

NORTH BEND

"easy to reach... hard to leave"

COMPREHENSIVE PLAN





CITY OF NORTH BEND

COMPREHENSIVE PLAN 2015

Provided for the residents of North Bend by city staff and elected officials

www.northbendwa.gov

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Photo courtesy of Snoqualmie Valley Historical Society

“...with this beautiful little branch of the river flowing through it, pure and sparkling right from the mountains close by.”

-Samuel Hancock, 1851

ACKNOWLEDGEMENTS

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Mt. Si from Borst Lake . Photo Credit: Mary Miller

City of North Bend Comprehensive Plan

INTRODUCTION

A significant part of the quality of life in North Bend and the Upper Snoqualmie Valley lies in the area's abundance of dominant natural features. The geology, water, vegetation and wildlife systems characteristic of the area are separate but highly connected components of the natural environment; a disturbance in one system can have direct or indirect effects on the others, including the human system.

The quality of life perceived by city residents is directly associated with the quality of the environment. North Bend has historically been attractive to live in because of attributes of the high quality natural environment: clean air and water, lush forest areas, and a beautiful physical setting. Protection of these elements is essential if residents are to maintain their healthy lifestyle. The contamination or reduction of these resources where people reside and work damages the very reasons that people choose to live here.

King County Countywide Planning Policies (CWPP) adopted November 2012 and amended December 3, 2012 provide local direction to implement the GMA mandate for protection of critical areas. The full list of CWPP's is available at: <http://www. kingcounty.gov/property/permits/codes/growth/GMPC/CPPs.aspx>. The goals and policies of this element were reviewed and found to be consistent with the CWPP: Environment EN-1 through EN-4, Earth and Habitat EN-6 thru EN-9, Flood Hazards EN-10 thru EN-12, and Water Resources EN-13 thru EN-15.

The overarching Environment Goal of the CWPP is to restore and protect the quality of the natural environment in King County for future generations. The vision for King County 2030 is characterized by Protected Critical Areas providing beneficial functions and values for reducing flooding, protecting water quality, supporting biodiversity, and enriching our quality of life for future generations as the region's population continues to grow.



Photo by Jon Luke, 2012.

chapter 1

LAND USE ELEMENT

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A. INTRODUCTION

A.1 Purpose and Intent

The Land Use Element provides a long-range guide to the development of North Bend and its Urban Growth Area (UGA). Its purpose is to ensure that an adequate supply of land, a desired mix of uses, and employment opportunities are available for the successful implementation of the other elements of the Comprehensive plan. The element translates the vision of the City into a plan and directs development in North Bend over the next twenty years by introducing strategies that will retain and enhance small-town character, environmental health, and cultural and economic sustainability.

The Land Use Element of the Comprehensive Plan examines the character and quality of existing development in both the City limits and the unincorporated areas of the UGA. It identifies, trends, and projects potential growth within recognized opportunity areas. It also proposes the distribution, location, and extent of land used for various land use classifications. It considers both the state mandates of the Growth Management Act (GMA) as well as appropriate Countywide Planning Policies in King County. It presents the community's principal themes of preservation of its small town character with its desire to protect environmentally sensitive lands as growth occurs. Finally, it formulates the guiding goals and policies designed to shape the community into its acknowledged vision.

The Land Use Element sets general land use designations for the City and its UGA. Land use designations are intended to provide predictability to residents and property owners about the nature of land use within North Bend and provide the necessary planning tools to decision makers to make decisions about development applications. As mandated by the GMA, the Land Use Element accommodates the Growth Management Planning Council population and employment targets assigned to North Bend.

The Land Use Element is the result of a series of planning efforts first started in 1988. Subsequent community forums sponsored by the City's Planning Commission, and the City's adoption in 1993 of principles found in the *North Bend Vision Plan* (see Appendix 10-1) all led to the first Land Use Element adopted in 1995. The Land Use Element was subsequently revised in 2002, 2004 and 2007.

A.2 North Bend's Vision

The community of North Bend wants to preserve its rural character, natural beauty, and small town scale. The residents of the community also desire to enhance the built environment of the downtown, the riverfront and community parks, new and existing residential neighborhoods, and the community's gateways.

A.3 VISION 2040

The Puget Sound Regional Council (PSRC) VISION 2040 is a regional strategy for accommodating the growth expected to happen in the region by 2040. VISION 2040 is a long-range plan for maintaining a healthy region while promoting the well-being of the citizens and communities, economic vitality, and a healthy environment. VISION 2040 identifies ways to reduce greenhouse gas emissions and requires no net loss of critical areas. VISION 2040 includes provisions that ensure that a healthy environment remains available for future generations in our city.

The North Bend Comprehensive Plan Elements address each of the policy areas in VISION 2040. VISION 2040 has policies that address habitat protection, water conservation, air quality, and climate change. North Bend's Comprehensive Plan has been updated based on residential and employment targets that align with VISION 2040. Chapter 3 of the North Bend Comprehensive Plan identifies the number of housing units in the City for the year 2031, and also includes affordable housing goals. North Bend's Comprehensive Plan supports a sustainable approach to growth and future development.

The Comprehensive Plan and North Bend Municipal Code (NBMC) support low-impact development techniques for landscaping and stormwater. The Comprehensive Plan calls for urban development in the downtown core and includes design guidelines for mixed-use and transit-oriented development. The Housing Element commits to expanding housing options to meet the diverse needs of both current and future residents. The Economic Development Element in the Plan supports creating jobs and maintaining a high quality of life. The Transportation and Sustainability Elements advance cleaner and more sustainable mobility, with provisions for complete streets and green streets. In addition, the City has programs and strategies that support multimodal travel.

B. REGULATORY SETTINGS

B.1 Growth Management

Under the Growth Management Act (RCW 36.70A.070) a Land Use Element is required to address the following:

- distribution/location/extent of land uses (agriculture, timber production, housing, commerce, industry, recreation, open spaces, public utilities, public facilities and other land use);
- population densities, building intensities and estimates of future population growth;
- protection of the quality and quantity of ground water used for public water supplies; and
- drainage, flooding and stormwater runoff within and nearby the jurisdiction as well as guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state.

B.2 Countywide Planning Policies

The King County Countywide Planning Policies (CPP's) provide a countywide vision and serve as a framework for each jurisdiction to develop a comprehensive plan consistent with the overall vision for the future of King County. North Bend is located outside the larger metropolitan UGA to the west, which includes nearby cities such as Issaquah, Bellevue, Kirkland, Redmond and Woodinville; however the City has its own designated UGA boundary. Within the designated UGA, North Bend shall provide urban services, residential densities, and a mix of land uses that will provide for residential and economic growth for the next twenty years. The full list of CPP's is available on King County's website at: <http://www.kingcounty.gov/property/permits/codes/growth/GMPC/CPPs.aspx>.

The Land Use Element also recognizes the Growth Management Planning Council (GMPC) growth and employment targets for the City as a key component to its direction. The GMPC, working with all metropolitan jurisdictions, identified household and job growth targets based on the land capacity of each city and its identified UGA that would accommodate its portion of the State Office of Financial Management's (OFM) projected growth for the region.

C. LAND USE

C.1 History and Existing Development Patterns

North Bend's development pattern is the result of its

spectacular setting in the upper Snoqualmie Valley between Mount Si and Rattlesnake Ridge, at the foothills of the Cascades. The Snoqualmie River defines a rich and environmentally sensitive river valley. The historic development activities of farms, pasture lands and timber harvesting, and the existing built environment including the Interstate 90 interchanges, are all influences molding the City's present and future development.

The river valley floor is relatively flat and has developed with the most intensive land uses such as those located in downtown, east of downtown along North Bend Way, and the freeway interchanges at Exit 31 and Exit 34. These areas contain the heart of the City's retail, manufacturing and commercial districts, as well as the highest density residential developments. Lower density residential, protected open space and rural pasture lands comprise the balance of land activities within the City, its UGA, and surrounding unincorporated lands.

This rich history of early reliance on the area's abundant natural resources is a guide to defining the City's future where the natural setting of North Bend continues as the key component to the City's identity and heritage.

C.2 Natural Features

The natural setting of North Bend within the broad Snoqualmie Valley allows ample opportunities for residential living with a small town feel, supportive services, and sub-regional employment centers. At the same time, development constraints such as aquifer recharge areas, rivers, streams, floodplains, wetlands, steep slopes, and geologically unstable soil define the existing development limits and predict the shape of future development activity along key corridors.

The North Bend UGA occupies a very small percentage of the entire upper Snoqualmie River basin (above the falls), but its location on the valley floor close to the outlet for the upper Snoqualmie basin makes it vulnerable to major flooding, which can damage residences or other property. Implementing development and management practices that acknowledge the impact of the river and its tributaries is critical for the health and safety of existing and future residents. Associated wetlands are key natural resource areas for enhancing water quality, providing important fish and wildlife habitat, and serving as water retention and flood storage areas. They provide opportunities to maintain

the natural geologic systems of the area and their related habitat functions.

Additional information on the City's predominant natural features and their importance to the future development of the City is given in detail in the Critical Areas Element and the Shoreline Element. Review of drainage, flooding, and stormwater run-off in North Bend, as well as protection of the quality and quantity of groundwater intended for public use is addressed in the Critical Areas Element of the North Bend Comprehensive plan. To the extent necessary to comply with RCW 36.70A.070(1), the Critical Areas Element is incorporated by reference in this Land Use Element. North Bend's Shoreline Master Program (SMP) was most recently amended in 2012. Shoreline designations shall coordinate future land development and permitted uses with the Shoreline designations identified in the Shoreline Master Plan.

C.3 Built Environment

The historic development pattern of the City is along its east-west spine. The City's downtown commercial area developed along the old east-west SR-10 corridor (also known as the 'Old State Highway' or 'Sunset Highway'). In part, this 'Sunset Highway' first came to North Bend via Snoqualmie on the Boalch road alignment. The original route was subsequently moved to the present alignment of SR-202 then replaced with the old east-west SR-10 corridor now called North Bend Way. When Interstate 90 was completed in 1973 south of downtown North Bend, the original SR 10 assumed the function of a local access arterial route. Early residential neighborhoods clustered around the downtown employment node and were generally platted along the grid system, which gave definition and form to the urban environment. Other, typically rural land uses were scattered throughout the Upper Valley and are still evident today along the minor and major arterials as a mix of large lot rural residences with small commercial and industrial land uses.

The completion of the I-90 interchanges propelled new land uses forward by the mid-1980s in response to the commercial opportunities created by interstate transportation access. The principal impact at the Exit 31 South Fork interchange was the emergence of retail sales outlets and services that cater to both the visitor population and to the City and the surrounding area. With the distribution center for Nintendo at Exit 31 and the Genie facility at Exit 34, and the zoning of additional

Employment Park lands for similar uses, the City has additional employment opportunities in the South Fork Neighborhood, as well as the vacant lands along North Bend Way in the Tanner and Edgewick Neighborhoods. The I-90 corridor is a Designated National Scenic Byway which gets international tourism promotion from the Federal Scenic Byways Program. The Mountains to Sound Greenway Trust (MTSGT) and City of North Bend work together on enhancement projects throughout the City primarily funded through the Snoqualmie Watershed Forum by the King County Flood Control District. The MTSGT strives to protect and enhance the I-90 corridor greenway. The City of North Bend received 'Tree City USA'¹ in 2011 and has reached certification every year since.

Many of the existing, older commercial and residential structures show signs of age, particularly in the downtown neighborhood area. Maintaining the City's charm and appeal as a vital rural center will require additional attention to the rehabilitation and maintenance of its existing developed areas and structures. In part, the maintenance and repair of the City's infrastructure forms the foundation for this work.

C.4 Historic and Cultural Preservation

One of the goals of the Comprehensive Plan is to help promote historic and cultural preservation within the City. Several sections of the Land Use Element reference key historic sites (see **Table C.4**) that deserve public intervention for protection. Some examples include the historic Tollgate and Meadowbrook Farms which are now in public ownership, and the historic downtown commercial district which was formally designated in 2000. Preservation of heritage sites helps to maintain the City's aesthetic and cultural diversity and provides continuity with its past. Heritage sites include buildings, properties, natural areas, and structures of cultural significance. Identifying heritage resources and determining appropriate measures for their protection, preservation, or restoration is an ongoing process involving the King County Landmarks Commission, the City of North Bend, and state and federal agencies. (See **Figure 1-4**)

¹Tree City USA is a national program that acknowledges cities who meet four standards of sound urban forestry management: maintaining a tree board or department; having a community tree ordinance; spending at least \$2 per capita on urban forestry; and celebrating Arbor Day.

TABLE C.4 INVENTORY OF HISTORIC SITES

Name	Location	King County Survey File Number
Tollgate Farm	North Bend	0740
Si View Park Buildings	North Bend	0848
Fort Smalley	Tollgate Farm on SR-202	0015
Meadowbrook Farm	North Bend and Snoqualmie	N/A*
Milwaukee Railroad Bridge (since removed)	North of North Bend on South Fork of Snoqualmie River	0018
Downtown Commercial Historic District	Downtown North Bend	HRI#1567
Snoqualmie Tribe "Swing Rock"	Highway 202	N/A*
Forest Service Complex	North Bend Way	N/A*

* Sites not included in King County's historic survey designation but are important to the identity of North Bend.

In order to facilitate the City's continued preservation of key area landmarks, the City will support the development of a process that identifies, evaluates, and protects its local historic and cultural resources.

The City works closely with the King County Historic Preservation Program to implement the City's historic preservation ordinance. This may include entering into an interlocal agreement with the County to provide for the designation of a commission of landmarks within the City. The City should also work closely with Mountains to Sound Greenway to support its efforts to create a network of greenway buffers and interpretative signs which inform and celebrate the local history. Opportunities for interpretive facilities for existing designated historic sites and structures should be pursued, as well as the opportunity to work with the City of Snoqualmie on the Meadowbrook Farm property for significant interpretative venues. Local historic and interpretive avenues are greatly fostered within the City of North Bend through its support of the efforts of the Snoqualmie Valley Historical Museum. This support should continue and expand as the museum considers future plans to restore or expand its facility in North Bend. The museum offers an accessible and unique avenue for retaining and expanding the community's awareness of its historic and cultural roots.



Historic Images of North Bend: Log trucks going through downtown



Historic Images of North Bend: Downtown Building

C.5 Land Use Types

The Land Use Element identifies the type, location, and intensity of the following distinct land uses and includes discussion of mixed uses among these categories.

Residential Land Uses: Residential land uses include low-to high-density housing and cottage housing.

Commercial Land Uses: Commercial land uses include retail, services and office.

Employment Park Land Uses: Office parks, high technology business parks, warehouses, heavy industrial, and manufacturing businesses are included in the discussion of employment-generating land uses.

Parks, Open Space, and Public Facilities Land Uses: These areas include recreational open space, active and passive parks uses, and publicly owned facilities.

Mixed-Use: Mixed-use refers to the combining of retail/commercial/office and/or service uses with residential use in the same building or on the same site. Typically this is accomplished in the following way; 1) A structure with ground floor retail/commercial or service uses and the above floors occupied by residential use; 2) A structure which provides retail/commercial or service use in the portion fronting the public street with attached residential or office uses behind; and 3) Multiple structures on one site which provide retail/commercial or service uses in the structure(s) fronting the public street or public realm, and residential and/or office uses in separate structure(s) behind. Mixed-use development opportunities are recognized as a key plan component in creating revitalization of the existing built environment and spurring new development opportunities. Benefits of mixed use developments include but are not limited to: 1) allowing citizens to live, work and shop within a close proximity to each use; 2) creating activity within the district or neighborhood during longer periods of the day; 3) creating housing options and housing diversity; 3) promoting pedestrian activity and reduced auto dependency and 4) creating a sense of place.

C.6 Community Design and Mixed Use

Traditional zoning separated homes from employment, shopping and commercial spaces. Commercial and industrial spaces were concentrated in large centers oriented towards the freeway and the automobile.

Population growth and traffic congestion created a need to accommodate a better mix of uses where people can live, work and shop. Mixed-use development can provide a better jobs to housing balance and provide citizens with the option to live closer to work, thus making walking, biking and transit choices more abundant. Mixed-use buildings as described under C.5 above are a combination of retail/commercial/office and/or service uses with residential use in the same building or on the same site. Mixed use is permitted and encouraged in the Downtown Commercial (DC) zone, Neighborhood Business Zone (NB) and through Planned Neighborhood Development Review in the Employment Park I (EP-1) zone.

D. LAND AND USE CHARACTERISTICS, DISTRIBUTION AND LOCATION OF LAND USES

D.1 Distribution of Land Uses

Table D.1.A Distribution of Land Uses – 2015			
LAND AREA BY ZONING (City and UGA)			
Abbrv.	Zoning District	Acres	Total (%)
CLDR	Constrained Low Density Residential	368	10%
CR	Cottage Residential	61	2%
LDR	Low-Density Residential	1177	30%
HDR	High-Density Residential (HDR)	37	1%
HDR	High Density Residential with Density Restrictions	10	0%
DC	Downtown Commercial	67	2%
IC	Interchange Commercial	77	2%
IMU	Interchange Mixed-Use	40	1%
NB	Neighborhood Business	167	4%
EP-1	Employment Park – 1	350	9%
EP-2	Employment Park – 2	133	3%
POSPF	Park / Open Space / Public Facilities	652	17%
Un-zoned	Un-Zoned Areas (right of way / river)	728	19%
TOTAL		3866	100%
Source: City of North Bend GIS (Geographic Information System)			

The City of North Bend with its UGA is approximately 3,868 acres in size. The predominant land use activities, as classified on the current zoning map, are residential uses. (See Figure 1-2)

LU - Goal 1: **Preserve North Bend's small town qualities and its natural environment, while allowing for growth and development.**

Policies:

- LU - 1.1 Encourage infill residential development within the existing incorporated area in an effort to reduce sprawl and create more housing options.*
- LU - 1.2 Allow development to occur within the identified Urban Growth Area as City services become available and adopted annexation policies are met when it is consistent with adopted population and employment growth targets.*
- LU - 1.3 Locate new residential land uses in environmentally unconstrained areas where public services are available or nearby.*
- LU - 1.4 Encourage retention of natural habitat in residential developments by providing sustainable landscaping, and by creating zoning incentives.*
- LU - 1.5 Develop a Citywide Gateway Plan, and associated regulations, to create attractive City entrances that highlight the community's small town character.*
- LU - 1.6 Revise the zoning map for Parks, Open Space or Public Facilities Zoned properties to reflect the primary use of the property as either Parks/Open Space or Public Facilities.*

D.2 Parks, Open Space and Public Facilities

About 17% percent of the UGA land area, or 652 acres, is now used for parks, open space and public facilities, a relatively high percentage compared with most communities, but consistent with the high priority residents have placed on maintaining the City's rural and small town character. This zone includes City offices and properties, schools, Si View Park and the fire station. Other key components of open space include the Meadowbrook and Tollgate Farms, which together have been designated by North Bend to serve as an urban separator between the Cities of North Bend and Snoqualmie. The preservation of land identified as environmentally critical areas, open space, and parks provides a variety of functions such as: providing access to the Snoqualmie River and its tributaries; providing visual relief from the built environment; retaining areas for wildlife habitat and stormwater retention; creating opportunities for study of the natural environment; supporting recreation opportunities; and linking the City with its historic past.

To adequately protect such critical land uses, the North Bend Municipal Code has specific zoning categories to identify and retain areas which function as either parks or open space. The Parks Element identifies recreational resources and provides specific policies, while establishing level of service standards for this important component of North Bend's amenities. (See the Parks Element of the Comprehensive Plan for more information.)

The City is well served by a diverse range of public facilities developed to meet the needs of its residents as well as the needs of those living in adjacent unincorporated King County. Facilities include: a King County public library (1994), a post office (1994), a public works Complex (2002), and a new fire station (2012).

North Bend has a variety of public programs offered at public facilities. The North Bend Depot and associated historic train activities link North Bend to the City of Snoqualmie. In addition, the historic train provides tourist activities, which help generate economic activity. The Senior Center has a rich variety of programs and activities. The Si View Park complex has the only public pool in the Upper Valley and offers many classes and camps year round. The Snoqualmie Valley Historic Museum has a depth of high quality programs, resources, and displays. (See the Capital Facilities Element and Parks Element for more information on parks, open space and public facilities.)

D.3 Residential Land Use

According to the 2010 Census, 5,731 people live in North Bend in a total of 2,348 housing units, an increase of 459 housing units since 2000. The 2013 population estimate is 6,236 (a 7.1% increase from 2010).² The City has continued to see a steady rise in development since 2013 and expects the population within the City could increase another 7% with the projects currently under review.

The 2010 Census shows that 471 homes (24% of the existing housing stock) in the City were constructed prior to 1959. Between 1960 and 1989 493 homes (25% of the existing housing stock) were constructed. Half of the existing housing stock in the City was constructed since 1990 (990 units, or 51%). Nearly all units in the City are served by public water systems, while only 75% are served with public sewer. (See the Housing Element for more information and Table H.2.A below for a summary of residential and permit plat activity.)

D.4 Commercial Districts and Employment Centers

North Bend offers a variety of jobs to persons residing both inside and outside the City limits. Commercial Districts and Employment Centers are predominately concentrated along Bendigo Boulevard and North Bend Way and Boalch Avenue NW, as well as on the east side of the City in lands zoned EP-1 and EP-2.

D.5 Neighborhood Planning Areas

For Comprehensive Plan purposes, the City has been divided into fourteen neighborhood planning areas identified in **Figure 1-3**. These neighborhoods have been established to create land use patterns that will help the City maintain its existing rural character, natural beauty and small town scale, as well as to identify neighborhood-specific planning and design issues and establish policies that help create identity, community, and a sense of place. These neighborhoods are characterized by pedestrian orientation and are linked by the City's existing and planned network of pedestrian and bicycle trails.

The potential for the creation of future neighborhood-specific plans will enable neighborhood residents to have a voice in the direction their neighborhood may take. Anything from the identification of needed neighborhood amenities to the development of neighborhood signage

² United State Census Bureau 2009-2013 American Community Survey.

LU - Goal 2: Protect, conserve and enhance the historic and cultural heritage of North Bend.*Policies:*

LU - 2.1 Coordinate and cooperate with local, state and national historic and cultural preservation organizations, and the Snoqualmie Tribe, in order to promote and protect historic and cultural preservation within the City.

LU - 2.2 Develop criteria to establish a system of priorities for the preservation of historic, archeological and culturally significant properties.

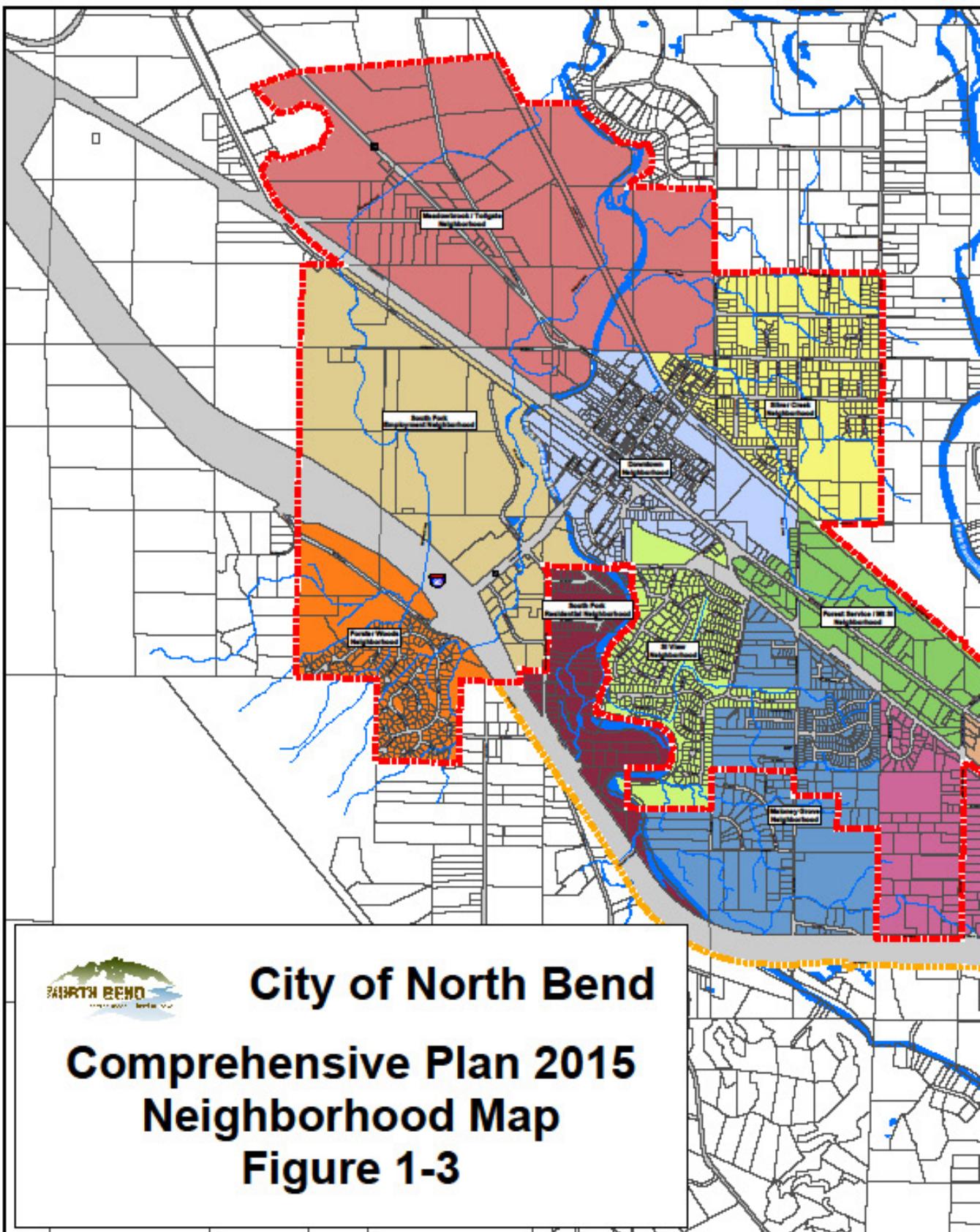
LU - 2.3 Work with the Snoqualmie Valley Historical Society to make historic and cultural resources available in order to raise awareness of the richness of cultural diversity and to encourage retention of personal and community heritage.

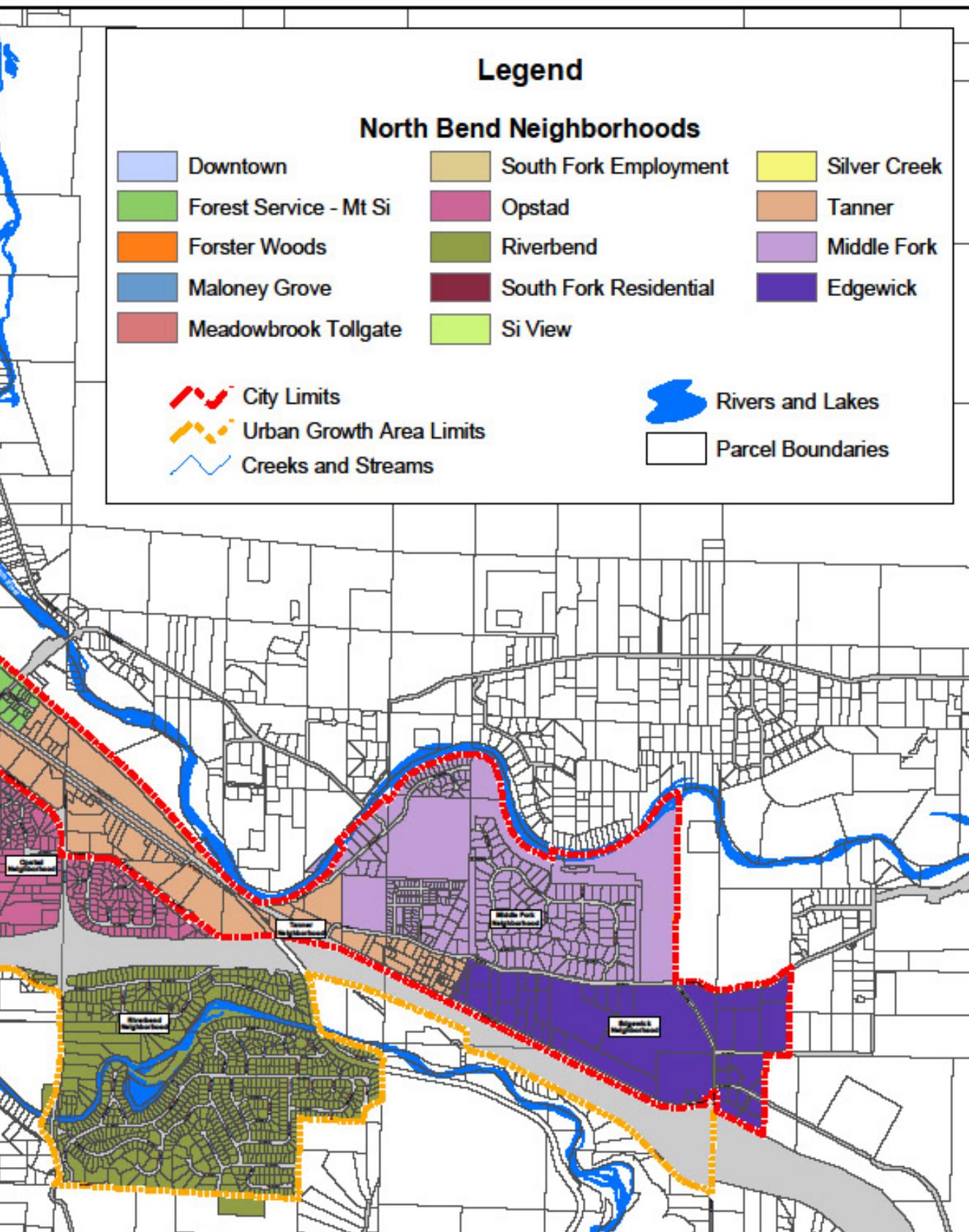
LU - 2.4 Promote a mutually supportive relationship between historic and cultural preservation and economic development.

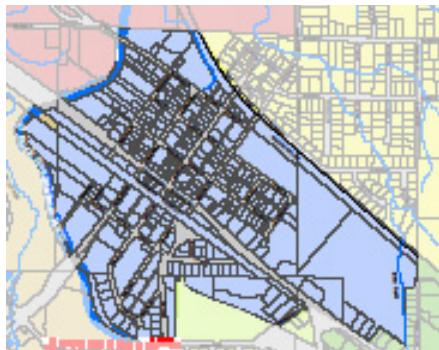
LU - 2.5 Incorporate the preservation of sites and structures of historic, cultural, and archeological significance as a part of the aesthetic and environmental consideration in site design and subdivision plan reviews.

programs can be explored within the context of the neighborhood planning process.

Figure 1-3 shows all of the City's neighborhoods as currently designated. In concert with the Transportation Element and the Parks Element, the City should strive to seek land to accommodate neighborhood greenways and bike paths that both connect and articulate each neighborhood's identity. Development of future comprehensive neighborhood signage programs may help distinguish the neighborhoods' unique characteristics.







Downtown Neighborhood

The Downtown Neighborhood includes the historic commercial downtown and the original town plat of North Bend, with a mix of commercial and residential uses. The Downtown Neighborhood contains several areas of vacant and re-developable land envisioned for infill projects and is one of the City's key employment centers for future commercial growth. The City has encouraged investment and improvement in the downtown through a number of ways.

Neighborhood size is generally defined by the walking distance to the neighborhood center. The Downtown Neighborhood has been designated in such a way that jobs, housing and services may be readily available to the local residents, often within walking distance. By encouraging a walkable downtown, a sense of community is affirmed, automotive pollutants are reduced, healthy lifestyles are encouraged, and human interaction is fostered. In addition, the City seeks to reduce urban sprawl as it encourages compact development, helping preserve the natural lands adjacent to the City.

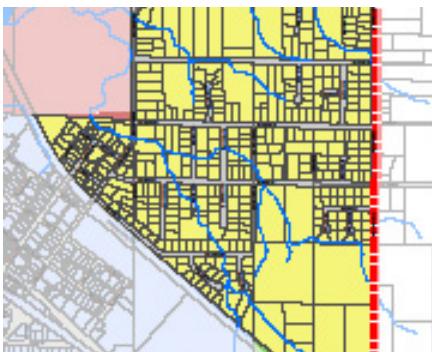
The identification and development of the Downtown Neighborhood within the City occurred with several goals in mind. First, the downtown can be compact and comprised of structures of varying scale. Clustering is to be encouraged to help minimize impacts of conflicting land uses while enhancing the natural features or open spaces within a proposed development. Second, development within the downtown must respect the historic and architectural styles and patterns of development. Streetscape and pedestrian scale are some of the additional components required by the Residential, Commercial, Mixed-Use and Industrial Design Standards adopted May 18, 2010.

In 2000, the City established the Downtown Commercial Historic District, covering seventeen historic buildings. This designation, administered through an interlocal agreement with the King County Historic Preservation Program, is intended to preserve and restore the historic character of the District. The Downtown Commercial Historic District is supported by several programs designed to stimulate maintenance and redevelopment of the designated structures.

In 2008, the City adopted a Downtown Master Plan. This plan identifies key development opportunity sites, specific infrastructure improvements, traffic and parking recommendations, and regulatory measures to help achieve the plan goals. In addition to the recommendations in the Downtown Master Plan, a future city hall, civic center, and plaza are envisioned in the downtown core, which can serve as a catalyst for further economic development and as a venue for community events. The Downtown Master Plan also recommends gateway features that are intended to draw people in and establish a sense of arrival. The City has achieved many of the Near-Term Projects and Actions identified in the Implementation Timeline of the Downtown Master Plan. These include projects such as: a roundabout at North Bend Way/Cedar Falls; way-finding signs; invasive vegetation removal at Riverfront Park; Downing Avenue Extension; intersection control at Park and North Bend Way; and garbage screening along McClellan. In addition, a new Visitor Information Center (VIC) was built in 2014 at the corner of Bendigo Blvd and Park Street.

The City also supports further investment in its downtown core through economic development strategies that foster a synergistic mix of retail, restaurant, nightlife, and service uses, clear and concise guidelines for development, and by developing incentives for infill and redevelopment such as expedited permit processes and reduced impact fees.

In other areas of the Downtown Neighborhood, infill and redevelopment of underutilized properties is expected to occur as property values increase relative to the value of existing structures. Supporting higher-density residential in the Downtown Neighborhood is key to fostering both pedestrian-oriented development and additional market support for further commercial uses. Mixed-use developments are particularly suitable for the Downtown Neighborhood and should be supported and encouraged through appropriate policies.



Silver Creek Neighborhood

The Silver Creek Neighborhood is characterized by predominately single-family development, and further development should be limited to low-density residential in recognition of the established neighborhood character, its location within the floodplain, and the proximity of a number of floodway channels and critical areas associated with Silver Creek. Effort should be made to secure additional park land adjoining to E.J. Roberts Park as development is proposed. The additional park land will serve the growing number of residents using the park facilities in the Silver Creek Neighborhood.



Forest Service/Mount Si Neighborhood

The Forest Service/Mount Si Neighborhood is a residential and commercial mixed neighborhood located southeast of downtown. The neighborhood is bisected by North Bend Way and the vacant Burlington Northern Railroad corridor/ Tanner Trail, with residential uses predominantly south of North Bend Way and commercial uses north of North Bend Way. Primary existing public uses include the US Forest Service Ranger Station Complex, the City of North Bend Public Works site, and Fire Station 87.

Formerly Highway 10, this area developed along its length as an auto-oriented commercial strip, with motels, service stations, restaurants, and mobile home parks. As such, it exhibits the effect of auto-oriented "strip commercial" development with numerous egress and ingress points from North Bend Way. These multiple curb cuts are detrimental to public safety, impede the smooth flow of traffic, discourage walking and bicycling, and should be reduced over time through shared-driveways required as a part of redevelopment. Effort should also be made to ensure protection of significant trees located between North Bend Way and Cedar Falls Way, which form a distinct part of the neighborhood's character.

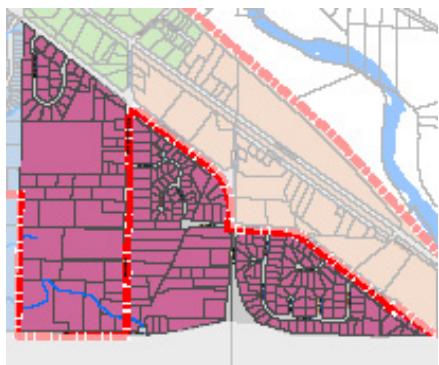
The neighborhood contains significant vacant and redevelopable areas which are envisioned for the development of cottage housing south of North Bend Way, and a mix of commercial and residential uses north of North Bend Way.

