Chapter 3: Transportation Network and Design Standards

Capacity Deficiency:

Level of Service & Utilization

The intersection analysis performed using Synchro 7® traffic modeling program did not result in any Level of Service deficiencies. Two intersections, Sunset Highway at Aplets Way/Division Street, Cottage Ave, demonstrate a change from LOS A to LOS B. This indicates that the two intersections are approaching capacity during the peak hour and likely operate above capacity for short periods of time during that peak hour.

RECOMMENDATION:

Adopt LOS "C" as the minimum acceptable LOS for concurrency under the Growth Management Act for all intersections other than Aplets Way and Cottage Avenue where LOS "D" is the minimum acceptable.

Intersection	Current LOS	Existing Utilization	Future LOS	Future Utilization
Sunset Highway & Wescott Drive	A	24.2%	A	28.2%
Sunset Highway & Goodwin Road	A	30.8%	A	37.2%
Sunset Highway & Aplets Way	A	39.6%	B	59.7%
Sunset Highway & Evergreen Drive	A	28.4%	A	35.5%
Pioneer Avenue & Evergreen Drive	A	25.7%	A	35.3%
Pioneer Avenue & Tigner Road	A	29.7%	A	32.3%
Pioneer Avenue & Mission Creek Road	A	35.3%	A	42.6%
Mission Creek Road (No) & Binder Road	A	20.0%	A	26.0%
Railroad Avenue & Aplets Way	A	31.2%	A	50.0%
Railroad Avenue & Olive Street	A	13.3%	A	17.7%
Cottage Avenue & Aplets Way	A	37.9%	B	56.8%
Binder Road & Mission Creek Road (So)	A	21..2%	A	24.3%

Table 3-1
LOS Comparison

Network Recommendations:

Street Classification

The City of Cashmere is not a large city and the need for an extensive classification scheme for the arterial system does not provide a significant advantage. The differentiation in use between arterial classes becomes difficult to define and even more difficult to apply when using a complex classification scheme.

The Federal Aid Route Major Collector and Minor Collector designations appear to provide an adequate classification basis for the City of Cashmere. This means that there will be two classes of arterials, a local

access street, and a private road to define all roadways within the city and UGA. There may be a future need to define some streets as arterials in addition to those on the Federal Aid System. Care should be taken to ensure that additions to the arterial network are truly arterial in function as previously described.

The classification of an arterial segment indicates its relative importance to the community. This is a balance between providing mobility and providing access to adjacent property. Some features are evident, such as multiple lanes of travel. Others, such as sidewalk location or lane width are less evident.

- A Major Collector provides reasonably direct routes within the City's major points of traffic demand or routes that cross the City that provide direct access to regional routes. Movement of traffic generally takes priority over providing on-street parking, so a bikeway may be present with no parking allowed. A Major Collector is generally a continuous route.

- A Minor Collector provides access between Major Collectors and local destinations, such as industrial areas, school complexes or neighborhoods. A Minor Collector may also provide a travel path between two Major Arterials that might not be the most direct (straight) path. A Minor Collector might end at an intersection with a local access street. Traffic movement and local property access are generally considered to be of equal importance, although individual intersections might have parking restricted to provide for dedicated turn lanes.

- A Local Access Street is a non-arterial public street. The main purpose is to provide access to adjacent property. The alignment of a local access street can used to reduce traffic speeds in order to improve the livability of the neighborhood. Access to adjacent property is a higher priority than traffic movement.

- A Private Street serves the same function as a Local Access Street, but is not part of the public street system. Property owners are responsible for all maintenance of the street. Typical uses of private streets are within housing developments, especially apartment complexes, and commercial and industrial parks.

Design Standards:

Design standards are provided as guidance for the designer when building or reconstructing facilities. It is not generally feasible for streets that have been constructed to a different standard to be reconstructed to a new standard when such is adopted. Every reasonable effort should be made to bring existing streets to the current standard when reconstruction is necessary. The minimum standards for arterial streets and roads in the State of Washington are determined by a committee of City and County officials.[5] Utilizing those standards as a basis for the City of Cashmere's standards for arterials and collectors will insure that designs that conform will be eligible for various state and federal funding programs that may be available. Local conditions, such as the need for snow storage, may necessitate design standards that exceed the minimum requirements.

[5] WSDOT Local Agency Guidelines M36-63.04 Page 42-1, RCW 36.78.030, RCW 43.32.020

local access streets (non-arterials) should have standards appropriate for the ultimate use of the roadway. Often, the needs of emergency response vehicles – especially fire trucks – will dictate the minimum standards for width. The community values for pedestrians will influence the need for sidewalks or pathways on non-arterials.

Although the City of Cashmere has limited ability to impose design standards directly on development outside the City and within the UGA, the City's standards should be applied to such development to reduce the need for major reconstruction when the UGA areas become annexed. The City and Chelan County have executed an agreement where the County requires the City's standards for development within the Cashmere UGA.

Utility Location:

All new construction should include underground installation of all utilities. Each utility type is assigned a location within the City's right-of-way as shown on the street sections. The design standards for the ultimate owner of the utility installation shall apply to the facility being installed.

Street Design Standards:

Major Arterials

Major Arterials are defined as transportation arteries which connect the focal points of traffic interest within a city; arteries which provide communications with other communities and the outlying areas; or arteries which have relatively high traffic volume compared with other streets within the city;

Major arterials shall be designed in accordance with current State Design Standards including WSDOT Local Agency Guidelines and AASHTO A Policy on Geometric Design of Highways and Streets.

Secondary Arterials

Secondary arterials (and/or collectors) are defined as routes which serve lesser points of traffic interest within a city; provide communication with outlying districts in the same degree or serve to collect and distribute traffic from the major arterials to the local streets;

Secondary arterials shall be designed in accordance with current State Design Standards including WSDOT Local Agency Guidelines and AASHTO A Policy on Geometric Design of Highways and Streets.

Local Access Streets

Local access streets are defined as land service streets and are generally limited to providing access to abutting property. They are tributary to the major and secondary thoroughfares and generally discourage through traffic.

Local Access Streets shall be designed in accordance with current City adopted standards and/or State Design Standards including WSDOT Local Agency Guidelines and AASHTO A Policy on Geometric Design of Highways and Streets.

