

APPENDIX C – TRANSPORTATION WORKSHEET

The following transportation Worksheet shall be filled out in association with Sections 3.1.1 and 3.1.2 of this Code.

Project Name: _____ By: _____

Date: _____ Title: _____

Property Address or Legal Description (lot, block, subdivision): _____ Address: _____

Phone: _____

Fax: _____

Existing Zoning: _____

E-mail: _____

Developer: _____

Part One: All Developments

Provide the following information, to the best of your knowledge, for all projects:

- 1. Has a previous Transportation Impact Study (TIS) been prepared for the site? Yes ___ No ___
- 2. Are there proposed street intersections included with this development? Yes ___ No ___
- 3. Are there existing intersections affected by the development action(s)? Yes ___ No ___
If yes, which? _____
- 4. What is the proposed year of build-out? _____
- 5. Will the project be phased? Yes ___ No ___
If yes, what is the proposed phasing plan? _____
- 6. Are there other proposed developments in the study area? _____
- 7. Are there other committed roadway improvements in the area? _____
- 8. Are there proposed roadway improvements to be provided by the Applicant with this project? _____
- 9. Are there bicycle and pedestrian attractions near the development? (Existing or imminent within 1320' of the site. This distance may be increased up to 1.5 miles for residential projects near existing or proposed school sites.)
Yes ___ No ___

Part Two: Non-residential Development

Provide the following information, to the best of your knowledge, for all non-residential projects:

A. Existing Use:

1. Description of existing land use: (if none, proceed with Part B): _____
2. Existing building area (square footage) for above use(s): _____
3. Number of employees on site each day: _____
4. Daily trip ends for employees [multiply line 3 by the number 4]: _____
5. Number of customers on site each day: _____
6. Daily trip ends for customers [multiply line 5 by the number 2]: _____
7. Number of vendors on site each day (include trash, UPS, etc.): _____
8. Daily trip ends for vendors [multiply line 7 by the number 2]: _____
9. Total vehicular daily trip ends [line 4 plus line 6 plus line 8]: _____
10. How many Company Vehicles are used daily: _____
11. How many Company Vehicles will be parked on site: _____
10. Source of trip generation data (circle one): ITE, business records, traffic engineer, personal estimates, other: _____
 _____. Attach documentation to support your data.
11. Number of accesses, width, and type of drive surface exiting onto the public street(s) from this property: _____
12. Number of pedestrians visiting site each day: _____
13. Number of bicyclists visiting site each day: _____
14. Do sidewalks exist along all street(s) adjacent to property? Yes ____ No ____
15. Is property adjacent to a major collector or arterial street? Yes ____ No ____

B. Proposed Use:

1. Description of proposed land use: _____
2. Proposed building area (square footage) for above use(s): _____
3. Anticipated number of employees on site each day: _____
4. Daily trip ends for employees [multiply line 3 by the number 4]: _____

- 5. Anticipated number of customers on site each day: _____
- 6. Daily trip ends for customers [multiply line 5 by the number 2]: _____
- 7. Anticipated number of vendors on site each day: _____
- 8. Daily trip ends for vendors [multiply line 7 by the number 2]: _____
- 9. Total vehicular daily trip ends [line 4 plus line 6 plus line 8]: _____
- 10. Source of trip generation data (circle one): ITE, business records, traffic engineer, personal estimates, other: _____
 _____ . Attach documentation to support your data.
- 11. Proposed number of accesses onto the public street(s) from this property (does NOT include any existing accesses proposed to remain for use): _____
- 12. Number of existing accesses proposed to remain and be used: _____
- 13. Number of pedestrians visiting site each day: _____
- 14. Number of bicyclists visiting site each day: _____
- 15. Do sidewalks exist along street(s) adjacent to property? Yes ____ No ____
- 16. Property is not adjacent to a major collector or arterial street as show on the City's Master Transportation Plan.
 Yes ____ No ____
- 17. Is a zone change requested? Yes ____ No ____
- 18. If yes, the existing zone is _____, and the proposed zone is _____ .

If the total new trips (the difference between the daily trip ends calculation for any existing use and the total daily trip ends calculation for any existing use and the total trip ends calculated for the proposed use) is less than 500 and if peak hour and/or daily traffic counts demonstrate that the existing traffic plus the site generated traffic volumes are within the limits by these standards, you (the applicant) may request a waiver of the Transportation Impact Study submitted requirements by signing below.

Signature: _____ Date: _____

Transportation Impact Study Required: _____	Transportation Impact Assessment Required: _____	TIS Waived: _____
By: _____		Date: _____

Part Three: Residential Development

Fill out the table below and indicate in the table the number of dwelling units or access changes proposed for the type(s) of residential development included in your development. If the number of dwelling units and changes in access are less than the thresholds established above and if peak hour and/or daily traffic counts demonstrate that the existing traffic plus the site generated traffic volumes are within the limits set by City policy, you (the applicant) may request a waiver from the TIS requirement by signing your name below. Provide the following information, to the best of your knowledge, for all residential projects:

NUMBER	RESIDENTIAL DEVELOPMENT TYPE
	Single-family detached/dwelling units
	Multi-family dwelling units in duplex, tri-plex, or four-plex structures
	Multi-family dwelling units in structures containing five or more units
	Access changes onto a collector or arterial roadway

Signature: _____

Date: _____

Transportation Impact Study Required: _____	Transportation Impact Assessment Required: _____ Waived: _____	TIS
By: _____	Date: _____	

APPENDIX D [RESERVED]

APPENDIX E PEDESTRIAN AND BICYCLE GUIDELINES

E-1	Intent
E-2	Responsibilities
E-3	Standards
E-4	Specifications
E-5	Site Designs General Connectivity Requirements
E-6	Design Features and Accommodations for Pedestrians
E-7	Pedestrian Crossings at High-use Pedestrian Areas
E-8	Mid-block Crossings
E-9	Crosswalk Locations and Warrants
E-10	Elevated Crosswalk to Refuge Island
E-11	Bulbouts/Curb Extensions
E-12	Modern Roundabouts
E-13	Design, Location, and Type of Bicycle Parking Facilities

E-1 INTENT

Sidewalks and bicycle facilities are integral to the transportation system. The Pedestrian Level of Service Guidelines are intended to ensure that pedestrian interests and bicycle interests are considered in all analysis of the study, analysis, planning, design, engineering, and construction of transportation facilities. They are also intended to ensure that any flexibility in the transportation standards of this code is executed in a manner that is most appropriate to the context and site, and that it properly balances pedestrian and bicycle interests with other transportation interests.

E-2 RESPONSIBILITIES

The builder on the lot is responsible for sidewalk construction. Where sidewalks are not directly related to a lot, the construction of sidewalks is the responsibility of the developer. A certificate of occupancy will not be issued until sidewalks required by the approved site plan are constructed and approved.

E-3 STANDARDS

Sidewalks shall be provided for any portion of a site which abuts a roadway. All sidewalks shall be in the public right-of-way. Sidewalk width will be as specified in Article 4 of this code. When a sidewalk abuts angled parking such that there will be vehicular overhang, the sidewalk shall be a minimum of six feet in width. Curb ramps shall be provided wherever an accessible route crosses a curb as per the current ADA Accessibility Guidelines. Driveways shall also be constructed in accordance with current ADA Accessibility Guidelines in order for person in a wheelchair to negotiate the sidewalk. Where there is adequate right-of-way, the construction of the sidewalk independent of the curb and gutter section is required on arterials and collectors, except where on street parking is permitted, and recommended elsewhere. The area between the sidewalk and the back of the curb shall be appropriately landscaped. Sidewalks in the Downtown Development District shall conform to streetscape recommendations set forth in the *Cheyenne Downtown Streetscape Design and Improvement Standards*, available at the Cheyenne MPO Office.

E-4 SPECIFICATIONS

Sidewalk construction and removal shall be in accordance with the current *City of Cheyenne and Board of Public Utilities Construction Standards and Specifications*. Curb ramps are illustrated in Standard Drawings of the specifications.

NOTE: The requirements of the Americans with Disabilities Act for sidewalks, curb ramps and protruding objects change from time to time. Persons designing or building sidewalks should verify with the City Engineer that they are using the current criteria. Sidewalks shall be a minimum of 4 inches thick, except where traversed by driveways, in which case the driveway thickness shall govern.

E-5 SITE DESIGNS GENERAL CONNECTIVITY REQUIREMENTS

The following sections identify general connectivity standards, features, and accommodations for pedestrians.