A key intersection within this neighborhood is at East North Bend Way and SE Mount Si Road. This intersection provides access to the Mt. Si Trailhead. Because this trailhead is a regional draw, attracting over one hundred thousand people each year, retail and commercial opportunities are abundant. This neighborhood will see a demand for Neighborhood Business type uses, serving both the recreationalists and local clientele, and serving as a future neighborhood center. Retail and commercial uses should be pedestrian friendly, concentrated at the intersection, with parking located to rear. Mixed-use development consisting of retail/commercial and residential is encouraged. Residential uses on the north side of North Bend Way at this intersection should be limited to the second story and/or located to the rear of the retail uses.



Riverbend Neighborhood

The Riverbend Neighborhood is a residential neighborhood in the Urban Growth Area south of I-90 Exit 32. The neighborhood has been largely built-out, with remaining single-family residential infill and redevelopment potential on existing larger residential lots off 436th Ave. SE. Private parks within the Riverbend neighborhood provide gathering places, and a golf course with associated restaurant and commercial uses provide additional services just outside the UGA. The Snoqualmie Valley Trail provides an important pedestrian and bicycle link under I-90 from the Riverbend Neighborhood to downtown and other parts of the City.



Opstad Neighborhood

The Opstad Neighborhood is a residential neighborhood located southeast of downtown and directly south of the Mount Si Neighborhood. The neighborhood contains lower density single-family homes, Opstad Elementary School, and areas of vacant and redevelopable land. Much of the neighborhood has been "established" by existing residential subdivision patterns and should remain as low-density residential.



Maloney Grove Neighborhood

The Maloney Grove Neighborhood is a residential neighborhood located southeast of downtown and directly west of the Opstad Neighborhood. The southern edge of the neighborhood is bounded by the I-90 right-of-way. The area contains lower density single-family residences. This neighborhood contains areas of vacant and redevelopable land envisioned for low-density residential development. Southern areas of the neighborhood are constrained by the floodplain and floodway. Development of trails along the South Fork levee as redevelopment of these properties occur would provide important extensions of the City's trail network and enable a safe pedestrian and bicycle connection to other areas of the City.



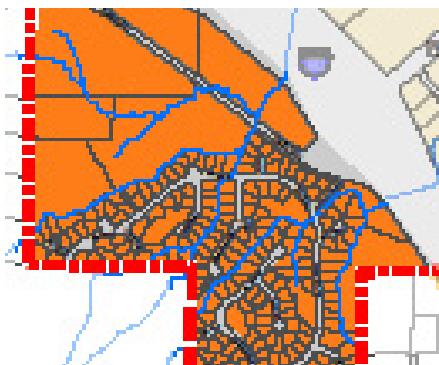
Si View Neighborhood

The Si View Neighborhood is a residential neighborhood located south of downtown and northwest of the Maloney Grove Neighborhood. The western edge of the neighborhood is defined by the South Fork of the Snoqualmie River. The neighborhood has been largely built-out, and contains minimal area of vacant or redevelopable land, which is envisioned for single family residential use. Portions of the neighborhood are constrained by the floodplain and floodway. The neighborhood center is identified as Si View Park.



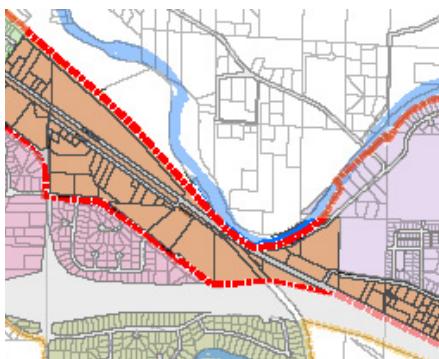
South Fork Residential Neighborhood

The South Fork Neighborhood is a residential neighborhood located in the City's UGA, south of downtown and east of the South Fork Interchange area. It contains the existing subdivisions of Shamrock Park and Berry Estates. The neighborhood is bounded to the east by the South Fork of the Snoqualmie River. The neighborhood center is identified as the Exit 31 interchange commercial area within the South Fork Neighborhood to the west. Future development in the neighborhood is constrained by its location within the floodplain, some portions of which are in the floodway. Zoning in the neighborhood should be limited to low-density residential to be compatible with the established development pattern and constraints of the floodplain.



Forster Woods Neighborhood

The Forster Woods Neighborhood is a residential neighborhood located southwest of downtown and southwest of the I-90 Exit 31 interchange. The area contains the Forster Woods subdivision, both single-family and multi-family, and additional vacant residential and commercial land with moderate development constraints. Adjacent to the freeway intersection, vacant parcels would be developed as land uses suitable to the interchange, such as mixed-use designations to be compatible with adjoining residential areas. Existing environmental constraints must be addressed in any future development that occurs here. The remaining undeveloped lands in the Forster Woods Neighborhood area is proposed at LDR 4 (gross) units per acre on the south side of W. Ribary.

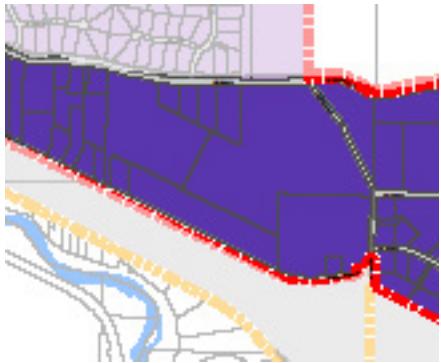


Tanner Neighborhood

The Tanner Neighborhood is a predominantly light-industrial neighborhood located southeast of the Forest Service/Mt. Si Neighborhood and the Edgewick Interchange.

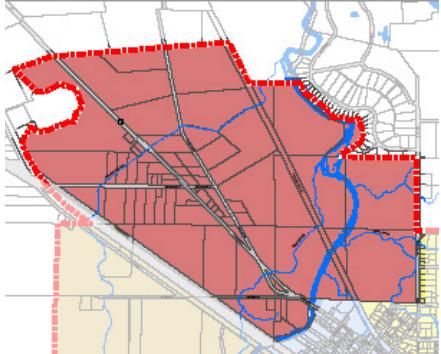
The neighborhood contains significant vacant and redevelopable land suitable for commercial and light-industrial uses and is an area anticipated to accommodate additional employment growth. Special overlay districts within areas of this neighborhood recognize unique site characteristics such as the presence of the Snoqualmie Valley Trail and the King County Tanner Landing Park, and therefore allow for a mix of residential and commercial/light industrial uses that wouldn't otherwise be permitted (see Overlay Districts section below).

The King County Snoqualmie Valley Trail provides an important pedestrian link through this neighborhood, connecting multiple parts of the City and encouraging bicycle and pedestrian transportation. The future Tanner Trail, within the Burlington Northern Railroad corridor, will provide a similar link along North Bend Way, and future developments that abut or contain this corridor should be constructed to align with and incorporate the trail into the design of the development. The area also has important scenic qualities with views of the Middle Fork of the Snoqualmie River and Mount Si. Interpretive or historic signage would be appropriate, located in key areas along the corridor to give perspective on the natural and human histories of the area, including that of the Tanner Mill and the former Northern Pacific (Burlington Northern) and Milwaukee Road Railroad Lines.



Edgewick Neighborhood

The Edgewick Neighborhood is a predominantly light-industrial neighborhood between SE 140th Street and North Bend Way at the eastern end of the City, and is one of the City's key employment areas anticipated to accommodate future employment growth. The neighborhood contains significant vacant and redevelopable land suitable for light-industrial and office park development. This area has great potential for increased job development due to its flat topography and excellent freeway access, and proximity to the Seattle metropolitan area. Attention to the most appropriate zoning classifications and land uses is also a significant issue, as the North Bend Vision Plan clearly articulates the City's desire to manage new commercial development with attention to the scale and intensity suitable for a small city. Employment-generating uses should be given preference over larger-scale warehousing and storage uses. The East North Bend Master Plan Overlay District provides additional planning and land use guidance to ensure a well-coordinated mix of office, employment park, research and industrial, and light manufacturing uses, and to coordinate vehicular circulation and site design to minimize adverse impacts to adjacent residential areas and nearby schools. The commercial areas at the Exit 34 interchange form the neighborhood center. Because 468th Ave. SE serves as the gateway to the popular Middle Fork recreation area, special attention should be paid to ensure that building and site design within this area—although it may be light industrial—retains a small town character and scale consistent with the City's vision statement.

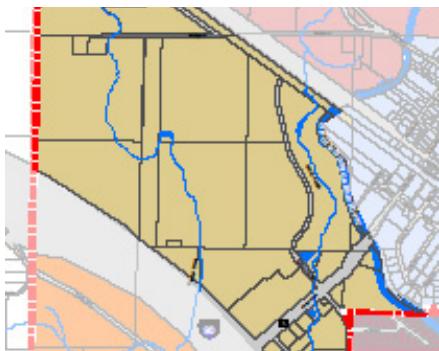


Meadowbrook/Tollgate Neighborhood

The Meadowbrook/Tollgate Neighborhood is chiefly characterized by the preserved Meadowbrook and Tollgate Farms, and is designated as an urban separator. Both Meadowbrook Farm and Tollgate Farm are managed consistent with master plans that were developed for each property, as public park and open space areas intended to preserve scenic, historic, and cultural resources, and to be developed for lower intensity recreational activities, with a portion of Tollgate Farm also being developed for active recreation. (See the master plan for each property for more information.)

The retention of open space and passive and active recreation within the Meadowbrook/Tollgate Urban Separator is an important priority for the City. The urban separator designation has been supported by designating the neighborhood as a development rights transfer sending zone.

The Meadowbrook neighborhood contains some housing units as well as limited commercial and manufacturing land uses. The neighborhood contains areas of vacant and redevelopable land, and is envisioned as a mix of density of residential uses and lower-intensity commercial uses. Much of the area outside of the publicly owned properties remains vacant. However, this neighborhood is not anticipated to accommodate higher-intensity commercial growth, based on the objectives of the Urban Separator Overlay Zone. Future development in the neighborhood is also constrained by wetland, stream and floodplain critical areas.



South Fork Employment Neighborhood

A commercial and light-industrial neighborhood, the South Fork neighborhood includes the Exit 31 interchange commercial area and the large vacant and redevelopable properties between I-90 and North Bend Way in the western end of the City. This neighborhood is one of the City's primary employment centers and is anticipated to accommodate much of the City's future employment growth. Key existing uses include Nintendo and North Bend Premium Outlets to the west of Bendigo Boulevard, and the Mountain Valley Center east of Bendigo Boulevard. The neighborhood also serves as a primary gateway into the rest of the City. Maintaining and enhancing the streetscape along Bendigo Boulevard with landscape, lighting, signage, and sidewalk improvements consistent with recommendations in the Downtown Master Plan will help draw people from this area into downtown.

Policies for industrial lands are intended to provide guidance toward identifying adequate land area for job growth and creation, developing parameters to help reduce conflicts between adjoining land uses and providing direction for new development to exhibit sensitivity to the natural environment. Uses in the Interchange Mixed-Use zone are to be limited to less intensive commercial activities that will be more compatible with the residential zoning district surrounding the interchange.

D.6 INCOMPATIBLE LAND USES

The City of North Bend's Comprehensive Plan and development regulations need to reduce incompatibility between residential and commercial or industrial land uses in the North Bend UGA. Reducing and/or mitigating compatibility of land uses between adjacent residential and non-residential properties is fundamental to sound land use planning. To improve compatibility between residential and non-residential properties, the City development code shall include enhanced setbacks, additional landscaping, and enhanced design guidelines as well as limitation on permitted uses in specified locations. The objective of the development code will be to provide buffering as necessary to preserve and enhance the character of residential zoning districts. Establishment of the Interchange Mixed Use (IMU) zoning district and a Transitional Landscape Area (TLA), will achieve the reduction of incompatibility between residential and commercial or industrial uses. (See Section F below for a further description of these overlay zones.)

E. LAND USE AND ZONING DESIGNATIONS

How the City classifies uses of land within its incorporated boundary and its growth areas is important to the way the City will develop over the next twenty years. The present zoning code is designed to implement the principles of the *North Bend Vision Plan* by promoting neighborhoods that are pedestrian-scale, predominately residential areas with mixed commercial and residential uses permitted in the commercial and industrial core of the City.

A general description of the City of North Bend's zoning code classifications are provided in the following sections. The zones provide the direction necessary to fulfill the City's vision for greater choice and expanded opportunity for residents and businesses, while also allowing the City to meet the population, employment, and affordable housing targets mandated by Countywide Planning Policies.

E.1 Residential Land Use

Much of North Bend is identified as Residential Neighborhoods (see **Map 1-4**). Residential zones provide for both single-family and multi-family housing with a range of densities while also accommodating appropriately scaled commercial nodes within proximity to residential areas. Locating these uses in a "mixed-use core" within walking distance of the neighborhoods in a deliberate, pedestrian-scaled pattern, encourages people to walk

and bicycle and makes for a safer and more vibrant neighborhood. New residential development is encouraged to evolve according to traditional settlement patterns, with higher densities concentrated in the "unconstrained" areas and the "mixed use core" area, and gradually diminishing at the neighborhood's edges. All residential zones (definitions below) create attractive and satisfying environments for family and household life, ensure adequate services are provided, and provide for public amenities such as passive and active recreation areas, open space, and trails, and promote the opportunity for area-wide coordination and continuity of pedestrian, bicycle, and greenbelt corridors. In addition, these zones promote a traditional neighborhood development pattern and scale which serves to maintain and enhance the existing character and pedestrian orientation.

Low-Density Residential (LDR)

Low-Density Residential designations provide for neighborhoods of predominately single-family structures at a maximum density of four dwelling units per acre. This zoning designation can accommodate for other uses that are compatible with single-family residences, including accessory dwelling units and some percentage of cottage housing within a planned neighborhood district.

Constrained Low Density Residential (CLDR)

Constrained Residential is a portion of the Low-Density Residential designation that is recognized for having larger lots or development constraints, such as frequently flooded areas, geologically hazardous areas, river and stream corridors, channel migration areas, wetlands, and native wildlife and fish habitat. Density in this area is expected to reach a maximum of two dwelling units per acre. The CLDR area includes properties located within the floodplain and floodway areas adjacent to the South Fork of the Snoqualmie River, and includes properties within the UGA, characterized by larger lot sizes and in keeping with the rural character recognized as important in the city's vision statement.

Cottage Residential (CR)

Cottage Residential zoning designation provides for innovative housing types on smaller lot sizes with increased densities to create greater diversity for residents of North Bend. CR is comprised of predominately single-family smaller detached housing, though some attached housing is allowed.

LU - Goal 3: Maintain residential quality and neighborhood livability suitable for residents of North Bend.*Policies:*

LU - 3.1 Encourage the development of human-scale neighborhoods planned to be easily accessed by transit for civic, cultural and/or recreational activities.

LU - 3.2 Encourage retention of existing open spaces and the creation of a citywide, linked open space network in order to retain the existing rural character within residential neighborhoods.

LU - 3.3 Utilize adopted multi-family and single family design guidelines which help to promote high quality residential development.

LU - 3.4 Protect neighborhoods from adverse impacts such as junk vehicles or other nuisances by actively enforcing City codes.

LU - 3.5 Support new transit opportunities linked to residential growth.

LU - 3.6 As needed work with neighborhood residents to help define each neighborhood's character and address each neighborhood's challenges.

LU - 3.7 Promote walkways and bikeways within new residential developments that can be linked to existing or proposed trails and walkways.

LU - 3.8 Reduce sprawl by creating development regulations that allow smaller lot infill development at a scale and intensity that preserves existing neighborhoods.

LU - 3.9 Protect residential zoning districts from adverse impacts created by land uses permitted in adjoining commercial or industrial zoning districts.

LU - 3.10 Preserve the "established" character in existing neighborhoods that are significantly built-out by zoning for infill development to occur at densities that are consistent with the existing development pattern.

LU - 3.11 Protect the public health and safety by limiting single-family residential infill development in floodplain areas outside of the downtown commercial zone to Low-Density Residential and Constrained Low Density Residential zones.

LU - 3.12 Limit new multi-family dwellings constructed in the Downtown Commercial zone to the second story or above when constructed in the downtown core.

High-Density Residential (HDR)

High-Density Residential zoning designations provides for attractive and satisfying pedestrian-friendly neighborhoods and/or areas of predominantly multi-family structures allowing for a mix of housing types, including affordable housing.

E.2 Parks, Open Space, and Public Facilities

Parks / Open Space or Public Facilities (POSPF)

The Parks Open Space or Public Facilities designation will include all public parks, schools and community facilities, as well as developed trails and other public recreational corridors and lands. Through the City's Parks and Open Space Element, property to be acquired for future parks or trails may be designated "future" Parks, Open Space, and Public Facilities. The "future" Park's designation may be applied without changing the underlying zoning.

The POSPF zoning may be segregated to distinguish lands designated primarily for parks and open space from lands designated primarily for public facilities. Agriculture, forestry, galleries, gardens and museums, cemeteries, as well as governmental offices are permitted.

E.3 Employment

Employment Park (EP-1 & EP-2)

The Employment Park designations include areas where the future employment growth for North Bend will occur. This designation provides for development of large and small business to meet the twenty-year job target identified for North Bend by the Growth Management Planning Council. An important consideration for the development regulations is the need for parcels of sufficient size, with few constraints, that can provide efficient use of land to meet job targets. Activities promoted in this designation could include indoor fabrication, research and development, finance and other service-related businesses, and distribution facilities. Typical heavier industrial uses will be accommodated here as well.

E.4 Commercial

Downtown Commercial (DC)

The Downtown Commercial designation will be the focus of services, entertainment, specialty retail, and mixed-use development. Development will be encouraged to conform to traditional northwest vernacular architecture and color palette, front onto streets, include pedestrian

amenities, promote alternative transportation by providing bicycle racks and facilities, and develop shared parking facilities. Multi-storied development will be permitted to include residential and/or professional office uses above the street level. By promoting and enhancing commercial land uses within the historic, or traditional downtown area, redevelopment activities are encouraged which can prepare the North Bend downtown for the opportunities of the next century.

Interchange Commercial (IC)

The Interchange Commercial designation provides for business activities that typically serve the travel and tourist trade while also supplying goods and services in larger scale commercial development.

The Interchange Commercial zone provides for services to the traveling public, as well as larger scale commercial activities

Interchange Mixed-Use (IMU)

The Interchange Mixed-Use zoning designation provides a modified set of permitted "interchange commercial" activities to protect residential uses adjacent to Interchange Commercial zoning districts.

The Interchange Mixed-Use occurs where Interchange Commercial (IC) zoning is near residential (LDR, HDR) zoning. The purpose of this zoning is to provide a transitional zoning district to act as a buffer between Interchange Commercial and Residential zoning. The transitional area provides for a limited set of interchange commercial uses that are more compatible with adjacent residentially zoned parcels.

Neighborhood Business (NB)

The Neighborhood Business zone is a commercial zoning district intended to allow a variety of small-scale retail centers for shops providing goods to serve the everyday needs of the surrounding population, where mixed-use development can be encouraged.

LU - Goal 4: Focus future employment growth in designated economic opportunity areas including the downtown, the South Fork interchange and employment park area and the East North Bend Way to Edgewick corridor.

Policies:

LU - 4.1 *Implement a high level of design and retention of the City's unique visual quality to areas zoned for commercial or industrial land uses through review and implementation of the adopted Commercial and Industrial Design Standards.*

LU - 4.2 *Promote pedestrian-scale development by utilizing shared driveways or existing roads and providing pedestrian-level amenities.*

F. MASTER PLAN OVERLAY DISTRICTS (MPODS)

The North Bend Municipal Code (NBMC) Master Plan Overlay Districts (MPODs) provide a process by which a specific planned mix of uses and layout may be provided through a master plan to address unique site-specific opportunities and constraints. The underlying zoning for these areas has not changed but in most cases they have been given special considerations for types of uses, approximate locations for open spaces, public streets and access points. The Planning Commission or property owner may docket consideration of an overlay zone. The first and initial land use development application for any parcel within an MPOD shall show consistency with the overlay district.

Urban Separator Overlay District

The City has established an Urban Separator Overlay District (USOD) (**Figure 1-2**) for the land enclosed by the Meadowbrook and Tollgate Farms including the "constrained" land lying east of the Tollgate Farm and west of the South Fork of the Snoqualmie River between SR-202 and West North Bend Way. Urban Separators are corridors of land that define community or municipal identities and boundaries, provide visual breaks in the urban landscape, and link parks and open space within and outside the North Bend UGA. (See the NBMC for more information.)

Transitional Landscape Area

The Transitional Landscape Area (TLA) includes specific locations along I-90 and key arterials and collector

streets within North Bend and its UGA, which, require appropriate landscape transitions to buffer incompatible uses and sustain the City's natural assets for continued economic prosperity and quality of life and support the regional efforts along the I-90 corridor to maintain it as a National Scenic Byway. (See the NBMC for more information.)

Planned Neighborhood District

The Planned Neighborhood Overlay District (PND) encourages a variety of residential housing types, sizes, and pricing. It provides flexibility to bulk and dimensional standards (except density). The PND applies to all Cottage Residential (CR) development; LDR development that proposes any cottage homes; and in any zone where a mix of residential housing types is proposed. (See the NBMC for more information.)

Additional MPOD

Additional MPOD may be adopted over time and incorporated into the NBMC and zoning map amendments. Currently, the NBMC has three additional MPOD: Limited Commercial Overlay District (LCOD), the Tanner Landing Master Plan Overlay District (Tanner Landing MPOD), and the East North Bend Master Plan Overlay District (ENB-MPOD). (See the NBMC for more information.)

LU - Goal 5: Maintain an Urban Separator Overlay District in the Meadowbrook / Tollgate Neighborhood.

Policies:

LU - 5.1 Support the Urban Separator Overlay District (area and boundaries), to include the Meadowbrook / Tollgate Neighborhood to protect the resource land uses occurring there, protect the neighborhood as a corridor of land that defines the municipal identity and boundaries, provide a visual break in the urban landscape, and link parks and open space within and outside the North Bend UGA.

LU - 5.2 Design the Urban Separator Overlay District covering the Meadowbrook / Tollgate Neighborhood to include and link parks and other lands that contain significant environmentally sensitive features, provide wildlife habitat or critical resource protection, contain defining physical features, and contain historic resources.

LU - 5.3 The residential density for residential zoned land designated in the Urban Separator Overlay District covering the Meadowbrook / Tollgate Neighborhood should be consistent with minimum build-out in the zoning district.

LU - 5.4 The level of density for assignment of Transfer of Development Rights should be the minimum in the zoning build-out.

LU - Goal 6: Maintain a Transitional Landscape Area.

Policies:

LU - 6.1 Maintain a Transitional Landscape Area which requires enhanced landscaping to help buffer incompatible uses.

LU - 6.2 Sustain the City's natural assets for continued economic prosperity and quality of life.

LU - 6.3 Support the regional efforts along the I-90 corridor, a designated National Scenic Byway, which gets international tourism promotion from the Federal Scenic Byways Program.

LU - Goal 7: Maintain and Promote the Transfer of Development Rights Program.*Policies:*

LU - 7.1 Maintain a Transfer of Development Rights program to create the opportunity for preservation of selected urban separator, resource, and sensitive area land from development and redirect development to the appropriate land areas.

LU - 7.2 Adopt regulatory incentives to encourage Transfer Development Rights from sending site areas and purchase of development rights in receiving site areas.

G. TRANSFER OF DEVELOPMENT RIGHTS

A Transfer of Development Rights (TDR) program provides a means to purchase and sell residential development credits from lands that provide public benefit. The TDR program is voluntary – property owners may choose not to participate in the program. Landowners receive the financial benefit from selling development rights without having to develop or sell the land itself. The landowner retains all other rights of title and private use of the property, subject to conformance with the TDR agreement in place. Permanently preserved land is established through a conservation easement without cost to taxpayers or added regulations to landowners, and public access is not required. The credits are transferred from the property that is preserved, known as the “sending site,” to a “receiving site.”

The adopted TDR program for North Bend will allow individuals to purchase and sell development credits from lands that provide a public benefit. In North Bend, the lands that can transfer development rights presently include properties in an Urban Separator Overlay District and specified environmentally sensitive lands including the floodway, channel migration areas, wetlands, streams, and their buffers. Designated receiving sites are currently focused in the Downtown Commercial. Through TDR, landowners can receive financial compensation without developing or selling their land and the public can receive permanent preservation of the land. Specific sending site areas and receiving site areas for the transfer of development rights are designated in the development regulations.

H. GROWTH TARGETS AND BUILDABLE LANDS

The Growth Management Act³ requires Washington cities and counties to measure their land supply (in acres) and land capacity for both housing units and jobs in order to ensure these cities and counties have sufficient capacity to accommodate forecasted growth for a 20 year period. North Bend has analyzed preceding years and forecasted capacity for the future anticipated growth, and found there is adequate land available for housing and employment target numbers. Future development and build-out analysis assumes highest and best use of lands, which is not always achievable or realized with each individual development.

The 2014 King County Buildable Lands Report identifies a **housing target of 665 units** and **employment target of 1,050 net new jobs** for North Bend for the years 2006–2031. As shown in Table H.1, since 2006, North Bend has 234 total net new housing units, requiring an additional 431 units by 2031 to reach the target housing units. As shown in Table H.4.B, the 2035 analysis found that North Bend has the **capacity for 2,331 new housing units, exceeding the target with a surplus of 1,666 units**. As shown in Table H.5, the analysis also found that North Bend has the **capacity for 7,092 new jobs within the boundaries of the city, therefore exceeding the target with a surplus of 6,042 jobs**.

³The Washington Legislature enacted the Growth Management Act (GMA) in 1990 to guide planning for growth and development. It has been regularly amended to further define requirements and to advance coordination among local governments.

The current targets established by the Growth Management Planning Council (GMPC) are for the planning period 2006-2031. The Growth Management Act requires cities to plan for sufficient areas and densities for growth anticipated to occur in a twenty year period. In order to plan for the twenty year period, 2015-2035, the housing and employment growth targets have been extended to 2035. North Bend's **housing target for 2006-2035 is 771 new units** (subtracting the 234 new houses constructed since 2006 makes the target 537), and **employment target is 1,218**. As shown in Table H.5, the 2035 analysis found that North Bend has capacity for 2,331 new housing units and capacity for 7,092 new jobs, therefore North Bend **exceeds the 2035 household targets with a surplus of 1,560 units and exceeds the employment targets with a surplus of 5,874 jobs**.

H.1 Residential

From 2006 to 2014, 234 net new units were permitted in the City of North Bend.

Table H.1: Net New Housing Units 2006–2014				
Gross Permitted Units	Any Other New Units (ADUs, Conversions, etc.)	Demolitions	Net New Units	Total Net New Units:
252	1	(19)	234	234

H.2 Residential Development Activity

Table H.2 shows the residential permit and plat activity, and densities achieved, from 1996 to 2014. The densities that were achieved in past developments are shown in **Table H.2** and are used to predict future residential densities (see **Table H.8.A**).

Table H.2 Residential Permit and Plat Activity 1996–2014												
Year	Residential Permit Activity					Residential Plat Activity						
	Single-Family Zones			Multi-Family and Mixed Use Zones		Single-family Zones			Multi-Family and Mixed Use Zones			
	Net Acres Permitted	Total Number of Units	Avg. Permit Density (net)	Net Acres Permitted	Total Number of Units	Avg. Permit Density	Net Acres Platted	Total Number of Lots	Avg. Plat Density	Net Acres Platted	Total Number of Lots	Avg. Plat Density
			(du / acre)			(du / acre)			(lots / acre)			(lots / acre)
1996-2000	69.01	287.00	4.20	8.95	233.00	26.00	4.35	16.00	3.70	N/A	0	N/A
2001-2005	3.44	15	4.36	N/A	0	N/A	1.95	6	3.08	N/A	0	N/A
2006-2014	40.40	245	6.06	1.36	7	5.14	47.96	262	5.47	0.68	4	5.91

H.3 Residential Land Supply 2015

As shown in Table H.3, before deducting constraints, the City of North Bend has about 558 gross acres of vacant and redevelopable residential land within its current city limits. There are also approximately 263 gross acres of land available in the UGA. Altogether there are about 822 gross acres potentially available for residential development within the City and its UGA. Once deductions for critical areas and public purpose are accounted for, there are approximately 320 net acres in the City and 138 net acres in the UGA for residential land supply.

A market factor is the assumption for the variability of land that will not be on the market at any given time. There is not enough data or a high degree of variability to provide a solid market factor at this time. If a 5% market factor were applied, residential land supply would go from 459 total adjusted net acres to 436 total adjusted net acres, a reduction of 23 acres. The 5% assumption used in this example is based on development trends observed recently in North Bend.

Table H.3: Residential Land Supply – 2015

Land Characteristics	Gross Acres	Deductions		Net Acres	Market Factor %	Adjusted Net Acres
		Critical Areas Acres	Public Purpose %			
SF Vacant	228.138	39.25	33%	126.557	0%	126.557
SF Redevelopable	276.472	42.335	33%	156.874	0%	156.874
MF Vacant	11.135	1.265	33%	6.613	0%	6.613
MF Redevelopable	1.482	0	33%	0.993	0%	0.993
Mixed Use Vacant	23.704	NOTE 1	10-20%	16.924	0%	16.924
Mixed Use Redevelopable	18.014	NOTE 1	0-20%	12.507	0%	12.507
Sub Total: Current City Land Supply	558.945	82.850		320.467		320.467
UGA SF Vacant	51.962	20.773	33%	20.897	0%	20.897
UGA SF Redevelopable	211.541	35.803	33%	117.745	0%	117.745
Sub Total: Current UGA Land Supply	263.503	56.576		138.641		138.641
Total: Residential Land Supply	822.448	139.426		459.108		459.108

Note 1

All deductions for Critical Areas, Public Purpose (ROW, Parks, Utilities), and Buildable Areas with a “No Change” assumption have been applied before division into commercial/residential acres. This has been done due to the development assumptions applied in conjunction with North Bend Zoning and Overlay District specifics.

H.4 Residential Capacity

The 2014 King County Buildable Lands Report identifies a housing target of 665 additional units in North Bend for the years 2006–2031. North Bend has achieved 35% of this with a remaining target of 431 net new households (see **Table H.4.B**). Per **Table H.4.A**, the 2015 Comprehensive Plan zoning 2035 analysis found that North Bend has the capacity for 2,009 new housing units within the current City boundaries and is therefore able to accommodate the 2031 target of 665 new units as well as the 2035 target of 771 new units. There is an additional capacity of 322 units in the UGA based on North Bend’s planned zoning after annexation to the City. The total capacity in North Bend and its UGA is 2,331 units.

Table H.4.A: Summary of Development Capacity (2015)				
Residential Development Capacity – 2015				
Zoning	Housing Capacity (Units) on:			Total
	Vacant Land	Redevelopable Land		
Single Family				
LDR - City	413	554	997	
LDR - UGA	11	153	164	
Constrained LDR - City	62	15	77	
Constrained LDR - UGA	37	121	159	
CR - City	239	121	360	
ADU's @ 5% in City	21	29	50	
Units lost in commercial redevelopment	0	0	0	
Subtotal - City	734	749	1484	
Subtotal - UGA	49	274	322	
Multifamily				
HDR - City	6	11	17	
HDR w/density restrictions - City	45	0	45	
Units lost in commercial development	0	0	0	
Subtotal - City	51	11	62	
Mixed –Use				
DC - City	105	-1	104	
NB - City	146	82	228	
EP-1 Tanner Landing Overlay - City	0	58	58	
EP-1 Tanner Junction Overlay - City	99	0	99	
DC/NB/EP-1 Zones – City	0	-22	-22	
Units lost in commercial redevelopment	0	-5	-5	
IC/IMU/EP-2 Zones – City	0	-5	-5	
Units lost in commercial redevelopment	0	-5	-5	
Subtotal - City	350	112	463	
Total - City	1136	873	2009	
Total - UGA	49	274	322	
Grand Total - City and UGA	1185	1147	2331	

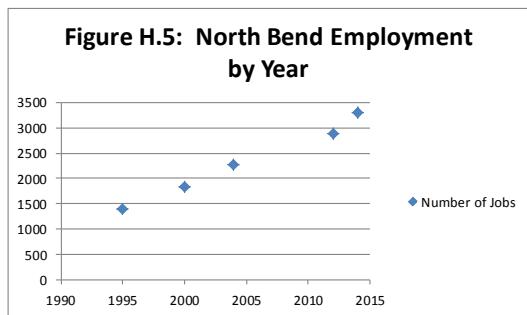
As shown in Table H.4.B, the city has achieved 35% of its target due to the 234 new housing units permitted since 2006. As of May 8, 2015 North Bend has approximately 700 single-family, cottage and multi-family units in the pipeline under review, which means that the City should reach the housing target well ahead of the twenty-five-year projection.

Population projections for City and UGA in 2035 are estimated to be 14,401. This is based on an additional 2,808 units at 2.22 people per renter-occupied household and 2.8 people per owner-occupied household⁴. According to the 2010 Decennial census North Bend is currently at a ratio of 60.8% owner-occupied to 39.2% renter-occupied. Using this ratio it is assumed that the City in 2035 (2,331 units) would have 1,417.248 owner-occupied units and 913.752 renter-occupied units. Using the estimate household size of 2.22 people per renter-occupied and 2.8 people per owner-occupied household, this adds an additional 5,978 people to North Bend's estimated 2010 City and UGA population estimate of 8,423 people, totaling 14,401 people. (Note this does not take into account potential units lost to commercial redevelopment)

Table H.4.B: Residential Capacity to Growth Targets – 2015

Residential Capacity in Relation to Target					
Net New Units: 2006-2015	25 Year Housing Target	Percent Achieved	Remaining Target	Current Capacity (units)	Surplus or (Deficit) in Relation to Target
219	665	33%	446	2,331	1,885

H.5 Job Capacity Analysis and Employment in Relation to Target



The Growth Management Planning Council (GMPC) assigned Job Growth Target for North Bend is 1,050 net new jobs. As shown in Table H.5, the 2015 Comprehensive Plan zoning 2035 analysis found that North Bend has the capacity for 7,092 new jobs within the current City boundaries as of 2015, therefore exceeding both the 2031 and 2035 targets. All potential employment zones are within the current city limits, no employment zones remain within the UGA. Under the current zoning there is surplus of 6,042 jobs for the 2031 employment target and a surplus of 2,689 for the 2035 employment target. A history of North Bend Employment is shown in Figure H.5.⁵

Employment population projections for the City and UGA in 2035 are assumed to be 7,122. The 2010 Decennial US Census Data reports 3,191 persons over the age of 16 are employed in the labor force (the data does not show if employed inside or outside the City, but the average travel time to work is 26.2 minutes,⁶ so it is assumed a large number do not work in North Bend). Assuming 1.4 persons per household over the age of 16 are employed⁷ and 2,808 housing units are added in the planning period, there would be an additional 3,931 employed residents for a total employed population in 2035 of 7,122. The capacity of 7,092 new jobs, in addition to the existing 3,191 jobs (totaling 10,283 jobs), is enough to accommodate the future employment needs of the City in 2035 using current trends.

⁴ Source: 2010 U.S. Decennial Census Data Report.

⁵ PSRC derives the Employment numbers from the Quarterly Census of Employment and Wages (QCEW) that employers report, by law, to the Washington State Employment Security Department.

⁶ Source: 2010 U.S. Decennial Census Data Report

⁷ Number derived from the 2009-2013 American Community Survey (ACS) 5-Year Estimates which reports 3,191 people over 16 years of age to be in the labor force (employed). Taking this number and dividing it by the number of 2,257 estimated households in North Bend (2009–2013 ACS 5-Year Estimates) there are an average 1.4 persons per household, above 16, in the labor force.

Table H.5: Job Capacity 2015

Job Capacity – 2015			
Zoning	Employment Capacity (Jobs) on:		
	Vacant Land	Redevelopable Land	Total
Commercial			
IC – City	489	0	489
IMU – City	331	0	331
Subtotal – City	820	0	820
Industrial			
EP-1 – City	2452	458	2910
EP-2 – City	1377	142	1518
Subtotal - City	3829	600	4428
Mixed-Use			
DC – City	319	34	353
NB – City	553	325	877
EP-1 Tanner Landing Overlay – City	0	183	183
EP-1 Tanner Junction Overlay – City	430	0	430
Subtotal – City	1301	542	1843
Grand Total – City	5950	1142	7092

H.6 Commercial and Industrial Development

As shown in **Table H.6**, North Bend had 15.63 acres developed for commercial and industrial development between 2006 and 2014 (with an achieved floor area ratio (FAR)⁸ of 0.08). This is a 41% decrease from 26.50 acres in 2001 to 2005 (with an achieved FAR of 0.13).