Design Element	Major Collector (Figure 3-1)	Minor Collector (Figure 3-2)	Local Access (Figure 3-3)	Private (UGA) (Figure 3-4)
Right-of-Way	70' (min.)	50' (min.)	40'	30' (easement or tract)-UGA
# Lanes	3 – 5	2 - 3	2	2
Lane Width	12	12'	13'	10'
Pavement	Gutter to gutter	Gutter to gutter	Gutter to gutter	20 ft
Typical Cul-De-Sac/Hammer head	Figure 3-5 or 3-6	Figure 3-5 or 3-6	Figure 3-5 or 3-6	Figure 3-5 or 3-6
Curb & Gutter	Yes	Yes	Yes	*No if 4 lots or less. 5 or greater lots Require curb & gutter
Parking	Yes	Yes (one side min.)	Yes (one side)	*Off-site parking if they serve lots less than 14,000 square feet
Sidewalk	Yes, Both Sides	Yes, Both Sides	Yes, One Side	*No if 4 or less lots. 5 or greater lots require sidewalk system
Drainage/Stormwater	Enclosed	Enclosed	Enclosed	*Ditch
Bike Lane	Yes (If Designated)	Yes (If Designated)	No	No
Landscaping/Trees	Yes (Figure 3-9-4)	Yes (Figure 3-9-4)	No	*No
Transit Pullout	Yes (Yes if designated by LINK)	Yes (Yes if designated by LINK)	No	No
Illumination/Street lights	Yes (Figure 3-9-5)	No	No	No
Maximum Road Grade (Percent)	8%	12%	12%	12%
Roadway Geometrics	Per AASHTO & WSDOT STDS	Per AASHTO & WSDOT STDS	Per AASHTO & WSDOT STDS	N/A
Amount of Lots	N/A	N/A	N/A	3 to 12 lots

* Possible Site Plan, Subdivision or SEPA condition or condition of approval

Table 3-2
Street Standards

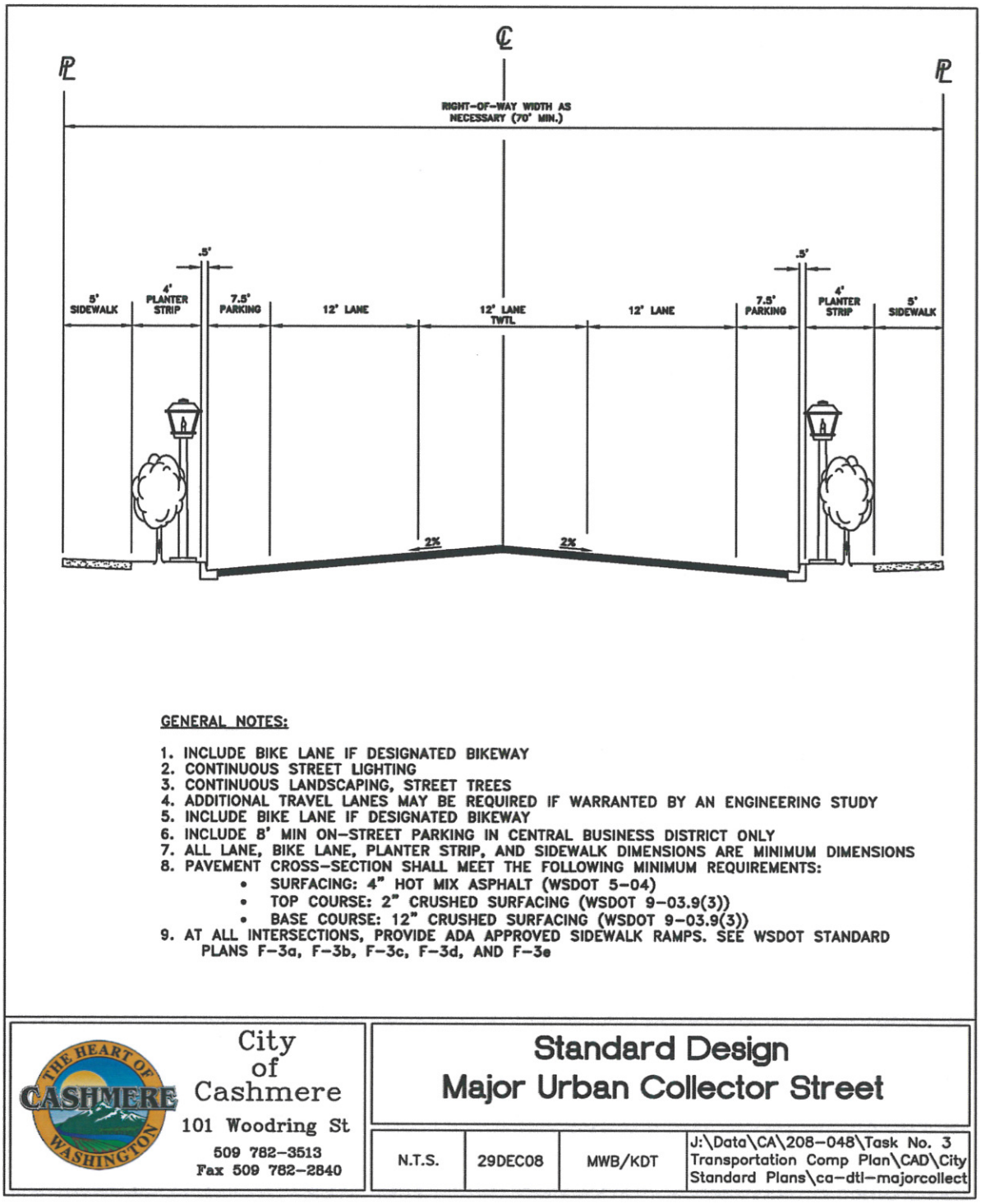
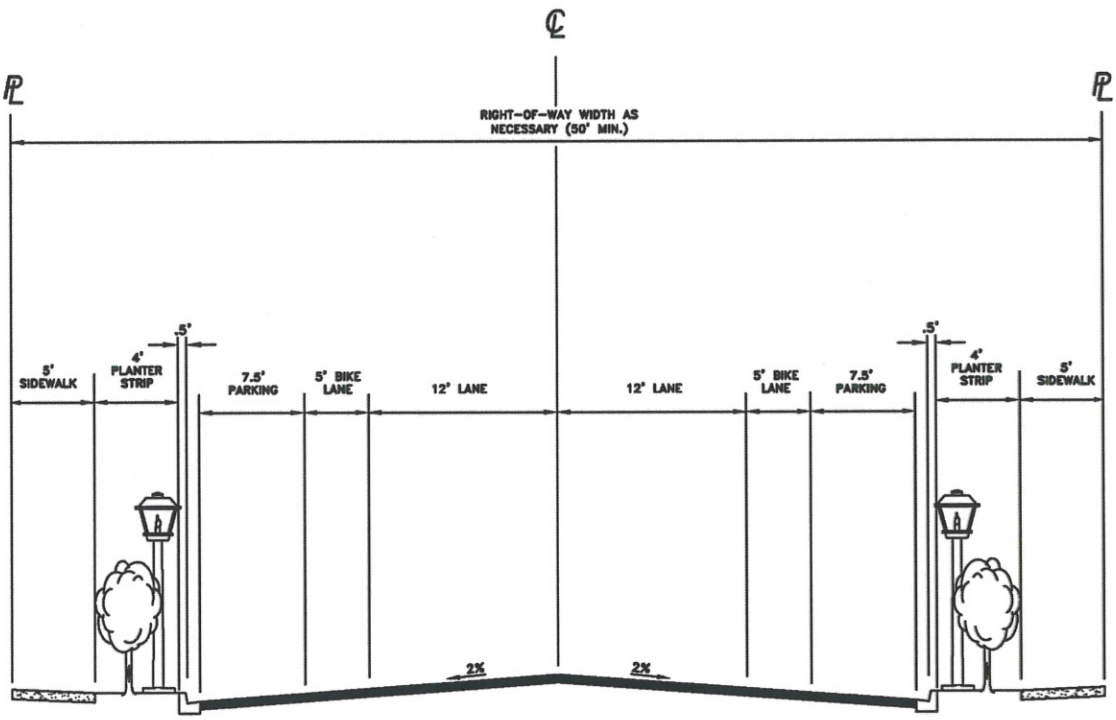


