical traffic calming devices indicates the transportation user’s consistent failure to appropriately interact with the surroundings. Regardless of any traffic calming measures installed, the primary responsibility for safe use of the streets lies with the individual driver, cyclist, or pedestrian.

The success of traffic calming measures on a local street depends upon strong support by residents in the immediate area. Additionally, the traffic calming measures need to address situations that a number of residents agree should be addressed. Situations that many people agree exist and that could respond to traffic calming techniques will have more support from the neighborhood, and will better enhance the neighborhood environment. Traffic calming projects which involve installing “hard” improvements should meet several criteria before being considered for implementation, because they can be disruptive to the residents in the surrounding area, difficult to fund and maintain, and difficult to remove once installed.

Traffic calming is a series of techniques designed to lower vehicle speeds, reduce the amount of cut-through or non-local traffic, and in certain cases, decrease truck traffic. The goal of these techniques is to keep traffic on a local street local. Other goals which traffic calming can achieve include the following:

- Reduce air and noise pollution caused by vehicles;
- Reduce the frequency and severity of accidents;
- Improve the street environment through increased landscaping;
- Improve the quality of life for residents;
- Promote walking and bicycling;
- Reduce the need for police enforcement;
- Address speeding or other problems on collectors or minor arterials; and
- Improve pedestrian safety.

Traffic calming elements can be incorporated into the initial design of subdivision, or can be retrofitted into existing subdivisions. The City of Whitefish has many streets which already contain Traffic calming measures. These include on-street parking, and sidewalks separated from the street by a planting strip. Other techniques can include landscaped medians, pedestrian bulb-outs at corners, traffic circles or other intersection design techniques as well as other mid-block design techniques.

Very few traffic calming techniques are appropriate for use on arterials, because they interfere with an arterial's ability to move people and vehicles quickly from one place to another.

Types of Traffic Calming Measures. A table of traffic calming measures is included in Appendix N. Traffic calming measures generally fit into one of the following six categories:

1. Passive measures
2. Education and enforcement
3. Signing and pavement marking
4. Vertical deflection
5. Horizontal deflection
6. Obstruction

1. Passive Measures. Passive measures are described as measures which are built into the street environment. They are not immediately obvious to the traveling public, but nevertheless produce a calming effect on traffic. Some of these measures are listed below.

- Tree-lined streets;
- Streets with boulevards separating the sidewalks;
- Streets with raised center medians (usually landscaped);
- On-street parking (including angled parking);
- Highly visible pedestrian crossings; and
- Short building set-back distances.

These elements tend to slow traffic by giving motorists the impression that the street is narrow and that extra care is required, but these elements do not restrict or interfere with

traffic flow. A combination of more than one of these techniques, or these techniques combined with measures from the other categories, will produce better results.

2. Education and Enforcement. Several techniques are available to raise public awareness of traffic problems and change the behaviors contributing to problems. Some of these techniques are listed below.

- Neighborhood Speed Watch Program - A speed monitoring program where residents themselves measure vehicle speeds with a radar unit and record license plate numbers of speeding vehicles. Follow-up action of the data can include sending letters to the registered owners of the vehicles explaining the safety concerns within the neighborhood and requesting better observance of the speed limits.
- Radar Speed Monitoring Trailer - A pull-behind trailer equipped with speed detection equipment, a readout of vehicle speeds, and a sign with the posted speed limit is brought to an area with speeding problems. These trailers are usually unmanned; however better results are obtained if someone is present. Additionally, the trailer can be equipped with a camera that would record license plate information for possible follow-up.
- Neighborhood Traffic Safety Campaign - As a part of the normal neighborhood group activities, newsletters or other materials can be produced containing educational information regarding traffic issues. These materials can be tailored to issues of specific concern to different neighborhoods. These issues can then be addressed at regularly scheduled meetings or at special meetings and recommendations can be put forward to increase neighborhood traffic safety.
- Target Enforcement - This is a requested, time-limited addition of police enforcement within a neighborhood.
- Public Service Announcements (PSA's) - Video public service announcements on traffic issues, mainly related to safety, can be produced. These can include traffic calming information, and should be televised during local news programs, to inform the public on traffic issues and calming techniques identified in this technical memorandum.

3. Signage and Pavement Marking. Traffic control signs and pavement markings can be installed as non-intrusive traffic calming measures. These techniques are already in use in the Whitefish area. The signs can include speed limit signs, dead-end street signs, and signs indicating school crossings or general pedestrian crossing. Pavement markings can include marked crosswalks, delineation of (narrow) lanes, and speed limit markings. Traffic calming techniques which specifically fall in this category include:

- Truck Route Signing – Signs placed on routes where trucks are allowed, plus signs placed on routes where trucks are not allowed.
- Basket Weave Stop Sign Pattern – Stop signs placed at every intersection in a residential neighborhood with stops alternating between east west and north south. Note: this is appropriate for local access streets only, and it disregards MUTCD warrants.
- Additional speed limit signs.
- Edge Lines – Painted lines on the pavement which narrow traffic lanes and/or provide for bicycle lanes or on-street parking.
- Stop Bars – painted lines on the pavement that show motorists where to stop for stop signs.

4. Vertical Deflection, Horizontal Deflection, and Obstruction. There is a wide variety of physical traffic calming measures which fall under the categories of vertical deflection, horizontal deflection and installation of obstructions. Each measure has both advantages and disadvantages. A comprehensive description of a wide variety of these measures is presented on the tables at the end of this technical memorandum. These tables include a general cost for basic installation of each measure. Actual costs may increase, depending upon such additions as irrigation systems, street lighting, landscaping, installation of decorative brick pavers, etc. Acquisition of additional right-of-way can also raise the cost, sometimes dramatically so.

Several guidelines should be considered when deciding to implement these types of deflection and obstruction measures. These include:

- Attempt less restrictive measures before considering more restrictive measures such as road closures or other route modifications.
- Space devices 300-to-500 feet apart in order to contain speeds to a 20-to-25 mile-per-hour speed range.
- Make accommodations for drainage and snow removal.
- Make accommodations for emergency vehicles.
- Consider pedestrian and bicyclist needs.
- Address landscaping or other maintenance issues.