Table H.6: Commercial and Industrial Development Activity 2001-2014

Commercial and Industrial Development Activity:							
Years		Gross Site Area	Constraints	Net Site Area	Net Site Area	Floor Area	Achieved FAR
		Acres	Acres	Acres	Square Feet	Square Feet	Floor Area / Net Site Area in Sq. Ft.
2001 – 2005	Commercial	21.20	14.03	7.17	312,499	59,782	.19
	Industrial (Tanner Electric Substation)	5.30	2.04	3.26	142,006	-	-
	Total Commercial & Industrial Development	26.50	16.07	10.43	454,505	59,782	.13
2006 – 2014	Commercial	11.51	0.0	11.51	501,325	53,563	0.11
	Industrial	4.12	0	4.12	179,467	1,200	0.01
	Total Commercial & Industrial Development	15.63	0	15.63	680,792	54,763	0.08

⁸ A floor area ratio (FAR) is the ratio of a building's total floor area to the size of the piece of land it is built on.

H.7 Commercial and Industrial Land Supply

As shown in Table H.7 after deducting constraints, the City of North Bend has 250 net acres of vacant and redevelopable commercial, industrial, and mixed-use land within the current City boundaries. A market factor is the assumption for the variability of land that will not be on the market at any given time. There is not enough data or a high degree of variability to provide a solid market factor at this time. If a 10% market factor were applied, commercial and industrial land supply would go from 250 total adjusted net acres to 225 total adjusted net acres, a reduction of 25 acres. A 10% market factor is used for this example based on recently development trends observed by the City of North Bend.

Table H.7: Commercial and Industrial Land Supply – 2015						
Land Characteristics	Gross Acres	Deductions		Net Acres	Market Factor %	Adjusted Net Acres
		Critical Area Acres	Public Purpose (ROW, Parks/OS, Utilities) %			
Commercial Vacant	41.865	14.965	20%	21.521	0%	21.521
Commercial Redevelopable	0.000	0.000	20%	0.000	0%	0.000
Industrial Vacant	258.837	56.694	20%	161.715	0%	161.715
Industrial Redevelopable	55.345	24.211	20%	24.909	0%	24.909
Mixed-Use Vacant	65.114	NOTE 1	10–20%	28.951	0%	28.951
Mixed-Use Redevelopable	19.509		0–20%	13.549	0%	13.549
Total: City Current Land Supply	440.670	95.870		250.645		250.645

Note 1

All deductions for Critical Areas, Public Purpose (ROW, Parks, Utilities), and Buildable Areas with a “No Change” assumption have been applied before division into commercial/residential acres. This has been done due to the development assumptions applied in conjunction with North Bend Zoning and Overlay District specifics.

H.8 Future Achieved and Assumed Development

Tables below represent the assumed densities North Bend used to calculate capacity within the current City limits. As shown in Table H.8.A, the LDR zone achieved a higher net density than assumed before the zoning regulations were modified. As shown in Table H.8.B, there has not been significant development to back up the assumed and achieved densities.

Table H.8.A: Assumed Future Residential Densities – 2015

Zoning	Achieved DUs/Acre (net)	Assumed DUs/Acre	Reasons/Documentation for Differences Between Achieved and Assumed DU/Acre
LDR	5.47	4	Majority of development has been in new plats. Zoning regulations have been modified to increase the minimum lot size and average lot size to reduce density. Assumed density is the gross density allowed by the zoning district.
CR	6.6	8	Only 2 projects have received preliminary approval to date, mid-range was chosen for assumptions. A 37 lot project has received preliminary plat approval at 6.43 DU per gross acre density. A 55 lot project has received preliminary plat approval at 6.8 DU per gross acre density.
CLDR	No Activity	2	No Activity.
HDR	No Activity	12	No Activity. No pipeline projects to date.
DC	5.91	16	Minimal Activity. Duplex and single-family units. One mixed-use development in the pipeline.
NB	No Activity	16	No Activity. One 12-unit project in the pipeline.

Table H.8.B: Assumed Future Non-Residential Densities

Zoning	Achieved FAR	Assumed FAR	Reasons/Documentation for Differences Achieved and Assumed FAR
DC (Total)	0.32	1.5	Minimal Activity. Three projects since 2005. FAR is the baseline allowed in the Development Standards regulations.
EP-1	0.01	.40	Minimal Activity. One permit that is not representative of zoning district potential.
EP-2	No Data	0.50	No Activity. Baseline maximum calculated.
IC	0.14	0.35	Minimal Activity that added additional footprint to an existing developed site. Not representative development that is allowed in the zone.
IMU	0.08	0.35	Minimal Activity that added a small % of additional space to the Mountain Valley Center. Binding Site Plan.
NB	0.68	0.75	Minimal Activity – One permit for a two story office building.
POSPF (Total)	0.13	None	No development assumed in this category with the exception of public infrastructure.

H.9 Methodology for Calculation

The following section describes the methodology used to calculate capacity for housing units and jobs.⁹

H.9.A Definition of Vacant and Redevelopable Land (North Bend)

Table H.9 summarizes the technical definitions used by all jurisdictions in the Buildable Lands Program to identify vacant and redevelopable parcels of land. Multiple columns reflect different methods used to screen for redevelopable land. Further detail about the methodologies employed by individual jurisdictions can be obtained by contacting the planning department for King County or the City of North Bend.

Table H.9.A: Definition of Vacant and Redevelopable Land – 2006

Vacant Land	Single-Family Redevelopable	Multi-Family Redevelopable	Mixed-Use Redevelopable	Commercial/Industrial Development
“Vacant” per city LU inventory	Parcel area > 0.5 acres	Existing use is SF residential	% of parcels where existing use is SF residential	All single-family usage goes away

H.9.B Deductions for Critical Areas, ROWs, Public Purposes, and Market Factors (North Bend)

Table H.9.B summarizes the methodology used by most jurisdictions through buildable lands to account for several factors that were assumed to reduce the supply of land that is theoretically developable.

- **Critical areas** includes streams and rivers (ST), wetlands (WL), slopes and slide and erosion hazards (SL), flood hazards (FH), seismic hazards (SM), wildlife habitat (WH), and shorelines (SH). The data was derived from the City Critical Area's map. A GIS overlay analysis was used to deduct the Critical Areas.
- **Future Right-of-Way & Public Purposes** are shown as percentages and are assumptions about the proportion of land, which is not constrained by critical areas that will likely be needed for future rights-of-way and land that will likely be needed for future public uses, such as drainage facilities and parks. For single-family zones a 33% deduction was applied, and for all other zones a 20% deduction was applied.
- **Market Factors** are shown in percentages and are assumptions about the proportion of land, which is not constrained by critical areas and not needed for future ROWs or public purposes, that is not likely to be available for development during the planning period. A zero percent market factor was applied to all zones.

H.9.C Assumed Future Square Feet of Floor Area per Employee (North Bend)

A summary of the assumptions made by the City of North Bend (as shown in Table H.5) about the capability of commercial and industrial space to house future employees:

- 500 to 550 square feet of floor area per employee in the commercial/office use category.
- 400 to 1000 square feet of floor area per employee in the industrial/warehouse use category.

The range indicates that different assumptions were made depending on the zone-based on King County Buildable Lands reporting of what has occurred in the area.

⁹ For additional information refer to the 2014 King County Buildable Lands Report, <http://www.kingcounty.gov/property/permits/codes/2014%20KC%20Buildable%20Lands%20Report.aspx>.

I. DIRECTIONS FOR FUTURE GROWTH

I.1 Urban Growth Area Annexation

The City's UGA offers many opportunities to provide high quality City services to future residents and businesses. Over the next twenty years, the City will entertain a variety of requests for annexation by property owners who value North Bend's services and recognize the need for City utilities and amenities in order to develop or redevelop their properties in an ecologically responsible manner. The purpose of the annexation goals and policies included in this Plan is to establish parameters which facilitate the smooth transition from King County to North Bend jurisdiction when areas within the UGA seek to be annexed by the City.

Annexation of property within the UGA should benefit the City, its residents, and property owners. The City benefits by its ability to hold new development to City standards, to extend its boundary in a logical manner, to expand its economic tax base, and to provide opportunities for new residential development that meet the needs of underserved populations. Property owners and new residents gain the ability to participate in local government, which directly impacts their lives and property. They also gain access to local services including building and land use controls and City water and sewer systems.

Annexation which occurs before an area is ready to develop can overextend and cause inefficiencies in the provision of City services. Annexation can also act as an impetus for establishing urban densities and may encourage development before it is appropriate. Property owners may seek annexation if they can meet the annexation criteria outlined in Chapter 35A.14 RCW, and if they can establish the merit to their proposal to the satisfaction of the City.

When deciding whether to annex areas of the UGA, the City considers:

- the City's ability to provide City services;
- consistency with City population and employment targets;
- achievement of logical, regular boundaries;
- development potential of area to be annexed; and
- identification of existing or potential community.

I.1.a Residential

Additional specific measures will be proposed to ensure consistency of new growth with adopted population and employment targets. To comply with concurrency standards and achieve urban densities, extension of water and sewer would be necessary for all new development in the City. The City evaluates the potential to accommodate new residential development by infilling within the current City limits or on case-by-case basis at the time it is presented with an annexation proposal. Before accepting residential annexation proposals, the City will make a determination if required services have been extended to existing areas of the City in sufficient quantity to accommodate remaining growth targets. If the serviced land has not been created inside the City, the annexation shall be subject to compliance with the policies outlined below and with the annexation criteria in Chapter 35A.14 RCW.

LU - Goal 8: **Develop agreements with King County to apply City-compatible development standards that will guide UGA land development prior to annexation.**

Policies:

- LU - 8.1 *Require that unincorporated land that is adjacent to the City boundary be annexed to the City at the time development is proposed. The extension of City services to an area will not occur without that area first seeking annexation into the City.*
- LU - 8.2 *Consider allowing unincorporated land that is located in the UGA, but is not adjacent to the City boundary and is not practical to annex, to develop subject to compliance with City Comprehensive Plan designations, zoning and other development standards, and impact mitigation requirements.*
- LU - 8.3 *Include an interlocal agreement provision regarding protection of sensitive land areas and environmental reviews, transportation system planning, and design and building permits for projects at specified threshold levels.*
- LU - 8.4 *Pursue interlocal agreements with King County to address issues of potential concern to the City within the Urban Growth Area.*
- LU - 8.5 *Evaluate proposed utility service extensions to ensure that development enabled by the utility extension is consistent with City development standards and policies of the Comprehensive Plan specifically including population and employment growth targets.*

LU - Goal 9: **Annex areas within the Urban Growth Area consistent with the goals and policies of this Plan, the interlocal agreement policies of this Plan, and the general annexation policies listed below.**

Policies:

- LU - 9.1 *Encourage growth and development consistent with the City's ability to provide adequate and efficient services and facilities and the City's desire to maintain high quality service provisions in areas to be annexed.*
- LU - 9.2 *Encourage economic growth consistent with the long-range financial position of the City and its residents in all annexation considerations.*
- LU - 9.3 *Consider the opportunity to promote a healthy mix of residential, commercial, industrial, and parks and open space land uses when areas seek annexation.*
- LU - 9.4 *Work with property owners to preserve the existing neighborhood character and identity consistent with the goals and policies of the Comprehensive Plan in annexation proposals.*
- LU - 9.5 *Provide for urban services within the City's Urban Growth Boundary at time of annexation.*
- LU - 9.6 *Seek to expand the area of annexation proposed when such an expansion is based on natural features, would serve to make the City boundaries more regular, or where the area to be served is a logical extension of City service capabilities and is within the UGA.*



Middle Fork Snoqualmie River at Tanner Landing Park

chapter 2

CRITICAL AREAS ELEMENT

Contents

A. Introduction

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F. Critical Areas Mapping (Figures 2-1 to 2-10)

A. INTRODUCTION

A significant part of the quality of life in North Bend and the Upper Snoqualmie Valley lies in the area's abundance of dominant natural features (see [Figure 2-1 Topography Map](#)). The geology, hydrology, flora and fauna systems characteristic of the area are intricately connected components of the natural environment. A disturbance in one system can have direct or indirect effects on the others, including the human system.

The quality of life experienced by city residents and visitors is directly associated with the quality of the environment. North Bend has historically been attractive to live in because of the high quality natural environment: clean air and water, lush forest areas, and a beautiful physical setting. Protection of these elements is essential if residents are to maintain their healthy lifestyle. Conversely, the contamination or reduction of these resources where people reside and work negatively impacts the quality of life fundamental to the very reasons that people choose to live here.

King County Countywide Planning Policies (CPP) adopted November 2012 and amended December 3, 2012 provide local direction to implement the GMA mandate for protection of critical areas. The full list of CWPP's is available at: <http://www.kingcounty.gov/property/permits/codes/growth/GMPC/CPPs.aspx>. The goals and policies of this element were reviewed and found to be consistent with the CWPP: Environment EN-1 through EN-4, Earth and Habitat EN-6 thru EN-9, Flood Hazards EN-10 thru EN-12, and Water Resources EN-13 thru EN-15.

The overarching Environment Goal of the CWPP is to restore and protect the quality of the natural environment in King County for future generations. The vision for King County 2030 is characterized by Protected Critical Areas providing beneficial functions and values for reducing flooding, protecting water quality, supporting biodiversity, and enriching our quality of life for future generations as the region's population continues to grow.

Together, North Bend's Vision Statement and the King County Countywide Planning Policies (CWPP) guide this Critical Areas Element.

Growth Management Detail

The Growth Management Act calls upon local government to protect the environment and enhance the state's high

quality of life including air and water quality and the availability of water. To implement this goal the GMA required local governments to protect critical areas and ecosystems. In designating and protecting critical areas cities shall include the best available science when preparing policies and development regulations to protect the functions and values of critical areas. In addition, cities shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. Pursuant to GMA wetlands regulated under development regulations shall be delineated in accordance with the wetland manual adopted pursuant to RCW [90.58.380](#).

In addition to the GMA mandate to protect critical areas there are related State mandates to evaluate the impacts of policy decisions or actions that could have a significant impact on the environment under the State Environmental Policy Act (SEPA), to protect the shoreline environment in the Shoreline Management Act (SMA) and various directives to protect surface water and ground water. These state mandates have companion federal mandates to achieve similar goals for federally-funded actions or projects occurring on federal lands. Finally, at the federal level, there is a mandate to protect threatened or endangered species of animals through the Endangered Species Act (ESA). The North Bend area is known as a contributing environment for two threatened species including in the Chinook salmon (water quality and quantity in the Snoqualmie River only) and the Bull Trout, though none have been found in the immediate North Bend area.

The State and Federal environmental protection mandates give clear direction to guide the policy actions the City must take to protect the environment. Natural features which represent limitations to the scope or scale of physical development that can occur within North Bend and its UGA are critical areas which include:

WATER AND RELATED RESOURCES

River and Stream

Corridors

Frequently Flooded Areas

Channel Migration Areas

Wetlands

Aquifer Recharge Areas

Wellhead Protection Areas

FISH AND WILDLIFE HABITAT AREAS

GEOLOGICALLY HAZARDOUS AREAS

Erosion Hazards

Landslide and Steep-Slope Hazards

Seismic Hazard Areas

CA Goal 1: Use Best Available Science (BAS) as defined by the Growth Management Act to define and protect Critical Areas

Policies:

- CA 1.1 *Collect and evaluate BAS to identify the appropriate level of protection for critical areas.*
- CA 1.2 *Recognize limitations on critical area function and value created by existing development and design critical area regulations to provide optimal protection to the remaining higher value critical areas, including areas where high value functions can be restored.*
- CA 1.3 *Utilize the risk assessment method prescribed by the GMA to evaluate the potential impact of not using BAS to protect critical areas where it is determined to be unfeasible to fully protect the functions and values because of existing development patterns.*
- CA 1.4 *Evaluate state and federal protection mandates when developing local critical area protection and land use development regulations.*

While this chapter contains policies intended to protect critical areas in North Bend and influence the protection of areas outside local control, these policies recognize the qualitative differences between various critical areas and the fact that not all areas are constrained for the same reasons. Some are critical because of the hazard they present to public health and safety. Others are critical because of the intrinsic values they represent to the welfare of the North Bend community and/or the region. In some cases, the risk posed to the public, natural system or natural process by the use or development of a critical area can be mitigated or reduced by engineering or site design. In other cases, the risk or impact potential cannot be effectively reduced except by avoiding development within the critical area.

This chapter's intent is to assure long term sustenance of natural features and processes by limiting development in areas where it may interrupt or degrade natural ecological functions and values, subject persons and property to unsafe or hazardous conditions, or affect the perceived quality of life in the North Bend community. Sustainable management of North Bend's environmentally critical areas is considered a high priority action to successfully implement the Comprehensive Plan.

B. WATER AND RELATED RESOURCES

Water is a powerful physical and chemical force, whose movement can shape the form and function of the landscape. Heavy rains typical of the Northwest, and North Bend in particular, can scour out river and stream channels, inundate valley floodplains, and flood wetlands. Soil and loose material picked up in one area is often transported by rivers, streams, and floods and deposited to other parts of the Snoqualmie Valley, and ultimately to Puget Sound. Likewise, chemicals dissolved in rainwater are carried to wetlands, over floodplains and downstream. Both surface runoff and groundwater flows of water may combine to create landslides or other earth movement that further alters the physical environment and poses hazards to people and property.

As development occurs, native vegetation and absorbent top soils are removed, land becomes compacted and paved, and existing site topography is changed. Such landscape changes can alter the way water moves, add to existing hazards associated with natural drainage systems and affect the habitat, recreational, and scenic value of water resources.

B.1 Drainage Basin

The South and Middle Forks of the Snoqualmie River and its tributaries are the dominant watercourses in the North



Creek on Heartland Property

Bend area. Originating from the western slopes of the Cascades, the Middle Fork drains 171 square miles and the South Fork drains 85 square miles for a total of 256 square miles.

B.2 Water Quality and Quantity

In addition to contributing significantly to the area's natural beauty and quality of life, the rivers, streams, and wetlands in the Upper Snoqualmie Valley store, purify, and convey surface waters. Stormwater runoff is a significant contributor to water pollution in urbanized areas. Development of homes, farms, and businesses may result in runoff that pollutes these surface waters and groundwater and threatens habitat, recreation value, and/or drinking water supplies. Sedimentation from ground disturbed by grading, construction, farming, and logging can reduce river or stream channel capacity, fill wetlands, and destroy aquatic life and habitat. Surface water runoff from developed areas can carry pollutants such as oils, heavy metals, fertilizers, and pesticides into streams. Changes caused by development can alter or reduce the quantity of water in the ground, streams and rivers. Protection of both water quality and quantity is important to protect fish habitat and provide adequate supplies of potable drinking water. The City has adopted stormwater management regulations and a stormwater utility to implement state and federal stormwater protection standards. Low impact development approaches for managing stormwater and protecting water quality are a critical component of the stormwater standards.

Regional Groundwater

Protection Planning

Guidance for aquifers notes that the City is required to implement the East King County Ground Water Management Plan per WAC 173-100-120 and directs a series of actions to implement the plans. In April 1990, the Department of Ecology designated East King County, including the North Bend planning area, as Groundwater Management Area No. 14, pursuant to RCW 90.44. The designation authorized King County to develop a Groundwater Management Plan (GWMP) for the area. The GWMP process was overseen by a Groundwater Advisory Committee and included representatives of cities, health agencies, state and federal agencies, and public and special interest groups. The City of North Bend participated as a member of the Advisory Committee.

The first phase of the GWMP process included reviewing technical studies of existing groundwater resources in the area. The U.S. Geological Survey had recently completed a comprehensive inventory of 600-800 wells

in the area was conducted to identify aquifers and other geologic features. Of those wells, approximately 150 were sampled for a variety of water quality data. The East King County Groundwater Advisory Committee continued the monitoring of the technical studies to develop the Groundwater Management Plan. The East King County Ground Water Management Plan was completed by the East King County Ground Water Advisory Committee in December 1998 then subsequently approved by the King County Council and certified by the Washington Department of Ecology in 2000. In 2001, the King County Council has passed an ordinance establishing a new East King County Ground Water Management Committee for three years. The East King County Groundwater Management Committee monitored progress made under the plan, charted out subsequent groundwater protection efforts and reviewed / revised the plan as necessary. The East King County Groundwater Management Committee did not renew their charter within the county code and became inactive by 2005.

Recharge Areas

Susceptibility and Vulnerability

The Growth Management Act requires cities to classify aquifer recharge areas according to vulnerability. Vulnerability is the combined effect of the (1) hydrogeological susceptibility to contamination and (2) the potential for contamination. A highly vulnerable recharge area would be one where land uses could contribute contamination that might degrade groundwater quality, and hydro geologic conditions (e.g. very porous, well drained soils) that facilitate such contamination. Low vulnerability is indicated by land uses that do not contribute contaminants that will degrade groundwater, and susceptibility conditions that do not facilitate degradation.

The susceptibility of a recharge area to contamination is a function of several physical characteristics including but not limited to: depth to groundwater, aquifer properties such as hydraulic conductivity and gradients and soil structure. Factors relevant to the contaminant loading potential side of the vulnerability equation include general land use, waste disposal sites and practices, and agricultural activities.

The potential for contamination includes a number of factors such as the amount of contaminant present, toxicity, mobility and persistence.

Classification, identification and regulation of critical aquifer recharge areas in the North Bend and the

CA Goal 2: Maintain the long-term quality of groundwater resources in North Bend and its growth area by prevention of contamination.

Policies:

- CA 2.1 *Protect critical groundwater recharge and wellhead protection areas, and develop planning and regulatory measures to ensure that groundwater resources are protected from potential pollution.*
- CA 2.2 *The City of North Bend shall implement goals and policies outlined in the East King County Groundwater Management Plan as required per WAC 173-100-120.*
- CA 2.3 *Take corrective action for failing septic systems by requiring failed systems to hook up to the City sewer system consistent with NBMC.*
- CA 2.4 *Require filing with the City of a hazardous materials emergency plan for industries identified as using, transporting, or storing known hazardous materials.*
- CA 2.5 *Continue to work with other governmental agencies to identify and control the use of hazardous materials in aquifer recharge areas and wellhead protection areas.*
- CA 2.6 *Provide education and technical assistance on the use of pesticides and fertilizers to homeowners and businesses in North Bend.*
- CA 2.7 *Implement land use regulations that prohibit uses that pose a significant threat to contamination of a groundwater aquifer in areas defined as high susceptibility wellhead protection and aquifer recharge areas.*
- CA 2.8 *Work cooperatively with State, County and environmental resources to identify and develop strategies to clean up contaminated properties (brownfields) that present a threat to groundwater quality or redevelopment of the contaminated properties.*

surrounding area will be founded on the available technical studies completed by the City of North Bend and Groundwater Protection Program through the East King County Groundwater Management Committee process. See the policies regarding aquifer recharge areas are general concerns relative to long term protection of groundwater resources below.

B.3 Critical Aquifer Recharge Areas

Under the GMA, the City is required to create a Critical Aquifer Recharge Area (CARA) designation and apply city regulations to protect the aquifer consistent with the East King County Ground Water Management Plan.

Groundwater is an important source of domestic water supply for the North Bend planning area. It is contained in underground aquifers and delivered through such means as springs and wells. Most aquifers are replenished, or recharged, by rainwater. Development can threaten the quantity as well as quality of groundwater by contamination and reducing recharge. Preventing contamination is necessary to avoid potential risks to public health, significant costs, and hardship. The quality of groundwater in an aquifer is directly linked to its recharge area. Intensive development can deplete groundwater or seriously threaten groundwater quality if not properly managed. North Bend's ability to identify the potential impacts to groundwater from new or existing development and recommend

CA Goal 3: Protect the natural hydraulic, hydrologic and habitat functions, scenic as well as recreational values of streams.

Policies:

- CA 3.1 *Control the quality and quantity of stormwater runoff to protect natural drainage systems. New development should not increase peak stormwater flows.*
- CA 3.2 *Require mitigation measures on all public improvements and private development which proposes to alter natural drainage systems.*
- CA 3.3 *Insure the implementation of Best Management and Low Impact Development Practices to reduce the impacts of construction and construction-related activities that may affect streams.*
- CA 3.4 *Minimize stream crossings; where authorized, stream crossings should consist of bridges rather than culverts.*
- CA 3.5 *Evaluate state and federal stream habitat protection mandates when developing local critical area protection and land use development regulations.*
- CA 3.6 *Continue to utilize the Department of Ecology Stream Restoration and Culvert Installation or Replacement Guidelines, or a similar comprehensive standard, for projects in the City of North Bend.*
- CA 3.7 *Implement Best Management Practices for the treatment of wastewater that removes the river as the primary and secondary discharge point while accommodating target growth.*
- CA 3.8 *Discharge from the Wastewater Treatment Plant shall meet or exceed Department of Ecology Class A standards.*

mitigating measures depends on the quality of data available on local groundwater resources.

Groundwater management plans have been developed for the county, including the North Bend UGA. The protection of groundwater requires an understanding of (1) the quantity of water replenishing aquifers relative to the quantity being withdrawn from them, and (2) the potential for contamination. These issues are functions of related, but different factors and cannot adequately be addressed by the same designation. The areas highly susceptible to groundwater contamination are shown on Figure 2-4. Wellhead protection studies provide additional information about contamination susceptibility and vulnerability of water purveyor's wells. They also increase understanding of where the wells are being recharged. The City of North Bend will update their Wellhead Protection Plan and Critical Aquifer Recharge Areas as required and necessary.

B.4 River and Stream Corridors

The City of North Bend is located upstream from Snoqualmie Falls, which functions as a barrier to the upstream migration of anadromous fish. However, the Snoqualmie River above Snoqualmie Falls with its three main branches and its many tributaries provide valuable habitat to resident fish species. Figure 2-6 depicts streams within the North Bend Planning Area.

Goal 4: Protect public safety by discouraging development within the river floodway and its natural systems and by preserving the flood storage function of floodplains.

Policies:

- CA 4.1 *Reserve flood hazard areas for less intensive activities such as public open space and recreation. Uses permitted in the regulated flood areas shall not change flood elevation or obstruct or divert the natural flow.*
- CA 4.2 *Support non structural methods for flood prevention and flood damage reduction measures that do not increase upstream or downstream flooding.*
- CA 4.3 *Prohibit construction of permanent structures in the floodway (FEMA).*
- CA 4.4 *Locate roads at grade level and build structures at least one foot above the 100 year flood elevation to maintain existing flood storage capacity where development is allowed in the floodplain.*
- CA 4.5 *Work with the City of Snoqualmie, King County and the Snoqualmie Watershed Forum to establish criteria for joint review of significant projects which may have flood related issues.*
- CA 4.6 *Preserve the natural functions of drainage systems, including vegetation and channel corridors, and control runoff from new development in terms of peak flows, total quantity and location of discharge.*
- CA 4.7 *Review and revise the policies relating to flood protection as necessary for consistency with the North Bend Floodplain Management Plan.*

Natural drainage systems provide important and beneficial functions including storing and regulating stormwater flow, purifying surface water, recharging groundwater, conveying water, providing important aquatic habitat and supporting important biological activities. Alteration of natural drainage systems results in public costs and can disrupt natural processes, leading to environmental degradation including flooding, erosion, sedimentation, and damage to infrastructure, water quality and habitat.

The most effective solution for protecting natural drainage systems and water quality is to control the amount and quality of surface water runoff. New development can be designed to prevent significant runoff and water quality problems, protect the integrity of natural channels, preserve the habitat functions and values of riparian corridors, and maintain the scenic character provided by local watercourses. North Bend Goals and Policies for Regulated Shoreline Environments are contained in the Shoreline Element of the

Comprehensive Plan.

B.5 Frequently Flooded Areas

Flooding is a natural geologic process which has shaped the Upper Snoqualmie Valley, providing habitat for wildlife, and creating rich agricultural lands. Human development often interferes with the natural processes of floodplains, affecting the distribution and timing of drainage and resulting in inconvenience or catastrophe. Flood problems can increase as human activities encroach upon floodplains.

North Bend is located on the floor of the Upper Snoqualmie Valley, upstream of Snoqualmie Falls and near the confluence of the three forks of the Snoqualmie River. Upstream of North Bend and this confluence is a river basin with an area of approximately 256 square miles. A combination of high annual precipitation and melting snow in the Upper Snoqualmie Basin contribute to the potential for significant winter flooding from November through February. Rivers that carry runoff out of the upper basin are constricted downstream and collect



South Fork Snoqualmie River at Bendigo Boulevard N.

on the flat valley floor where North Bend is located. Although incorporated North Bend with its developed areas occupy a very small percentage of the entire river basin, its location on the valley floor close to the outlet of the basin makes it vulnerable to flooding, which can damage residences or other property.

Flooding of lowland areas by excessive stormwater runoff and snowmelt is one of North Bend's most common and costly natural hazards. The built environment also creates localized flooding problems outside of natural floodplains by altering and confining historic drainage channels, thereby reducing their capacity to contain flows. Flooding has been part of the history of North Bend and the entire Snoqualmie Valley. High flow events occurred in 1932, 1933, 1943, 1947, 1951, 1959, 1964, 1975, 1986, 1989, 1990, 1995, and 1996, 2006, 2009, 2011 and 2015 in the Valley. North Bend flood hazard areas are defined by the Federal Emergency Management Agency (FEMA) as those areas subject to inundation by the 100-year flood (i.e. the 100-year floodplain). The 100-year floodplain is that

area that has at least a 1 percent probability of inundation in any given year. Streams, lakes, wetlands, and closed depressions all have floodplains that may also qualify as flood hazard areas. Figure 2-7 depicts flood hazard areas within the North Bend planning area. The goal and related policies of this plan provide guidance in protecting the public from flood hazard and at the same time protect the environment by discouraging development within flood areas. Primary planning policies and implementation measures to reduce the hazards of flooding in North Bend are provided in the North Bend Floodplain Management Plan.

B.6 Channel Migration

The upper Snoqualmie River and its three forks, near the City of North Bend, is one of several rapidly migrating river systems in King County. These rivers have a tendency to move large distances across the floodplain in a short period, sometimes during a single flood. Channel migration hazard areas are not shown on Federal Emergency Management Agency (FEMA) flood insurance maps, which only show areas subject to inundation. The

CA Goal 5: Preserve, protect, restore and enhance wetlands for their hydraulic, ecological, visual and cultural values.

Policies:

- CA 5.1 Encourage no net loss of remaining wetlands acreage, functions and values within the North Bend city limits and it's UGA.*
- CA 5.2 Encourage the creation and restoration of wetlands to increase the quantity and quality of wetlands in North Bend.*
- CA 5.3 Protect and buffer wetland functions from significant human impact.*
- CA 5.4 Allow for and incorporate public access to wetlands in development plans when the city determines such access will not degrade the resource and is desirable for establishing interpretive facilities and/or providing links to existing or proposed parks, open space or scenic areas.*
- CA 5.5 Maintain the natural hydrology to wetlands while identifying methods to remove potentially harmful contaminants from stormwater discharge.*
- CA 5.6 Promote the use of property tax reductions, conservation easements and other techniques as incentives to preserve wetlands as a public benefit.*
- CA 5.7 Mitigation projects requiring the replacement of wetlands functions and values should, when feasible, contribute to existing wetland system or restore an area that was historically a wetland. Wetland mitigation banking within our watershed may be allowed.*
- CA 5.8 Design critical area regulations to recognize limitations on wetland function, value and habitat created by existing development and focus greater protection to the remaining higher value wetland habitat areas.*
- CA 5.9 Evaluate the effect of state and federal wetland protection mandates when developing local critical area protection and land use development regulations.*

FEMA maps are used by regulatory agencies, landowners, and developers to determine where development can be allowed along rivers. The City of North Bend has approved zoning for potential residential development in accordance with flood insurance maps in areas where a change of river course has been mapped by King County. In many cases, landowners buy the property with little awareness of the potential hazard from bank erosion. An additional complication arises because FEMA maps are based on fixed base hydraulic analyses. Because of channel migration, the floodplain and floodway boundaries shown on the maps are in some cases only reliable for short periods after the maps are completed.

King County's historic approach to bank erosion problems has been to try to control rivers through extensive construction of levees and revetments. However, few new projects of this type have been built since the 1970's, due to lack of funds and the adverse effects of these projects on flooding and aquatic habitat. Projects that have been constructed more recently tend to protect specific small areas such as roads or houses. Levees and revetments are expensive to build and maintain, can aggravate flooding or erosion problems off-site, and are subject to failure due to

channel migration upstream or downstream from the project. Traditional rock levees and revetments have degraded in-stream and riparian habitats by eliminating side channels and riparian vegetation and reducing recruitment of gravels and woody debris into rivers. In order to regulate development in hazardous zones along rapidly migrating rivers, the King County Flood Hazard Reduction Plan recommended conducting channel migration hazard mapping and studies. The 1996 report on Channel Migration in the Three Forks of the Snoqualmie River report is a result of such a study. The study includes a determination of historic limits and rates of channel migration, estimation of probable future limits of channel migration, and development of maps that show channel migration hazard zones. Hazard maps produced by these studies have been adopted by King County to use in regulating development under the Critical Areas Code.

The Three Forks of the Snoqualmie River report covers the upper Snoqualmie River mainstream from Snoqualmie Falls upstream to the confluence of the three river forks of the Snoqualmie, and each river fork upstream to a stable section of the channel. Within the study area, levees, and revetments (rock-armored banks) are discontinuous and subject to damage by channel migration upstream or downstream of the armored site. On the South Fork Snoqualmie River upstream from the Burlington Northern right-of-way in North Bend, channel migration has been effectively prevented for 30 years by channelization of the river between narrowly spaced levees. Although the levee system requires frequent maintenance due to toe scour (Shannon & Wilson, 1993; King County, 1993), the channel is not expected to migrate outside the levees on this part of the South Fork. Little channel migration occurs on the north Fork upstream from Ernie's Grove or on the Middle Fork upstream from Tanner, where the channels are relatively steep and stable. However, downstream from Tanner on the Middle Fork and north of the Snoqualmie Valley Trail (old Milwaukee railroad) on the South Fork, the river has potential to migrate in conjunction with a flood event placing portions of the Silver Creek Neighborhood at risk for an avulsion channel migration.

CMZs refer to a river's likely lateral movement, based on evidence of active movement over the past. North Bend's CMZs have been mapped by King County depicting areas of potential, moderate and severe hazard for channel migration. The goal and related policies of this plan provide guidance in protecting the public from flood

hazard and at the same time protect the environment by discouraging development within flood prone areas, including channel migration or avulsion areas. Figure 2-3 in the Comprehensive Plan shows the North Bend UGA River Channel Migration Hazards.

B.7 Wetlands

Wetlands are defined as those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, bogs, and similar areas. They occur both in association with rivers, streams, lakes or ponds, and as isolated wetlands which exist due to saturated soil conditions. Wetlands are classified into various types. Each type has its own characteristics and related development constraints. Wetlands located in the 100 year floodplain are part of the "shoreline" environment regulated under the State Shoreline Management Act and also receive Federal protection from the US Army Corps of Engineers.

Historical Wetland Detail

Wetlands are a valuable natural resource, which serve many important ecological and social functions. Wetlands are among the most productive biological systems for they provide important habitat for fish and wildlife, including essential nesting, feeding, breeding, and hiding places. Because of the rich biological environment they contain, wetlands provide unique educational and scientific research opportunities. An important quality of wetlands is their value as a scenic resource, providing pleasant visual contrast to manage forest uplands, agricultural lands, and developed areas. In addition, wetlands provide recreational and educational opportunities. Wetlands also improve water quality by filtering out sediments, excess nutrients, and toxic chemicals. They can support agricultural activities and provide a rearing habitat for fish. Wetland vegetation can help stabilize shorelines and effectively reduce stream bank erosion from river currents. In many cases, wetlands help recharge groundwater supplies and maintain stream flows. Finally, they play an important role in flood reduction by slowing and storing flood waters.

Wetland preservation and protection can significantly reduce public and private costs associated with downstream flooding, poor water quality, and diminishing wildlife habitat. North Bend has recognized the value of natural wetlands. The city has mapped probable wetland

CA Goal 6: Strive to protect and enhance wildlife habitat areas within the City and its UGA.

Policies:

- CA 6.1 *Work with the state and county to identify, protect, and enhance important wildlife corridors within North Bend and its surrounding area to create a network of wildlife corridors which link habitat areas together to encourage the natural movement of plant and animal species.*
- CA 6.2 *Encourage community involvement and education in the creation, enhancement, management, interpretation and enjoyment of wildlife habitat areas.*
- CA 6.3 *Encourage access to sites of wildlife interest when not in conflict with wildlife protection goals.*
- CA 6.4 *Support and encourage the development of nature conservation programs within the Snoqualmie Valley School District.*
- CA 6.5 *Work with other agencies to develop a comprehensive fish and wildlife habitat and management plan for North Bend and its UGA.*
- CA 6.6 *Work with the Snoqualmie Watershed Forum and other stakeholders to develop and implement measure to preserve and restore "threatened" fish populations in the Snoqualmie Watershed including the Chinook salmon via the Near Term Action Agenda for Chinook salmon and the Chinook Salmon Conservation Plan as applicable.*
- CA 6.7 *Apply for restoration grants to ensure that the quality of the natural environment and its contribution to human health and vitality are sustained now and for future generations.*

areas within the planning area using a 1991 survey of "potential wetlands" using aerial photography and U.S. Soil Conservation Service Soil Survey maps, site specific data from projects on delineated wetlands, and the King County mapped wetlands. *Figure 2-5* depicts wetland resource areas within the North Bend planning area. Since the scale of this map does not allow the depiction of all wetlands, the North Bend Wetlands Inventory Map should be consulted for additional detail.