Figure 3-1 Major Urban Collector Street



GENERAL NOTES:

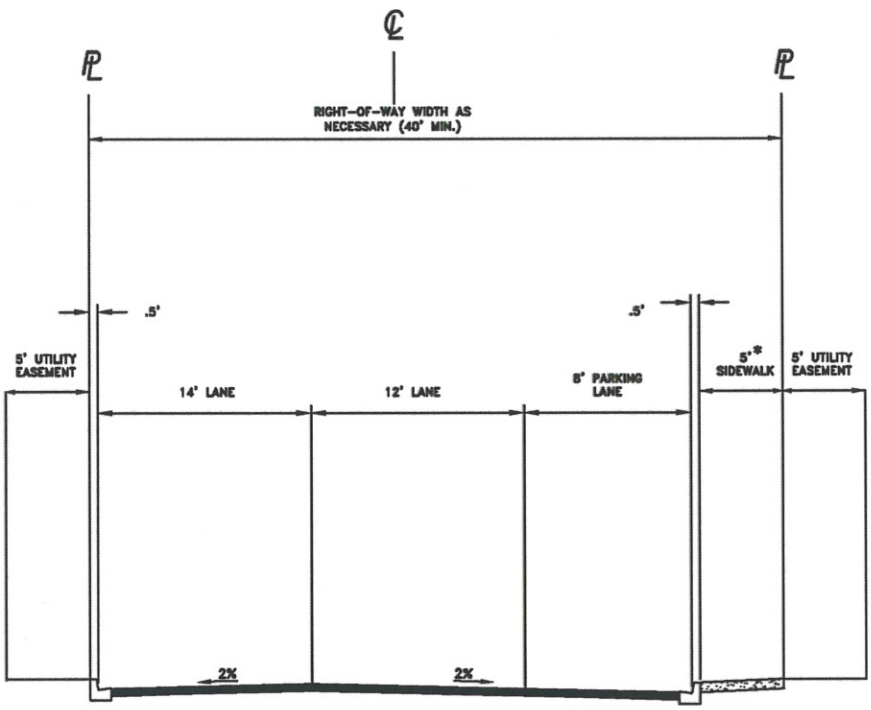
1. INCLUDE PARKING LANE ON AT LEAST ONE SIDE OF THE ROADWAY
2. INCLUDE BIKE LANE IF DESIGNATED BIKEWAY
3. INCLUDE PLANTER STRIP ON AT LEAST ONE SIDE OF THE ROADWAY
4. STREET LIGHTING AT INTERSECTIONS ONLY
5. INCLUDE TURN LANE AT INTERSECTIONS IF WARRANTED
6. ALL LANE, BIKE LANE, PARKING, AND SIDEWALK DIMENSIONS ARE MINIMUM DIMENSIONS
7. PAVEMENT CROSS-SECTION SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   - SURFACING: 4" HOT MIX ASPHALT (WSDOT 5-04)
   - TOP COURSE: 2" CRUSHED SURFACING (WSDOT 9-03.9(3))
   - BASE COURSE: 12" CRUSHED SURFACING (WSDOT 9-03.9(3))
8. AT ALL INTERSECTIONS, PROVIDE ADA APPROVED SIDEWALK RAMPS. SEE WSDOT STANDARD PLANS F-3a, F-3b, F-3c, F-3d, AND F-3e

City of Cashmere
101 Woodring St
509 782-3513
Fax 509 782-2840

Standard Design
Minor Urban Collector Street

N.T.S.	29DEC08	MWB/KDT	J:\Data\CA\208-048\Task No. 3 Transportation Comp Plan\CAD\City Standard Plans\ca-dtl-minorcollect

Figure 3-2 Minor Urban Collector Street



GENERAL NOTES:

1. ALL LANE, SIDEWALK, AND EASEMENT DIMENSIONS ARE MINIMUM DIMENSIONS
2. PAVEMENT CROSS-SECTION SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   - SURFACING: 3" HOT MIX ASPHALT (WSDOT 5-04)
   - TOP COURSE: 2" CRUSHED SURFACING (WSDOT 9-03.9(3))
   - BASE COURSE: 10" CRUSHED SURFACING (WSDOT 9-03.9(3))
3. AT ALL INTERSECTIONS, PROVIDE ADA APPROVED SIDEWALK RAMPS. SEE WSDOT STANDARD PLANS F-3a, F-3b, F-3c, F-3d, AND F-3e

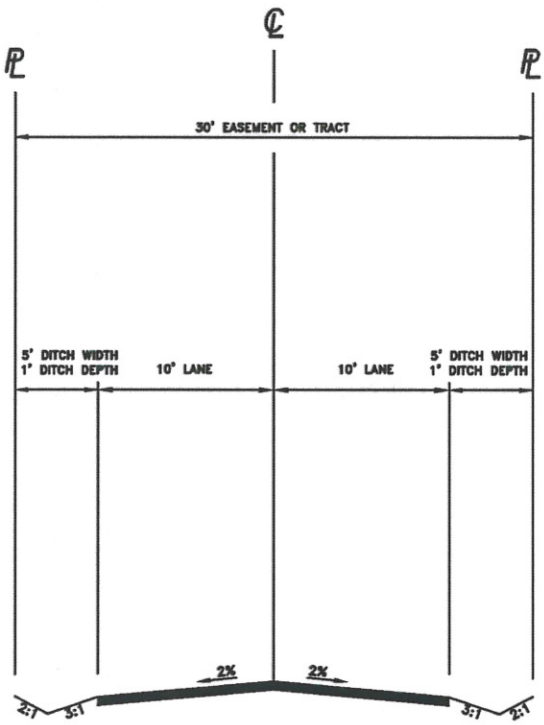
* MAY BE PLACED ON EASEMENT WITH CITY APPROVAL THEREBY DECREASING REQUIRED RIGHT-OF-WAY WIDTH TO 35'.