- A. Safe and convenient pedestrian access from the development site should be provided to existing designated trails or greenways located on or adjacent to the development site. On-site connections should be made at points necessary to provide direct pedestrian travel from the development to major pedestrian destinations located within the adjacent neighborhood(s), including but not limited to parks, schools, commercial districts, and transit stops.
- B. In order to provide direct pedestrian connections to these adjacent destinations, the City may require additional sidewalks, walkways, or bike paths not associated with a street, the extension of a sidewalk from the end of a cul-de-sac to another street or walkway and/or connections between developments.
- C. Paths, when built to the standards of the Greater Cheyenne Area Greenway and in 20' public right-of-way, will be maintained by City Parks and Recreation Staff. All commercial retail, office, industrial and residential apartment developments should provide for the following design elements:
 1. Wide, safe front sidewalk,
 2. Direct pedestrian sidewalks to surrounding properties, transit stops, and sidewalks along the surrounding street,
 3. Locate major entry driveways away from front of stores where pedestrians must cross, and enhance them with pedestrian facilities such as

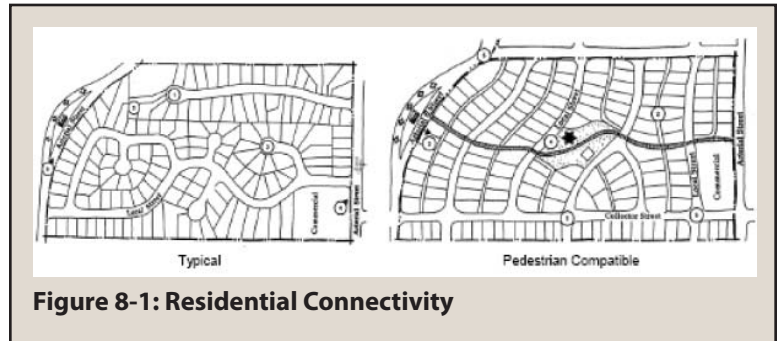


Figure 8-1: Residential Connectivity

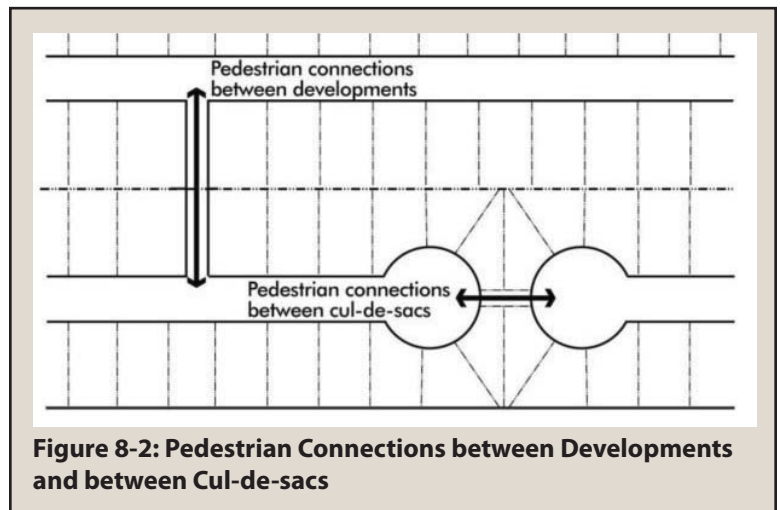


Figure 8-2: Pedestrian Connections between Developments and between Cul-de-sacs



Figure 8-3: Commercial Retail Shopping Center

- 4. Sidewalks and cross walks.
- 4. Canopies in front of stores to offer weather protection, and
- 5. Pedestrian plazas.
- D. The following exhibits provide examples of typical developments as compared to developments with pedestrian-compatible improvements. These examples illustrate the same development yield for the site, illustrating that good pedestrian connection

and development opportunities are compatible and efficient.

- E. When necessary to assure the public’s safety in using on-site or connecting pedestrian sidewalks, the City may require the developer to provide on-site or off-site pedestrian overpasses, underpasses, or traffic signalization. These connections are particularly important for providing pedestrian connections to transit stops, schools and parks.
- F. Each development should provide and contribute to an on-site system of pedestrian walkways. To the maximum extent feasible, onsite walkways should provide the most direct access route between the intended points of travel. Specifically, pedestrian connections should be provided to and between the following points:
 1. The primary project entrance or entrances to each building housing a principal use,
 2. Any sidewalk or walkway on adjacent properties that extends to the boundaries shared with the development,
 3. Any public sidewalk system along the perimeter streets adjacent to the development site, existing or planned transit stations, shelters, stops and park-n-ride locations, and
 4. On-site amenities such as landscape/hardscape, benches, pedestrian lighting.
 5. All on-site and public sidewalks, pedestrian walkways, or trails should have and maintain a minimum unobstructed pathway width of at least 4.5 to 6 feet, and as otherwise specified by the street design standards.

E-6 DESIGN FEATURES AND ACCOMMODATIONS FOR PEDESTRIANS

To the maximum extent feasible, the following guidelines should be incorporated in the design of all new developments to ensure safe and convenient pedestrian access into and within the site, with minimum potential for conflict with motor vehicles. These design elements complement the five measures of pedestrian level of service: directness, continuity, street crossings, visual interest and amenity and security.

- A. **Directness.** Developers should provide and encourage direct pedestrian connections by adhering

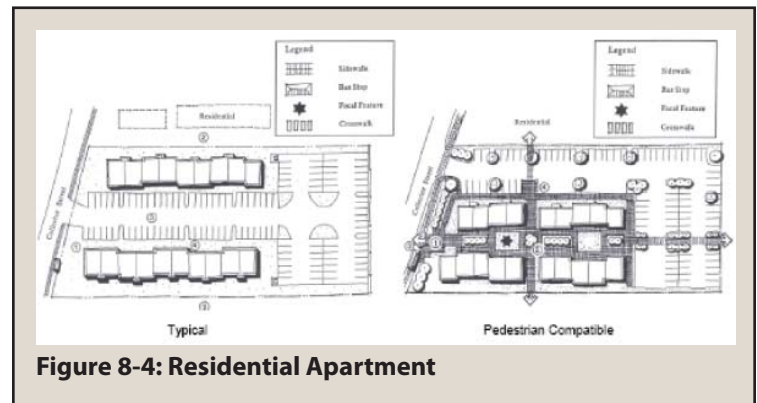


Figure 8-4: Residential Apartment

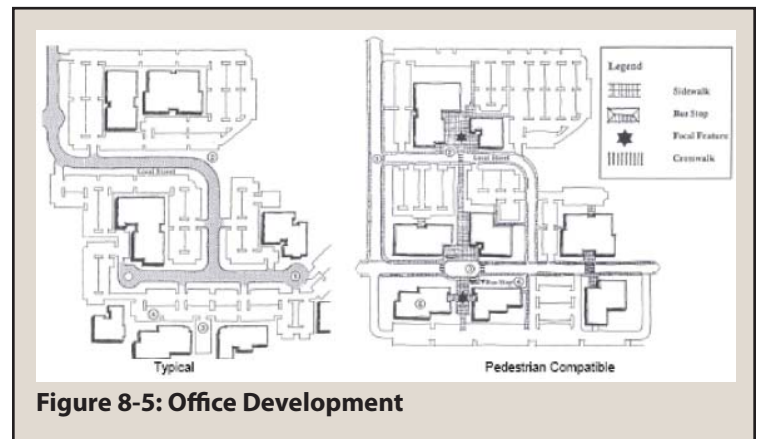


Figure 8-5: Office Development

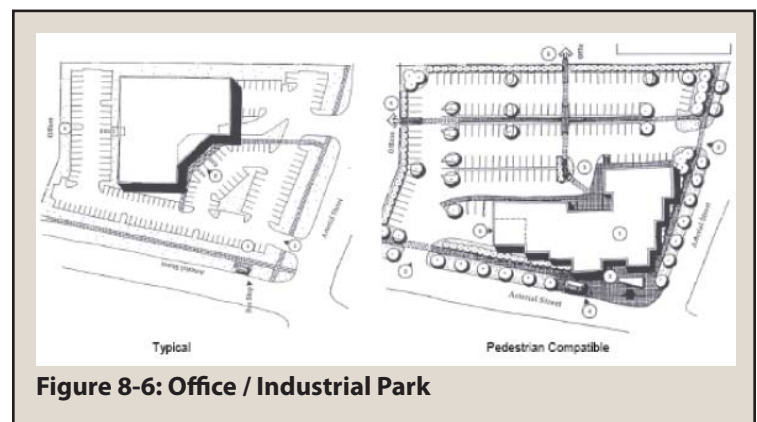


Figure 8-6: Office / Industrial Park

to the following guidelines.

1. Provide direct pedestrian connections to transit, schools, activity areas, and public facilities.
2. Provide visible connections to key pedestrian destinations. Align and locate buildings, roadways, and open space so that pedestrians can see their destinations before arriving there.

3. Provide clearly marked building entries as viewed from the street. Entries from parking lots should be subordinate to those related to the street. Buildings should be sited in ways to make their entries or intended uses clear to pedestrians.
 4. The location and pattern of streets, buildings, and open space must facilitate direct pedestrian access.
 5. Use light fixtures to provide direct indication for pedestrian traffic. Light fixtures should be of shielded type with flat level lenses when appropriate.
 6. Ensure that sidewalk uses, such as outdoor cafes, in high-use retail pedestrian settings, are compatible with direct pedestrian access to buildings and other destinations.
 7. Avoid barriers that separate commercial developments from residential development and transit.
 8. Locate buildings near street corners to improve access to bus stop and provide pedestrian connections to neighboring activities.
 9. Establish appropriate lot patterns that provide direct and visible connection of sidewalks between blocks.
 10. Provide direct connection between cul-de-sacs.
 11. Ensure appropriate width of sidewalks and street crossings to facilitate continuous movement of two people comfortably walking side by side with space for one to pass.
 12. Provide clear and direct pedestrian entries from the street, not just from parking areas.
 13. Minimize and remove physical obstructions/barriers that impede direct pedestrian access. Provide access through walls, fences, and other obstructing features and elements.
- B. **Continuity.** Link schools, neighborhoods, parks, activity centers, and other destinations with a continuous pedestrian network.
1. Provide a continuous and understandable pedestrian network by incorporating the following facilities, features, and elements:
 - a. Continuous sidewalks on both sides of the street,
 - b. A continuous alignment of building facades near the sidewalk,
 - c. A consistent park strip between the curb and the sidewalk, and
 - d. Consistent street trees.
 2. Use pedestrian-scaled furnishings, signs, landscaping, and facilities that appear as unified and themed entities in pedestrian networks, areas, and corridors.
 3. Ensure that sidewalk cafes and other uses/features of the sidewalk area support rather than obstruct a continuous pedestrian network.
 4. Provide bridges and crossings over drainages, and other features that are major barriers to a continuous pedestrian network. Design these crossings to minimize out-of-direction travel.
- C. **Street Crossings.** Develop safe, comfortable, and attractive street crossings.
1. Develop median refuges to improve the safety and comfort of arterial street crossings.
 - a. Establish standardized street-crossing improvements that include crosswalks, lighting, median refuges, corner sidewalk widening, sign, signals, and landscaping.
 - b. Develop and design crosswalks that:
 - c. Are well-marked and visible to vehicles,
 - d. Fit and enhance the local urban design context and character, and
 - e. Provide for safety for all age/ability groups.
 2. Develop civic improvements, including pedestrian-scale elements, landscaping, and sidewalk widenings, which improve the visibility and suggestion of pedestrians at street crossings.
 3. Develop street-calming improvements to enhance the safety of street crossings.
 4. Ensure that signals, signs, and street markings have clear vehicular and pedestrian indications for street crossings.
 5. Ensure that street crossings are lit to reflect the patterns of use.
 6. Provide automatic pedestrian signal phases at high-demand intersections and pedestrian buttons at low-demand areas.
 7. Provide for an exclusive pedestrian signal phase to improve safety.