C. FISH AND WILDLIFE HABITAT

The natural environment plays an important role in the health of the entire ecosystem and the overall high quality of life found in North Bend. The preservation of critical areas for habitat use is critical in sustaining wildlife and in retaining the City's rural character. Wildlife habitat areas associated with streams (Figure 2-2), wetlands (Figure 2-5) and their buffers can be protected by regulations and enhanced by innovative and critical site design. The

preservation of wildlife habitat and priority species with jurisdictional goals, policies, and regulations is mandated by the Growth Management Act. The development of the Critical Areas plan element for the protection and integration of wildlife habitat in the City of North Bend relates to various issues in regard to wildlife and its recognized importance to the city and its citizens. This plan includes goals and policies to provide guidance for integrating the needs of wildlife and protecting wildlife habitat as well as respecting property owner's rights.

C.1 Regional and National Environmental Compliance

The City of North Bend works closely with federal and state agencies, cities, and other counties to integrate and streamline compliance with federal mandates like the Clean Water Act, Clean Air Act, and Endangered Species Act (ESA). The City will also work with the Snoqualmie Watershed Forum and the Puget Sound Partnership to define and implement measures to protect habitats identified by WDFW. Programmatic actions taken in

CA Goal 7: Protect people, property, water quality and habitat from the negative effects of accelerated erosion and sedimentation.

Policies:

- CA 7.1 *Work with property owners to restore vegetative cover and natural drainage features on identified degraded sites where degradation has led to accelerated erosion and sedimentation.*
- CA 7.2 *Work with the County to restrict the scope and scale of development in erosion hazard areas which impact the City and its growth area.*
- CA 7.3 *Seek to retain as open space those areas where the soils have been identified as having severe or very severe erosion potential.*
- CA 7.4 *Minimize grading and require the restoration of native vegetation on development sites which are known to have a high probability of erosion.*
- CA 7.5 *Ensure the implementation of Best Management Practices to reduce the impacts of construction and construction-related activities.*
- CA 7.6 *Ensure usage of proper sedimentation controls and staged clearing and grading to minimize impacts to soil, understory vegetation or downslope conditions through permits and inspections of development sites.*

conjunction with the Watershed Forum to date include, development of the Near Term Action Agenda (NTAA) to protect Chinook Salmon, participation in development of the Long Term Salmon Conservation Plan for Chinook Salmon completed in 2004 and development of the joint Model Critical Area Protection Ordinance to incorporate the applicable recommendations of the NTAA and "Best Available Science" as defined by the GMA. Capital projects to date include acquisition and restoration of significant critical areas on the Tollgate and Meadowbrook Farms. Storm drainage projects outlined in the Capital Improvement Plan will improve storm drainage, water quality and habitat. The Puget Sound Partnership was created by the Washington State Legislature and Governor in July 2007 to achieve the recovery of the Puget Sound ecosystem by the year 2020. The Partnership's goal is to consolidate and significantly strengthen the federal, state, local, and private efforts undertaken to date to protect and restore the health of Puget Sound and its watersheds.

D. GEOLOGICALLY HAZARDOUS AREAS

Geologically hazardous areas are lands which are susceptible to hazards associated with underlying soils and geology. These include areas characterized by steep slopes, landslides, seismic hazards, and erosion. A number of geologic hazards exist within the vicinity of North Bend. For example, landslide and erosion hazards are common in hillside areas with steep and unstable slopes. In addition, these lands are at great risk in the event of an earthquake. Regulations include, at a minimum, provisions for vegetation retention, seasonal clearing and grading limits, setbacks, and drainage and erosion controls.

To address geologic hazards jurisdictions shall regulate development on lands with:

- a. Slopes with a grade greater than 40 percent;
- b. Severe landslide hazard areas;
- c. Erosion hazard areas;
- d. Mine hazard areas; and
- e. Seismic hazards.

CA Goal 8: Protect people and property from the risk and negative effects of unstable slopes and landslide hazards.

Policies:

- CA 8.1 Encourage use of landslide hazard areas and their alluvial fans as open space and maintain such sites in their natural condition, including preservation of vegetation.*
- CA 8.2 Permit developments in landslide hazard areas only if it can be shown that the development will not decrease slope stability, or the hazard can be eliminated or mitigated.*
- CA 8.3 Seek to retain areas with slopes in excess of 40 percent as open space areas in order to protect against geologic hazards.*
- CA 8.4 Work with the County in order to restrict development in landslide hazard areas and their flow paths.*

D.1 Erosion Hazards

Erosion is a natural process of the wearing away of land surfaces by water, wind and ice. While erosion and sedimentation are natural processes at work in the landscape, they are frequently accelerated by land use modifications and urban development.

The susceptibility of soil to surface erosion depends on its physical and chemical characteristics, slope, vegetative cover, the intensity of rainfall, and runoff velocity. Eroded material is moved by surface flows and deposited elsewhere as sediment. The negative effects of increased sedimentation are most pronounced where erosion of soils is connected to the surface drainage network. Through sedimentation, soil erosion can result in degradation of surface water quality and/or aquatic habitats.

Figure 2-10, Erosion and Debris Flow, depicts areas of potential landslide hazard within North Bend and its surrounding area. The map shows areas where soils are particularly susceptible to increased erosion as a result of development. It is important to note that while the map does not show any areas within the city which are characterized by erosion hazards, these conditions do exist here on a site specific or local scale. Soils mapped include those which may experience severe to very severe erosion (soil particle movement) according to the USDA

Soil Conservation Service. This definition is consistent with erosion hazard areas as designated in the King County Critical Areas Ordinance and meets the minimum guidelines for erosion hazard areas outlined in the Growth Management Act.

D.2 Landslide and Steep Slopes Hazard Areas

The identification of areas susceptible to landslides is necessary for informed land use planning and to support land development regulations which reduce the risk of property damage, personal injury, and environmental degradation. Landslide hazard areas lie principally outside the existing city limits but are evident in areas surrounding the City. Landslide flow paths however can directly impact the incorporated city. Landslide hazard areas are defined by alternate or co-existing landscape conditions, which are based on well-established geotechnical determinations of slope stability and considerable experience and research in the Puget Sound area. Earthquakes in the past have caused large rocks and boulders to fall from Mt. Si in 1949 and 2008.

The stability of slopes in landslide hazard areas is highly dependent on the water content of the underlying soils. Water readily percolates through sand and gravel, but ponds above less permeable silt, clay and till layers, thus saturating the overlying deposits. Where a less permeable layer (silt or clay) intersects a slope, water often seeps from the layers above. This combination of

CA Goal 9: North Bend should seek to diminish the risks to human life and property associated with earthquake activity in the Puget Sound Region.

Policies:

- CA 9.1 *Maintain and enforce the latest seismic standards within the City's building codes.*
- CA 9.2 *Work with the County to develop informational materials for property owners and occupants about seismic hazards.*
- CA 9.3 *Require additional setbacks for new buildings which lie below steep hillsides critical to earthquake related subsidence, rockfall hazards or which lie in the path of potential landslides.*
- CA 9.4 *Maintain and update the City of North Bend's disaster emergency response plan.*



CA Goal 10: Strive for the best available solutions to air quality and other environmental issues.*Policies:*

- CA 10.1 Adopt local regulations to require compliance with applicable state and federal standards for installation and operation of woodstoves and fireplaces.*
- CA 10.2 Improve air quality by supporting transportation modes that reduce reliance on Single Occupancy Vehicles (SOVs).*
- CA 10.3 Work to support and promote public information strategies that focus on air quality issues and identifies measures that each person can take to improve air quality.*
- CA 10.4 Continue to provide yard waste recycling and collection events as an alternatives to open burning.*
- CA 10.5 Develop and implement idling measures that reduce or prohibit the idling of vehicles, consistent with Objective 2.1 in the Transportation Element and its underlying policies.*

sedimentary deposits, topography, and local groundwater flow results in a high potential for landslides. An event that increases groundwater levels and flow, such as a rain storm or discharge of surface water above a slope, can saturate sediments near the surface and cause failure of a slope that is stable under dryer conditions. Likewise, erosion along a stream channel can steepen a slope or expose deposits which may become water saturated, increasing the potential for landslides on a previously stable slope.

Most landslide hazard areas outside of the City of North Bend involve a few feet of relatively loose soil on slopes underlain by denser and typically less permeable till or bedrock. All areas with surface soils underlain with relatively impermeable soils on slopes of 15 percent or greater and with drainage from topographically higher areas, and all areas with steep slopes greater than 40 percent (except consolidated rock), are depicted in Figure 2-10, Erosion and Debris Flow and Figure 2-9 Liquefaction Susceptibility. These unstable slopes represent a major hazard to people and structures and have limited development potential. The plan's goal and policies provide guidance in decreasing the hazards of developing within landslide hazard and steep slope areas.

D.3 Seismic Hazards

Seismic hazard areas are defined as those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or soil liquefaction. Loose, water saturated soils tend to experience the most severe ground shaking during an earthquake. When shaken by an earthquake, such soils lose their ability to support a load; some soils will actually flow like a fluid. Loss of soil strength can result in failure of the ground surface (settlement, surface cracking, and landslides) and damage to structures. Most of the floor of the upper Snoqualmie Valley has been identified as a seismic hazard area (See Figure 2-8).

Since the entire valley floor is a seismic hazard area it is unreasonable to restrict remaining undeveloped valley properties to agricultural or open space uses for seismic safety purposes. However, land use planning strategies and building code regulations can be used to reduce the health and safety risk due to seismic hazards in hillside areas where landslides and rock fall are possible. It is essential for the City to include an earthquake disaster response plan as part of the emergency response plan.

This plan would designate specific responsibilities to various city officials in the event a significant earthquake occurs and would outline the relationship between the City's disaster preparedness plan and other jurisdictional disaster

CA Goal 11: Maintain Critical Area Base Maps.

Policies:

- CA 11.1 Use Best Available Science (BAS) as defined by the Growth Management Act to define and protect Critical Areas*
- CA 11.2 Collect and evaluate BAS to identify the appropriate level of protection for critical areas.*
- CA 11.3 Recognize limitations on critical area function and value created by existing development and design critical area regulations to provide optimal protection to the remaining higher value critical areas, including areas where high value functions can be restored.*
- CA 11.4 Utilize the risk assessment method prescribed by the GMA to evaluate the potential impact of not using BAS to protect critical areas where it is determined to be unfeasible to fully protect the functions and values because of existing development patterns.*

response plans. The plan is currently being developed by the City and should also identify particularly hazardous buildings so damage response teams know where the most likely locations for structural failure and casualties.

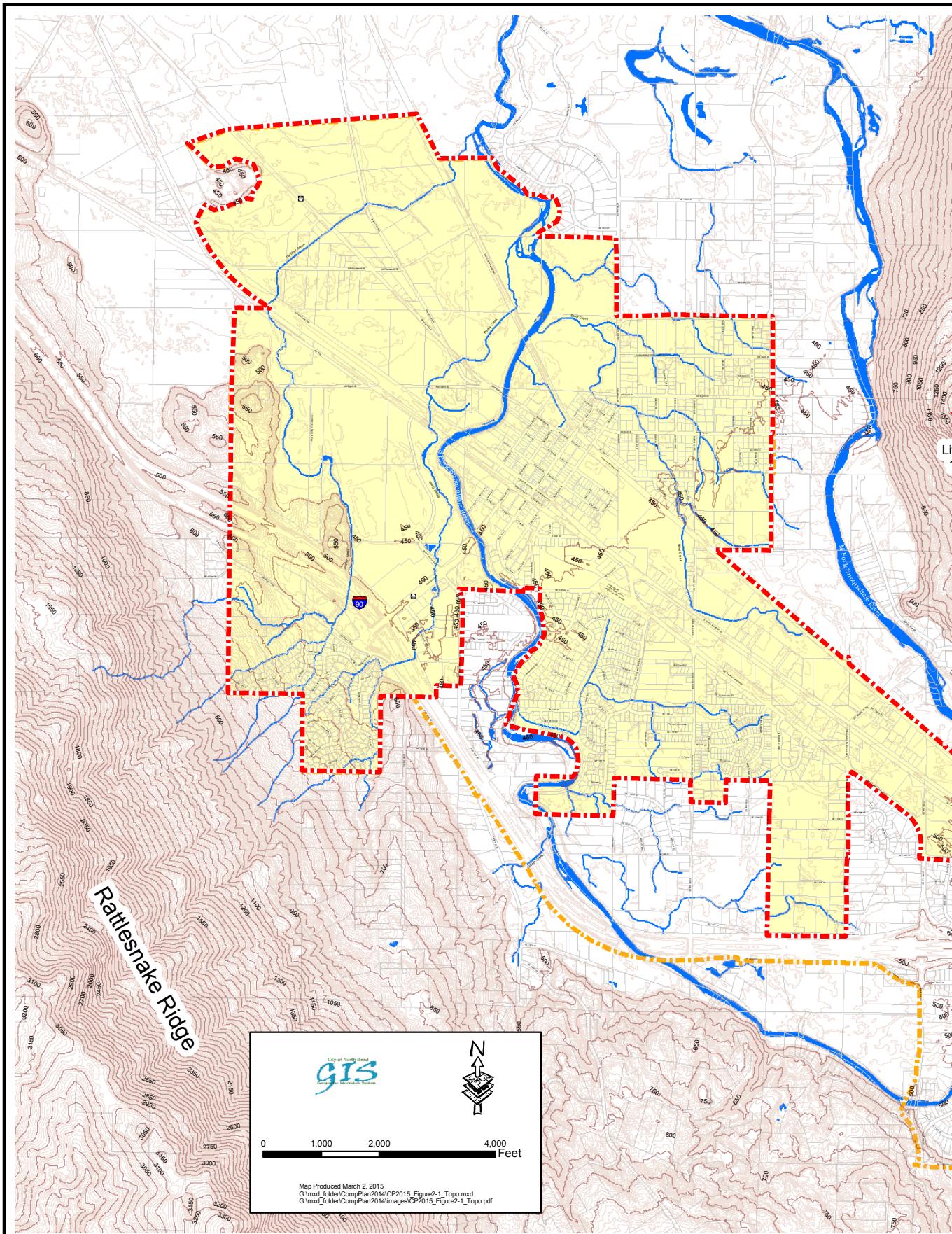
E. AIR QUALITY AND OTHER ENVIRONMENTAL ISSUES

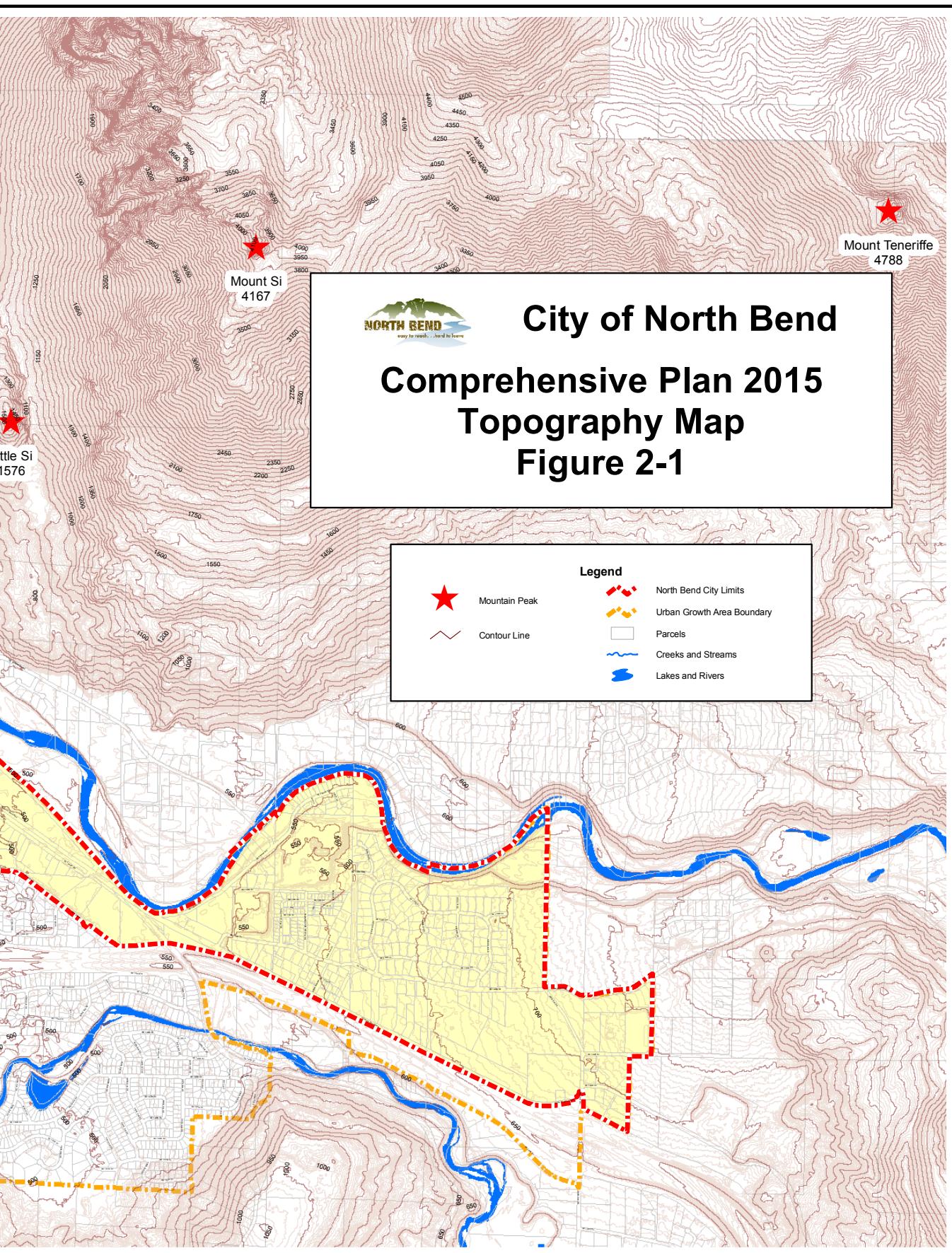
Quality of life is affected by environmental issues such as noise or light pollution. The city can work with its citizens and other governmental agencies to solve these issues.

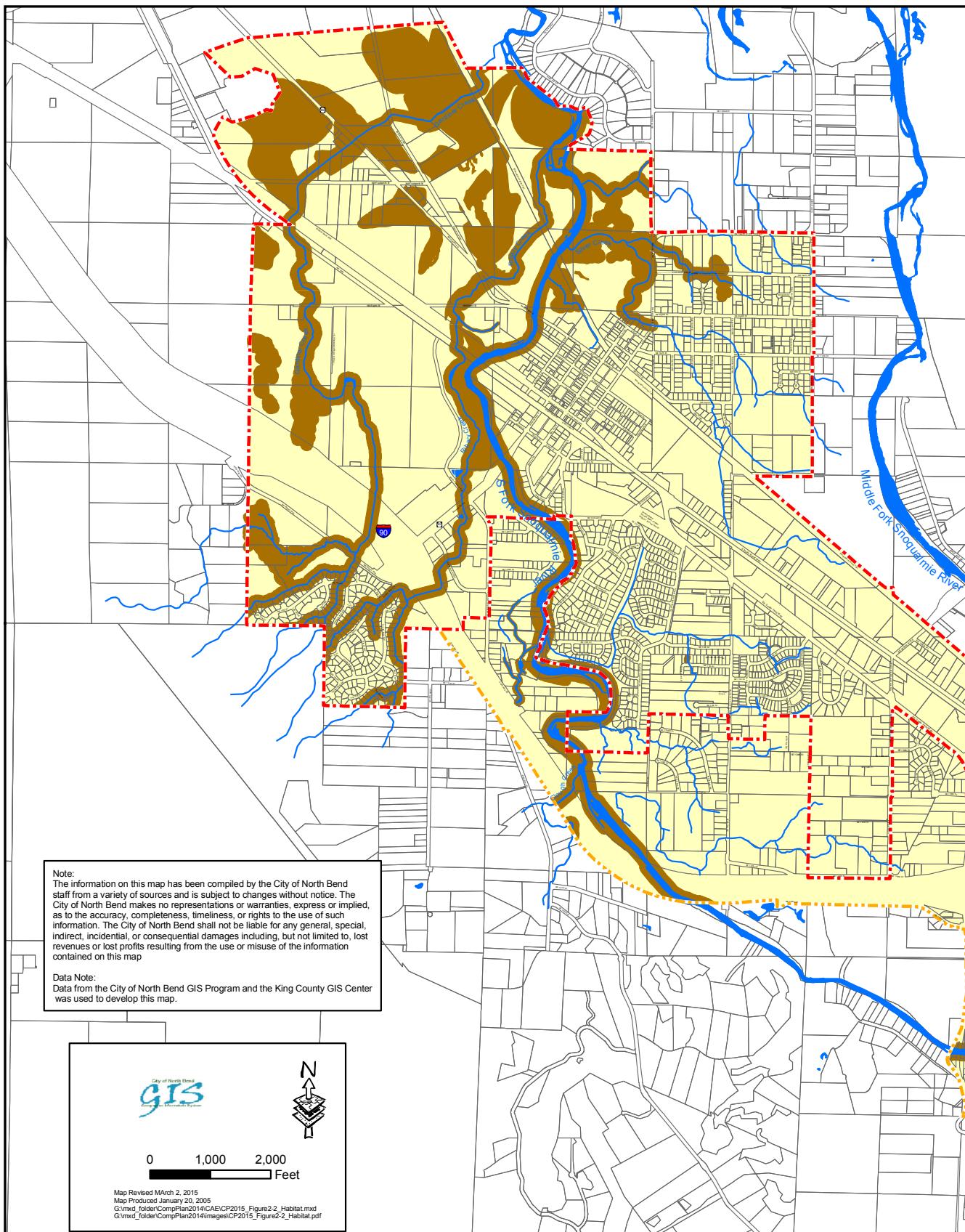
Air quality is addressed by development of policies, methodologies and standards that promote regional air quality, in coordination with the Puget Sound Air Pollution Control Agency and the Puget Sound Regional Council.

F. CRITICAL AREAS MAPPING

The Critical Area mapping found in this element includes those areas within North Bend and its UGA that are defined as: (1) floodways, (2) channel migratory areas, (3) streams and associated buffers, and (4) wetlands and associated buffers. Critical Aquifer Recharge Areas and Seismic Hazards Areas are stand-alone maps because both areas completely encompass North Bend and its UGA. The purpose of these maps is to identify the potential boundaries of the environmentally critical areas that present severe constraints to development.



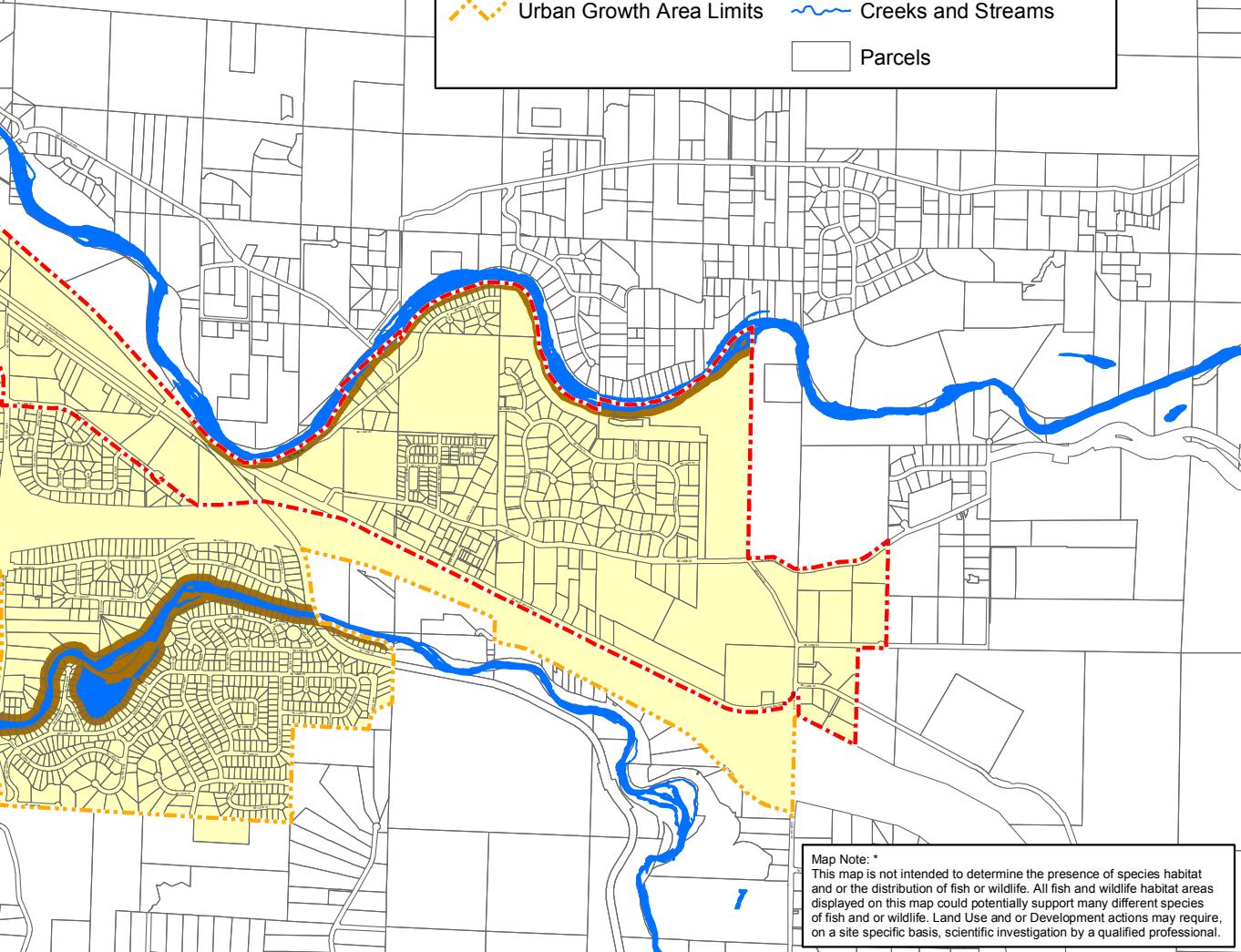




 **City of North Bend**
Comprehensive Plan 2015
Fish and Wildlife Habitat* Map
Figure 2-2

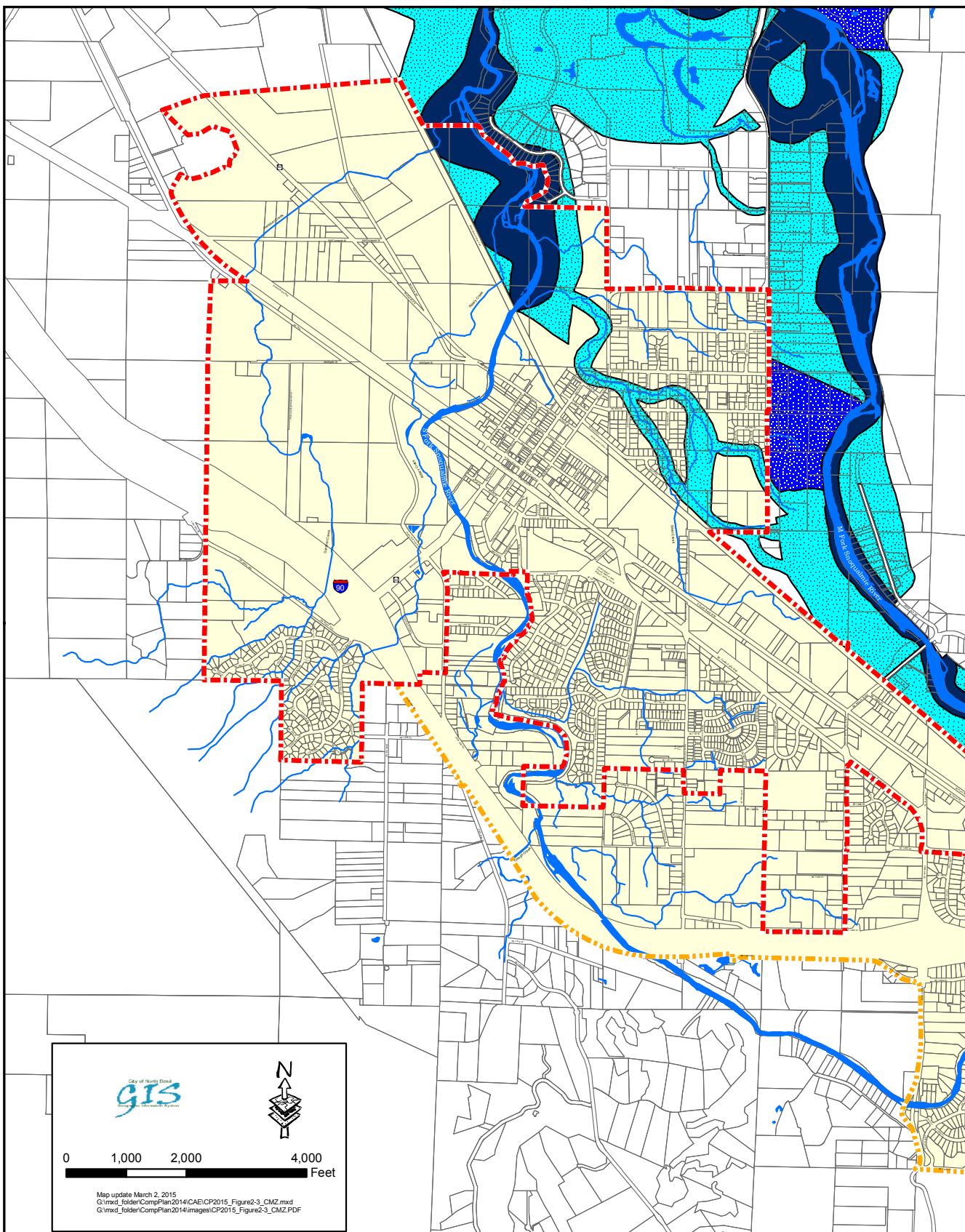
Legend

-  Fish & Wildlife Habitat *
-  North Bend City Limits
-  Urban Growth Area Limits
-  Lakes and Rivers
-  Creeks and Streams
-  Parcels

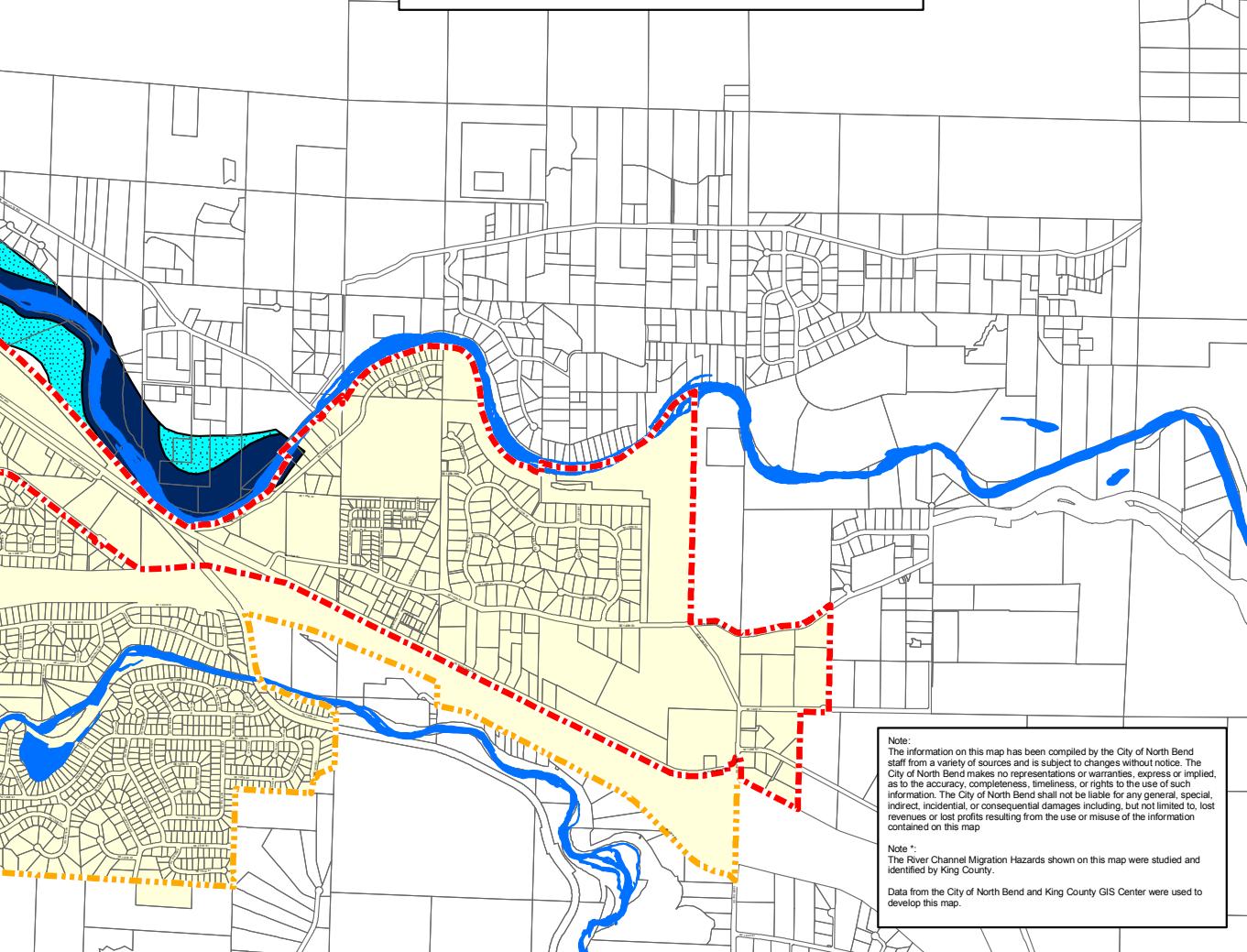
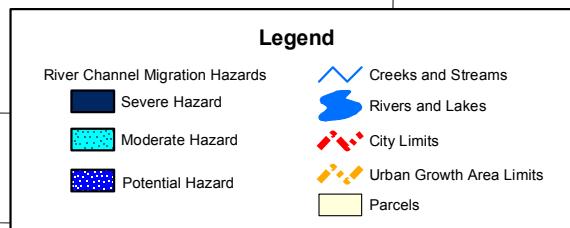


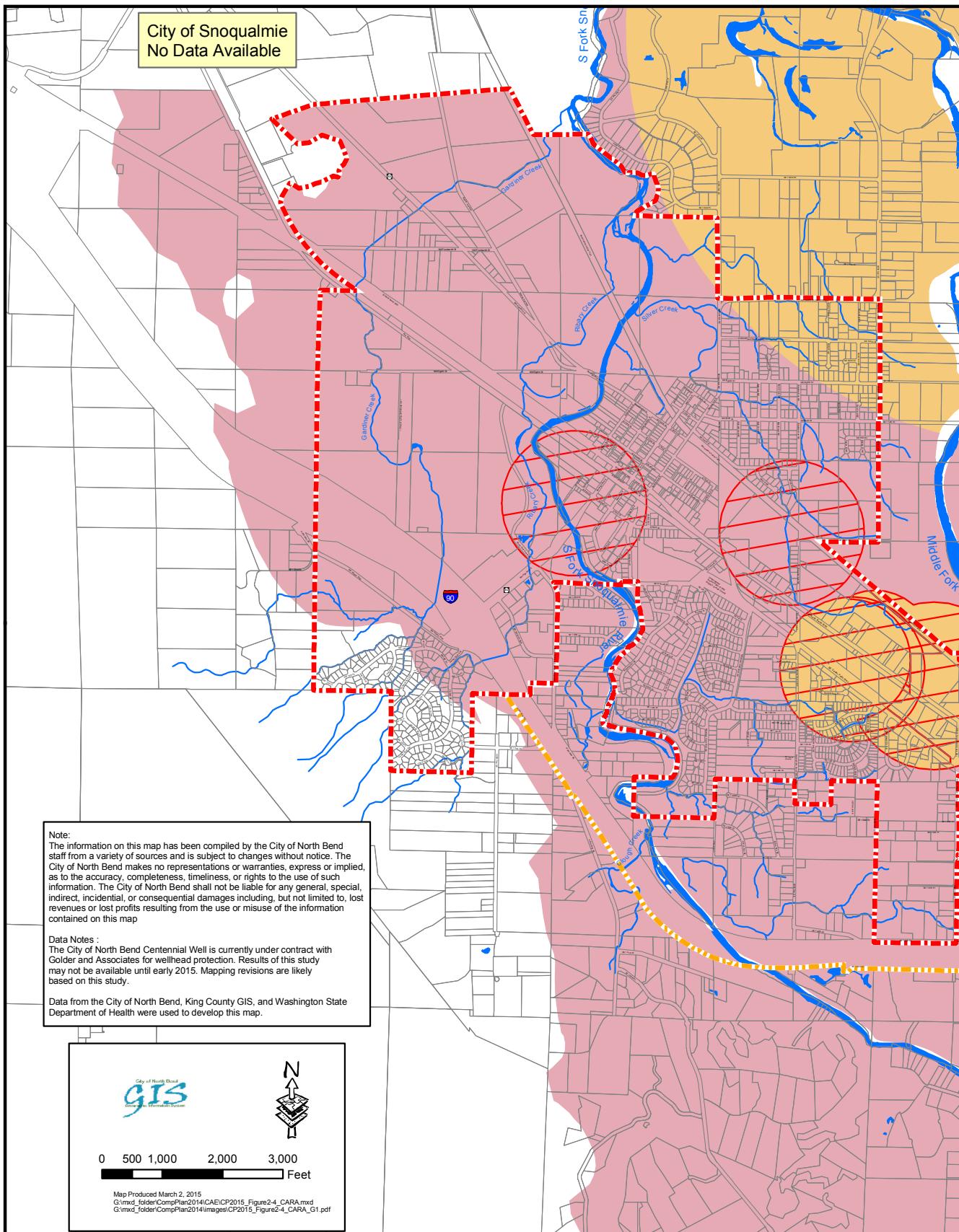
Map Note: *

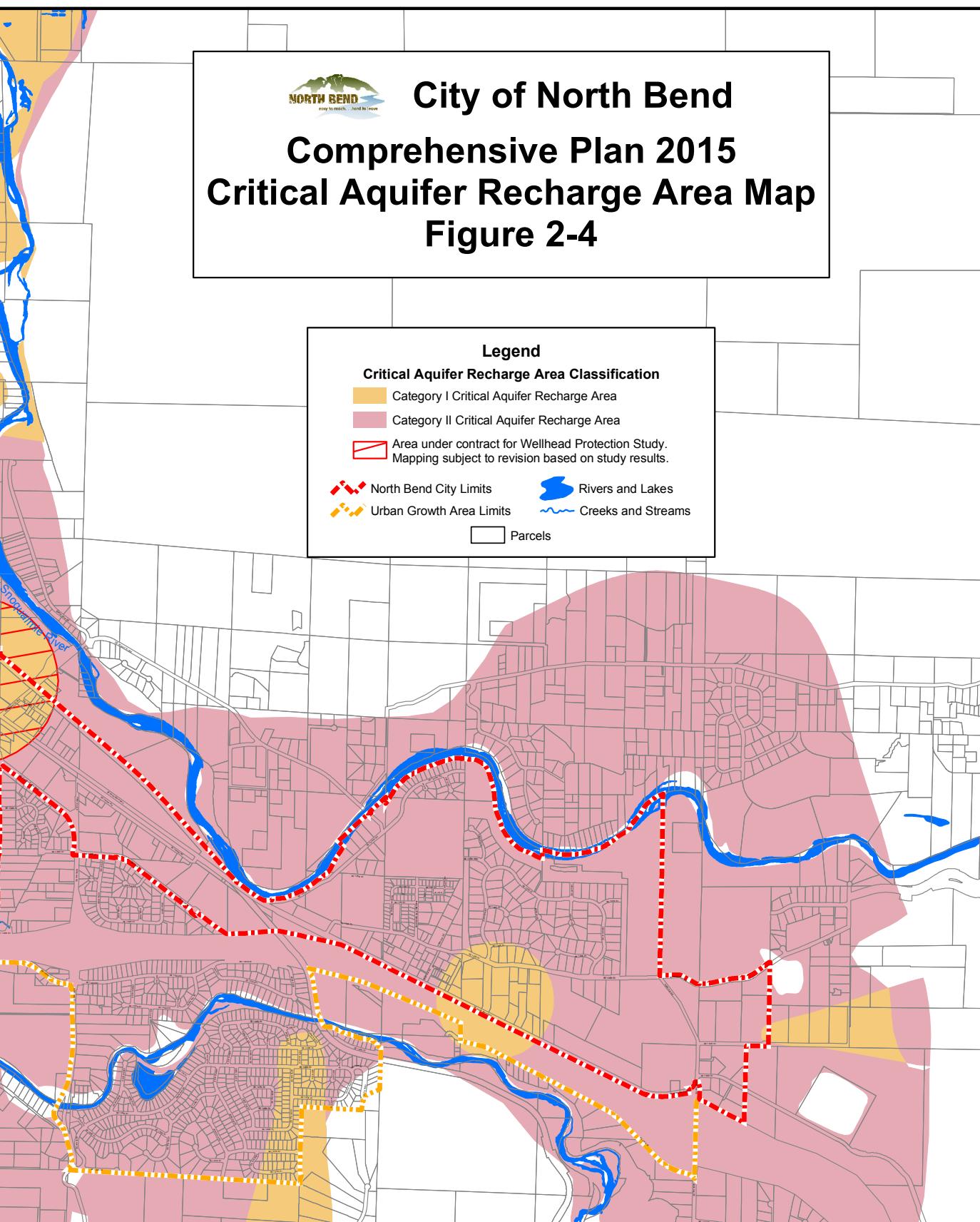
This map is not intended to determine the presence of species habitat and or the distribution of fish or wildlife. All fish and wildlife habitat areas displayed on this map could potentially support many different species of fish and or wildlife. Land Use and or Development actions may require, on a site specific basis, scientific investigation by a qualified professional.