City of Cashmere
101 Woodring St
509 782-3513
Fax 509 782-2840

Standard Design
Urban Local Access

N.T.S.	29DEC08	MWB/KDT	J:\Data\CA\208-048\Task No. 3 Transportation Comp Plan\CAD\City Standard Plans\ca-dtl-localaccess

Figure 3-3 Urban Local Access



GENERAL NOTES:

1. ALL LANE, DITCH, SIDEWALK, AND EASEMENT DIMENSIONS ARE MINIMUM DIMENSIONS
2. PAVEMENT CROSS-SECTION SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   - PAVEMENT: 2" HMA OR DOUBLE SHOT BST (WSDOT 9-03.9(3))
   - SURFACING: 4" CRUSHED SURFACING (WSDOT 9-03.9(3))
3. ROAD MAY BE SUPERELEVATERED ALLOWING THE DITCHES TO BE COMBINED ON ONE SIDE OF THE ROAD.

City of Cashmere 101 Woodring St 509 782-3513 Fax 509 782-2840	Standard Design Private Road			
	N.T.S.	29DEC08	MWB/KDT	J:\Data\CA\208-048\Task No. 3 Transportation Comp Plan\CAD\City Standard Plans\ca-dtl-privatedrive

Figure 3-4 Private Road Urban Local Access

Standard Cul-de-sac:

1. Minimum right-of-way radius across bulb section: fifty-five feet from the central point in a permanent cul-de-sac.

2. Providing a snow storage easement.

Temporary Cul-de-sac:

A temporary cul-de-sac shall be provided when there is a foreseeable likelihood of extending the road to adjacent properties, or as part of of a subdivision phasing plan. Right-of-way shall be thirty (30) feet total, with the bulb area lying outside the road right-of-way provided as a temporary easement pending forward extension of the road. Surfacing, curb and gutter requirements shall be as required for typical roadway section of the road classification. Removal of the temporary cul-de-sac and installation of permanent curb, gutter and sidewalk shall be the responsibility of the developer who extends the road.