8. Install stop bars on all approach legs at signalized intersections.
 9. Minimize curb radius to:
 - a. Reduce the speed of right- turning vehicles.
 - b. Reduce the distance for the pedestrian to cross the street.
 10. Locate lighting, signal and signage poles so they do not conflict with safe pedestrian circulation.
 11. Allow access for people of different abilities.
- D. **Visual Interest and Amenity.** Develop comfortable and attractive pedestrian facilities and settings to make an interesting pedestrian network.
1. *Pedestrian Facilities and Elements:*
 - a. Provide pedestrian-scale improvements that fit the urban context of the area.
 - b. The color, materials, and form of pedestrian facilities and features should be appropriate to the area where they are located, as well as to the functional unity of the pedestrian network.
 - c. Develop attractive improvements including landscaping, vertical treatments, sidewalk widening, and furnishings which improve the character and pedestrian scale of the urban environment.
 - d. Incorporate special design features, public art, and site details that can enhance the pedestrian scale of streets and become an urban amenity.
 - e. Develop standardized lighting improvements which enhance the character of the pedestrian environment. Consider the following criteria:
 - i. Varied light spacing and heights to be compatible with site-specific issues.
 - ii. Poles to incorporate pedestrian-scale features such as banners, potted plants, etc.
 - iii. Attractive luminaries to provide an organized and unified appearance throughout the pedestrian network.
 - f. Use quality materials and design, which will minimize maintenance needs.
 - g. Maintain pedestrian facilities.
 - h. To enhance the character of the pedestrian environment and to encourage pedestrian activities along the sidewalks on key streets and corners, prohibit large surface parking lots in these locations.
 2. *Landscaping:*
 - a. Develop a continuous edge of deciduous canopy street trees on both sides of the street. Select species that provide shade, shelter, scale and continuity for the pedestrian/ sidewalk environment.
 - b. Develop attractive landscaping by considering the following criteria:
 - i. Reduce clutter of little plants and disorganized planting.
 - ii. Establish patterns/spacing of street trees to provide formal visual rhythm, a linear edge to, and organization of the sidewalk area.
 - iii. Use trees of similar height and structure to provide a unified image and cohesive character for feature corridors and districts.
 - iv. Use specialty-landscaping themes to help distinguish districts.
 - v. Use landscaping selectively to soften the harsh appearance of some buildings and parking lots at the sidewalk edge.
 - c. Construct retaining walls of materials which reduce their apparent scale, like brick or stone, or treated architecturally to create an appropriate scale and rhythm. Hanging or climbing vegetation can soften the appearance of retaining walls. High retaining walls should be terraced down and include landscaped setbacks.
 - d. Design attractive urban open spaces to have a distinctive and definite shape, enclosed by buildings on 2-3 sides so the area feels like an "outdoor room," which is favored by pedestrians. These spaces must be located in the right places to be useful. Locate at intersections of 2 or more pedestrian routes.
 - e. Screen blank building walls and retaining walls with landscaping, architectural features, or art to enrich the pedestrian environment.

3. *Buildings:*

- a. Encourage outdoor cafes and activity areas that provide pedestrian character and human scale to the sidewalk environment.
- b. Construct windows and other openings that will relieve blank walls, adding visual interest, improving pedestrians' sense of security, and introduce a human scale to building frontages.
- c. Provide human scale character to the street with appropriate building design and details.
- d. Incorporate building entry details like porches and recesses, occupied spaces like bay windows and balconies.

E. Security:

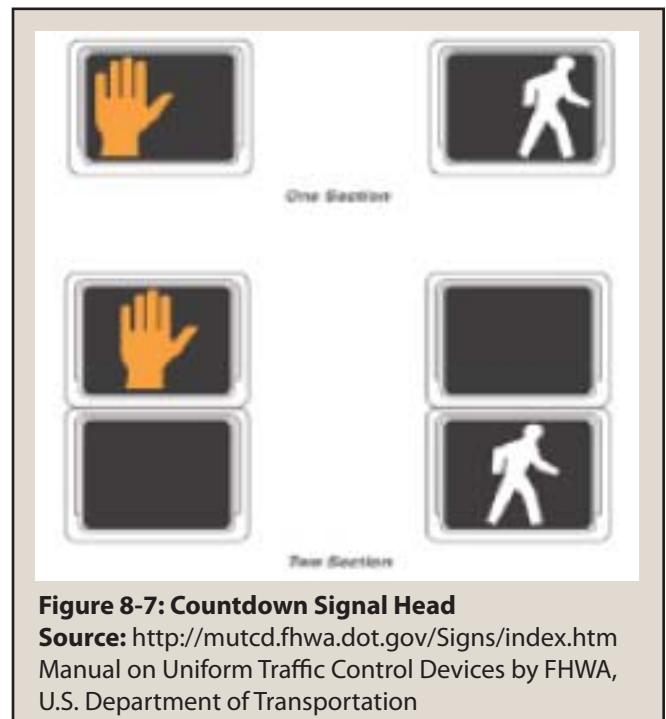
1. Develop secure pedestrian settings by developing a well-lit inhabited pedestrian network and by mitigating the impacts of vehicles.
2. Streets should appear inhabited to the greatest extent possible. New development should accommodate human activity by providing balconies, terraces, and yards for residents' use and interaction. In mixed-use buildings, retail elements like large windows, canopies, and integrated signage add activity by enhancing the shopping experience. Entrances, porches, balconies, decks, and seating should be located to promote pedestrian use of the street edge by providing weather protection, security, and safety.
3. Provide clear and direct lines of sight in pedestrian settings to increase feelings of security. Achieve this by minimizing use of shrubs, walls, berms, and other vertical features, which screen lines of sight to pedestrian facilities.
4. Provide general illumination for security and visual safety of pedestrian areas and corridors.
5. Use lighting fixtures to identify and highlight key pedestrian facilities and elements such as pedestrian intersections, paths, sidewalks, and entrances, while enhancing safety, and security. Provide a desirable and safe pedestrian environment by decreasing glare associated with tall, high intensity street fixtures. Provide indirect light to the sidewalk by lighting elements in the street environment such as trees, walkways, canopies, and entryways. All lighting should be down-directed and should not contribute to light pollution whenever possible.
- f. Develop physical buffers/edges between sidewalks and streets/parking lots.
- g. Avoid over-illumination of pedestrian areas, since these create, by contrast, shadowy areas nearby which may be threatening to pedestrians.

E-7 PEDESTRIAN CROSSINGS AT HIGH-USE PEDESTRIAN AREAS

The greater the number of lanes that a pedestrian must cross, the greater is the pedestrian's exposure to vehicles. In addition, wider streets tend to carry higher volumes of traffic and higher speeds. Intersections crossing multiple lanes require pedestrian enhancements. If it is determined that the traffic demand warrants additional through or turn lanes, then pedestrian mobility should be evaluated to determine whether additional pedestrian enhancements should be required to offset the traffic impacts on the pedestrian. The following are key intersection street-crossing design elements that should be considered in the guidelines for designing intersections.

- A. **Number of Lanes:** The number of travel lanes to cross is a significant safety factor for a pedestrian crossing the street. When the number of travel lanes increases, it is generally in response to higher traffic volumes. In addition, the pedestrian is exposed for a longer period of time in crossing those additional lanes.
- B. **Lane Widths:** Typically a travel lane is 12 feet. If the lane width is reduced, the time it takes a pedestrian to cross is also reduced. In addition, the narrower travel lane tends to calm or slow traffic, which is of benefit to the pedestrian.
- C. **Parking Lanes:** When parking lanes along a street exist, the pedestrian walk-time to cross the street increases as the pedestrian must first cross the parking lane before beginning to cross the traffic lanes. At intersections, vehicles that make wider, higher-speed turns often use these parking lanes.