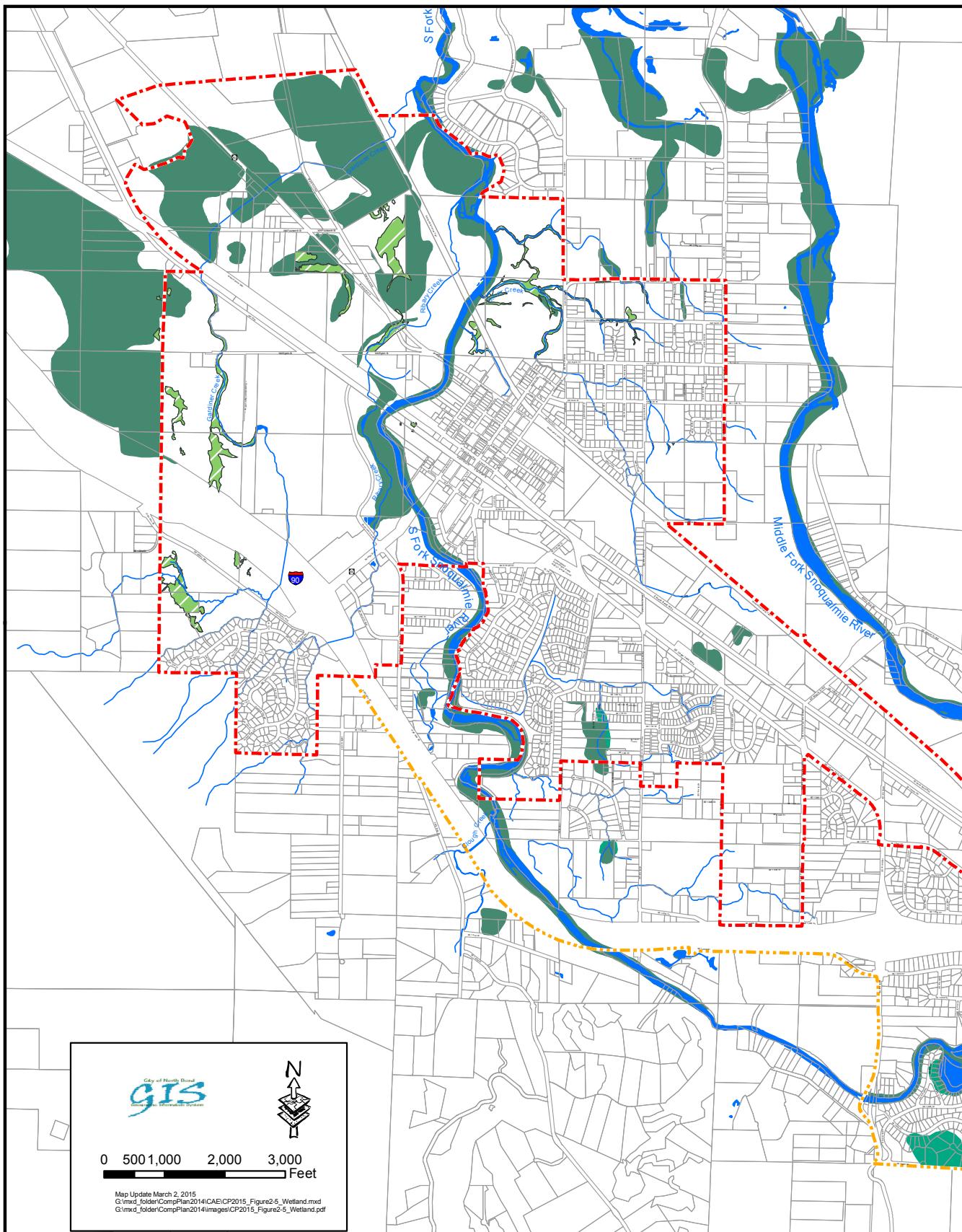


 **City of North Bend**
Comprehensive Plan 2015
River Channel Migration Hazard (CMZ) Map*
Figure 2-3









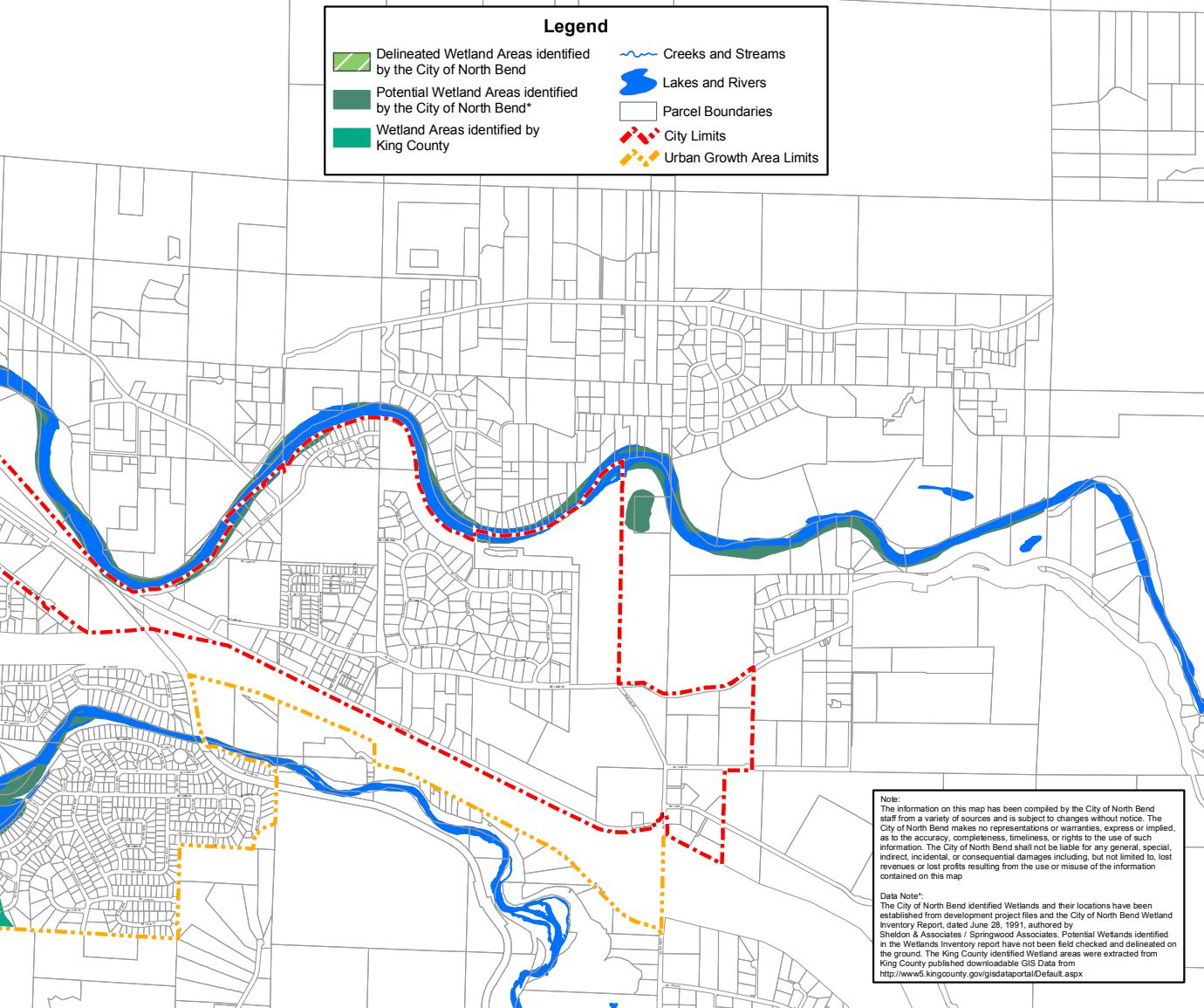
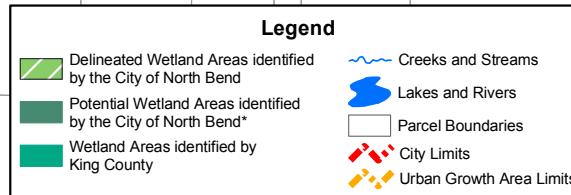


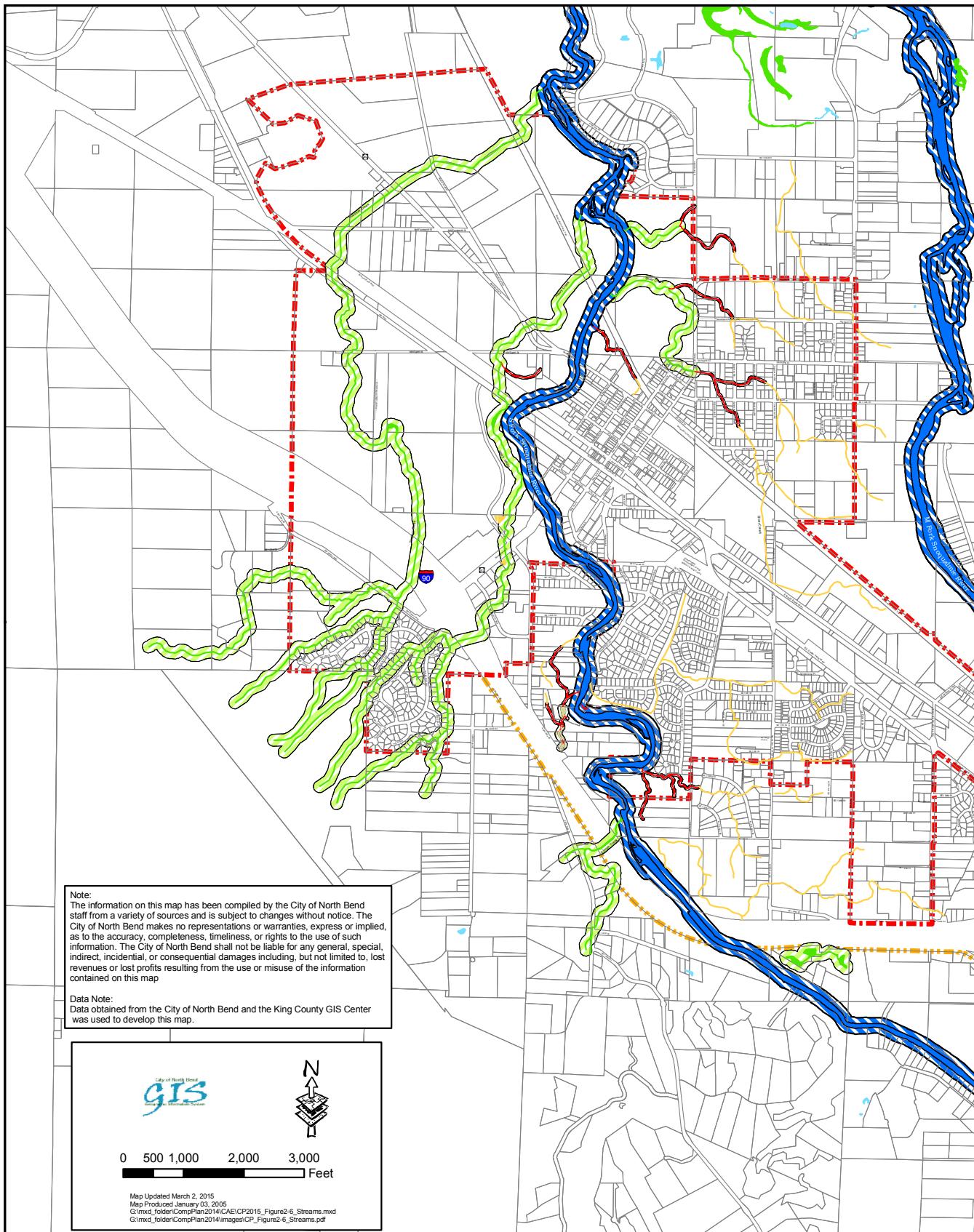
City of North Bend

Comprehensive Plan 2015

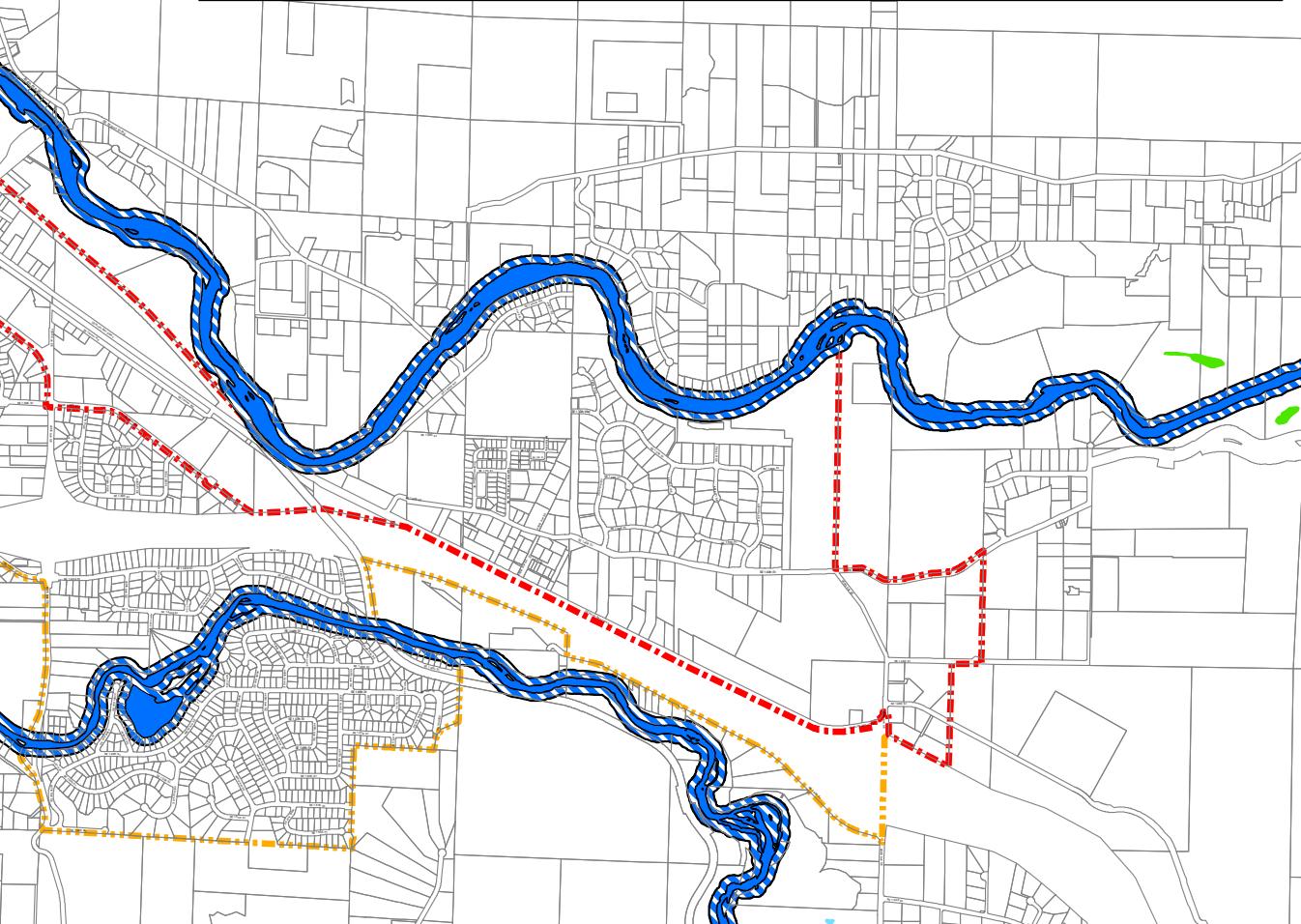
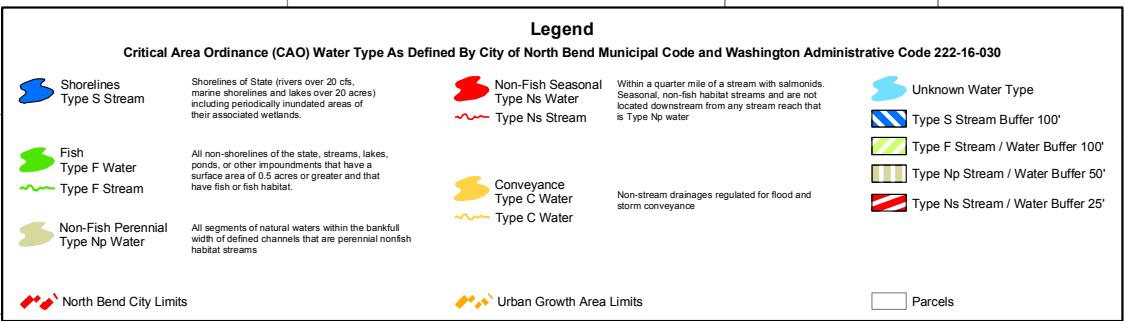
Wetland Area Map

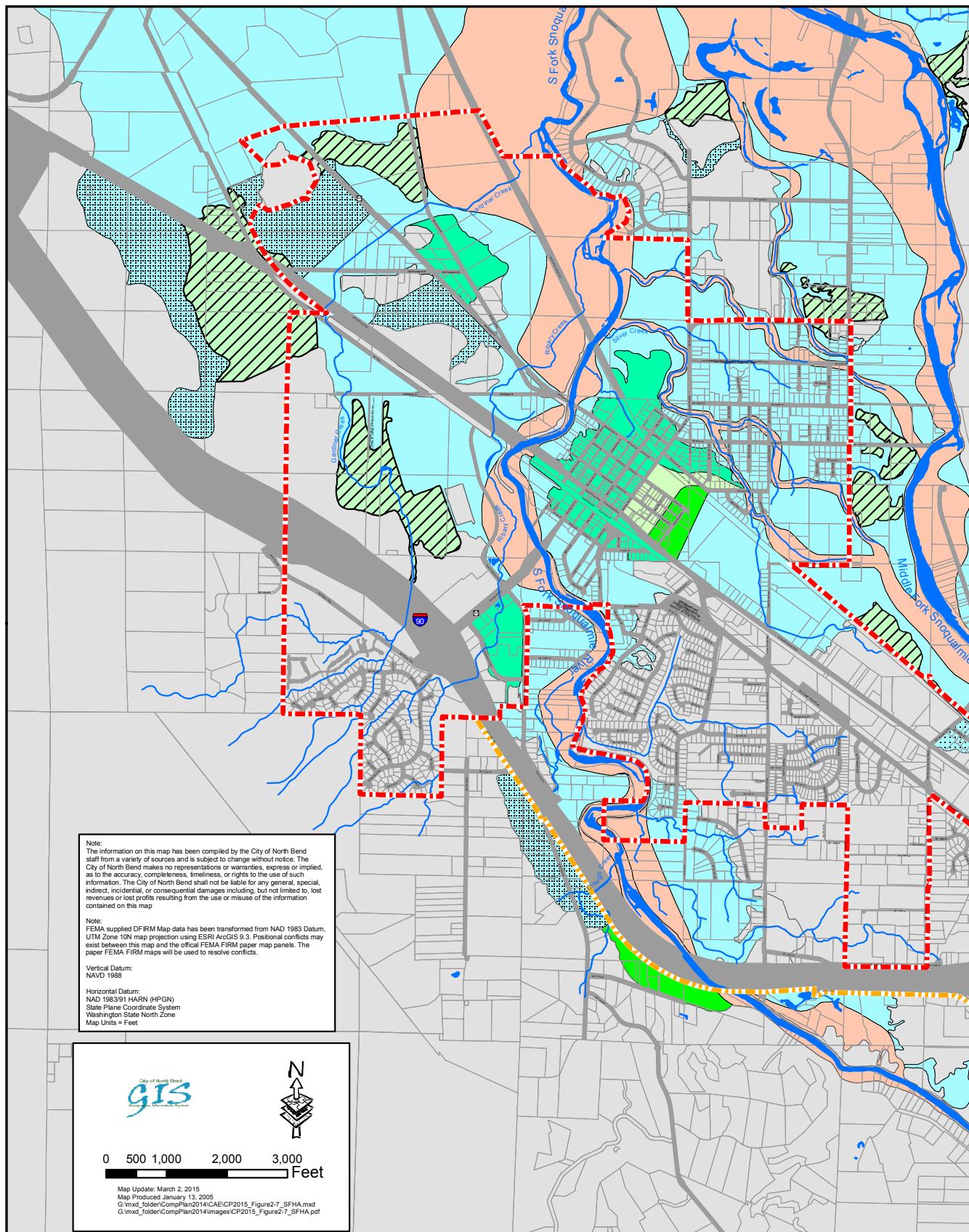
Figure 2-5



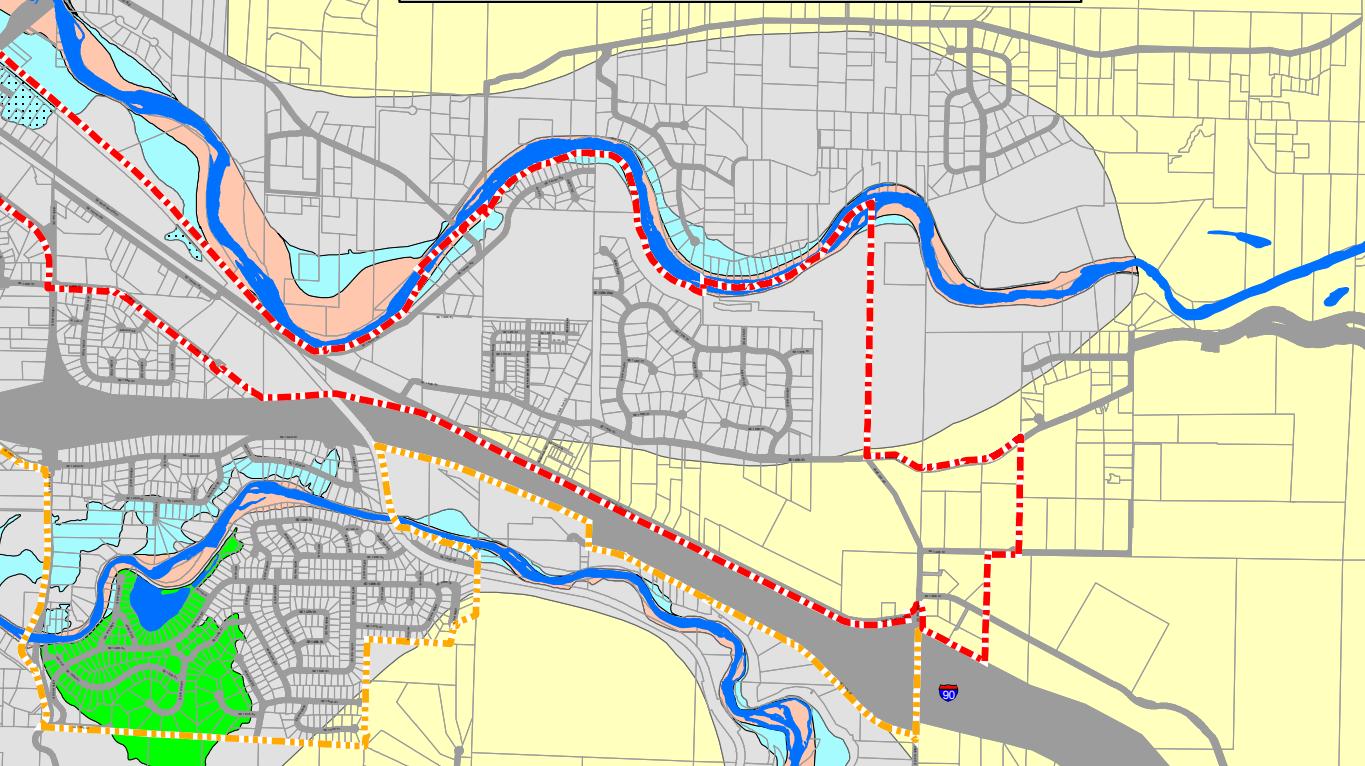
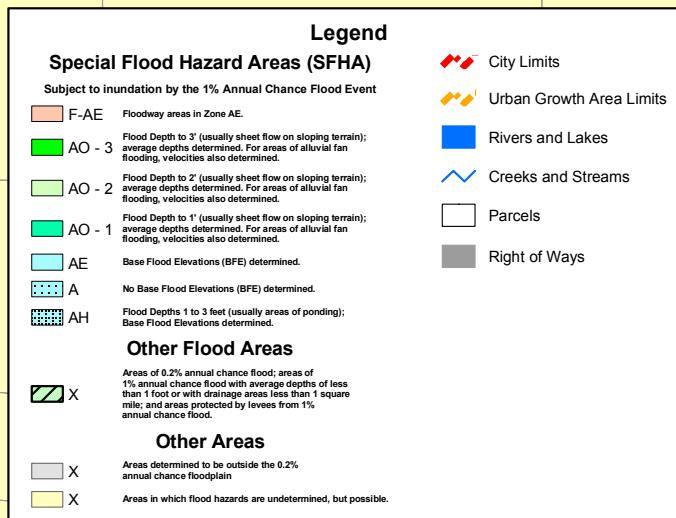


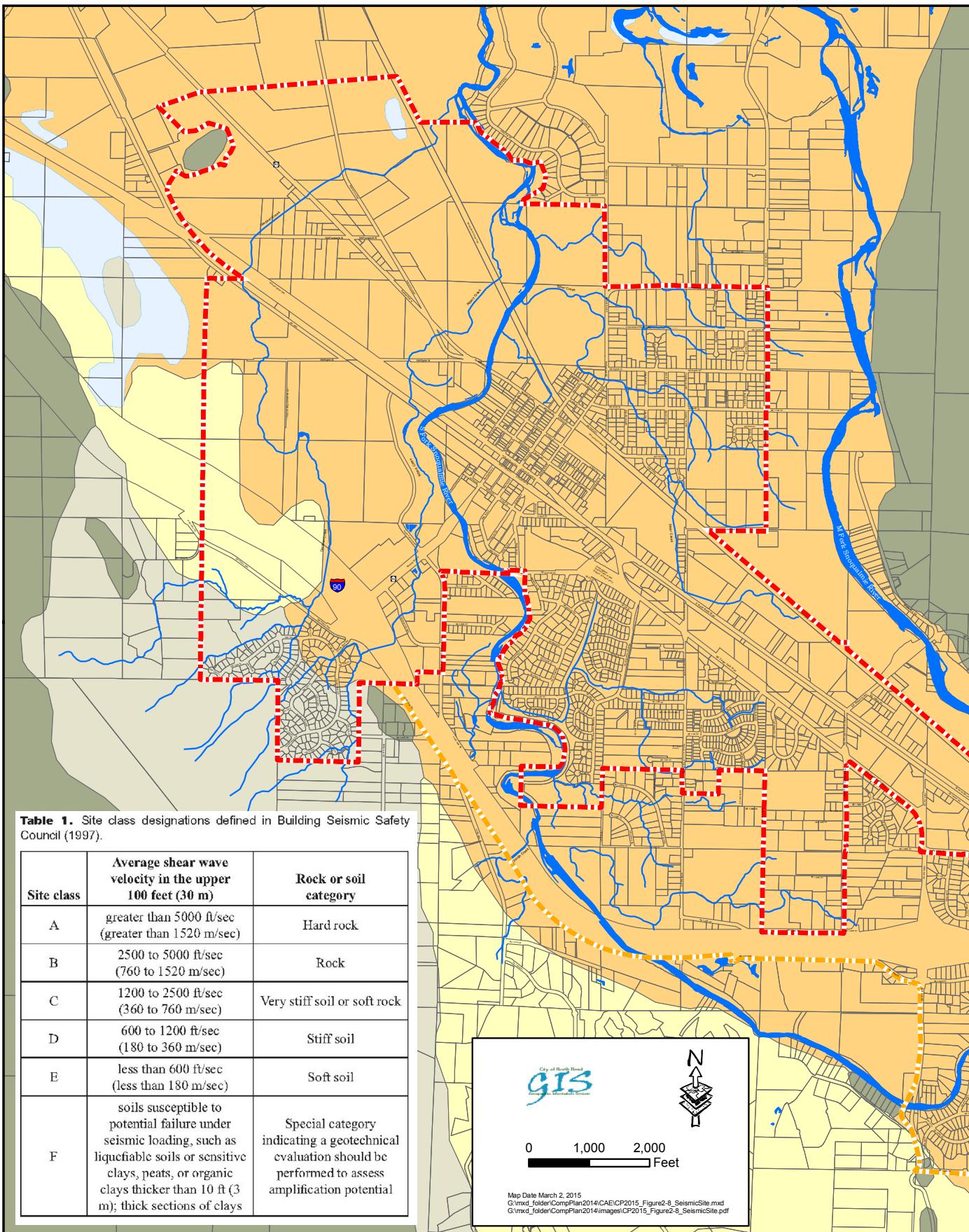
 **City of North Bend**
Comprehensive Plan 2015
River and Stream Map
Figure 2-6





City of North Bend
Comprehensive Plan 2015
Special Flood Hazard Area (SFHA) Map
Figure 2-7