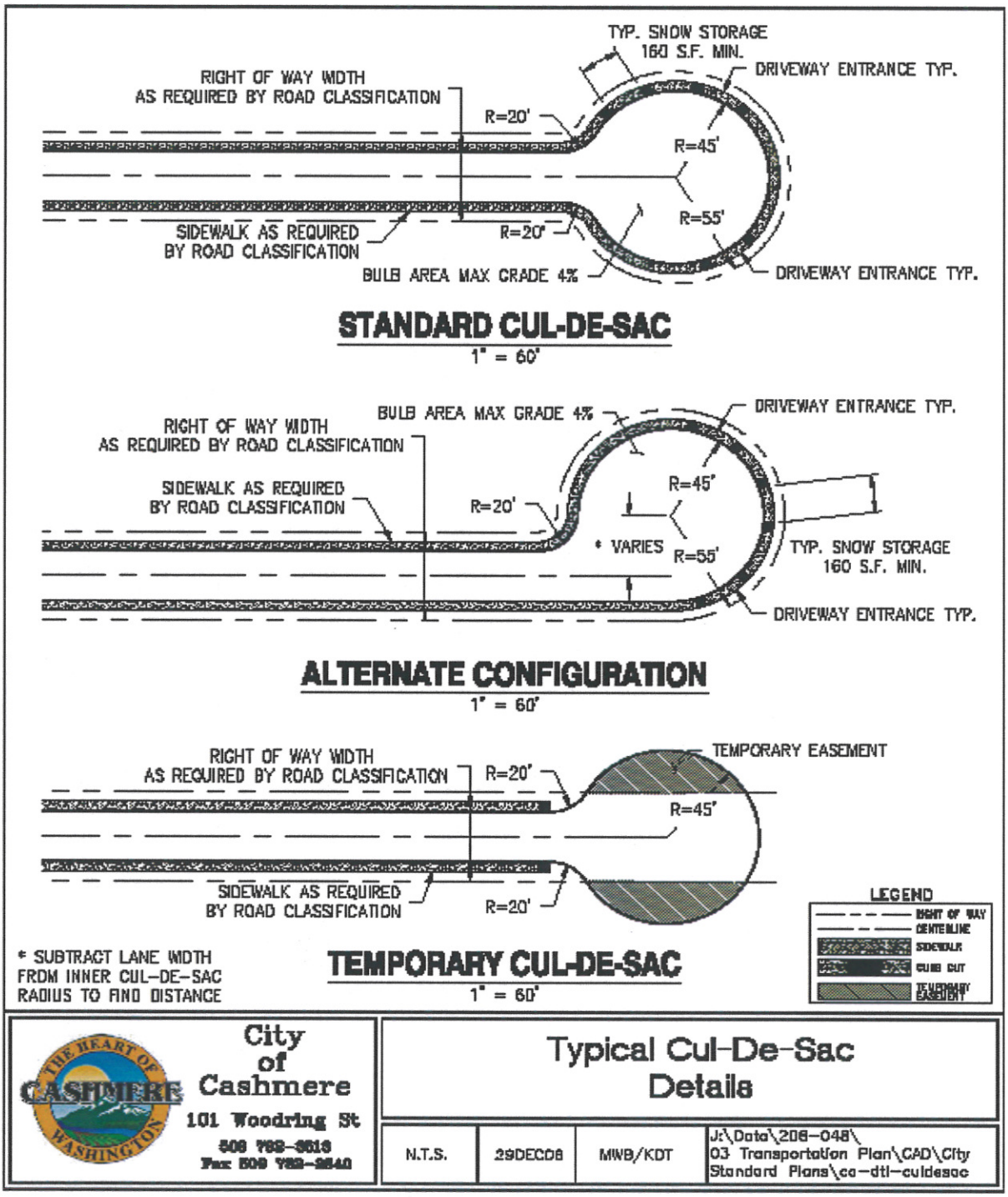


Figure 3-5 Typical Cul-De-Sac Details

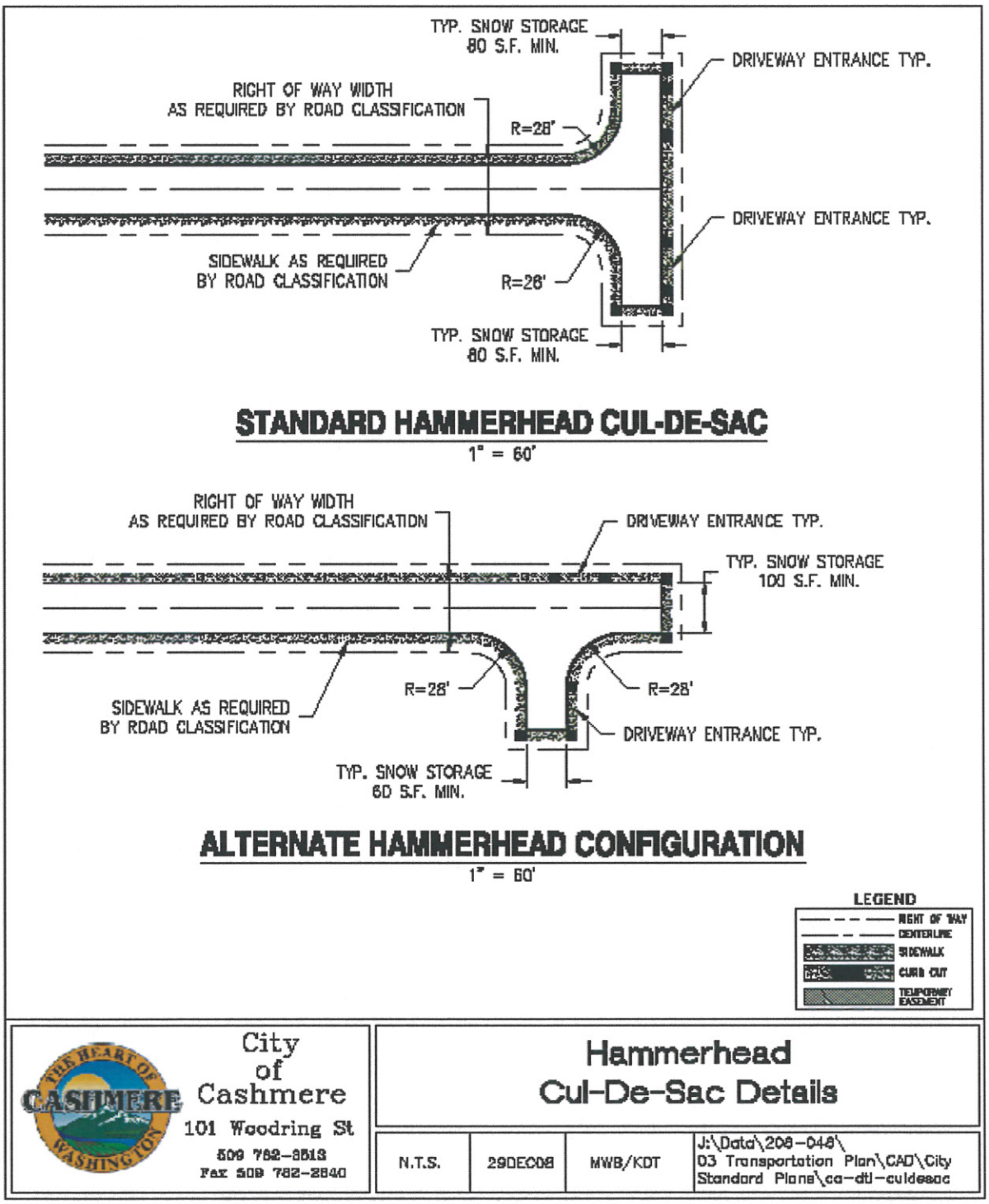


Figure 3-6 Typical Hammerhead Details

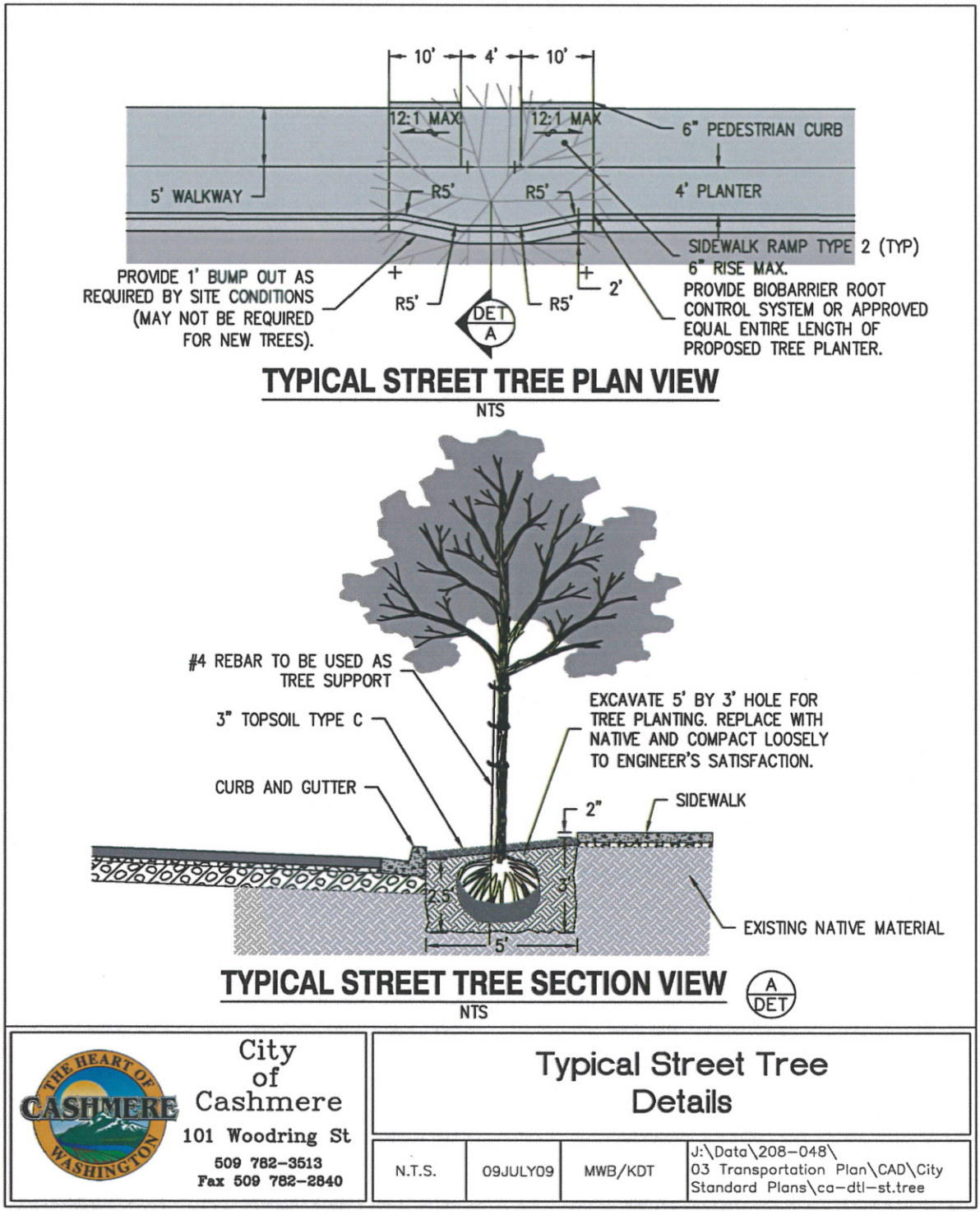


Figure 3-9-4 Typical Street Tree Details

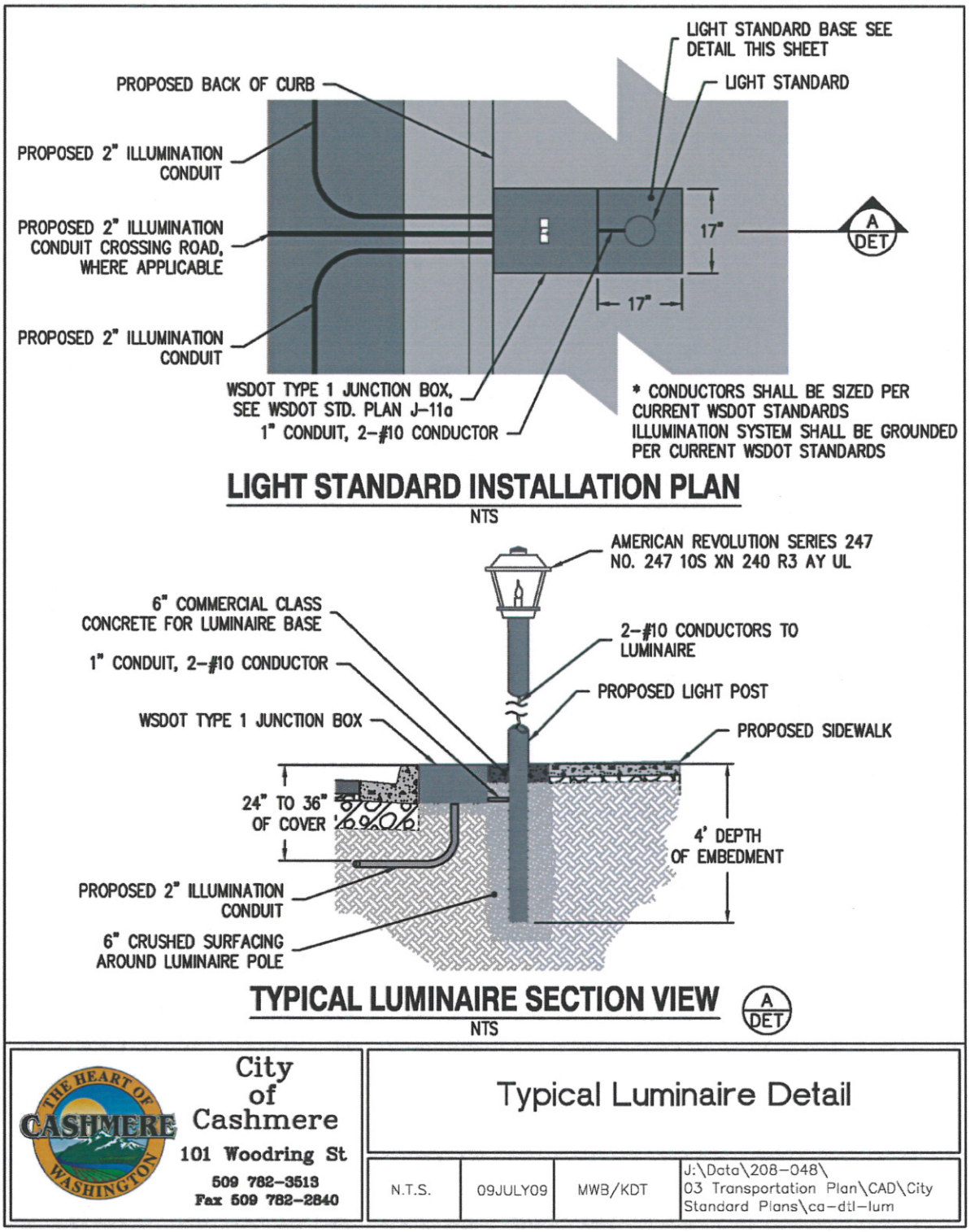


Figure 3-9-5 Typical Street Luminaire Details

Chapter 4: Overlay Standards/Zones

Overlay standards:

The purpose of the City of Cashmere Overlay Zones is to provide additional regulations, coordinated with the minimum requirements of the underlying zoning district, to ensure enhanced and coordinated site and building design standards within the City's primary and most visible corridors. The standards contained within the overlay pertain only to lots within the jurisdiction of the City of Cashmere.

The purpose of the City of Cashmere Overlay is to establish an aesthetically pleasing, economically viable, and pedestrian friendly atmosphere for the business and residential community.

Gateway/Entrance Overlay:

The Gateway Overlay is intended to provide a themed entrance to the City. Gateways are hereby identified as Sunset Highway, Cotlets Ave, Aplets Way, Pioneer Ave and Mission Creek. A Gateway will have special design elements that will include items such as special lighting, design treatment for sidewalks and/or bikeways and landscaping.

Design Element	
Curb & Gutter	Yes
Parking	Yes (both sides) (Figure 3-1)
Sidewalk, Curb & Gutter	Yes, Both Sides
Drainage	Yes (See Chapter 6)
Street Lighting	Continuous Figure 3-9-5)
Landscaping-Street Trees	Yes (Figure 3-9-4)
Planter Strip	Yes if associated with trees (Figure 3-9-4)
Transit Pullout	Yes (if designated by LINK)