- D. **Travel Speed:** Speed is a significant safety factor for a pedestrian trying to cross a street. Factors that might affect speed include minimum cross-street traffic, low number of access points, and geometric design. As mentioned previously, lane widths also contribute to travel speed.
- E. **Crosswalks:** Enhancements to crosswalks, including color, stenciling, and pavement treatment should be considered for all major intersection entryways to mixed-use centers.
- F. **Signal Indication:** Pedestrian signal heads should be included for all signalized intersections with crosswalks. The heads should be easily visible to the pedestrian.
- G. **Lighting Levels:** The intersection should be well lit so the pedestrian is visible at night.
- H. **Pedestrian Signal Indication and Pedestrian Buttons:** It would be optimal for all activity areas to have designated pedestrian signal phases. Pedestrian push-buttons should be required for all other intersections. The location of the push-button should be easily accessed and not require pedestrians to divert from their travel route. Signals without dedicated walk phases or push-buttons are not acceptable since the only way a pedestrian may ever get a green light is when an automobile on the side street activates the cycle.
- I. **Countdown Signal Heads:** At signal locations that experience a high number of pedestrians, such as at transit stops or universities, where there have historically been a large number of pedestrian accidents, or any other area where pedestrians often cross during the “Do Not Walk” phase, countdown signal heads should be considered to provide additional information about how much time is remaining for being able to cross the street.
- J. **Median Refuge Areas:** Painted medians offer little refuge other than getting out of a lane of traffic. Substantive raised medians of significant width with a cut-through provide some increase in security for the crossing pedestrian. For arterials with four or more lanes, a raised median refuge island should be designed for all intersections and mid-block crossings.
- K. **Amenity:** In pedestrian districts, amenities should include such elements as signing and design features that strongly suggest the presence of a pedestrian crossing.
- L. **Line-of-sight Distance:** Sight distance measures the unobstructed view between the motorist and the pedestrian. This can be a problem particularly when a motorist intends to make a left turn under the permissive left-turn phase, and it is difficult to see pedestrians around the opposing left-turn vehicle. Sight distance should be analyzed as a part of all intersection designs.
- M. **Right Turn on Red (Left Turn on Red on One-Way Streets):** One of the greatest increases in pedestrian accidents has been associated with right turns on red lights. Research has determined that an extremely high number of drivers do not stop at the crosswalk before making their turn and, instead, continue on while looking to the left for approaching conflicting vehicles, not to the right for pedestrians in the crosswalk. Some jurisdictions have installed signs that do not permit right turns on red in specific places and circumstances. As part of the traffic study, locations that would experience



high pedestrian volumes should be identified. Restricting right turns on red should be at the discretion of the City Traffic Engineer.

E-8 MID-BLOCK CROSSINGS

- A. Mid-block crossings should be provided where there is an existing or potential pedestrian demand to cross at higher volume roadways or streets where crossings are greater than 800 feet. Ideally, these crossings should be accommodated with a refuge island. Center crossing islands allow the pedestrian to deal with only one direction of traffic at a time and enable them to stop partway across the street and wait for an adequate gap in traffic before crossing the second half of the street.
- B. Where mid-block crossings are installed at uncontrolled locations (i.e., where no traffic signals or stop signs exist), crossing islands should be considered as a supplement to the crosswalk in order for the pedestrian to only cross one direction of traffic at a time. Providing an angled pedestrian travel way across the median allows oncoming traffic to be better viewed before crossing, further improving safety.

E-9 CROSSWALK LOCATIONS AND WARRANTS

- A. From a pedestrian-network perspective, extended distances between intersecting streets make it difficult for the pedestrian to cross the facility. Ideally, a system of grid streets that are around 400 feet in separation would be optimal. This distance would be appropriate for local streets within residential neighborhoods and activity centers. Spacing between intersections on primary arterials and secondary arterials might need to be longer to accommodate the higher volumes of traffic, storage for signals, and signal progression.
- B. The location and frequency of crosswalks along primary arterials, secondary arterials, and collector streets need to be balanced between need, traffic flow, and cost. Whereas an optimum pedestrian environment would have crosswalks at all major activity areas and spaced at 400-foot increments, too great a frequency of crosswalks can create a situation where the typical driver becomes immune to the crosswalk, which might create a safety hazard. The following should be considered when considering locations for crosswalks:
 1. All signalized intersections,
 2. Locations that will attract high pedestrian volumes,
 3. Locations for safety, such as crosswalks to school sites, transit stops or activity areas, and
 4. Mid-block crossings at a minimum of 350 feet from adjacent intersection crosswalks.
- C. In areas that have high volumes of pedestrians crossing a street, pedestrian crosswalks should be installed. The need for these crosswalks is a function of roadway type and pedestrian volumes. Roadway types from collector to primary arterial result in more travel lanes in which the pedestrian is exposed as he/she crosses, higher traffic volumes, and often increased traffic speeds. The following is a guideline as to where unprotected intersection and mid-block crosswalks should be considered based on street width/type and pedestrian volumes.

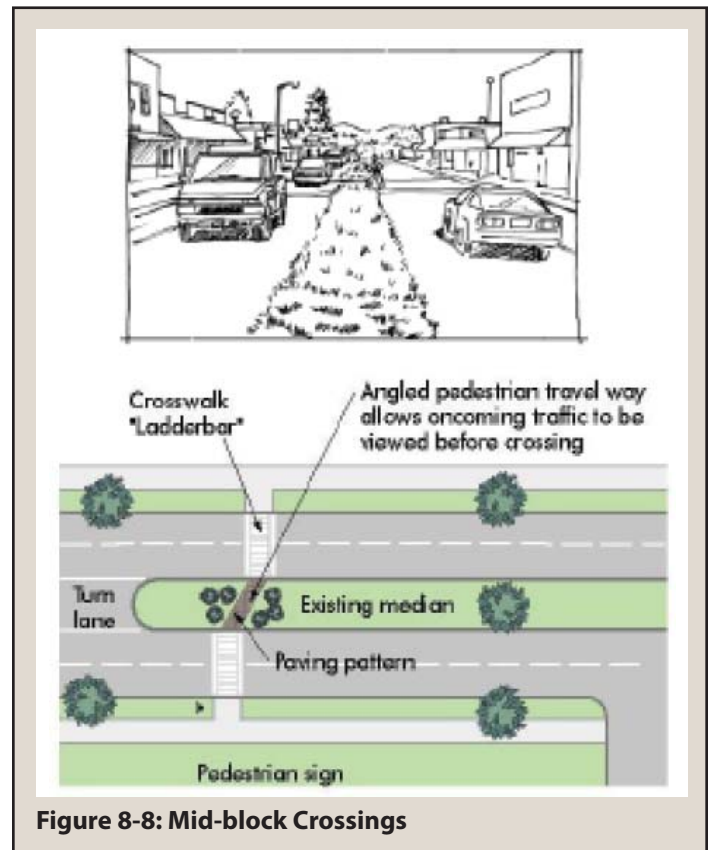


Figure 8-8: Mid-block Crossings

E-10 ELEVATED CROSSWALK TO REFUGE ISLAND

In locations where a dedicated right-turn lane is needed as determined by the Traffic Impact Study, the design should consider a raised crosswalk at the height of the curb and a ramp for the vehicles to cross the crosswalk. This resulting design is similar to that of a 10-foot speed table with a six-inch up-ramp, table, and down-ramp.

E-11 BULBOUTS/CURB EXTENSIONS

In special applications, the City or developer may consider bulbouts to reduce traffic speed and improve pedestrian safety. Bulbouts are simply intersection curb extensions, which extend past the parking lanes, but not into the bicycle or through lanes. The advantages of bulbouts are as follows:

- A. Bulbouts provide an entry or gateway statement into activity areas or where high volumes of pedestrians are present. As a motorist enters an area where a bulbout is present, the extension provides a clear difference between the arterial function and a local pedestrian activity area.
- B. Bulbouts enhance the visibility of the pedestrian because they physically permit the pedestrian to be located closer to the travel lanes, especially where parking is permitted, and allow the pedestrian to be seen more easily by the driver.
- C. Bulbouts constrict traffic flow through reduced lateral clearance. This reduction effects a reduction in travel speed along the corridors and improves safety for both pedestrians and vehicles.
- D. The bulbout changes the turning radius at the intersection, which reduces turning speed and vehicle and pedestrian conflicts.
- E. The extension of the bulbout reduces the time it takes pedestrians to cross from curb to curb. This reduction in pedestrian crossing time consequently reduces the time the pedestrian is exposed to moving vehicles.
- F. Bulbouts change the character of the intersection from automobile-dominant to pedestrian-friendly and multi-modal shared.
- G. Bulbouts can be an extremely positive visual and aesthetic enhancement. Features such as pedestrian lighting, planters, and benches create a focal point for pedestrian activity and change the character of the intersection from automobile to pedestrian. It should be noted that care must be taken when aesthetically enhancing bulbouts as such enhancements can block sight distances and create accident problems.

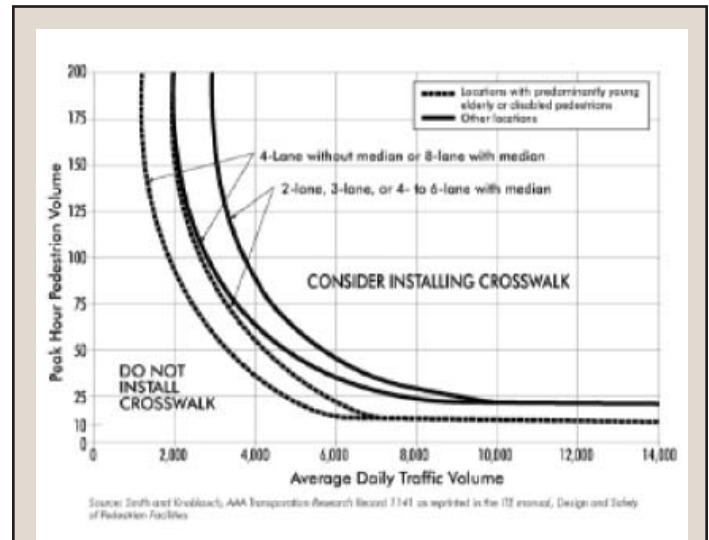


Figure 8-8: Guidelines for the Installation of Marked Crosswalks at Uncontrolled Intersections and Mid-block Crossings