City of North Bend

Comprehensive Plan 2015

Seismic Hazard Site Classification Map

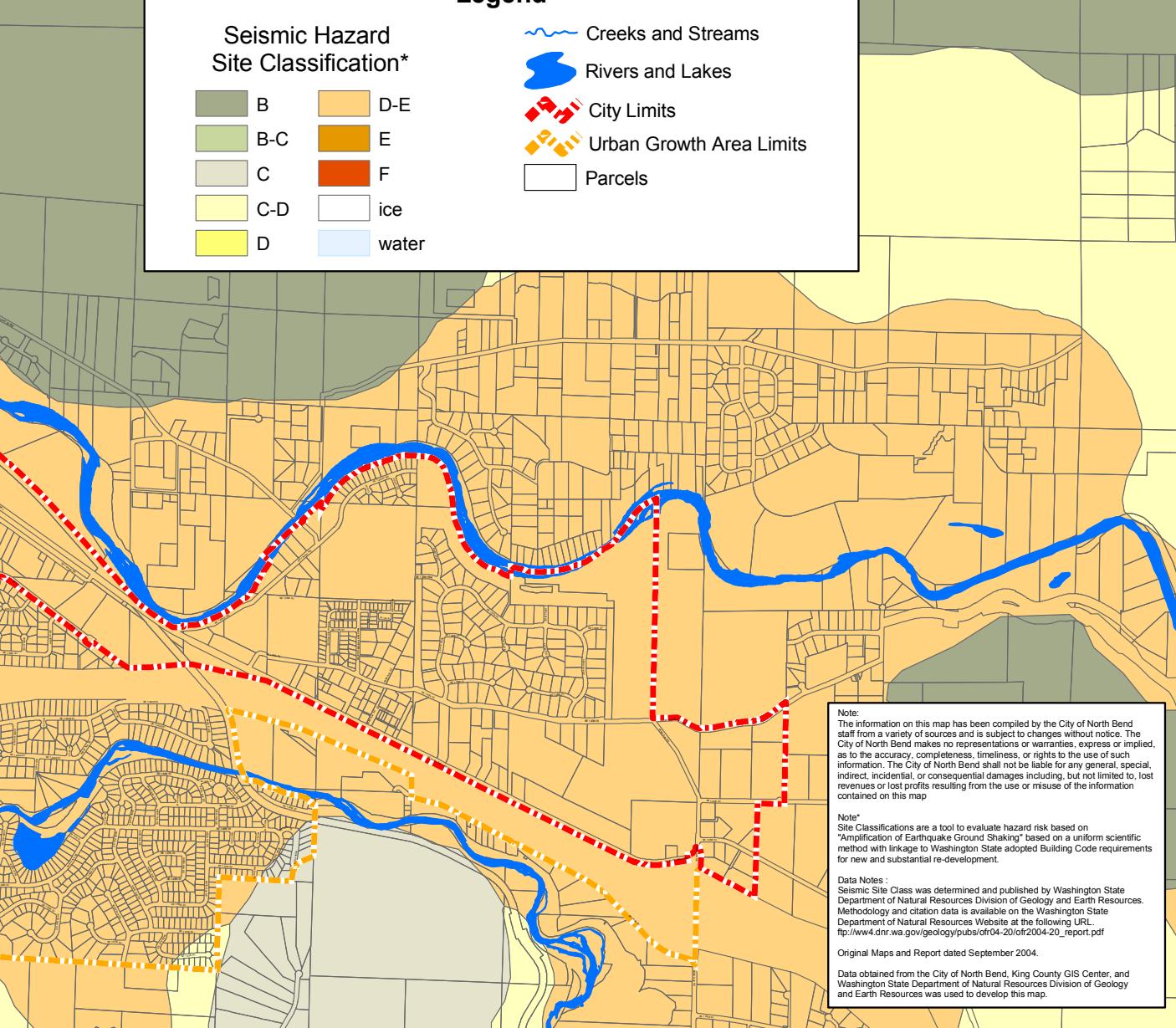
Figure 2-8

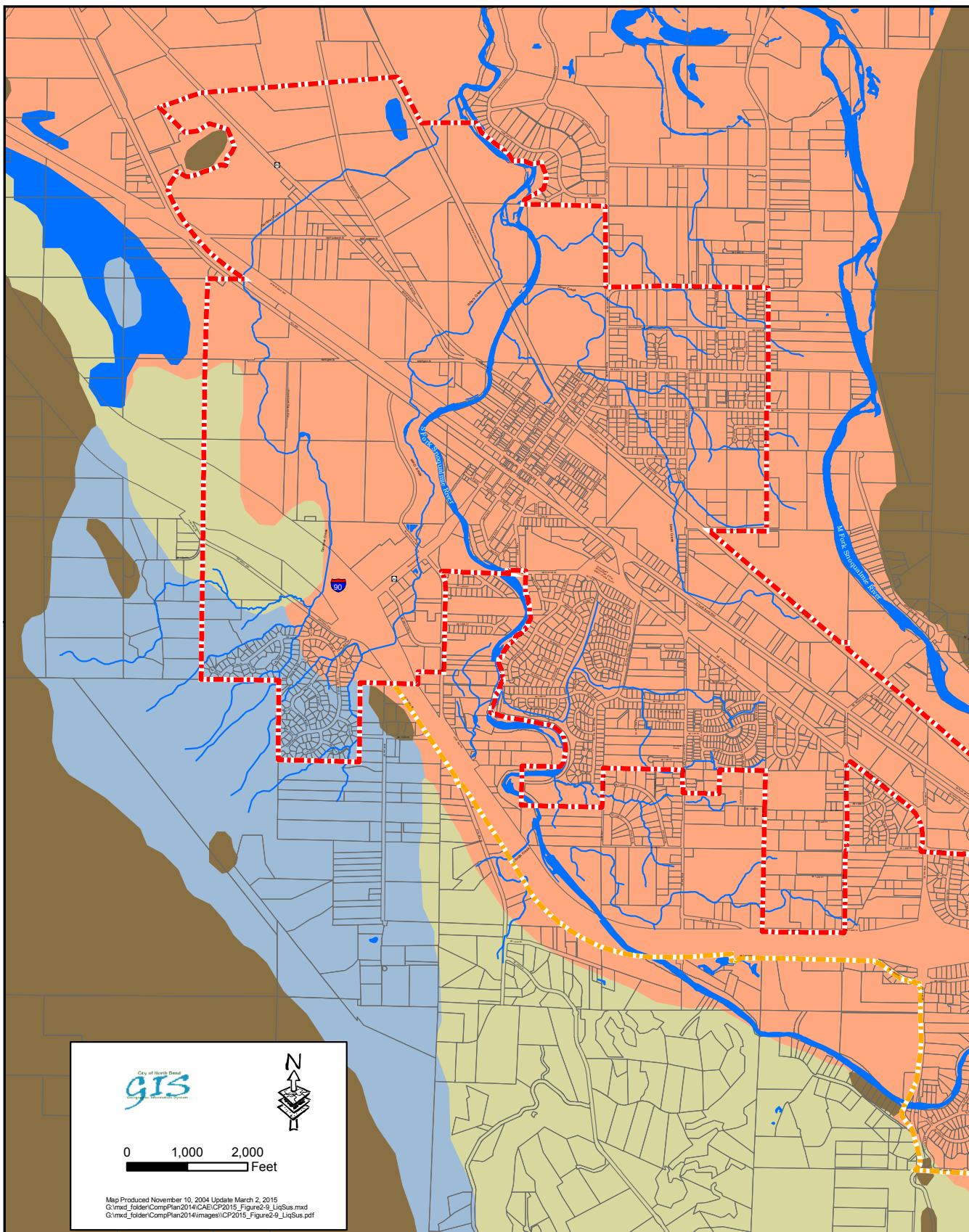
Legend

Seismic Hazard Site Classification*

B	D-E
B-C	E
C	F
C-D	ice
D	water

- Creeks and Streams
- Rivers and Lakes
- City Limits
- Urban Growth Area Limits
- Parcels





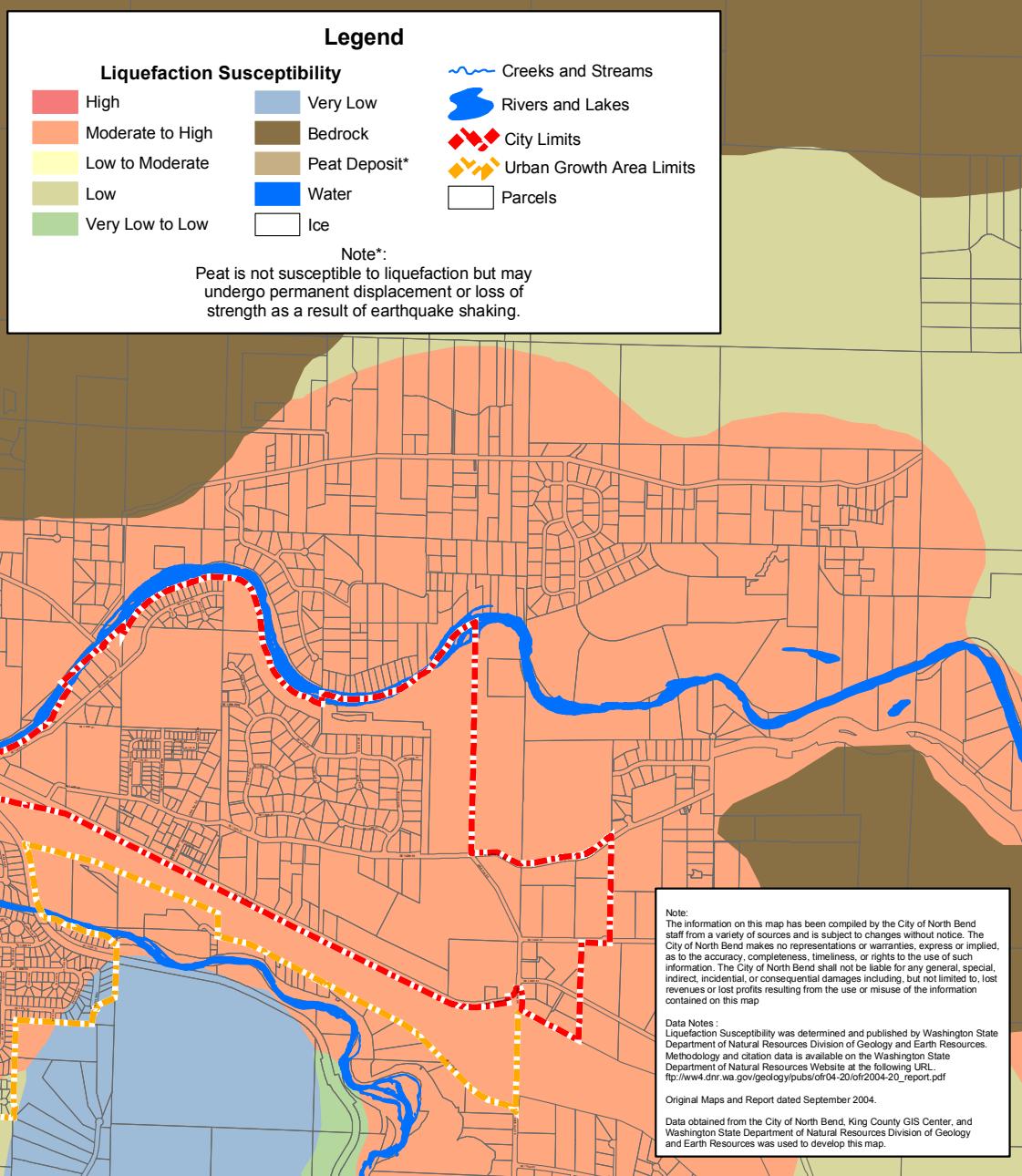


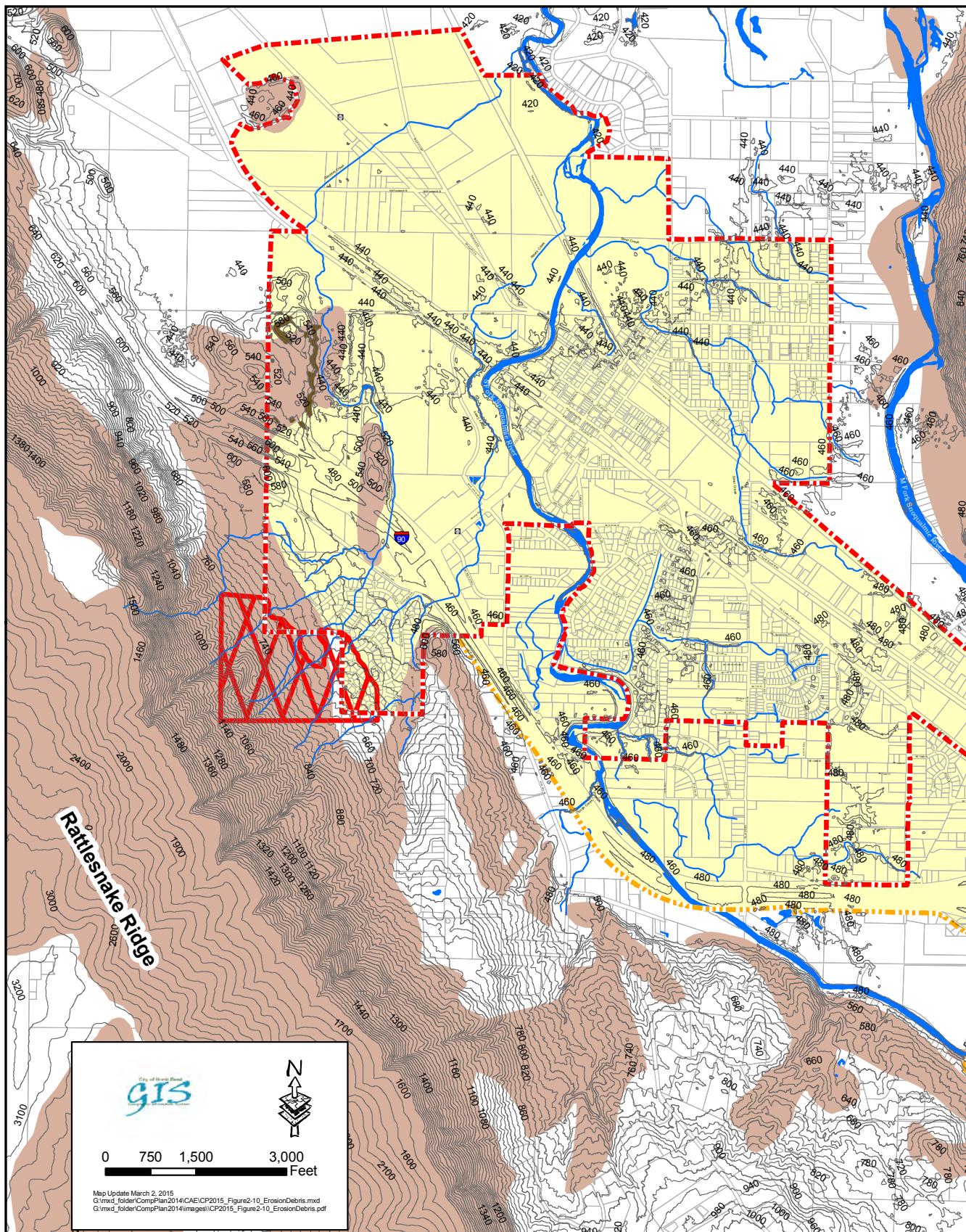
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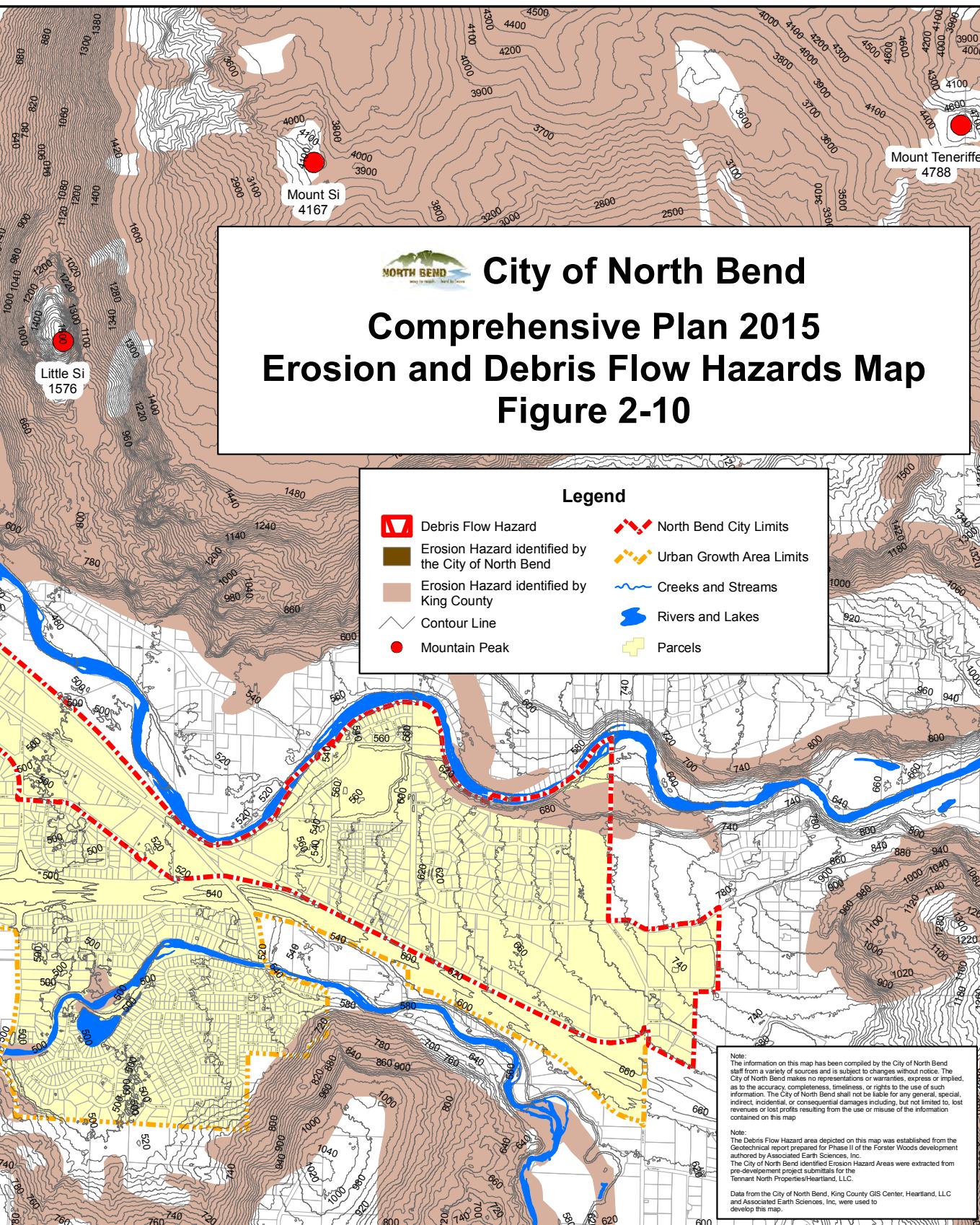
Comprehensive Plan 2015

Liquefaction Susceptibility Map

Figure 2-9









Cedar Falls Neighborhood

chapter 3

HOUSING ELEMENT

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G. Goals and Policies

A. INTRODUCTION

The Housing Element of the Comprehensive Plan sets policies that will guide future housing development, by both public and private sectors, to meet the long range housing needs of the community and to respond to the objectives of the Growth Management Act. The policies are written to support opportunities for developing housing for all income groups and for a variety of lifestyle choices. The plan considers the condition of existing housing stock and the provision of a variety of housing types and densities to meet the needs of the population while seeking to retain the small town life style that is so important to the community. The plan also seeks to develop policies that encourage the development of recognizable neighborhoods with supportive amenities such as parks, trail connections and open space.

It is the intention of the City, through its Housing Plan Element policies, to offer its residents a mix of attractive, safe, and well-maintained neighborhoods which contain a variety of housing options that are available without discrimination. Neighborhoods must be appealing, well kept, safe and close to city services, amenities, schools, jobs, and institutions.

The Housing Element was developed in accordance with the Growth Management Act, [RCW 36.70A.070](#), [WAC 365-195-310](#) (Housing Element Requirements), and the King County Countywide Planning Policies.

To fulfill requirements set forth by the Washington Growth Management Act, a Housing Element ensuring the vitality and character of established residential neighborhoods includes the following information:

1. An inventory and analysis of existing and projected housing needs that identifies the number of housing units necessary to manage projected growth;
2. A statement of the goals, policies, objectives, and mandatory provisions for the preservation, improvement, and development of housing including single-family residences;
3. Identification of sufficient land for housing, including, but not limited to, government-assisted housing, housing for low-income families, manufactured housing, multifamily housing, and group homes and foster care facilities; and

4. Provision for existing and projected housing needs of all economic segments of the population.

King County Countywide Planning Policies (CPPs) provide local direction to implement the GMA's mandate for consideration of affordable housing. Following is a paraphrased listing of the CPP's housing goals with direct applicability to North Bend. The number of each referenced goal is cited. Other CPPs may be indirectly applicable to North Bend. The full list of CPP's is available on the King County DDES website at <http://www.kingcounty.gov/property/permits/codes/growth/GMPC/ CPPs.aspx>.

- H-2: Jurisdictions are to address the need for housing affordable to households at less than 30% AMI (very low income), recognizing that this is where the greatest needs exists, and addressing this need will require funding, policies and collaborative actions by all jurisdictions working individually and collectively.
- H-4: Provide zoning capacity within each jurisdiction in the Urban Growth Area for a range of housing types and densities, sufficient to accommodate each jurisdiction's overall housing targets and, where applicable, housing growth targets in designated Urban Centers.
- H-5: Adopt policies, strategies, actions and regulations at the local and countywide levels that promote housing supply, affordability, and diversity, including those that address a significant share of the countywide need for housing affordable to very-low, low, and moderate income households (refer to CPP document for associated strategies)
- H-8: Tailor housing policies and strategies to local needs, conditions and opportunities, recognizing the unique strengths and challenges of different cities and sub-regions.
- H-12: Plan for residential neighborhoods that protect and promote the health and well-being of residents by supporting active living and by reducing exposure to harmful environments.
- H-18: Review and amend, a minimum every five years, the countywide and local housing policies and strategies, especially where monitoring indicates that adopted strategies are not resulting in adequate affordable housing to meet the jurisdiction's share of the countywide need.

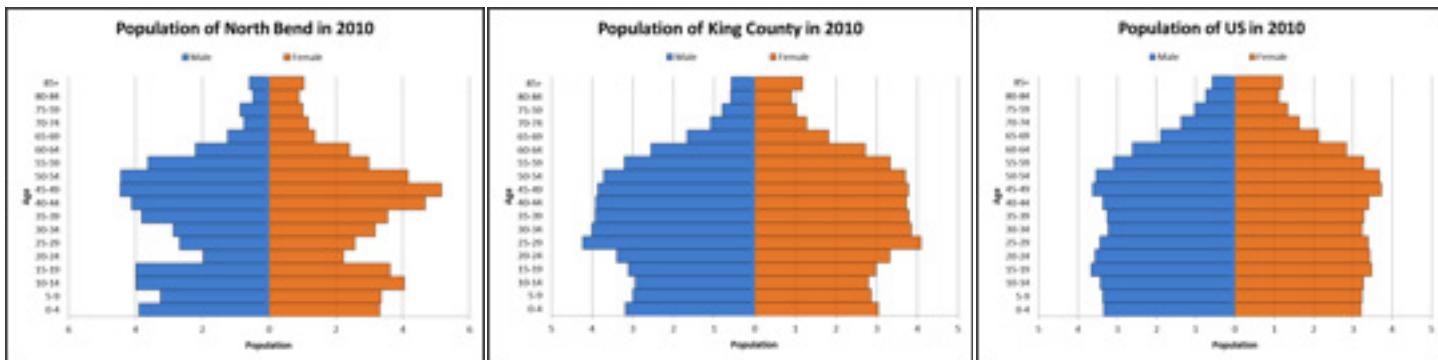


Figure 3-1: Population Pyramid for the City of North Bend, King County, and United States in 2010

B. INVENTORY & ANALYSIS

In order to get the most accurate data the city utilized multiple data sources. Where possible the decennial 2010 Census data was used. The decennial Census is conducted in years ending with 'o' and provides very accurate detail, but not the range of data needed at times. When data was needed that is not collected in the decennial data the 5-Year American Community Survey (ACS) was utilized. The 5-Year ACS collects data for 60 months to compile precise and reliable data. It is also the only survey that analyzes small communities, with a population less than 20,000.

According to the 2010 Census the population of North Bend was 5,731, with 2,348 households within the City limits, an increase of 21% from 2000. There was an average household size of 2.57. Of these 2,348 households 2,210 were occupied leaving 138 vacant. In 2010 there were 1,344 (57.2%) owner occupied 866 (36.7%) renter occupied units.¹

Between 2010 and 2014 there were 241 new housing units constructed. This is a significant increase in new housing compared to the previous decade (Table 3-2). In 2009 North Bend emerged from a 10 year building moratorium. The moratorium was established in 1999 as part of an agreement with Washington State's Department of Ecology when North Bend learned that the city had exceeded its share of water and to avoid fines the city agreed to not allow new residential construction. Ten years later the city secured additional water rights and building was allowed to resume.

Much of the City's housing was constructed prior to 1980. As the housing stock ages, the need will increase for rehabilitation of the oldest structures. Table 3-2 shows the age of the housing stock in the City of North Bend.

The median household income in North Bend was \$74,788 with 11.2 percent of the families or 13.5 percent of the individuals having incomes below the poverty level.² This income level indicates that the City must be responsive to the need of its residents to secure safe, decent, and affordable housing. Working with other housing providers including developers, the County, non-profits, State, or other agencies, the City must ensure that adequate provisions are made so that all economic segments of the community can find the housing it needs.

North Bend can meet the housing needs of its low-income residents by working with housing providers to rehabilitate or develop new housing units that are affordable. The adopted Countywide Planning Policies (CPPs) include affordable housing guidelines based on the median income for King County.

For the planning period, the City will have to develop multiple affordable strategies that can help generate an adequate supply of units affordable to low income city residents.

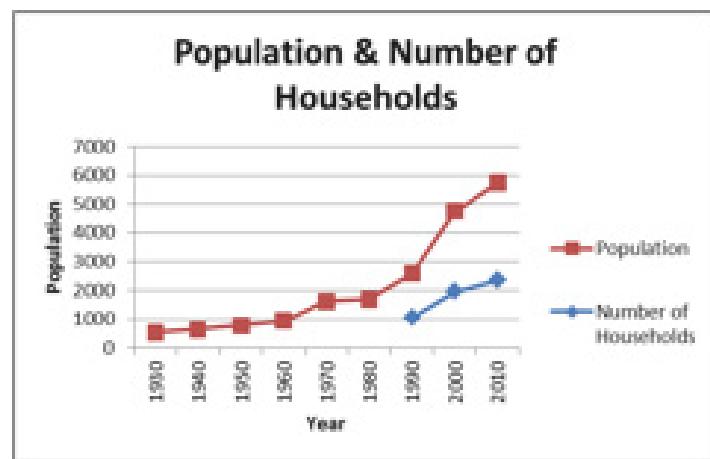


Figure 3-12 Data Source: 2010 U.S. Census

¹ 2009-2013 American Community Survey (ACS) 5-Year Estimates

H - Goal 1: Encourage a variety of housing types and densities compatibly located to meet the demands of a diverse population.

Policies:

- H - 1.1 Encourage the development of single-family residential infill that would blend with surrounding homes and be more affordable and be compatible with existing neighborhoods within the city limits.*
- H - 1.2 Encourage the provision of a diversity of housing types and sizes to meet the needs of a wide range of economic levels, age groups and household make-up.*
- H - 1.3 Encourage a mix of housing types, models and densities.*
- H - 1.4 Create incentives for developers to include affordable housing voluntarily in new developments.*
- H - 1.5 Encourage non-profit housing providers to pursue housing development opportunities that supply affordable housing while providing a high quality residential living environment.*
- H - 1.6 Work with King County to develop affordable housing opportunities within the Snoqualmie Valley communities.*
- H - 1.7 Reduce impact fees for residential developments that include affordable housing for those with low or very low-incomes.*
- H - 1.8 Seek housing assistance programs to meet the needs of low-income or other special-needs city residents, while seeking to preserve the existing subsidized housing currently located within the city.*
- H - 1.9 Work with the King County Housing Authority and other low income housing providers to provide affordable units to households at or below 80% of median income by the end of the target period (2022).*
- H - 1.10 Work with other governmental agencies to develop methods that can streamline the residential permit review process to reduce the impact on affordable housing development.*

H - Goal 2: Promote residential neighborhoods that contain the necessary public amenities and support facilities that contribute to a high quality of life for North Bend residents.

Policies:

- H - 2.1 Consider development of parks and recreational facilities jointly with the School District and Si View Metropolitan Park District.*
- H - 2.2 Encourage the formation of neighborhood or homeowners associations to help develop a sense of community within a particular neighborhood.*
- H - 2.3 Seek to create or to retain and protect links to a Citywide Trail System that connects neighborhoods with areas of commerce in an effort to promote alternative transportation systems.*

TABLE 3-1 : CITY OF NORTH BEND DATA

Year	Population	Number of Households	Number of owner occupied units*	Number of renter occupied units
1990	2,578	1,044	572 (54.8%)	471 (45.2%)
2000	4,746	1,954	1,079 (57%)	762 (41%)
2010	5,731	2,348	1,344 (57.2%)	866 (36.7%)

*The percentage of owner/renter occupied units does not add up to 100% due to vacant units.

TABLE 3-2: AGE OF HOUSING STOCK*

Year Structure Built	Units Constructed	Percent
2010-2014**	241	8.8%
2000-2009	106	3.9%
1990-1999	990	36.5%
1980-1989	547	20.1%
1970-1979	259	9.5%
1960-1969	125	4.6%
1950-1959	145	5.3%
1940-1949	101	3.7%
1939 or earlier	201	7.4%
Total	2,715	100%

*Data from 2009-2013 ACS 5-Year Survey

**The number of structures from 2010-2014 was derived from building permits issued at North Bend Community and Economic Development Department, therefore it is higher than the 2009-2013 ACS Census that does not include more recent developments.

C. DIRECTION FOR HOUSING POLICIES

1. The Housing Element of the Comprehensive Plan outlines the City's direction or response to three basic objectives:
 - the need to provide adequate capacity for residential growth to meet regional growth targets;
 - the need to encourage the development of a wide variety of housing alternatives to meet the needs of a diverse population; and
 - the need to foster opportunities that provide affordable housing.
2. The City can influence the local housing market through a variety of means:
 - by directing the location and amount of land available for residential development;
 - by amending its ordinances and codes to affect the size, type, and design of new and renovated housing;
 - by building amenities that attract quality residential development;
 - by seeking financial resources and partnerships which can help meet the objectives of maintaining the City's existing housing stock and providing affordable housing.

The Countywide Planning Policies (CPP's) require all jurisdictions to have the capacity to accommodate housing and employment targets. North Bend's net housing target for 2012-2031 is 649 new houses. North Bend's net job target for 2006-2031 is 1,050 new jobs. While much of the demand for housing will be met by new housing construction,

* The Census defines households in two categories: "Family households" consists of a householder and one or more other people related to the householder by birth, marriage or adoption; "Non-family households" consist of people living alone and households which do not have any members related to the householder.



A ranch house built in the 70's. (Silver Creek Neighborhood)



Multi-family housing with variety of housing options (2000). (Rock Creek Development)



Apartment complex built in late 80's.



New single family development built in the late 90's. (New Si View)

Figure 3.3 Typical existing housing in North Bend

H - Goal 3: The City should encourage the preservation and rehabilitation of the existing housing stock as a means of providing affordable housing.

Policies:

H - 3.1 Enforce building maintenance codes, and health and safety codes for the City's housing stock.

H - 3.2 Encourage the preservation of affordable older residential structures to maintain the available housing stock.

H - 3.3 Work to preserve and physically improve existing mobile home parks as a means of preserving affordable housing.

H - 3.4 Seek ways of maintaining and increasing the availability of low-income housing through pursuit of Community Development Block Grant funds for housing repair and maintenance, developing links with affordable housing providers.

H - Goal 4: The City of North Bend should provide adequate land capacity for forecasted population and residential growth within its city limits and Urban Growth Area in order to promote stable housing prices, foster affordability and broaden housing choices.

Policies:

- H - 4.1 Allow for density flexibility in housing development in order to meet population forecasts.*
- H - 4.2 Promote opportunities for infill housing within the downtown area that provide a mix of housing types, prices, and densities.*
- H - 4.3 Develop zoning regulations that will provide incentives to implement county wide planning policy targets for housing affordability as new housing development is permitted.*
- H - 4.4 Provide areas for mixed use and high density housing to support a wide range of housing options at all economic segments for residents.*
- H - 4.5 Continue to allow accessory units, shared housing, cottage housing, infill development at higher densities outside of "established" or "constrained areas" and mixed-use development, which includes either a mix of residential densities or a mix of residential and commercial land uses in specifically designated areas.*

rehabilitation of existing older structures and selective infill development within existing neighborhoods will also help satisfy this future demand.

Some of the future demand for housing will be for persons with special housing needs including those seeking group homes, emergency or transitional housing, senior housing, single room occupancy housing and so on. The City will work with the County to ensure that housing for persons with special needs can be accommodated here. The City will also work with providers of special needs housing to site new facilities or adapt to reuse other residential or non-residential buildings. The City of North Bend is committed to meeting the future demand for housing through the following strategies:

C.1 Expansion of City Limits:

The City of North Bend will accommodate increased population growth through annexations of land within its UGA. The North Bend UGA boundary is shown in Map 1-1 of the Land Use Element, North Bend Land Use Designations. The UGA will permit the City to grow to the

south to I-90. These areas contain existing low-density residential and some open rural land uses. The remaining undeveloped land within the UGA will provide additional capacity to meet the City's new housing demand over the next 20 years.

C.2 Infill Housing Within Existing Residential Areas:

This strategy would encourage additional housing on remaining lots within the City limits and existing residential areas. This strategy would permit development of smaller lots that are compatible with the existing neighborhood scale and character, helping to maintain and increase the vitality of these neighborhoods over time. Plots of smaller lots located within the existing city limits could allow for innovative housing types such as cottages, that would blend with surrounding homes and be more affordable, as well as other small, fee-simple units.

C.3 Mixed-Use Development:

Mixed-use development is a mix of different land uses in an area, on a property or within a single building such as commercial use first floor with residential above. Redevelopment of existing commercial areas would

permit the development of housing over retail shops or adjacent to commercial uses. Mixed-use in the downtown will encourage transit by providing increased density to support alternate modes of transportation.

The City permits the creation of low intensity home businesses that encourages entrepreneurship without changing the character of existing neighborhoods. The City promotes concurrent commercial/residential uses in the DC and NB zones that do not negatively impact the quality of life of adjacent neighbors. Mixed-use strategies are encouraged within a number of zoning districts through "Planned Neighborhood Development" review.

C.4 Mix of Housing Types:

Mixed-use development may also take the form of a mix of housing types within existing or yet-to-be-established neighborhoods. The goal of creating varied residential developments is to provide housing choices, integrate income and age groups, and encourage affordability. A variety in housing types should be permitted when the existing neighborhood character can be maintained or enhanced. An overall objective of the City is to work towards meeting Countywide Planning Policies on affordability while maintaining an overall single family to multi-family housing ratio of 70 percent to 30 percent. The City is presently at a ratio of 63 percent owner occupied to 37 percent renter occupied. To further encourage diversity, the City established a Cottage Residential (CR) zone that allows smaller lot sizes at higher densities.

Critical to the success of neighborhoods with mixed housing types is attention to scale and neighborhood character, the provision of adequate parking and the concurrent creation of mini parks supported by the homeowners, expansion of existing City parks, or fee in-lieu option for smaller plats to meet the needs of new residents.

As North Bend's population changes, so will its demographic profile. To respond to the expected changes in the population, lifestyles, and the rising cost of housing, the City should provide opportunities for a mix of housing types including townhouses, duplexes, small lot single family innovative housing including cottage housing and other alternative types of housing that would blend with surrounding homes and be more affordable, accessory dwelling units and mixed-use residential and commercial development. All new development must both meet the market demand as well as meet the City's goal of retaining its small town charm and rural appeal. Accomplishing this objective will be achieved in part by the creation and retention of integrated systems of open spaces, bikeways and pedestrian paths.

C.5 Manufactured and Mobile Homes:

As of 2010 North Bend has 182 mobile homes within the city limits (158 in mobile home parks and 24 stand-alone) based on city records. This is a significant increase from 2000 when there were 53, due to an annexation that included

Table 3-3: LOW INCOME HOUSING EXISTING INVENTORY

CPP Guidelines (AMI*)	Countywide need (% of total housing supply)	North Bend Existing Inventory**		
		Rental Units	Ownership Units	All Housing
50% to 80% of AMI (moderate)	16%	342 units	147 units	22.1%
30% to 50% of AMI	12%	192 units	70 Units (Under 50% AMI)	9.3%
30% and below AMI	12%	161 units		70 Units

*Area Medium Income (AMI)

** Overall Housing Affordability data is from King County's 2012 Needs Assessment, based on the 2006-2010 ACS 5-Year Survey data.

Housing is a basic need for every individual. Our [region's] success depends on ensuring the availability of a variety of housing types and densities, as well as an adequate supply of housing affordable at all income levels, to meet the diverse needs of both current and future residents.

- Puget Sound Regional Council, Vision 2040

two additional mobile home parks. These structures are located primarily in two mobile home parks located along North Bend Way and one on Bendigo Boulevard N. These mobile home parks provide a source of affordable housing, both rental and owner-occupied. Mobile home parks must demonstrate that they are safe and have adequate utilities and city amenities.

Manufactured homes, which are produced in factory-controlled settings and shipped to a housing site for assembly, can provide an affordable alternative to the conventional site-built single family home. By state law the City must permit manufactured housing that conforms to uniform codes in areas of the City with adequate utility service and capacity where they meet city zoning codes and are placed on permanent foundations.

D. AFFORDABLE HOUSING

The City of North Bend is committed to providing development opportunities for affordable and low-income housing. Affordable housing is defined as when the total housing costs, including basic utilities, does not exceed 30 percent of the income limit (for renters, 50 percent or less of the county median family income, adjusted for family-size, and for owners, 80 percent or less of the county median family income, adjusted for family size for owners) (WAC 365-196-210(e)(i)(C) (i-v)). Residents need assistance with the escalating cost of housing to ensure they have access to housing which best meets their needs. As shown in Table 3-3, North Bend is slightly under the targeted units for providing housing below 50% Area Medium Income (AMI). North Bend meets and exceeds the goals for 50-80% AMI. Concurrent with the need to provide safe, decent, and affordable housing is the need to ensure that lower income residents have equal access to the provision of social, recreational and community services. North Bend can help meet the needs of lower-income households through the following strategies:

D.1 Preservation of Existing Affordable Housing:

Older homes in existing neighborhoods, accessory

units, mobile homes, shared housing, and existing subsidized housing currently provide affordable housing opportunities for some residents. Preservation of the existing affordable housing stock is critical to maintaining access to those sources. The City will seek ways of maintaining and increasing the availability of low-income housing through pursuit of Community Development Block Grant funds for housing repair and maintenance, developing links with affordable housing providers not currently operating in North Bend, and the consideration of developing a Housing Authority, either alone or in conjunction with other valley cities, that could be charged with meeting residents' housing needs. The City will also work to enforce its building and maintenance codes to

ensure that the existing housing stock provides decent, safe, and sanitary housing.