Table 4-0

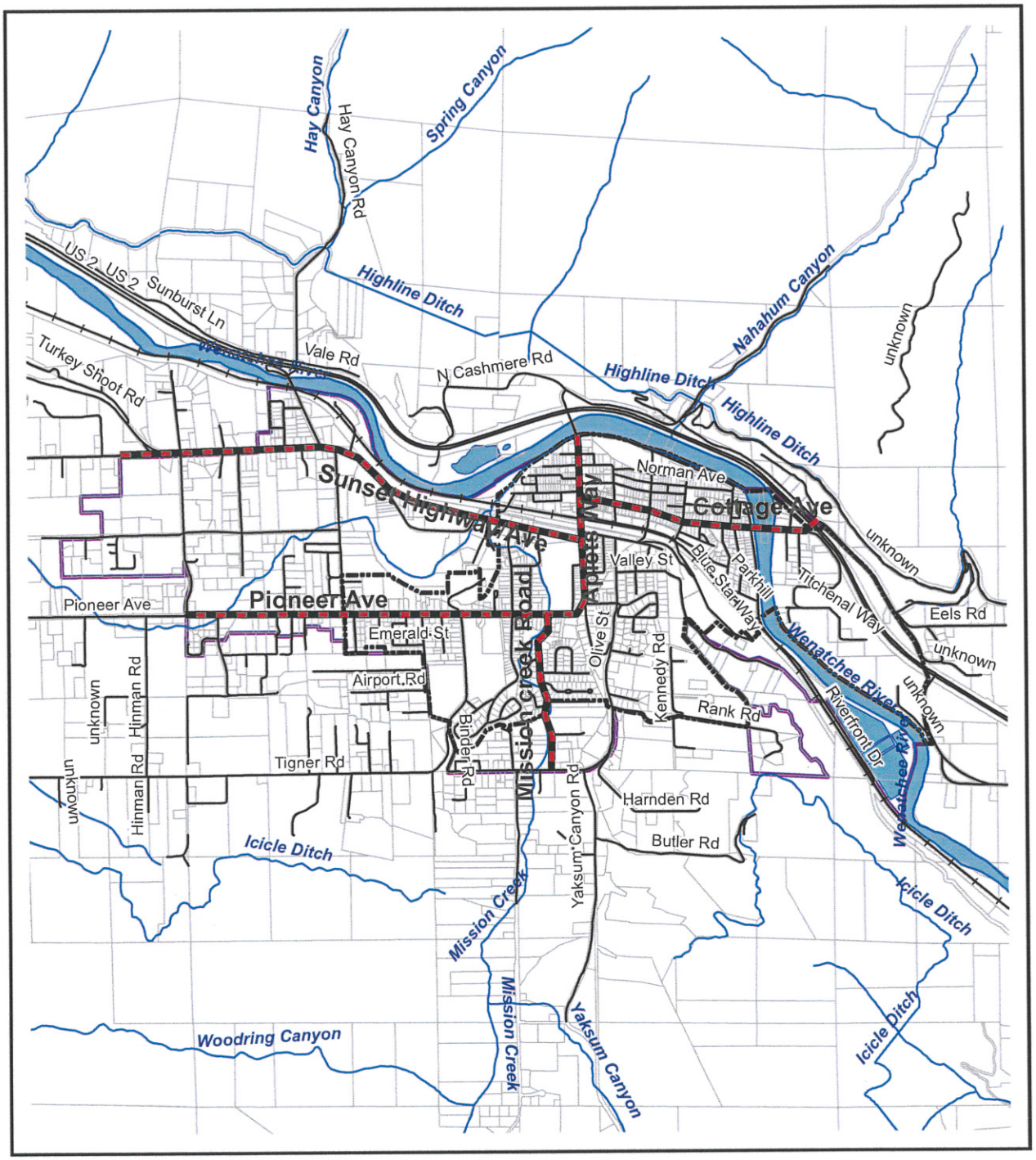


Figure 4-0-1 Gateway/Entrance Route Overlay

Safe School Route Overlay:

Providing safe routes for walking to schools is important. Sidewalks are the primary component of a safe school route, but other design elements can be applied to make the routes less hazardous for school children. The Safe School Route Overlay will provide for the completion of the network as roadway reconstruction occurs or other funding, such as the Safe School Route Program, is available. Every effort should be made to address safe routes to school for children.

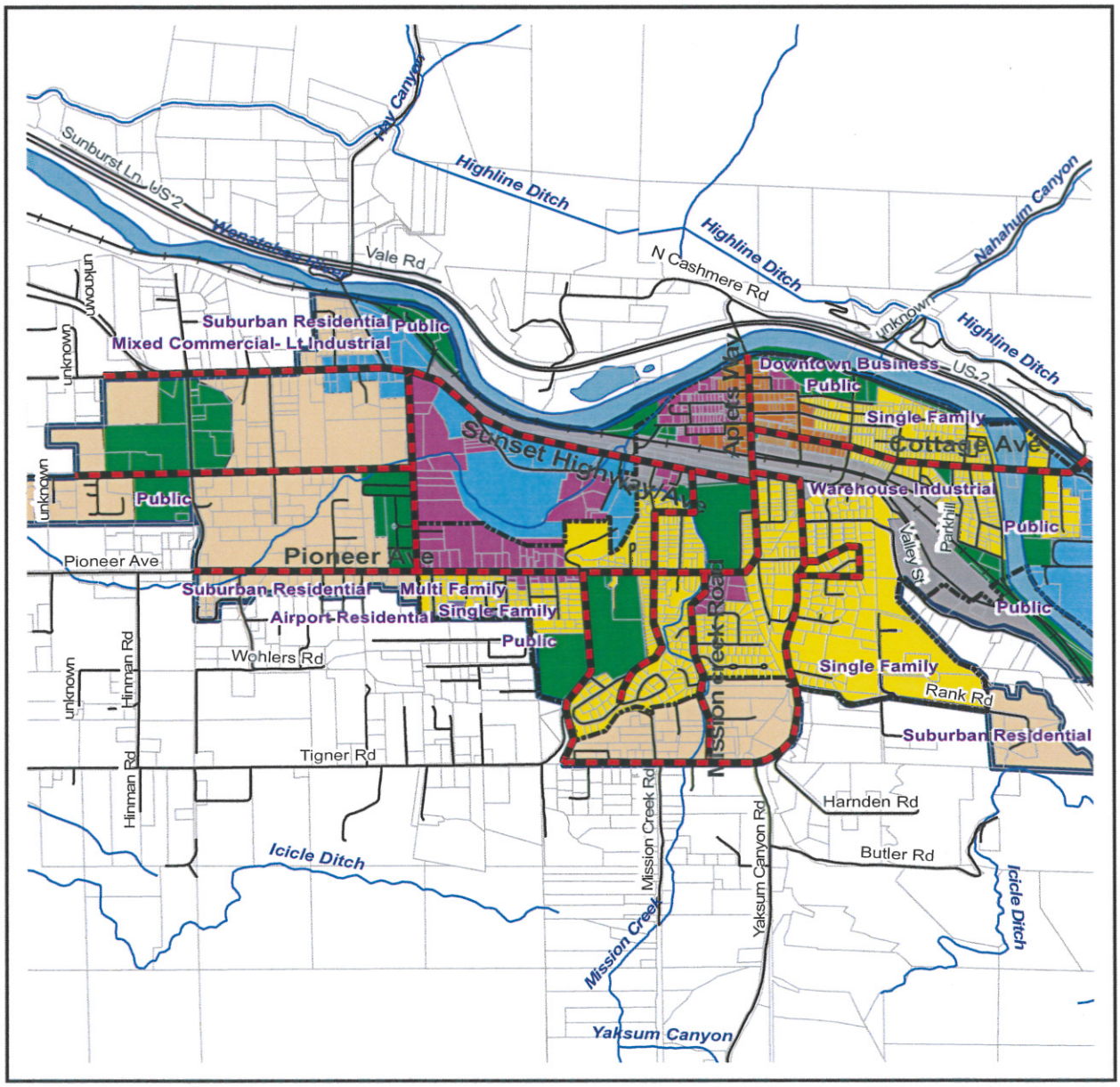


Figure 4-1 Safe School Route Overlay

Traffic Calming

Traffic calming techniques should be considered in the design of residential local access streets. Throated intersections, parking pockets and curvilinear designs are appropriate design elements to consider for residential streets to reduce speeds and enhance the neighborhood.