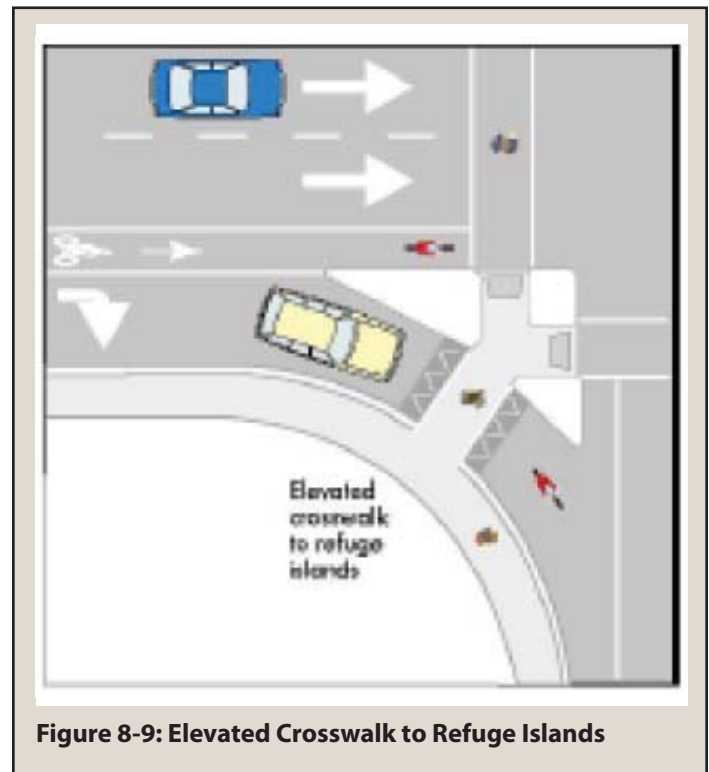


Figure 8-9: Elevated Crosswalk to Refuge Islands

E-12 MODERN ROUNDABOUTS

- A. The use of modern roundabouts as an alternative to conventional stop- and signal-control intersections is becoming increasingly popular in the United States. Studies conducted by the insurance industry have determined that these types of intersections result not only in a significant decrease in automobile traffic at an intersection, but also in a reduction in pedestrian accidents as well.
- B. At a conventional intersection, the pedestrian faces four potential vehicle conflicts:
1. Crossing movements on red (typically high-speed, illegal)
 2. Right turns on green (legal)
 3. Left turns on green (legal for protected-permitted or permitted left turn phasing)
 4. Right turns on red (typically legal)
- C. Pedestrians at roundabouts, on the other hand, face two conflicting movements on each approach:
1. Conflict with entering vehicle
 2. Conflict with exiting vehicle
- D. The crossing of the roundabout is relatively simple. The pedestrian waits for a gap in traffic and crosses from the curb to the splitter island that provides protection, and then crosses from the splitter island to the far curb when a gap in traffic occurs. Crossing in two steps reduces the vehicle exposure in half for each segment. In addition, safety is improved because the vehicles are forced to go slower through the roundabout than at a conventional intersection. The modern roundabout pedestrian crosswalk treatment consists of:
1. ADA compliant ramps
 2. Conventional crosswalk striping
 3. Raised splitter island pedestrian pass-through and refuge
 4. Pedestrian crossing sign
 5. Yield street markings
 6. Yield signs
- E. Typically, the crosswalk is placed approximately one car length from the yield bar to permit the pedestrian to safely walk behind a vehicle that is awaiting a merge into the roundabout when traffic permits.

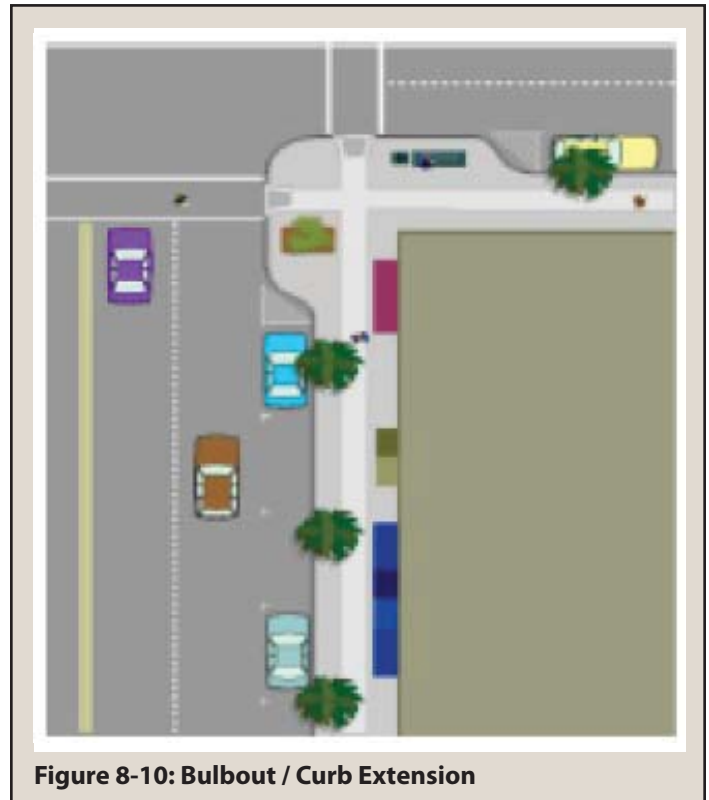


Figure 8-10: Bulbout / Curb Extension

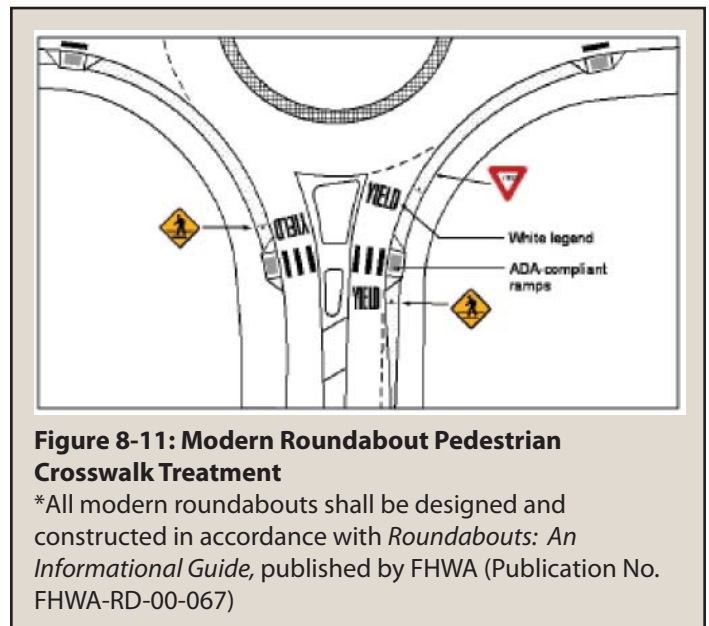


Figure 8-11: Modern Roundabout Pedestrian Crosswalk Treatment

*All modern roundabouts shall be designed and constructed in accordance with *Roundabouts: An Informational Guide*, published by FHWA (Publication No. FHWA-RD-00-067)

E-13 Design, Location and Type of BICYCLE PARKING FACILITIES

Convenient and secure bicycle parking is necessary at the destination end of a path or route. Inadequate bicycle parking facilities and fear of theft are major deterrents to bicycle transportation. A sufficient supply of effective bicycle parking requires a properly designed rack in an appropriate location for the type of use.

- A. **Design Standards.** Bicycle facilities shall be designed in accordance with Chapter 2 of the *AASHTO Guide*. Traffic control shall be in accordance with the *Manual on Uniform Traffic Control Devices*. Bicycle parking may be provided in floor-, wall- or ceiling-mounted racks. Racks at each location should:
1. Hold the bicycle frame, not just a wheel.
 2. Allow use of a U-shaped shackle lock.
 3. Accommodate a wide range of bicycle sizes, wheel sizes and types.
 4. Be covered with material that will not chip the paint of a parked bicycle with which it comes in contact.
 5. Not have hazards, such as sharp edges.
- To ensure bicycle parking will be used, the bicycle parking should be easy to find, convenient, and secure enough to reasonably safeguard against bicycle theft. Facilities can be located where cycles are already parked.
- B. **Type and Location.** There are many types of bicycle racks and lockers available. Some are suitable for certain situations but not others, and some designs are unsuitable anywhere. There are two general categories of bicycle parking requirements:
1. *Long-Term (Class I)* parking is needed where bicycles will be left for hours at a time. It requires a high degree of security and weather protection, with well-designed racks in covered areas, lockers, storage rooms, or fenced areas with restricted access.
 2. *Short-Term (Class II)* parking is needed where bicycles will be left for short stops. It requires a high degree of convenience (as close to destinations as possible). At least some short-term bicycle parking should be protected from the weather (a portion can be unprotected, since demand tends to increase during fair weather).
- C. **Visibility.** Racks should be highly visible so cyclists can spot them immediately when they arrive from the street. A visible location also discourages theft and vandalism.
- D. **Security.** Adequate lighting and surveillance is essential for the security of the bicycles and the users. Bicycle racks and lockers must be well anchored to the ground to avoid vandalism and theft.
- E. **Weather Protection.** A portion of bicycle parking should be protected from the weather (some short-term bicycle parking can be unprotected since bicycle use tends to increase significantly during fair weather, as mentioned previously). This can use an existing overhang or covered walkway, a special covering, weatherproof outdoor bicycle lockers, or an indoor storage area.
- F. **Clearance.** Adequate clearance is required around racks to give cyclists room to maneuver and to prevent conflicts with pedestrians or parked cars. Racks should not block access to building entrances or fire hydrants.