D.2 Subsidized Housing

The City of North Bend currently has approximately 90 units of subsidized housing located in the downtown area. The Sno-Ridge Apartments (39) are exclusively senior housing, the Cascade Park apartments (27) is for seniors and disabled persons under 62 and the SiView Court Apartments (20) are exclusively for families. This housing was developed through federal, state, and King County housing assistance programs. The City will continue to seek housing assistance programs to meet the needs of its low-income population while seeking to preserve its existing stock of subsidized housing.

D.3 Zoning Incentives:

Zoning incentives are a key mechanism to encourage the development of affordable housing through the private market. Incentives can include density bonuses, forgiveness or reduction of impact fees or permit costs, and streamlined permit and development review processes. Amendments to the zoning codes can also provide new mechanisms for development to contribute to a low-income housing trust fund for future affordable housing production.





D.4 Non-Profit Housing Organizations:

Non-profit housing organizations can provide opportunities for developing low-income housing in the communities they serve. These organizations can assist in preservation and rehabilitation of existing housing or construction of new housing and acquisition of property for housing. The City of North Bend will encourage these organizations to become active housing partners in the North Bend community.

The City can act as a catalyst to encourage the organization and participation of these groups and as a conduit through which to seek additional government support.

D.5 Accessory Housing and Housing Sharing:

Accessory housing is a means of providing additional affordable residential units. Larger homes can often accommodate a rental unit without causing negative impacts in an existing neighborhood. The City identifies appropriate standards for accessory housing units and has developed the regulatory means to accommodate them. Opportunities for shared housing can be encouraged by promoting local recognition of groups or agencies that assist in linking a housing provider with those seeking housing.

E. HOUSING FOR SPECIAL NEEDS

Federal and State law mandates that cities provide the same residential opportunities to individuals of special needs as are available to single family residences. These individuals may be part of group homes and require some assistance in their day-to-day living, such as the physically or mentally disabled, victims of domestic violence, substance abusers, people living with AIDS, youth at risk, and seniors. Family living situations, institutional settings, social service programs and assisted housing, specifically excluding Secure Community Transition Facilities as defined in Washington State law, all serve a portion of those with special needs. The Federal Fair Housing Act (Chapter 151B) includes all individuals with special needs and states that no individual shall be denied the opportunity for safe and independent living. In addition, the Washington Housing Policy Act states that a "decent home in a healthy, safe environment for every resident of the State" shall be provided (RCW 43.185B.009).

H- Goal 5: Support and provide for the availability of housing for residents of North Bend with special housing needs, excluding Secure Community Transition Facilities as defined in Washington State Law.

Policies

H- 5.1 Support the preservation and development of special needs housing in North Bend that serves both city residents and those in surrounding communities.

H- 5.2 Encourage and promote partnerships with public and private agencies, as well as developers, that provide funding for housing opportunities for those with special needs.

H- 5.3 Evaluate potential regulatory obstacles and ensure that codes or ordinances do not restrict development of special needs housing within North Bend.

The Housing Element supports goals and policies that provide equal and fair housing access for all residents of North Bend, including special needs residents. In order to provide housing opportunities for residents of special needs, the City shall work with public and private agencies to provide opportunities and services that would not be available otherwise to these residents. In addition, the City shall provide for these residences by continuing to support codes and ordinances which allow for a variety of housing opportunities, as well as encouraging the increase of social support services within the city and surrounding area. Adding flexibility to the City's land use code to allow group homes and home-based care is also a significant opportunity available to the City for meeting the demand for special needs

F. SENIOR HOUSING AND AGING IN PLACE

It is apparent from our population pyramid (Figure 3-1) that within the next 20 years a large portion of North Bend will be over 60. The City will need to accommodate this growing senior population by enabling the development of additional senior and assisted living housing, and by supporting the uses and needs of those residents. There are a rising number of challenges that communities, families and individuals face as the population over 60 increases. Communities can address these challenges by striving to become elderly-friendly. Elderly-friendly communities address the basic needs, optimize health and well-being, promote social and civic engagement, and increase independence for all people, but especially people who are frail or have disabilities. An aging-friendly community is also a community that is livable for all ages. These communities can be created by improving health care quality for older adults and adults with disabilities, addressing basic needs (education, housing, transportation, financial empowerment, and food security) that improve health and well-being, increase independence for older adults, and promote age readiness.

H-Goal 6: Support and provide for the ability to age in place safely, independently and comfortably, regardless of age, income or ability level.

Policies

H-6.1 Empower older adults, their families, and other consumers to make informed decisions and to easily access available services

H-6.2 Enable older adults to age in their place of choice with appropriate services

H-6.3 Prepare North Bend for an aging population

H-6.4 Strive to make the City of North Bend accessible, safe, and inclusive for children, youth, families, adults, and the elderly

H-6.5 Allow people to age in place, be it in their homes or neighborhoods, by encouraging the development of neighborhoods that provide a mix of housing typologies and sizes to accommodate a broad range of lifestyles and abilities.



Chapter 4

TRANSPORTATION ELEMENT

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North Bend is a small but growing city in King County that is located east of Seattle, along the Interstate 90 (I-90) corridor in the Snoqualmie Valley between Mount Si and Rattlesnake Ridge. The City is surrounded by the South and Middle Forks of the Snoqualmie River and lies near large tracts of county, state, and federal forests and parklands. North Bend's local park and recreation facilities serve residents within the City limits, as well as the City's Urban Growth Area (UGA) and the Upper Snoqualmie Valley. The City also serves as an important stopover point for regional and national tourists traveling on I-90.

A. INTRODUCTION

The Transportation Element of the City of North Bend Comprehensive Plan establishes a framework for providing a multi-modal transportation system of facilities and services to support the projected growth of land use within the City and its designated Urban Growth Area in East King County. The Transportation Element framework is consistent with Transportation 2040, the adopted long range plan of the Puget Sound Regional Council, and King County plans and policies. It meets the mandatory requirements of the Washington State Growth Management Act (GMA) under RCW 36.70A.070 and it provides transportation project recommendations for inclusion in the City's Capital Facilities Plan.

The vision of the Transportation Element is a safe, dependable, properly maintained, fiscally and environmentally sustainable multi-modal transportation system that is consistent with and supports the other elements of the Comprehensive Plan. The transportation system should respect community character, environment, and neighborhoods; improve mobility and safety; support economic vitality; minimize impacts from regional facilities; and promote increased use of transit and non-motorized travel. The transportation system needs to be both locally and regionally coordinated, adequately financed, and community supported.

The updated Transportation Element reflects the creation of a Transportation Benefit District (Proposition 1, passed by city voters in November 2011 to add a two-tenths of one percent (0.2%) city sales and use tax dedicated to transportation improvements) which will help to fund transportation facilities needed to support a vital economy and keep pace with the City's growth and development. The policy direction within this element and the project recommendations also provide for the improvement of facilities for walking and bicycling, and recognize the mobility benefits provided by King County Metro Transit within the bus service area. The objective of these policies and actions is to reduce automobile dependence, thereby minimizing the need for capital-intensive street capacity expansion, while improving conditions for moving about safely and conveniently without a car.

A.1 PURPOSE OF PLAN UPDATE

The purpose of the City of North Bend Transportation Element is to identify, evaluate and recommend transportation improvements for the City through the planning horizon of 2030. It provides a vision for the City's transportation system in 2030 and it is intended to guide the development of that system by the City and other responsible stakeholders.

The Transportation Element is an integral part of the City's Comprehensive Plan. It is required to satisfy GMA requirements that call for a balanced approach to land use and transportation planning, ensuring that the City's transportation system can support planned levels of land use development. The City has adopted level of service (LOS) standards for the transportation system as required, to provide a policy framework for maintaining the community's desired quality of life while it develops and changes over time.

In addition, the GMA mandates that capital facility funds be identified to pay for necessary transportation improvements. The Transportation Element identifies several sources to finance the recommended transportation projects, including the City's new Transportation Benefit District as identified above. It provides documentation to support grant applications by the City to fund needed improvement projects.

The Transportation Element includes the transportation goals and policies, as prepared for the Comprehensive Plan, adopted on May 16, 1995, and updated in 2003 and 2012. This plan includes goals, objectives and policies from other communities in the Northwest and amended and refined by City staff, elected officials and the community over time.

It is almost inevitable that some conflict will arise between a transportation policy and real-world constraints and opportunities, or even between two policies. After the specifics of the situation and the purpose of the policies are fully understood, the conflict should be resolved using the best judgment of the City Council, as advised by City Staff. However, it is of utmost importance that the transportation policies be applied consistently to every development proposal. If a policy cannot be consistently followed, the policy should be modified or replaced prior to the approval of a development request.

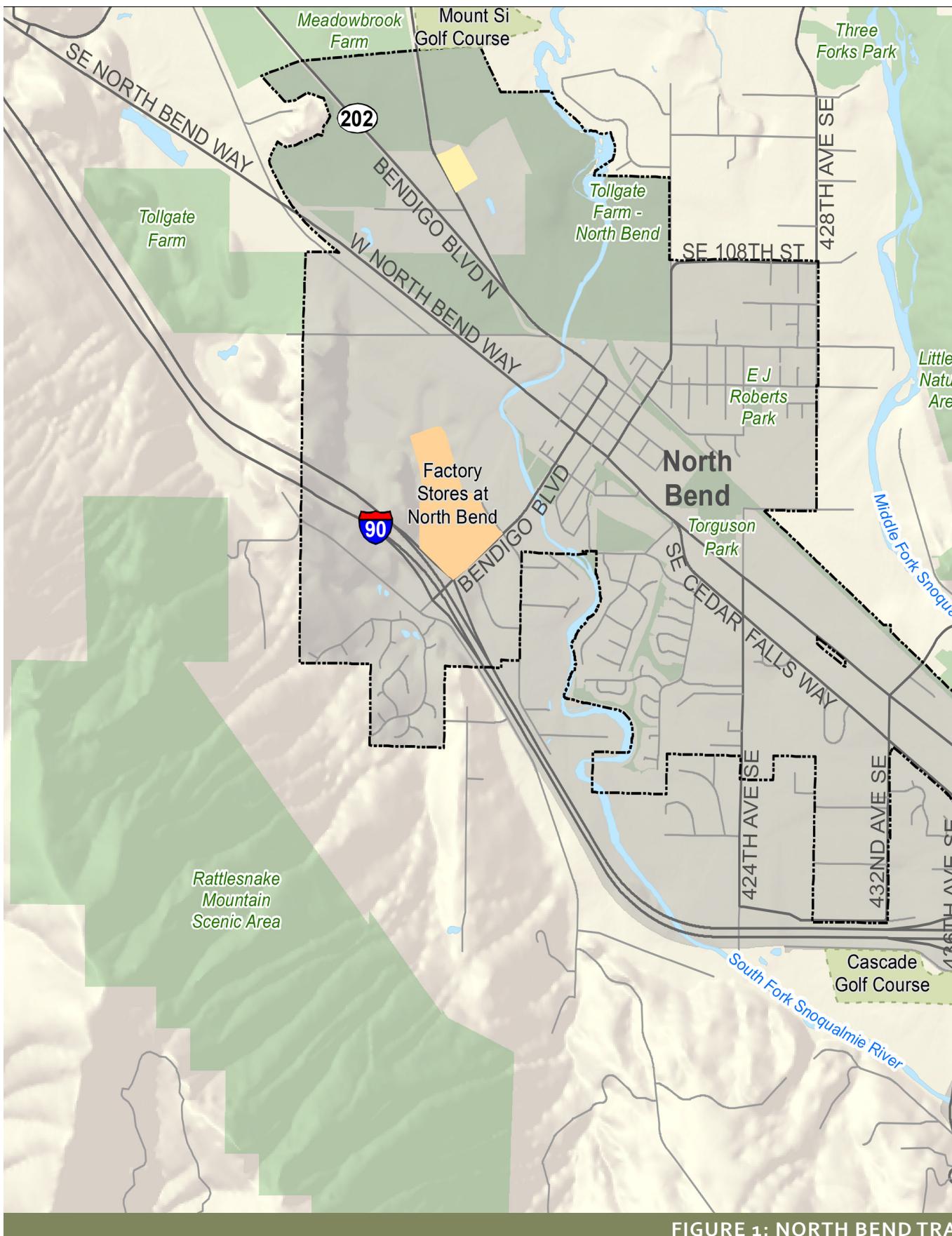
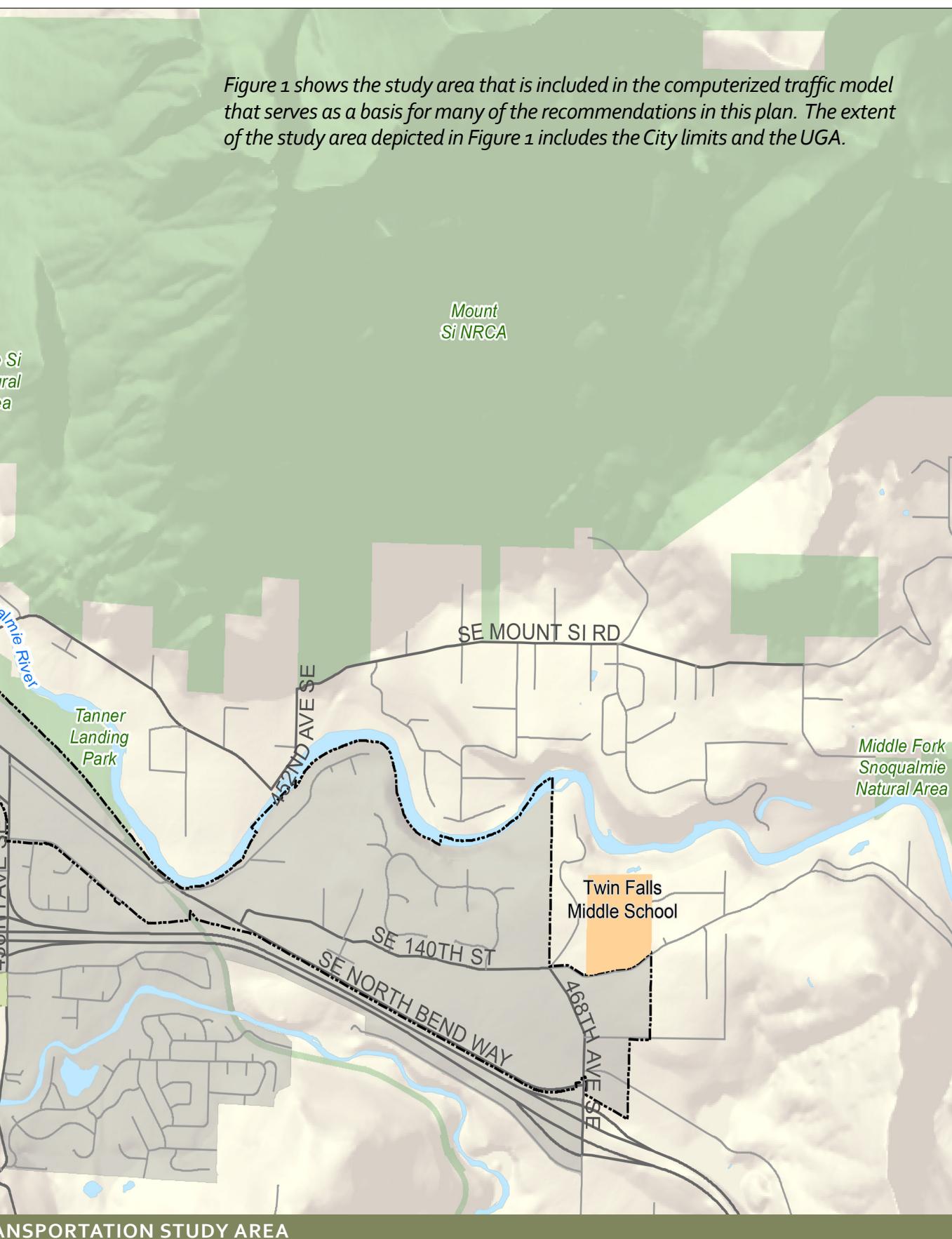


FIGURE 1: NORTH BEND TRA



A.2 THE GROWTH MANAGEMENT ACT

Transportation planning at the State, County and local levels is mandated by the Washington State Growth Management Act (GMA) [RCW 36.70A, 1990]. The GMA contains many requirements for the preparation of a transportation element the most important being consistency with the land use element.

Specific GMA requirements for a transportation element include:

1. Inventory of facilities by mode of transport;
2. Level of Service calculations to aid in determining the existing and future operating conditions of the facilities;
3. Proposed actions to bring these deficient facilities into compliance;
4. Forecasts of traffic based on land use;
5. Identification of future infrastructure needs to meet current and future demands;
6. Funding analysis for needed improvements as well as possible additional funding sources;
7. Identification of intergovernmental coordination efforts; and
8. Identification of demand-management strategies as available.

In addition to the above the GMA also states that development cannot occur unless existing infrastructure either exists or is built concurrent with development (within six years). This infrastructure could include: additional transit service, travel demand management strategies (e.g., ridesharing, etc.), and other transportation system management strategies as well as the possibility of construction of new facilities when necessary.

Puget Sound Regional Council Vision 2040/Transportation 2040

In April 2008 the PSRC adopted a long range regional growth strategy for the central Puget Sound region to accommodate a projected increase of 2.7 million people by 2040. Local jurisdiction comprehensive plans such as North Bend's must be reviewed and certified for consistency with the regional plan in order to maintain eligibility for funding from regional, state and/or federal agencies. A checklist has been provided by PSRC as a local jurisdiction comprehensive plan reporting tool, to guide plan certification. The transportation-related checklist items are provided on the next page.

sustain maintenance, preservation, and operations of facilities

MAINTENANCE, MANAGEMENT AND SAFETY

- Clean transportation programs and facilities, including actions to reduce pollution and greenhouse gas emissions from transportation
- Incorporate environmental factors into transportation decision-making, including attention to human health and safety
- Identify stable and predictable funding sources for maintaining and preserving existing transportation facilities and service
- Include transportation systems management and demand management programs and strategies
- Identify transportation programs and strategies for security and emergency responses

SUPPORTING THE GROWTH STRATEGY

- Focus system improvements to support existing and planned development as allocated by the Regional Growth Strategy
- Prioritize investments in centers
- Invest in and promote joint- and mixed-use development
- Include complete streets provisions and improve local street patterns for walking and biking
- Design transportation facilities to fit the community in which they are located ("context sensitive design"); use urban design principles when developing and operating transportation facilities in cities and urban areas

GREATER OPTIONS AND MOBILITY

- Invest in alternatives to driving alone
- Ensure mobility of people with special needs
- Avoid new or expanded facilities in rural areas
- Include transportation financing methods that

LINKING LAND USE AND TRANSPORTATION

- Integrate the ten Transportation 2040 physical design guidelines in planning for centers and high-capacity transit station areas
- Use land use development tools and practices that support alternatives to driving alone – including walking, biking and transit use

LAND USE ASSUMPTIONS AND FORECAST OF TRAVEL DEMAND

- Demonstrate that travel demand forecasts and transportation need assessments are always based on land use assumptions that correspond with the most recently adopted growth targets; ensure that population and employment assumptions are consistent throughout the comprehensive plan

SERVICE AND FACILITY NEEDS | INCLUDING LEVEL-OF-SERVICE STANDARDS AND CONCURRENCY

- Include inventories for each transportation system, including roadways, transit, cycling, walking, freight, airports, and ferries
- Establish level-of-service standards that promote optimal movement of people across multiple transportation modes
- Include state facilities and reflect related level-of-service standards
- Address multiple transportation modes in concurrency programs
- Tailor concurrency programs, especially for centers, to encourage development that can be supported by transit

FINANCING AND INVESTMENTS – INCLUDING REASSESSMENT STRATEGY

- Include a multi-year financing plan, as well as an analysis of funding capability

- Include a reassessment strategy to address the event of a funding shortfall

INTERGOVERNMENTAL COORDINATION

- Coordinate with neighboring cities, the county, regional agencies and the state

DEMAND MANAGEMENT

- Identify demand management strategies and actions, including but not limited to programs to implement the Commute Trip Reduction Act

PEDESTRIAN AND BICYCLE COMPONENT

- Include strategies, programs and projects that address non-motorized travel as a safe and efficient transportation option – including pedestrian and bicycle planning, project funding and capital investments, education and safety.

A.3 KING COUNTYWIDE PLANNING PROCESS

In response to the GMA mandates for regional coordination for growth, King County adopted policies to provide guidelines for regional cooperative growth management planning. The King County Countywide Planning Policies (CWPP) are directed at providing a balanced transportation system using all modes of transportation (e.g., automobiles, heavy vehicles, transit, bicycle, pedestrian, equestrian, air travel, etc.) as efficiently as possible. The policies direct that impacts to individual cities related to the movement of people and goods generated by State, County, and/or neighboring jurisdictions must be taken into account. The policies further require that jurisdictions coordinate with one another in the planning, financing and implementation of land use plans to minimize impacts on neighboring jurisdictions.

All interested parties (e.g., State, County, Metropolitan Planning Organizations, Puget Sound Regional Council, and neighboring jurisdictions) as well as transit operators, airport officials, etc., should work together to provide a region-wide transportation system.

Future improvement needs for all modes of transportation should be considered and included in the Plan with particular emphasis placed on completing the regional systems. Additionally, Level of Service (LOS)

calculations should be consistent to aid in determining accountability and impacts of projects. Mode-split goals for each mode of transportation should be determined to ensure services are adequate.

The CWPP also specifies that timelines for all improvements are to be identified, focusing on maintenance and preservation of existing infrastructure with additions as necessary to accommodate future growth. Further, when funding falls short of projected need, alternative funding sources should be sought including developer contributions, impact fees, LID's, etc. Consistency of plans, projects, and thresholds with regional, state, and neighboring jurisdictions should also be considered.

A.5 COMMUNITY INVOLVEMENT

The City of North Bend Transportation Element is the product of community involvement at all stages of the planning and development process.

A.6 TRANSPORTATION PLAN UPDATE

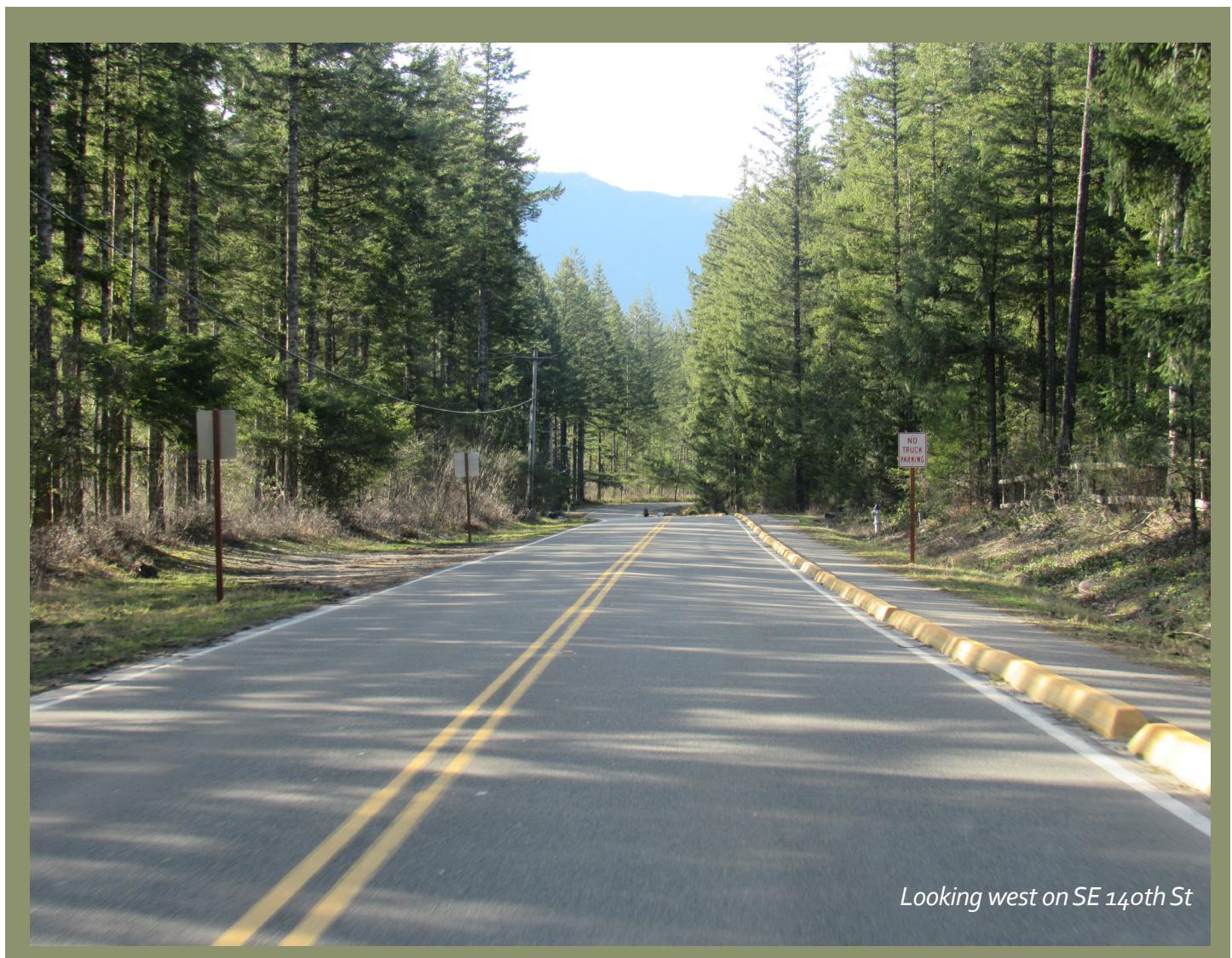
For the 2003 update of the Transportation Plan, the City implemented a community involvement strategy that included Public Open Houses and the formation of a Technical Advisory Committee (TAC). For the 2012 update the City implemented a similar community involvement strategy. The Planning Commission acted as the Technical Review Committee and hosted several public workshops during the plan update process during 2011 and early 2012. A number of transportation concerns were identified, as shown in Figure 2: June 9, 2011 Planning Commission Workshop. Issues identified included:

1. Congested peak hour traffic conditions at the intersection of North Bend Way and Bendigo Boulevard;
2. The need to modify the traffic diverter at Bendigo Boulevard/NE 4th Street to allow eastbound traffic movements, relieving the North Bend Way and Bendigo intersection, pending design analysis a roundabout would be preferred;
3. The need to slow traffic on North Bend Way in Downtown North Bend to create a more attractive and pedestrian-friendly gathering place;
4. The need for improved pedestrian facilities

at the Bendigo bridge over the South Fork, along Ballarat between NE 8th and NE 12th Streets, along SE Cedar Falls Way, 468th Avenue SE, the western part of SE 140th Street; and

5. Trucking-related needs, especially on 468th

Avenue SE and in the vicinity, including the need for a truck turn-around south of SE 140th Street, the need for improved on-site circulation at Truck Town, more enforcement of truck violations, and regional collaboration to increase truck stop parking and attention to regulatory needs.



Looking west on SE 140th St

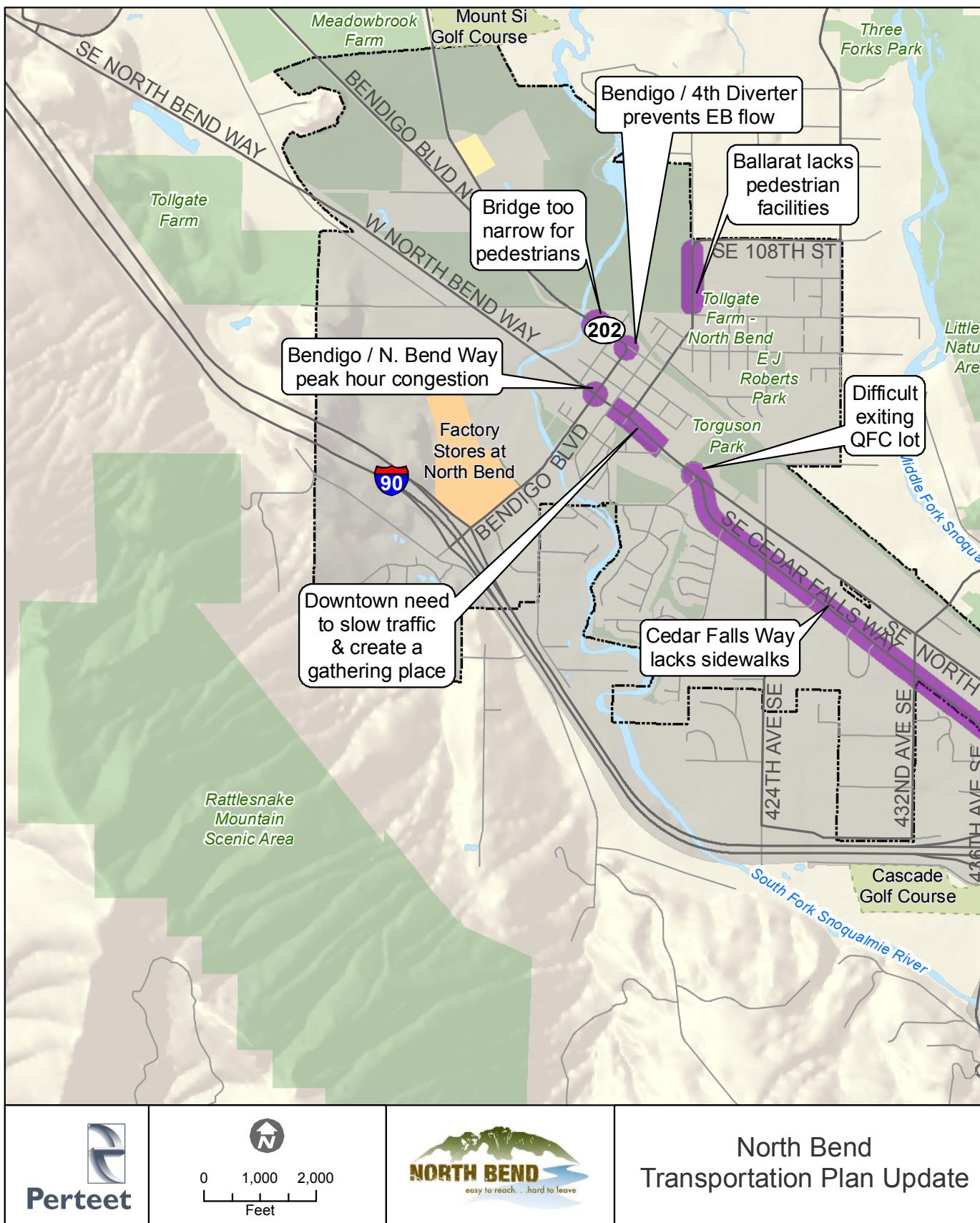
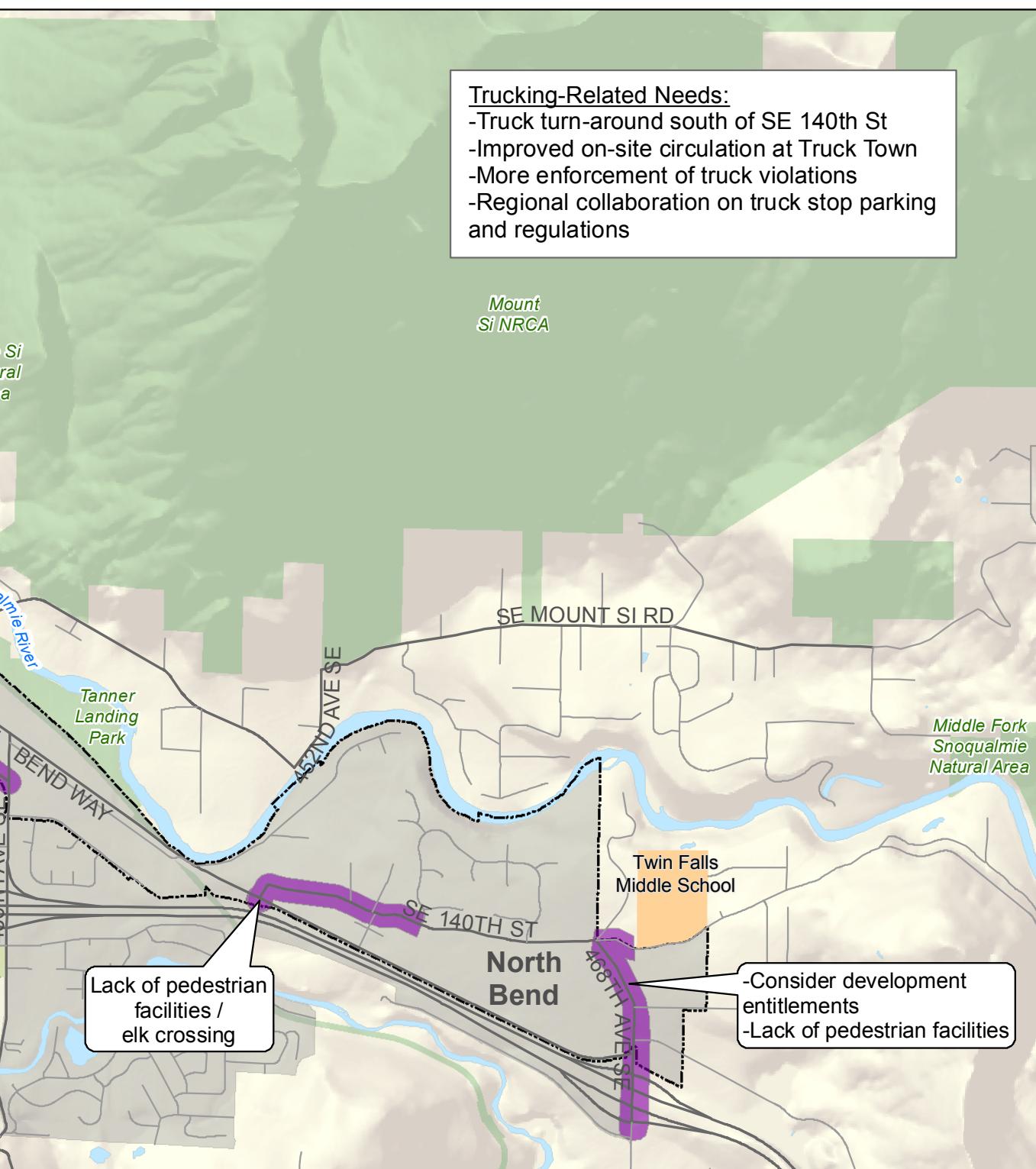


FIGURE 2: TRANSPORTATION ISSUES | JUNE 9



Transportation Issues

June 9, 2011 Planning Commission Workshop

OVERVIEW OF TRANSPORTATION PLAN

The City of North Bend Transportation Plan is presented in the following chapters, which include the Plan elements as described:

CHAPTER 1 – INTRODUCTION.

This chapter has described the purpose of the Transportation Plan Update, the regulatory environment which the plan must satisfy, and the community process.

CHAPTER 2 – GOALS, OBJECTIVES AND POLICIES.

This chapter presents the transportation policy framework that the City will utilize to plan, construct, operate and maintain the transportation system within the City of North Bend.

CHAPTER 3 – TRANSPORTATION INVENTORY.

This chapter describes the transportation and land use efforts with which this plan has been coordinated, provides an inventory of the elements of the current transportation system, and presents the existing adopted transportation improvement plan.

CHAPTER 4 – ROADWAY CONDITIONS AND LEVEL-OF-SERVICE.

This chapter describes the level-of-service criteria for the roadway system and assesses the operational elements of the existing road network.

CHAPTER 5 – TRAFFIC FORECAST MODEL SUMMARY.

This chapter presents the methodology used to forecast transportation conditions through the 2030 planning horizon, and provides an assessment of future traffic conditions if no additional improvements are made to the transportation system.

CHAPTER 6 – SYSTEM ANALYSIS.

This chapter provides a summary of the existing and future transportation issues that must be addressed, and presents potential improvements to address existing and anticipated future deficiencies in the system.

CHAPTER 7 – RECOMMENDED PLAN.

Finally, this chapter describes the transportation plan recommended to address deficiencies in the transportation system now and through 2030.

B. GOALS | OBJECTIVES & POLICIES

The purpose of the Goals, Objectives and Policies chapter of the Transportation Element is to guide the development of transportation facilities and services in North Bend in a manner consistent with the overall goals of the Comprehensive Plan. The Transportation Element addresses street classifications, levels of service, travel forecasts, travel improvements, alternative modes, funding strategies, and concurrency management. It is based upon current and projected land use and travel patterns, and addresses both local and State transportation facilities. The Transportation Element also provides direction for establishing regulations governing transportation systems, and for developing guidelines for facilities and improvement programs aimed at improving North Bend's transportation system.