Cul-de-Sac

A Cul-de-Sac is a design element that can be considered for use in a residential subdivision. Lengthy Cul-de-Sacs should be avoided. The bulb at the end of the Cul-de-Sac can contain a landscaped element so long as emergency vehicles are able to negotiate the turn around. Hammerhead designs are not appropriate for public roadways.

High Density Local Access

High Density Local Access streets, whether public or private, are those that provide access to dwelling units or building lots, whether single-family or multi-family. High Density streets may also exist in commercial and industrial areas where traffic is less than 1,000 vehicles per day (average daily traffic count). Such streets shall be constructed to the Collector Arterial design standard.

Low Density Access

Low Density access residential streets, whether public or private, are those that provide access to dwelling units or building lots, whether single-family or multi-family. They are also applicable for rural residential developments.

Chapter 5: Design Deviations

Requests for design deviations shall be submitted permit application with applicable fee or simultaneous with development land use application. Alternative standard compliance applies to standards within this Plan.

The request for a deviation shall be submitted in a format that clearly states the problem and the alternative standard proposed. The following information shall be required before the request for deviation will be considered:

- Explain the design standard(s) from which a deviation is requested
- Proposed requested alternative(s) to the design standard(s). Provide graphics as necessary to clearly illustrate your proposal.
- Explain why the proposed alternative design is necessary. Topics to consider are special circumstances relating to the size, shape, topography, location, or surroundings of the property, compatibility with adjacent development or transportation system improvements.
- Explain how the alternative design will achieve at least the same result as the design standard would have accomplished. If this is not possible or practical, clearly explain the deviations from the standards.
- Compare the environmental impact of the proposed alternative on adjacent properties with impact of the design standards.
- Compare the safety considerations of the proposed alternative such as police and fire access, vehicular operation, transit operation, clear sight view, non-vehicular travel and adverse weather travel with the design standards.
- Demonstrate that the proposed alternative accommodates all utilities, pedestrians, drainage, and snow removal.
- Demonstrate that the proposed alternative provides clear passage of emergency vehicles.
- Demonstrate that the proposed alternative is compatible with all existing and proposed transportation system improvements.
- Demonstrate that the proposed alternative does not preclude access to, or development of, adjacent property.
- Demonstrate that the proposed alternative will not be materially detrimental to the public welfare or injurious to the property or improvement in the project vicinity.

Deviation Process:

Upon receipt of a complete request for design deviation, the request will be reviewed by City of Cashmere Planning Commission at the next available Planning Commission meeting and reviewed by City of Cashmere Engineer. The deliberations and recommendations of the Cashmere Planning Commission and City of Cashmere Engineer will be presented to the City of Cashmere. Final decision on the deviation request shall be made by City of Cashmere Hearing Examiner and shall comply with applicable procedures for open record public hearing and notifications.

Design Deviation Process (City of Cashmere Urban Growth Area (UGA)):

Design deviations within Cashmere's Urban Growth Area shall comply with Appendix B of Chelan County Title 15 "Development Standards", with the following exception:

- Substantial deviations or modification applications shall be forwarded to City of Cashmere Planning Commission for a recommendation:

Chapter 6: Stormwater Management

Urban development causes significant changes in patterns of stormwater flow from land into receiving waters. Water quality can be affected when runoff carries sediment or other pollutants into streams, wetlands, lakes, and marine waters or into groundwater. Stormwater management can help to reduce these effects. Stormwater management involves careful application of site design principles, construction techniques and source controls to prevent sediment and other pollutants from entering surface or groundwater, treatment of runoff to reduce pollutants, and flow controls to reduce the impact of altered hydrology.

Design Manual:

RH2 Engineering recommends that developments in the City of Cashmere should comply with the requirements of the *Stormwater Management Manual for Eastern Washington* (SWMMEW) prepared by the Washington State Department of Ecology, September 2004 edition as amended. For the purposes of Hydrologic Analysis, Cashmere should be considered to be in Region 2 of Eastern Washington.

Note: Projects in Cashmere that discharge directly to the Wenatchee River are exempt from Flow Control (i.e. detention) Requirements.

Note: The SWMMEW does not provide criteria or guidance for designing pavement drainage or conveyance systems, so the following is recommended.

Pavement Drainage:

RH2 Engineering recommends that road pavement drainage comply with Chapter 5 – Drainage of Highway Pavements of the Washington State Department of Transportation's (WSDOT's) *Hydraulics Manual*, with the following two exceptions:

- Computing runoff for pavement may be calculated using the Rational Method or the Single Event Hydrograph Method and the Short Duration Regional Storm as identified in the *Stormwater Management Manual for Eastern Washington*;
- Because of much lower traffic volumes within the City of Cashmere as compared with WSDOT highways, the design storm frequency for sag points in roads shall be the 25-year event (replacing the 50-year event identified in Figure 5-4.1 of the WSDOT *Hydraulics Manual*).

Note: This generally means that the pavements on a grade will need to be designed with a storm collection system to safely intercept the 10-year design storm and pavements at sag points will need to safely intercept the 25-year design storm. The general concept behind this is that roads on a grade may utilize the curb and gutter as a secondary conveyance component, and in turn reduce the required pipe conveyance sizing up to the sag locations.

Conveyance Systems:

RH2 Engineering recommends that conveyance systems (pipes, ditches, swales, etc.) should be designed to convey the water tributary to them as described for road pavement drainage. If the conveyance system is not associated with road pavement drainage (i.e. the runoff being conveyed is directly from areas such as parking lots, roofs, landscaped areas, etc.) then the conveyance system shall be sized to safely convey the peak runoff from the 25-year design storm event using the Rational Method or the Single Event Hydrograph Method and the Short Duration Regional Storm as identified in the *Stormwater Management Manual for Eastern Washington*.

Conveyance systems shall be allowed to overtop for design storm events larger than the aforementioned design events to the extent that the overtopping does not create or contribute to a flooding or erosion problem. The project design shall demonstrate a stabilized conveyance path (e.g. overland) for the 100-peak flow within the project site to ensure it is adequately conveyed to an exempt water body or to an adequately sized surface water management facility, and discharges at the natural location for the project site.

A backwater analysis should be performed on any proposed conveyance system design or existing conveyance system to be affected by the project to ensure adequate conveyance capacity, unless it can be reasonably concluded that the system will have adequate capacity. (e.g. Pipe flowing less than 70 percent full using a Manning's equation and low flow velocities so as to not create significant head losses at junctions.)