APPENDIX F – GUIDELINES FOR PREPARING A JOINT PARKING STUDY

In association with Section 6.2.4 of this code, planning applications where collective or shared parking is contemplated may be required to include parking accumulation studies for existing facilities similar to the proposed uses and for the surrounding uses with which joint parking is being considered. The applicant shall adhere to the following guidelines:

- A. Prepare a scaled drawing indicating the parking areas and the facilities requiring parking in the area.
- B. Determine if shared parking is possible by examining the land-use mix adjacent to the subject site, the size of each use, the type of operation, and, most importantly, the 12- to 24-hour parking demand characteristics of each use.
- C. Conduct the 12- to 24-hour parking accumulation studies for existing facilities similar to those for which reciprocal parking is being requested, and for the surrounding ones with which shared parking is anticipated. Weekly and monthly variations in parking demand must be taken into consideration.
- D. Occupancy factors may be a consideration in determining how well the parking spaces for the existing adjacent uses, with which shared parking is being contemplated, are currently being utilized. These can be determined during the accumulation studies outlined above.
- E. Based on the data for existing similar facilities, the total parking demand for all uses included in the shared parking analysis must be projected for each hour over a 12- to 24-hour period for the most critical day of the week and month of the year. This must include the Thanksgiving-to-Christmas period, if the facilities are affected by this period. This will determine the minimum number of spaces that must be provided.
- F. Based on this analysis, if the maximum number of vehicles accumulated during a 24-hour period for all uses exceeds the number of spaces that were required by the zoning ordinance for all the uses, no reciprocal or shared parking will be permitted.
- G. If the projected peak accumulated demand is lower than the spaces required, elimination of those spaces exceeding the maximum accumulated demand may be considered by permitting shared parking, providing details of an agreement are provided guaranteeing perpetuity of such shared parking arrangements in case of future ownership or tenant changes.

APPENDIX G STREETScape DESIGN, PLANNING AND MAINTENANCE GUIDELINES

- G-1 Intent
- G-2 Applicability
- G-3 Medians
- G-4 Tree Lawns
- G-5 Planting Guidelines
- G-6 Planting Standards
- G-7 Irrigation Standards
- G-8 Turf Seeding Standards
- G-9 Fine Grading and Soil Preparation Standards
- G-10 Streetscape Maintenance Standards

G-1 INTENT

Streets are the most significant portion of the public realm of most communities – both in area and in investment. The intent of the Streetscape Design Guidelines is to ensure that the quality of the streetscape environment, including medians and tree lawns within the public right-of-way, is attractive, functional and links the public street corridors together through a unified City-wide plan.

G-2 APPLICABILITY

The Streetscape Design Guidelines are used in the evaluation of new development and redevelopment projects. The guidelines set forth acceptable standards and practices to meet development requirements and design objectives in this code. These guidelines apply to projects located within the public right-of-way along arterials, collectors, and local streets. For additional information on related streetscape design, see the City of Cheyenne's current editions of the *Landscape Design Regulations (UDC Section 6.3)*, *City Urban Forestry Ordinance*, and *Standard Specifications (UDC Section 4.3)*.

G-3 MEDIANS

- A. **Landscape Plan.** All street designs that include a median shall submit a median landscape plant that meets or exceeds the standards of this section.
- B. **Timing of Median Landscaping.** Landscaping of medians shall occur in connection with the adjoining development or with improvement of the roadway as described below.
 - 1. *Arterial Streets.* Landscape development shall occur with the improvement of the roadway.
 - 2. *Non-arterial Streets.* Landscape development shall occur in connection with the adjoining development.
- C. **Median Planting Design Options.** Landscaping shall be based on one of the following styles:
 - 1. *Tree Corridor Style.* Deciduous trees shall be planted in an evenly spaced row. Ornamental trees may be planted in an evenly spaced row at the end of the median where the landscape area narrows. Trees should have variety. Yet, strong contrasts within tree rows should be avoided with repetition or subtle changes in form, size, texture, and color.
 - a. Tree plantings shall be made in the center of the landscape area at regular spacing of 25 feet minimum to 40 feet maximum. Shade or ornamental tree plantings shall not occur where the distance between median curbs is less than 7 feet.
 - b. Shrubs or groundcover plantings shall be made to provide a homogeneous surface with minimal amount of variation. Plant material shall have a mature height of 18 inches or less. Plantings may be excluded from the ends of

- medians for maintenance or visibility concerns.
 - c. Organic mulch shall be placed at a depth of 3 inches directly on top of the soil surface in all landscape areas. Fabric shall be placed on top soil under mulch as a weed barrier.
 - d. Landscape area within the median shall be graded level 3 inches below the edge. Berming or cresting the landscape area is not permitted.
 - e. Flowering annual or perennial plants shall be restricted to high visibility areas and may occasionally be used as a landscape element in a section of the street corridor in wider sections of medians. Separate irrigation zones shall be installed for annual beds.
 - f. The tree corridor style is appropriate for medians in any classification of street where the median is at least 7 feet in width.
2. *Variety Combination Style.* Trees and shrubs of several types and forms should be planted. Continuity is not provided by the perpetual repetition of individual elements but by the occasional repetition of a dominant tree form. This continuity may be achieved by planting groups of the same evergreen tree as a repeated form along the street corridor. Plant groups placed between the repetitive dominant tree forms may be in sharp contrast to each other—in terms of size, color, form, and texture—to emphasize visual variety and detail. Tree selection may be from shade, evergreen or ornamental types. The landscape area of a median must be 12 feet in width if evergreen trees are to be planted. Deciduous trees must be at least 3.5 feet, and evergreen trees 6 feet from the edge of the landscape area. Spacing between trees may vary within the following requirements:

TABLE G-1: SIZE AND SPACING OF TREES		
	<i>Canopy Shade Tree</i>	<i>Ornamental</i>
Minimum Size	2.0: Caliper (1.25" Residential Street)	1.5" Caliper
Minimum Spacing	25 feet	20 feet
Maximum Spacing	40feet	30 Feet

D. Arterial Median Protection. The border of a landscape median in an arterial street shall be raised with a vertical wall or shall include an inclined splash block of a medium-to-dark earthtone color (see Median Planting detail on following page).

E. Hardscape. Landscape paving shall be used as a median cover wherever a landscape area is not provided. The hardscape may completely cover a median, or part of a median, that is less than 7 feet in width. Landscape paving may be integrated into a tree corridor or variety combination style, but shall not exceed 40% of the area of such a landscaped median. Landscape paving shall be of an aggregate or paver type and of a medium-to-dark earth-tone color.

G-4 TREE LAWN

A. Landscape Plan. All developments or roadway improvements shall submit a tree lawn landscape plan that meets or exceeds the standards of this Section.

B. Tree Lawn Planting Design Options

- 1. Canopy shade trees shall be planted at 25 to 40 foot intervals (spacing) in the center of all such tree lawn

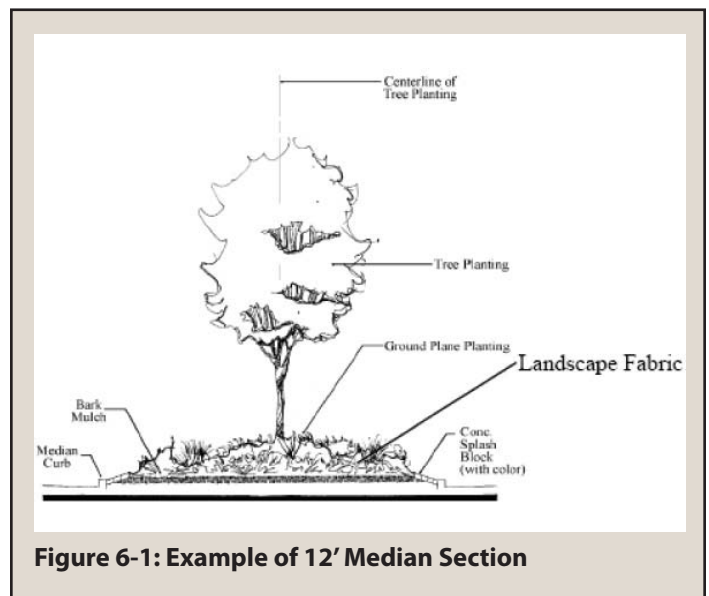


Figure 6-1: Example of 12' Median Section

areas whenever the sidewalk is separated from the street by a tree lawn. Whenever the sidewalk is attached to the street, the canopy tree shall be established 2.5 feet behind the sidewalk at 25- to 40-foot spacing, or in tree wells were specified by the Street Standards.

2. Ornamental trees shall be planted in substitution of the canopy shade trees where overhead lines and fixtures prevent normal growth and maturity.
3. The tree lawn ground plane planting design shall consist of turf grass and automatic irrigation system. Xeriscape design principles should be incorporated whenever appropriate. Within the tree lawn, the ground plane should be attractive but not dominant, uniform, uncluttered, and low in height and growth.
4. Trees must be planted in the center of the tree lawn measured from the front of the sidewalk and back of the curb.
5. No street tree shall be planted closer to the street than 2.5 feet from the back of the curb for ornamental trees and 3.5 feet from the back of curb for large shade trees.
6. Larger maturing trees should be placed 40 feet apart and smaller maturing trees (such as in the Variety/Combination Median style) may be placed 20 feet apart. When space is limited or to achieve certain design effect, closer spacings may be considered.
7. No tree shall be planted closer than 10 feet from any driveway or alley, nor shall a tree be planted in such a manner that its eventual growth cannot be reasonably controlled so as to avoid interference with or obstruction to any improvements installed for public benefit.

C. **Utilities.** Landscape and utility plans shall be coordinated. The following list sets forth minimum dimension requirements for the most common tree/utility separations. Exception to these requirements may occur where utilities are not located in their standard designated locations, as approved by the City. Tree/utility separations shall not be used as a means of avoiding the planting of required street trees.

1. 40 feet between street trees and streetlights. 15 feet between ornamental trees and streetlights. (See figure below.)
2. 10 feet between trees and water or sewer lines.
3. 4 feet between trees and gas lines.
4. 10 feet between trees and fire hydrants
5. Street trees on local streets planted within the 8-foot-wide utility easement may conflict with utilities and should be avoided. Additional conduit may be required to protect underground electric lines.

D. **Visual Clearance or Sight Distance Triangle.** A visual sight distance triangle, free of any structures or landscape elements greater than 2.5 feet in height shall be maintained at street intersections and driveways, and comply with Section 4.3.5 of these Standards.

1. Fences shall not exceed 42 inches in height and shall be of an open design. Fences shall not be permitted in the clear sight triangle described in Section 4.3.5.
2. Deciduous trees may be permitted to encroach into the clearance triangle provided that the lowest branch of any such tree shall be at least 12 feet from grade at maturity.
3. At the intersection of roadways or vehicular access points, no plant material with a mature height greater than 2.5 feet shall be planted within a sight triangle measuring 35 feet along the boundary of each of the intersecting roadways, measured from the point of intersecting curblines, except where engineering standards indicate otherwise.
4. Trees shall be located no closer than 10' to any driveway or alley.

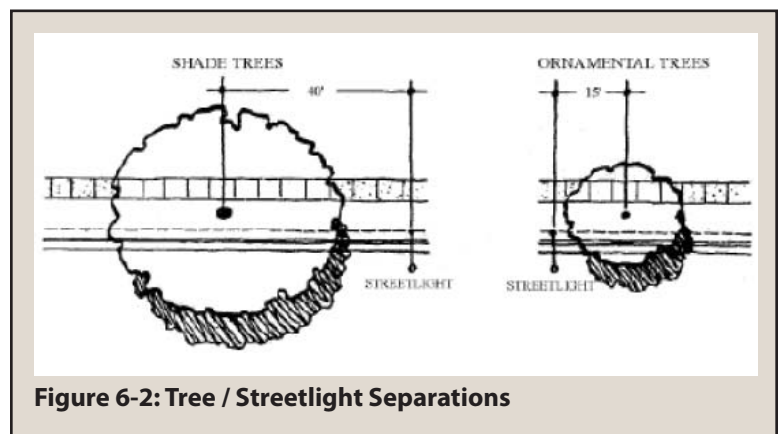


Figure 6-2: Tree / Streetlight Separations

G-5 PLANTING GUIDELINES

- A. **Weather, Climate, Soils.** Due to severe climate conditions in Cheyenne, consideration of long-term maintenance is an important element of the initial design of any streetscape. Precipitation is limited to 15 inches per year on average, with extreme temperatures in the 90's in the summer and as low as -20 in the winter. As much as one-third of the rain comes in May and June as heavy downpours. Heavy snows in spring and fall may break tree limbs, coming when trees are in leaf. Mild spring and fall weather is broken by sudden frosts.
- B. **General Planting Considerations.** Severe conditions require careful design and selection of vegetation. Suitable plant lists are available at the Botanical Gardens and Urban Forestry websites. Adaptable plants that have proven hardy are recommended wherever possible. Xeriscape methods are advisable, such as grouping plants with similar water demands together and watering higher-demand plants on a different sprinkler schedule while drought-tolerant plants may be watered by rain or bubbler irrigation. Soil preparation is a critical step in all xeriscape. General planting considerations include the following:
1. Coordinated tree planting sets a rhythm and pattern for the street. By alternating tree types, a sense of enclosure can be achieved while slower growing trees are established.
 2. Gardens of perennials and annuals should be restricted to high-priority areas for maintenance and safety reasons.
 3. Consider utilizing xeriscape principals for high-traffic, low-maintenance, or otherwise dry or difficult areas.
- C. **Streetscape Approval.** The developer shall contact the City Project Manager, Project Engineer, or Construction Manager before work on any City maintained streetscape commences.

G-6 PLANTING STANDARDS

- A. **Projects Governed by Planting Standards.**
1. Public projects such as streets, medians, and tree lawns shall provide for tree planting as a part of the development process. The landscape plan for such projects shall be approved by the City Forestry Department and must adhere to the design objectives, spacing locations, and other requirements with the City.
 2. Private projects shall provide for street tree planting as part of the development process. Street trees shall be located on the public right-of-way and must adhere to the design objectives, spacing, location, and other requirements of the City. These plantings are meant to work as a cohesive standard with the City's current Landscape ordinance. Exceptions can be made for tree plantings in the right-of-way due to Utility placement and other variations that would be deemed by the City Engineer to make Street Trees in the right-of-way unfeasible.
- B. **Specific Standards.**
1. Existing healthy street trees shall be preserved wherever possible. If a tree is removed, mitigation trees of at least equal value as that of the removed tree shall be provided as determined by the City Forester.
 2. New street trees that are part of a new development project and infill plantings shall be at least 1.5 to 2-inch caliper.
 3. Automatic irrigation shall be provided to all trees, shrubs, and turf per City standards.
- C. **Size, Type, and Distribution of Tree Species.**
1. Public tree planting can be accomplished with container trees, balled and burlapped trees or use of a tree spade. Bare-root plantings are not permitted without written permission as determined by the City Forester.
 2. No single species shall make up more than 50% of the total City tree population. The following requirements are for tree species at any one site:

Number of Trees at Site	Maximum % of any 1 Species at Site
10 to 19	50
20 to 39	33
40 to 59	25
60 or more	15

3. The plant palette listed in the 'Adopted Species List' available at the City Forestry Department constitutes the official tree species for Cheyenne. Species other than those included in this list shall not be planted as street trees without written permission of the City Forester.

D. Soil Preparation Requirements

1. All utilities shall be located prior to trenching and shall be protected from damage.
2. Trenching around established trees is prohibited within 10' of trunk.

G-7 IRRIGATION STANDARDS

- A. Irrigation systems in any public ROW (which are now or will at some future point be maintained by the City of Cheyenne) must be constructed in accordance with the standards set forth in the current edition of the City of Cheyenne, Parks and Recreation *Standards and Specifications*.
- B. Commercial properties would be advised to utilize commercial-grade irrigation equipment.
- C. The City Engineer reserves the right to require adherence to Irrigation Standards set forth in the City of Cheyenne, Parks and Recreation *Standards and Specifications* on ROW or properties that may have extenuating or special circumstances.
- D. If irrigation system is dedicated to the City then all components including irrigation meter pits and backflow preventers shall be placed in the public right-of-way or an easement dedicated to the City.

G-8 TURF SEEDING STANDARDS

A. General.

1. *Seed Mix*. Shall be approved by the Project Manager, Project Engineer, or Construction Manager based on the activity to take place, planned irrigation method and maintenance to be performed in the area being seeded.
 - a. Pre-approved Dryland Mix (for temporary or permanent unmowed and non-irrigated areas):
 - (1) 44% Fairway Crested Wheetgrass
 - (2) 10% Blue Grama
 - (3) 10% Butte Side Oats Grama
 - (4) 3% Texoka Buffalograss
 - (5) 20% Annual Rye Grass
 - (6) 10% Western Wheat Grass
 - (7) 3% Critana Wheat Grass
 - b. Pre-approved Irrigated Seed Mix(for mowed applications) *Fescue Mix*:
 - (1) 10% Chewing Fescue
 - (2) 10% Creeping Fescue

APPENDIX G

- (3) 10% Hard Fescue
- (4) 10% Sheep Fescue
- (5) 20% Tall Fescue (Regiment II)
- (6) 20% Tall Fescue (Crew Cut II)
- (7) 20% Tall Fescue (Blade Runner)

2. *Seeded Areas.* Seeding is allowed in Tree Lawns where approved by the City, on side slopes of detention ponds to be maintained by the City, and in some temporary dryland applications. No seeding is allowed in medians. All proposed seeded areas are to be specifically approved by the City and shall be of the latest crop.

B. **Submittals.** The developer shall submit certificates showing State, Federal or other inspection showing source and origin of materials to the City.

C. **Materials.**

1. *Seed.* Shall be of fresh, clean, new crop seed composed of the varieties approved by the City with tested minimum percentages of purity and germination clearly labeled on the package. All seed shall be free of *Poa annua* and all noxious objectionable weeds with a maximum crop of .1% and maximum weeds of .1% weeds.
2. *Mulch.*
 - a. For slopes 30% and less: Native grass straw without weed seed and consisting of grasses as specified for seeded application.
 - b. For slopes 30% and greater, and inaccessible areas: Hydromulch using Weyerhaeuser "Silva-Fiber" mulch or approved equal. The wood cellulose fiber for hydraulic mulching shall not contain any substance or factor which might inhibit germination or growth of grass seed. It shall be dyed a green color to allow metering of its application.
 - c. Tackafier use Teratack III, or approved equal.
3. *Netting.* For slopes greater than 30%, use Soil Saver jute netting, or approved equal. Netting to be stapled with No. 11 gauge steel wire forged into a 6-inch long U-shape and painted for visibility in mowed areas. Netting must be placed so it does not cause a problem for mowers.
4. *Fertilizer.* Use a fertilizer with a formula of 18-46-0 on all areas to be seeded.
5. *Inspection.* Inspect finish grade and trim where needed to obtain finish grades of 1 inch below adjacent pavements. Verify positive drainage away from all structures. Verify or complete removal of rock and debris larger than 1 inch from all areas to be seeded.

D. **Execution.**

1. *Fertilizer.* Apply 8 pounds per 1,000 square foot of seeded area and rake lightly into top 1/8 (0.12) inch of soil just prior to seeding operation.
2. *Seeding.*
 - a. Do not sow seed in windy weather or when ground is frozen or otherwise untiltable.
 - b. Use Brillion type drill or hydraulic seeding methods. Drill seed in manner such that after surface is raked and rolled, seed has ¼ (0.25) inch of cover.
 - c. Hydraulic seeding will be used in areas that are not accessible for machine methods. A hydraulic pump capable of being operated at 100 gallons per minute and at 100 pounds per square inch pressure should be used. The equipment shall have an acceptable pressure gauge and a nozzle adaptable to hydraulic seeding requirements. Storage tanks shall have a means of agitation and a means of estimating the volume used or remaining in the tank. Do not seed and mulch in the same operation.
 - d. Rates: Dryland Mix—30 pounds pure live seed per acre. Irrigated Mix—10 pounds per 1000 sq. ft.
3. *Mulching.*
 - a. Native Grass Mulch: Apply at a rate of 2 tons per acre. Mulch seed beds within 24 hours after seeding.
 - b. Hydromulching: Wood cellulose fibers must become evenly dispersed when agitated in water. When sprayed

uniformly on the soil surface, the fibers shall form a blotter like ground cover which readily absorbs water and allows infiltration to the underlying soil. Cellulose fiber mulch shall be added with the proportionate quantities of water and other approved materials in the slurry tank. All ingredients shall be mixed to form homogenous slurry. Using the color of the mulch as a metering agent, spray-apply the slurry mixture uniformly over the seeded area. Apply with tackafier used at a rate of 120 pounds per acre. Unless otherwise ordered for specific areas, fiber mulch shall be applied at the rate of 2,000 pounds per acre. Hydraulic mulching shall not be performed in the presence of free surface water resulting from rains, melting snow or other causes.

4. *Netting.* Net areas over 30% slope. If contractor fails to net and subsequent soil erosion occurs, contractor shall re-establish finish grade, soil preparation, seed bed and apply netting at no cost to the City of Cheyenne.
 5. *Watering.* Immediately after seeding and mulching, water seeded area slightly, but with care so that no erosion takes place and no gullies are formed. Water a minimum of three times a day and keep seeded area moist until turf is established. Sloped areas should be hand watered until turf is established to prevent erosion; water these areas more often but for shorter periods of time.
 6. *Clean Up.* Remove all hydromulch and other mulch materials from all plant materials, fences, concrete and other areas except for seed bed.
 7. *Protection.* Provide and install barriers as required to protect seeded areas from pedestrian and vehicular damage. Provide signage if needed.
- E. **Guarantee/Warranty.** Warrant seeded areas for consistency and completion of coverage. Re-seed as needed to ensure a successful stand of grass that is acceptable to the City. Once a vigorously growing stand of grass is achieved with a minimal amount of weeds, the request for Construction Acceptance may be made.

G-9 FINE GRADING AND SOIL PREPARATION STANDARDS

A. **General.**

1. Soils tests conducted by a certified or qualified soils testing lab must be completed and submitted to the City for review; recommendations in the lab reports shall be followed in all cases. Generally this will include soil amendment and fertilizer recommendations; in some cases, all new topsoil will be required.
2. If the site is undisturbed, topsoil is to be stripped to a 6-inch depth, or to topsoil depth as determined by field inspection. Stockpile and re-spread stripped topsoil over landscape areas after rough grades are established. If site has been disturbed, or sufficient topsoil is not available, topsoil is to be imported to achieve 6-inch depth in all landscaped areas.

B. **Submittals.**

1. *Soil Amendment.* Submit sample and written confirmation from supplier of material composition including: percent organic matter, salts, nutrient composition and trademark. Sample is to be representative.
2. *Topsoil.* Submit sample and written confirmation from supplier of material composition including: percent organic matter, salts, and nutrient composition. Sample is to be representative.

C. **Materials.**

1. *Soil Amendment.* Certified organic material or approved equal. A high quality composted material containing a minimum of 50% organic matter. The mixture shall be free from clay subsoil, stones, lumps, plants or roots, sticks, weed stolons, seeds, high salt content and other materials harmful to plant life. The compost shall be coarsely ground with an even composition and have an acidity in the range of pH 5.5 to pH 7.0. All material shall be sufficiently composted such that no material used is recognizable.
2. *Topsoil.* Must be taken from a well drained, arable site and shall be reasonably free of subsoil, stones, clods, sticks, roots and other objectionable extraneous matter or debris. No stones or other materials over 2 inches in size shall be allowed. Topsoil shall contain no toxic materials and have an acidity in the range of pH 5.5 to pH 8.5.
3. *Fertilizer.* Balanced fertilizer with a chemical analysis of 10-25-12.

D. Inspection.

1. Locate all utilities prior to trenching and protect from damage.
2. Accept rough grading from other contractors per approved plans. Rough grade inspection is to allow for 6-inch minimum depth of topsoil and specified soil amendments as part of the fine grading work.

E. Execution.

1. Protect existing trees, landscaping, existing structures, fences, sidewalks, utilities, paving, curbs, and other features remaining as final work during construction. Contact the City Forester for proper procedures on how to implement tree protection.
2. Grub and remove unsuitable woody and rock material present in the surface grade.
3. Take precautions to accommodate proper drainage and flow during and after grading and soil preparation.
4. Apply herbicide to areas where noxious weed beds have been established and/or where seed mix is to be planted. Herbicide must be applied by certified contractors at the rate recommended by the manufacturer after proper notification has been done in accordance with chemical applicator's standards. Precautions must be taken to avoid drifting of spray onto other properties; spraying shall not be done in breezy conditions. Harm to plant material not designated for herbicide application shall be replaced by the contractor.
5. Rip to 6-inch depth with agriculture subsoiler in all areas to receive plantings. Contact City Forester regarding acceptable procedures to not disturb existing roots or established trees. Remove all objects greater than 2 inches in diameter.

F. Application.

1. Spread 6 inches topsoil over entire landscaped area, except in the dripline of existing trees, and grade to smooth and even lines. Establish swales and drainage as required per plans.
2. Evenly distribute soil amendment at rate of 3 cubic yards per 1,000 square feet of area, or 1-inch depth over the entire area to be prepared; alter rate if soils test recommends otherwise. Till amendments into top 6 inches of soil. Compact to a firm, but not hard density (80% of Standard Proctor Density at 2% optimum moisture). Evenly distribute triple superphosphate fertilizer at the rate of 15 pounds per 1,000 square feet; modify type and rate if soils test recommends otherwise.
3. Trim finish grade elevations adjacent to paved areas to 1 inch below pavement finish grade.

G-10 STREETScape MAINTENANCE STANDARDS

- A. Purpose.** The purpose of this section is to ensure a consistent, high-quality appearance for all streetscapes, whether maintained by the City, its agents, or by private developers, businesses, or individuals. Given the high visibility of City streetscapes, the public is able to observe maintenance practices in the field as well as the results of that maintenance. The public perception of a well maintained landscape is promoted by practices which benefit the health of the landscape materials and achieve a neat, well-cared-for appearance. Quality maintenance is a function of workmanship, funding, and technique. These standards will ensure that all streetscapes are cared for in a manner which reflects the high esteem that citizens have for these important public spaces. Generally, all landscaping shall be maintained in a healthy condition throughout the growing season. A neat and attractive appearance is essential. Irrigation systems, structures, and sidewalks shall be maintained to represent the original integrity of the design and installation.
- B. Planting and Maintenance Standards/** The practices of the City of Cheyenne Forestry Department will serve as the standard for planting and maintenance for all trees in the public rights-of-way; Forestry Department standard practices apply whether the work is performed for the City contractually, by the City, or by private entities or individuals.
- C. Permit.** As per city code, a permit must be obtained from the City Forestry Division before any planting, pruning, removal, or destruction of any tree, shrub, or hedge in or upon the public right-of-way. All work requiring a permit shall be conducted in a manner as to cause the least possible interference with or annoyance to others. Pedestrian and vehicular traffic shall be

allowed to pass through the work areas only under conditions of safety and with as little inconvenience and delay as possible.

- D. **Maintenance.** Maintenance of ground-level streetscapes shall be the responsibility of the adjacent property owner.
1. Mowing shall not interfere with the use of streets and sidewalks and shall meet the provisions of the City nuisance and weed ordinance.
 2. Turf should be maintained within the designated planting area, and mulch, either wood or rock, should be free of weeds.
 3. Dead plants should be replaced, clippings and trash removed, and mulch and plants replaced as they diminish and die off.
 4. Landscaped area should be kept as similar to its initial appearance as possible.
 5. Irrigation times and installations should occur per City requirements.

G-11 ESTABLISHMENT MAINTENANCE FOR NEWLY PLANTED TREES.

- A. **New Residences.** Information regarding street tree planting and maintenance requirements can be obtained from the City Forester's office.
- B. **Establishment Maintenance Guidelines.**
1. Maintain irrigation standards. Newly planted trees require additional irrigation for 2 to 3 years. Particularly during the first year this can exceed water demand of turf. New trees should receive 1 inch of irrigation per week during the first growing season, applied over the root system. Normal turf irrigation is generally adequate (1 inch per week) for the second and third year. 15 inches of supplemental irrigation per growing season is adequate after establishment. Irrigation times should occur per City requirements.
 2. Insure irrigation rates for new trees in turf areas are adequate during establishment even when that is greater than water demand for turf.
 3. Mulch newly planted trees over the root system with 3 inches of organic mulch. Trees in turf zones shall be planted in 4-foot diameter rings.
 4. Inspect new plantings on a regular basis and remove dead, broken and diseased branches.
 5. Remove sprout growth from stems and root collars early in the growing season.
 6. Evaluate mulch on an annual basis. Re-mulch trees to maintain a maximum of 3-inch deep mulch cover. Keep mulch 3 inches away from the tree trunk.
 7. Maintain tree rings in turf zones as weed free.
 8. Monitor insect and disease levels and control measures implemented when necessary following Integrated Pest Management (IPM) practices.
 9. Remove all nursery or other tags from plants and landscape materials.
 10. Remove tree wrap and stakes the next spring season after planting.

NOTE: See "Adopted Species List" available at the City Forestry Department and online at <http://www.cheyennetrees.com/>

APPENDIX H SUBDIVISION DRAINAGE STANDARDS

(4.5.3.c.)

Insert existing standards.

APPENDIX I EXHIBITS

Insert existing Exhibits from Subdivision Regulations.

APPENDIX J FORMS

Insert existing Forms from Subdivision Regulations.