The Transportation Element of the North Bend Comprehensive Plan includes transportation goals and policies, as prepared for the Comprehensive Plan, adopted on May 16, 1995, and as updated in 2003 and 2012.

Following the adoption of a set of transportation policies intended to serve as a roadmap to an efficient transportation system, it is almost inevitable that some conflict will arise between a transportation policy and real-world constraints and opportunities, or even between two policies. It is of the utmost importance that the transportation policies be applied consistently to every development proposal. When conflicts arise, consideration of the specific situation and with advice by City staff, the conflict should be resolved using the best judgment of the City Council.

The Goals, Objectives and Policies of the Transportation Plan Element play a central role in plan implementation. The following definitions are intended to provide guidance as to the purpose of "Goals," "Policies," and "Objectives."

Goals are broad, general statements of the desired long-term future state towards which the Plan aims. They indicate what ought to exist in a community or what is desired to be achieved in the future. In other words, Goals articulate the preferred vision for the future.

Objectives are statements of the desired short-term and more measurable aims of the Plan; the objectives

articulate how a goal will be achieved.

Policy describes a specific course of action or method that should be used to accomplish the purposes of the Transportation Element. Policies are decision-oriented statements which guide the Mayor, City Council, Planning Commission, and staff in their efforts to evaluate new projects, proposed changes to adopted ordinances, or other initiatives affecting the transportation within the City of North Bend.

In summary, goals are value-based statements that are hard to measure. Objectives state more specifically how a particular goal will be pursued. Policies help guide the review of development applications, and also help guide the City Council in adopting ordinances or preparing budgets.

For the purposes of the North Bend Transportation Element, the policies often use "should" rather than shall. The word "shall" would then be used in implementing ordinances or codes.

In this section, goals, objectives and policies are defined under the following major categories:

Goal 1 - Streets and Highways

Goal 2 - Environmental Quality

Goal 3 - Pedestrian and Bicycle Transportation

Goal 4 - Public Transportation

Goal 5 - Streetscape

Goal 6 - Capital Facilities

B.1 GOAL 1 STREETS & HIGHWAYS

Develop a multi-modal transportation system that is consistent with the land use element of the Comprehensive Plan that preserves and enhances the livability of North Bend and the Upper Snoqualmie Valley.

STREETS & HIGHWAYS | OBJECTIVE 1

For transportation facilities which primarily benefit non-North Bend residents, local community standards must be adhered to in accordance with the following policies:

POLICY

1. Streets and highways should be located and designed to meet the demands of both existing and projected land uses as provided for in the North Bend Comprehensive Plan.
2. Safe and efficient movement of pedestrian and bicycle traffic throughout North Bend, especially in school and recreational areas, and the downtown should be provided.
3. Whenever another governmental agency causes additional transportation impacts or costs to the City of North Bend, the City shall charge mitigation fees to defray any costs not mitigated by any additional benefits accruing to the City as a result of the other government agency's transportation-related actions. The City should develop reciprocal concurrency agreements with adjacent jurisdictions to facilitate the collection of mitigation fees or construction of needed improvements to impacted intersections.
4. Integrate economic development factors into long-range transportation planning.

STREETS & HIGHWAYS | OBJECTIVE 2

Streets should be located, connected, designed and improved in a manner that will conserve land, materials and energy.

POLICY

1. Streets should be designed with the minimum pavement areas required in order to reduce impermeable surfaces, consistent with current AASHTO safety standards.
2. Future street construction shall provide transportation alternatives for pedestrians and

bicycles consistent with the North Bend Park Element and encourage conservation of energy.

3. Collector and arterial streets should be designed to accommodate public transportation, bicycles, and truck access.

STREETS & HIGHWAYS | OBJECTIVE 3

Design standards for streets should provide reasonable guidance for the development of streets that are safe, functionally efficient, aesthetically pleasing, and cost effective. All new transportation improvements should be scaled to the function they are designed to perform in conformance to the density and land uses they serve. The following policies should provide guidance for the design of new transportation improvements:

POLICY

1. Adequate, but not excessive on-street parking should be encouraged on commercial and residential streets where it can be safely accommodated.
2. Streets should be designed to accommodate vehicles that use the street most frequently rather than for large vehicles which may use the street only occasionally.
3. Required street widths should be related to the function and level of service standards for the street, while reducing impervious surface to the maximum degree feasible.
4. Residential streets should be designed to preserve existing trees and vegetation.
5. Landscaping should be utilized to provide visual and physical barriers but should be carefully designed not to interfere with visibility and traffic safety.
6. Subject to available funding, undergrounding of existing overhead utilities should be explored and encouraged at the time of street improvement through the establishment of U.L.I.D.'s. Utilities shall continue to be underground for all new construction.
7. Circulation from private property to the public street system should be designed in a manner that provides a safe and convenient access system that respects community needs and values.

(a) For safety reasons, limit and provide access to the street network in a manner consistent with the

function and purpose of each roadway. Require the preparation of comprehensive access plans and consolidation of access points in commercial and high density residential areas through shared driveways and local access streets.

(b) Require new development to minimize and consolidate access points along all principal and minor arterial streets, but especially along state routes and arterial streets. (c) Place a high priority on consolidating existing driveways onto all arterial streets. This effort should be coordinated with local business and property owners in conjunction with improvements to the arterial system and redevelopment of adjacent land parcels.

(d) Develop and utilize minor access streets as the primary means of providing access to residential areas. (e) Access onto state highways shall be regulated according to RCW 47.50.

STREETS & HIGHWAYS | OBJECTIVE 4

Circulation through the City of North Bend should be primarily via the system of collector and arterial streets, bicycle and pedestrian paths.

POLICY

1. The City of North Bend will encourage the efficient movement of people and goods through an effective and inter-connected collector and arterial street system that protects sensitive areas including wetlands, riparian corridors, floodways, and channel migration zones.
2. To minimize trip distances and maximize pedestrian and bicycle mobility, ensure that future developments are interconnected, with multiple access points into and between neighborhoods.
3. Vehicular and pedestrian connectivity between neighborhoods shall be a priority. The use of dead end streets and cul-de-sacs should be avoided. When unavoidable, the length of a dead end street, including cul-de-sac, should be limited.

STREETS & HIGHWAYS | OBJECTIVE 5

Improve traffic safety and reduce congestion through appropriate street design and site layout during the development process.

POLICY

1. New development shall be required to dedicate and improve street rights-of-way for private and public streets as specified by City Standards and the Transportation Element of the Comprehensive Plan.
2. In some cases, such as for the installation of sidewalks, the City may acquire easements and/or development rights in lieu of rights-of-way.
3. Cooperate with the WSDOT and other regional agencies (including the Port of Seattle) as appropriate to increase the supply of off-street facilities for overnight truck parking along the I-90 corridor.
4. Cooperate with the WSDOT and King County to plan for, and efficiently manage spillover truck parking demand due to emergency closures of I-90, especially in winter months.

STREETS & HIGHWAYS | OBJECTIVE 6

Plan, develop, and maintain transportation systems that are consistent with The City of Snoqualmie, King County, the Snoqualmie Valley School District, the Si View Metropolitan Park District, and the state.

POLICY

1. Participate in local and regional forums to coordinate strategies and programs that further the goals of the Comprehensive Plan and implement the Transportation Element.
2. Work with neighboring jurisdictions and regional and state agencies to coordinate transportation system improvements and assure that funding requirements are met.

STREETS & HIGHWAYS | OBJECTIVE 7

Document citizen requests concerning traffic calming and develop an annual process to prioritize them for corrective actions.

POLICY

1. Preserve the neighborhood environment through use of traffic calming techniques.

STREETS & HIGHWAYS | OBJECTIVE 8

Provide a designated system of roadways that provide reliable truck mobility through the City, and to/from the growing number of businesses in the City, while minimizing negative community aspects.

POLICY

1. The City recognizes that the safe and efficient movement of freight is vital to the economic viability and success of businesses located in North Bend. Given that fact, consider the movement of freight in the design, operations and maintenance of the City's transportation system.
2. Designate two types of truck routes on the City's arterial and collector streets: a) Through Truck Routes, principally on arterial streets – for movements through the City, and b) Truck Access Route, principally on collector streets – for movements between the Through Truck Routes and freight destinations within the City. Through Truck Routes will include I-90 and Bendigo Boulevard/SR-202.
3. On designated truck routes, give design consideration to the additional requirements of truck weight, turning radius requirements, and slower travel speed relative to the construction of pavements, intersections and traffic signals.
4. Restrict truck parking in residential neighborhoods.

B.2 GOAL 2 ENVIRONMENTAL EQUALITY

Develop public and private transportation improvements that minimize adverse impacts on the natural environment, air and water quality, public health and energy consumption, and support healthful mobility options including walking and biking.

ENVIRONMENTAL EQUALITY | OBJECTIVE 1
Comply with federal and state air quality requirements related to the North Bend transportation system, including the law passed by the State Legislature in 2008 that establishes a statewide goal to reduce greenhouse gas emissions to 1990 levels by 2020; to 25% below 1990 levels by 2035; and to 50% below 1990 levels by 2050.

POLICY

1. Participate in efforts by the State and Puget Sound agencies to improve air quality as it is affected by the movement of people and goods.
2. Conform to the Federal and State Clean Air Acts by maintaining conformity with the long range regional

growth strategy of the Puget Sound Regional Council as documented in its Vision 2040 and Transportation 2040 plans, and by following the requirements of Chapter 173-420 of the Washington Administrative Code, the Washington State Clean Air Conformity Act, with which local transportation plans and transportation improvement programs must comply.

3. Work with the Puget Sound Regional Council, WSDOT and other agencies and jurisdictions in the development of transportation control measures and air quality programs where warranted.

ENVIRONMENTAL EQUALITY | OBJECTIVE 2

Reduce the adverse environmental and health impacts of vehicle emissions and associated pollution.

POLICY

1. Implement an idling policy for all City vehicles, and educate the public about the benefits of not idling vehicles.
2. Develop and implement idling measures that reduce or prohibit the idling of vehicles.
3. Encourage and develop incentives for agencies, organizations and companies with vehicular fleets, to install emission reduction devices on all vehicles, especially for engines manufactured after 1989.
4. Encourage truck facilities to employ ultra-high frequency identification (FID) (Ultra-HighFID) radio technology, or a technology of the like, to improve lot flow and aid incoming drivers of lot space.
5. Make education materials available at North Bend truck stop facilities and the truck drivers to inform and educate truck operators of emission reduction programs, rebates, and incentives.
6. Require for any permit meeting the city established threshold for compliance with the new code that commercial truck facilities provide heating and cooling as well as auxiliary power for convenience and refrigeration of cargo thereby permitting engine shut off and to comply with city idle code(s).
7. Work with County, State and Federal transportation agency planners and stakeholders to ensure that sufficient truck stop and parking facilities are provided and planned for along I-90 and Highway 18, between approximately the Snoqualmie summit and Preston, or as otherwise necessary to reduce the adverse impacts from trucks in North Bend.

ENVIRONMENTAL EQUALITY | OBJECTIVE 3
Comply with federal and state storm water controls and treatment, groundwater protection, and endangered species act requirements related to construction, operation, and maintenance of the North Bend transportation system.

B.3 GOAL 3
SINGLE OCCUPANT VEHICLE TRIP REDUCTION

Manage the City's transportation system and develop improvements that minimize trips by single occupant vehicles.

SINGLE OCCUPANT VEHICLE TRIP REDUCTION | OBJECTIVE 1

To reduce traffic congestion, greenhouse gas emissions, and use of fossil fuels, seek ways to reduce overall vehicle miles traveled and single occupant vehicle trips by North Bend residents and employees.

POLICY

1. Establish and implement vehicle parking maximums and reduce vehicle parking minimums in the City's parking regulations to reduce the oversupply of vehicle parking not required by the actual parking demand.
2. Encourage use of bicycle and pedestrian modes of transportation for local trips by way of providing complete and interconnected streets and sidewalks, ensuring ample and convenient bicycle parking, and orienting buildings and land uses to sidewalks and pedestrians rather than to parking lots and vehicles.
3. Ensure that transportation concurrency requirements address all modes of transportation, including bicycle and pedestrian mobility.
4. Establish city work policies which support City employees to telecommute or to work flex schedules (such as longer days with a 4-day work week) to reduce commuting needs.
5. Create a bicycle and pedestrian-friendly environment throughout North Bend that connects neighborhoods to the downtown, to cultural, historic, and recreational facilities, and to other transportation elements such as park-and-ride lots and transit routes and to include connectivity to the City of Snoqualmie.

6. Connectivity to the City of Snoqualmie.
7. Objects located on the sidewalk such as poles, benches, planters, bike racks, awnings, etc., should not impede pedestrian traffic.
8. Sidewalks should be located to accommodate existing natural features, such as significant trees within rights-of-way, when present.
9. Pedestrian safety should be a high priority in areas frequented by children, such as near schools, libraries, and park and recreation facilities. Pedestrian facilities should be provided in these areas at every opportunity.
10. Implement a system of pedestrian street crossings and signage which gives pedestrian safety a high priority.
11. Prioritize sidewalk construction funding, based on the following criteria:
 - The improvement will enhance mobility for the disabled;
 - The improvement will improve pedestrian safety (e.g., the route occurs along a roadway with high vehicular speeds or volumes);
 - The improvement will result in links to key destinations;
 - The improvement will complete a missing link in the sidewalk system;
 - The improvement will be located in an area where there are no parallel pedestrian routes;
 - The improvement will remove a significant pedestrian barrier;
 - The improvement will promote intermodal trips;
 - The improvement will accommodate either current or predicted high levels of pedestrian activity, such as to key destinations; and
 - The improvement will match the needs in the district, i.e., commercial, retail or residential district.
12. The preferred pedestrian improvement will have curb, gutter and sidewalk, with planter strip. Appropriate levels of illumination should be provided. The minimum sidewalk width should be 5 feet, with wider sidewalks located in the Downtown and along

heavily traveled arterial streets.

13. Develop pedestrian and bicycle facilities separated from the travel lanes as identified in the Parks and Open Space Element.
14. Require development to provide additional sidewalks along local streets to complete missing links, increase pedestrian safety, and provide linkages to key destinations. The preferred pedestrian improvements on local streets include curb, gutter, median strip and sidewalk, or, alternatively, pedestrian paths may be allowed.
15. Develop links between off-road and on-road pedestrian and bicycle facilities to provide an intact system of trails.
16. Create development regulations which require new development to provide connections, or payments-in-lieu, to the City's bicycle/walkway trails system.
17. Payment-in-lieu of construction will be allowed under the following conditions:
 - The City's latest six-year Capital Improvement Program (CIP) includes and specifically identifies City project for sidewalks at the location of the development project, and
 - The City determines that it will be in the best interest of the City to construct sidewalks at the development project location as part of and concurrently with the City's identified capital project.

B.4 GOAL 4 **PEDESTRIAN & BICYCLE** **TRANSPORTATION**

Create a bicycle and pedestrian-friendly environment throughout North Bend that connects neighborhoods to the downtown, to cultural, historic, and recreational facilities, and to other transportation elements such as park-and-ride lots and transit routes and to include connectivity to the City of Snoqualmie.

SIDEWALKS | OBJECTIVE 1

Safe, attractive and barrier free pedestrian facilities should be provided as an essential element of the City's circulation and recreation system, in accordance with the following policies:

POLICY

1. Construct pedestrian facilities along all streets, and bicycle facilities along arterial and collector streets, in accordance with the City's street design standards.
2. Establish a pedestrian and bicycle network that is consistent with the Park & Open Space Plan and is connected to a greenway system which links commercial areas, employment centers, neighborhoods, and public facilities and include connectivity to the City of Snoqualmie.
3. Objects located on the sidewalk such as poles, benches, planters, bike racks, awnings, etc., should not impede pedestrian traffic.
4. Sidewalks should be located to accommodate existing natural features, such as significant trees within rights-of-way, when present.
5. Pedestrian safety should be a high priority in areas frequented by children, such as near schools, libraries, and park and recreation facilities. Pedestrian facilities should be provided in these areas at every opportunity.
6. Implement a system of pedestrian street crossings and signage which gives pedestrian safety a high priority.
7. Prioritize sidewalk construction funding, based on the following criteria:
 - (a) The improvement will enhance mobility for the disabled;
 - (b) The improvement will improve pedestrian safety (e.g., the route occurs along a roadway with high vehicular speeds or volumes);
 - (c) The improvement will result in links to key destinations;
 - (d) The improvement will complete a missing link in the sidewalk system;
 - (e) The improvement will be located in an area where there are no parallel pedestrian routes;



- (f) The improvement will remove a significant pedestrian barrier;
- (g) The improvement will promote intermodal trips;
- (h) The improvement will accommodate either current or predicted high levels of pedestrian activity, such as to key destinations; and
- (i) The improvement will match the needs in the district, i.e., commercial, retail or residential district.

8. The preferred pedestrian improvement will have curb, gutter and sidewalk, with planter strip. Appropriate levels of illumination should be provided. The minimum sidewalk width should be 5 feet, with wider sidewalks located in the Downtown and along heavily traveled arterial streets.

9. Develop pedestrian and bicycle facilities separated from the travel lanes as identified in the Parks and Open Space Element.

10. Require development to provide additional sidewalks along local streets to complete missing links, increase pedestrian safety, and provide linkages to key destinations. The preferred pedestrian improvements on local streets include curb, gutter, median strip and sidewalk, or, alternatively, pedestrian paths may be allowed.

11. Develop links between off-road and on-road pedestrian and bicycle facilities to provide an interconnecting system of trails.

12. Create development regulations which require new development to provide connections, or payments-in-lieu, to the City's bicycle/walkway trails system.

13. Payment-in-lieu of construction will be allowed under the following conditions:

- (a) The City's latest six-year Capital Improvement Program (CIP) includes and specifically identifies City project for sidewalks at the location of the development project, and
- (b) The City determines that it will be in the best interest of the City to construct sidewalks at the development project location as part of and concurrently with the City's identified capital project.

14. **Bicycle Facilities.** Safe bicycle routes should be an integral part of the City's street and recreation plans, in accordance with the applicable policies in Objective O3.1 and the following additional policies:

15. Sidewalks are not desirable for bicycle traffic due to obstacles and the presence of pedestrians. Separate bicycle facilities should be provided in congested areas, consistent with the Park & Open Space Plan.

16. Combination bicycle-pedestrian paths can be developed in non-congested areas.

17. The use of bicycles for transportation purposes in addition to recreation purposes should be encouraged, by providing bicycle lanes on appropriate collector and arterial streets, marked bicycle sharrows (travel lanes shared by bicycles and motor vehicles) where there is insufficient room for separate bicycle lanes and traffic speeds are low, and by maintaining existing roadway shoulders in a smooth and stable condition for safe bicycle travel.

18. Adopt and implement bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10% of projected use at all public and commercial facilities. Require the bicycle parking facilities be provided in close proximity to the building entrance.

BICYCLE FACILITIES | OBJECTIVE 2

Safe bicycle routes should be an integral part of the City's street and recreation plans, in accordance with the applicable policies in Objective O3.1 and the following additional policies:

POLICY

1. Sidewalks are not desirable for bicycle traffic due to obstacles and the presence of pedestrians. Separate bicycle facilities should be provided in congested areas, consistent with the Park & Open Space Plan.
2. Combination bicycle-pedestrian paths can be

developed in non-congested areas.

3. The use of bicycles for transportation purposes in addition to recreation purposes should be encouraged, by providing bicycle lanes on appropriate collector and arterial streets, marked bicycle sharrows (travel lanes shared by bicycles and motor vehicles) where there is insufficient room for separate bicycle lanes and traffic speeds are low, and by maintaining existing roadway shoulders in a smooth and stable condition for safe bicycle travel.
4. Adopt and implement bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10% of projected use at all public and commercial facilities. Require the bicycle parking facilities be provided in close proximity to the building entrance.

B.5 GOAL 5 PUBLIC TRANSPORTATION

The public transportation system shall provide alternatives to the use of automobiles that enable all persons to have reasonable access to locations of employment, health care, education, and community business activities.

PUBLIC TRANSPORTATION | OBJECTIVE 1
Public transportation shall be provided by King County Metro and other providers as an alternative to use of the automobile and as a means of reducing air pollution and greenhouse gas emissions, conserving energy, and relieving traffic congestion in accordance with the following policies:

POLICY

1. The adequacy of public transportation service shall be gauged according to three factors: a) geographic coverage, b) service frequency, and c) span of service. For concurrency purposes, an adequate level of transit service shall be considered to include regular fixed route service:
 - Focused geographically on the City Center area;
 - Providing hourly (60-minute) frequency on weekdays and Saturdays, and express bus service during weekday commute peak hours; and

- Providing a span of service from 5:30 am to 8:30 pm on weekdays, and 8:30 am to 9:30 pm on Saturdays.
- 2. Public transportation should be convenient and flexible enough to meet community needs. Fixed route coverage should be expanded from the City Center area to be conveniently reached from all the City's residential neighborhoods, consistent with their growth and development.
- 3. Work with King County Metro Transit to increase the frequency of express bus service to Seattle and the east side.
- 4. The public transportation system should be dependable, maintain regular schedules and provide an adequate level of commuter service and during evening hours, weekends, and holidays.
- 5. Designated activity centers outside of North Bend should be served by frequent, regular transit service from the North Bend area.
- 6. Transit service should be designed to serve local and eastside commuting and activity patterns, and should be coordinated with the City and significant concentrations of employment. New development and redevelopment in activity centers shall be designed to provide and encourage pedestrian access to transit.
- 7. The city should work with larger employers to implement transportation strategies that encourage transit or alternative transportation usage by workers.
- 8. Promote the use of the Snoqualmie Valley Transportation's shuttles and dial-a-ride transit for local trip needs.
- 9. The public transit system should be based on transportation alternatives that are economically feasible for North Bend and King County Metro Transit.
- Specialized transportation, such as dial-a-ride service, should be available for disabled and mobility-impaired people, consistent with ADA requirements. Transportation demand management actions should be encouraged and provided as a method for helping to meet access and parking requirements for new and

existing development.

10. Coordinate and encourage joint public/private efforts to participate in transportation demand management and traffic reduction strategies.
11. The City should support the placement of pedestrian access and signage to better integrate the train depot into the downtown.
12. More efficient use of existing public rights-of-way is encouraged to increase parking opportunities within the downtown core.
13. North Bend should endorse grant applications for the Northwest Railway Museum when the grant directly benefits the upper Snoqualmie Valley economic and transportation goals and policies.
14. Promote the use of the North Bend Park and Ride for carpooling and available King County Metro Transit services to reduce single-occupant vehicle commuting.

B.6 GOAL 6 STREETSCAPE

Incorporate streetscape design in the development and redevelopment of North Bend streets to enhance our scenic beauty and help preserve our historic downtown and neighborhoods.

STREETSCAPE | OBJECTIVE 1

Follow adopted design standards to create an attractive street system consistent with the character of the City of North Bend.

POLICY

1. Implement roadway design standards that enhance the small town atmosphere of North Bend.
2. Crosswalks should be six feet wide and designed to meet ADA standards.
3. Street lights shall be utilized for the safety and welfare of North Bend residents and the traveling public while protecting the rural character, quality of life, and economic well-being of the city with the following guidelines:

- Lighting fixtures shall be standardized and enhance the character and reflect on the history of the community; and
- Unnecessary light and glare which cause light pollution that may diminish the natural environment, including the beauty, high quality, and visibility of the night sky, shall be avoided by requiring shielded, full cut-off, and directional lighting fixtures.
- 4. Street trees should be installed along all streets in accordance with the City's street tree standards.
- 5. Develop a Downtown circulation pattern that provides adequate capacity for the traffic demand while implementing a plaza design, within the Downtown core, that provides a multi-purpose right-of-way during times of community gatherings.
- 6. Minimize the visual clutter of traffic control electrical boxes, vaults, and other such transportation-related equipment through appropriate placement, screening, and landscaping.
- 7. Establish appropriate levels of service for transportation facilities to adequately serve existing and future development.

B.7 GOAL 7 CAPITAL FACILITIES & TRANSPORTATION

Establish appropriate levels of service for transportation facilities to adequately serve existing and future development.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 1

Identify and define the transportation facilities in the City of North Bend.

POLICY

1. Maintain an inventory of existing transportation facilities owned or operated by the City and Washington State within North Bend. Include in the inventory the locations and capacities of such facilities and systems.
2. Establish and maintain an annual traffic count

program.

3. Maintain a traffic collision record system to evaluate and determine appropriate traffic safety measures.
4. Encourage design standards that minimize the number of curb cuts and points where vehicles cross over the sidewalk.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 2

Establish level of service standards for City owned transportation facilities in North Bend and adopt the State and PSRC level of service standards for state owned and regional facilities in order to achieve and maintain the desired quality of life and vision for the City of North Bend.

POLICY

1. Establish level of service standards which (1) measure the quality of life based on the City's vision of its future and values, (2) can be achieved and maintained for existing development and growth anticipated in the land use plan, and (3) are achievable with the TIP and the Comprehensive Plan. The following are the standards for City streets and transit services:

City Streets: All arterial street intersections shall operate at LOS D or better during peak periods, except the Bendigo/ North Bend Way intersection, which shall be exempted due to constrained right-of-way and urban character.

Transit: Service to activity centers or urban centers via transit hub, including Park and Ride lots. Span of service 6a.m. to 9p.m. Weekday peak service frequency: 60 minutes or better, also express service. Weekday off-peak service frequency: 60 minutes or better.

Use the level of service standards to (1) determine the need for transportation facilities, and (2) test the adequacy of such facilities to serve proposed development. In addition, use the level of service standards for city-owned transportation facilities to develop the City's annual budget and 6-year Transportation Improvements Program (TIP).

2. Re-assess the TIP annually to ensure that transportation facilities needs, financing, and levels of service are consistent with the land use plan.

The annual update should be coordinated with the annual budget process, and the Capital Improvement element amendment of the Comprehensive Plan.

3. Re-evaluate proposed land-use plan designations as necessary should funding for necessary transportation infrastructure not be available.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 3

Provide a variety of responses to the demands of growth on transportation facilities.

POLICY

1. Ensure City transportation facilities and services are provided concurrent with the impact of new development or redevelopment.
2. Make the most efficient use of existing transportation facilities, including techniques such as:
 - Transportation demand management; and
 - Encourage development that uses existing facilities.
3. Provide additional transportation facility capacity when existing facilities are used to their maximum level of efficiency consistent with adopted standards for levels of service.
4. Encourage development where adequate transportation facilities and services exist or can be provided in an efficient manner.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 4

Coordinate transportation planning and programming with state, county, and local agencies.

POLICY

1. Coordinate with non-City providers of transportation facilities and services on a joint program for maintaining adopted levels of service standards, funding, and construction of capital improvements. Work in partnership with non-City transportation facility providers to prepare functional plans consistent with the City of North Bend Comprehensive Plan.
2. Establish interagency planning mechanisms to assure coordinated and mutually supportive transportation

facility plans from non-City providers (WSDOT, King County Roads and Metro Transit, adjoining cities, etc.) of transportation facilities.

- Establish priority areas for transportation improvements consistent with the Comprehensive Plan.
- Periodically assess development trends and transportation facility needs to identify and remedy deficiencies or reassess the land use plan.
- 3. Regularly coordinate with WSDOT, King County Roads and Metro Transit, and the City of Snoqualmie to ensure that levels of service for transportation facilities are compatible.
- 4. Encourage additional improvements to enhance high-occupancy vehicle travel on I-90.
- 5. Coordinate Federal, State, County, City agencies, the Ports, and freight mobility industry leaders to develop a Regional Plan for freight mobility and staging, within the Puget Sound regional, that allows for efficient mobility while reducing or eliminating impacts on North Bend's streets and air and water quality.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 5

Annually develop a six-year transportation improvements program with which to facilitate implementation of the Comprehensive Plan.

POLICY

Prepare and utilize the six-year TIP to identify transportation projects necessary to respond safety issues, the planned growth of the community, and maintain desired levels of service.

Prepare and utilize the six-year TIP to integrate North Bend transportation capital projects and resources with other agencies in order to maximize financing opportunities such as grants, bonds, city funds, donations, impact fees and other available funding.

Maintain the TIP as follows:

- Provide for annual review of the Capital Facilities Plan contained in this Capital Facilities Element by the City Council and incorporate a citizen participation process;

- Ensure that the Capital Facilities Plan is consistent with the overall Comprehensive Plan;
- Defines the projects' need and links to levels of service and facility plans;
- Considers operations and maintenance impacts where appropriate; and
- Establishes project priorities in the order of safety first and then LOS.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 6

Establish mechanisms to ensure that the required transportation facilities are financially feasible.

POLICY

1. Base the financing plan for transportation facilities on realistic estimates of current local revenues and external revenues that are reasonably anticipated to be received by the City on an ongoing basis.
2. Finance the six-year TIP within the City's financial capacity to achieve a balance between available revenue and needed transportation facilities. If the projected funding is inadequate to finance needed transportation facilities based on adopted level of service standards and forecasted growth, the City could do one or more of the following:
 - Lower the level of service standard;
 - Change the Land Use Plan;
 - Increase the amount of revenue from existing sources; and/or
 - Adopt new sources of revenue.
3. Design roads to be financially feasible to maintain, by means of reduced impervious surfaces and implementation of low impact strategies that reduce maintenance costs, in addition to providing a well-connected street system, reducing the miles of roadway necessary to provide adequate circulation and access throughout the City.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 7

Establish mechanisms to ensure that the required transportation facilities are fully funded.

POLICY

1. Match revenue sources to transportation improvements on the basis of sound fiscal policies.
2. Revise the TIP in the event that revenue sources for transportation improvements, which require voter approval in a local referendum, are not approved.
3. Ensure that the ongoing operating and maintenance costs of a transportation facility are financially feasible prior to constructing the facility.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 8

Ensure existing and future development pay for the costs of needed transportation improvements.

POLICY

1. Ensure that existing development pays for transportation improvements that reduce or eliminate existing deficiencies, and pays for some or all of the cost to replace obsolete or worn out facilities. Existing development may also pay a portion of the cost of transportation improvements needed by future development. Existing development's payments may take the form of user fees, charges for services, special assessments, and taxes.
2. Ensure that future development pays a proportionate share of the cost of new facilities that it requires. Future development may also pay a portion of the cost to replace obsolete or worn-out facilities. Future development's payments shall take the form of one or more of the following: voluntary contributions for the benefit of any transportation facility, impact fees, mitigation payments, capacity fees, dedications of land, provision of transportation facilities, and future payments of user fees, charges for services, special assessments, and taxes.
3. In the annual budget, the city shall maintain its bridges, arterials, and collector streets system and implement safety improvements as a high priority. Development of new bridges, arterials, and collector streets should, subject to the availability of outside

grant opportunities, be a secondary budget priority.

CAPITAL FACILITIES & TRANSPORTATION | OBJECTIVE 9

Seek to mitigate disproportionate financial burdens to the City due to the siting of essential transportation facilities and freight mobility facilities.

POLICY

1. Through joint planning or interlocal agreements, the City shall seek to mitigate disproportionate financial burdens due to the siting of essential transportation facilities.
2. The City shall seek amenities or incentives for neighborhoods in which the facilities are located, and require compensation for adverse impacts.

C. TRANSPORTATION INVENTORY

This chapter describes the transportation and land use efforts with which this plan has been coordinated, provides an inventory of the components of the current transportation system, and presents the existing adopted transportation improvement plan.

C.1 REPORTS, PLANS AND RECORDS

Adopted city plans and prior reports were integral to the assessments presented in this chapter. Information was obtained from the following sources:

City of North Bend Comprehensive Plan - This document contains plans, policies and regulations for land use, sensitive areas, housing, transportation, utilities and capital facilities for the City of North Bend.

Highways of Statewide Significance (HSS) - A list of all Washington State highways that have been identified as a Highway of Statewide Significance compiled by the Washington State Transportation Commission, by Resolution #584.

City of North Bend Heritage Corridor Gateway Master Plan Narrative - November, 1999. This documents the concept plan for potential improvements to Bendigo Boulevard from Ribary Way to NE 4th Street. The plan discusses coordinated lighting, landscaping, public art and signage, including a bikeway and pedestrian system.

City of North Bend Design Standards - This document compiles design standards and guidelines for context, site, building, landscape, sign, and circulation.

City of North Bend Park Plan - This plan provides for trails, paths, and bike routes through the city.

North Bend Gravel Operation Final EIS, Appendix M – Transportation Technical Report, URS, December 2001.

WSDOT Truck Parking Study – Final Report, prepared for WSDOT by Parametrix, December 2005.

Middle Fork Business Park - SEPA DNS and MDNS, King County DDES: October 20, 2000; November 4, 2002; and July 9, 2008.

Middle Fork Road Re-Paving Project - contacted by Michael Traffalis, FHWA; June, 2011.

C.2 LAND USE REVIEW

Land use changes are integral to projecting traffic volume increase over time. For the purpose of the Transportation Plan Update, existing and projected land uses within the Urban Growth Area (City Limits plus the Annexation Area) were collated. In addition land use data was obtained from King County for parcels located outside the UGA, but may create a transportation need or impact, i.e. Cadman and Twin Falls Middle School. The projected land use change by subarea from 2011 through 2030 is shown graphically for residential units in Figure 3, and for employment growth in Figure 4. The identified changes were provided by city of North Bend staff based on known subdivision permitting activity and anticipated changes consistent with available land capacity and the adopted Comprehensive Plan. For detailed information related to projected Residential Capacity and Employment Capacity, refer to the North Bend Comprehensive Plan Land Use Element.

C.3 STATE OWNED TRANSPORTATION FACILITIES

As required under the WA Growth Management Act (GMA), comprehensive plan transportation elements are required to include a sub-element addressing state-owned transportation facilities, and transportation facilities of statewide significance. This section of the City's Transportation Element complies with the GMA requirements by providing:

- An inventory of state-owned facilities within the North Bend Planning Area;
- Estimates of traffic impacts to state-owned facilities

resulting from land use decisions so performance can be monitored and improvements can be planned;

- State adopted level of service (LOS) standards for measuring state facility performance;
- Identified current and future state facility needs that are consistent with WSDOT's statewide transportation plan.

C3.a INVENTORY OF STATE OWNED FACILITIES

Interstate 90 - I-90 is designated as a Highway of Statewide Significance (HSS) and a Strategic Freight Corridor (per RCW 47.06A.010). It is functionally classified as a Freeway by WSDOT, and it is rated on the Washington State Freight and Goods Transportation System (FGTS) as a T-1 facility carrying more than 10,000,000 tons per year (2011 update). The Strategic Freight Corridor Designation emphasizes its economic importance because it serves both international and interstate trade, and enhances the state's competitive position through regional and global gateways. In addition to freight, I-90 serves commuter, neighborhood, business and recreational travelers. Within the planning area, interchanges with I-90 are located at State Route 202 - Bendigo Boulevard, 436th Avenue SE, and 468th Avenue SE. I-90 is a critical transportation corridor, linking the Puget Sound region to eastern Washington and beyond. I-90 is a fully access-controlled, multi-lane divided highway through the North Bend planning area.

State Route 202-Bendigo Boulevard – SR 202 (Bendigo Boulevard) is a primarily east/west highway connecting from I-90 through Downtown North Bend westward through the cities of Snoqualmie, Fall City, Redmond and to Woodinville. It intersects with State Routes 203, 908 and 520, and terminates at SR 522 in Woodinville.

Within the City of North Bend, the typical two-lane cross section changes as follows: there is a three lane section between the I-90 ramp terminals (two northbound, one southbound); and a four lane section between the I-90 westbound ramps and South Fork Avenue SW. There are bike lanes between I-90 and the bridge over the South Fork of the Snoqualmie River, and intermittent sidewalks along the route through the city. The remaining portion of the state route through the city is a two-lane roadway. The completion of bike and pedestrian facilities is a priority for improvement, as is revising the intersection configuration of Bendigo Boulevard at NE 4th street to allow southbound to eastbound travel.

Recent Project Improvements Along State Facilities -

The WSDOT is preparing a Corridor Study for I-90 from Eastgate in Bellevue to 465th Avenue SE in North Bend (as of February 2012). The Corridor Study was funded by the State Legislature at \$2 million to identify safety and mobility improvement needs over the next two decades. It was mandated by the Federal Highway Administration's approval of the Sunset Interchange construction on I-90 in Issaquah. A Corridor Study Plan is scheduled for completion in Spring 2012. The City of North Bend was represented on the Corridor Working Group by Ron Garrow, Public Works Director. No other improvements are planned by WSDOT for either I-90 or SR 202 within the North Bend planning area in the WSDOT State Highway System Plan.

Recent project improvements along state facilities:

- In 2005, the City installed pedestrian facilities along SR 202 between Ribary Way and the South Fork Bridge immediately north of South Fork Avenue.
- In 2007 WSDOT completed construction of a 2-lane roundabout at the eastbound I-90 ramp to SR 202-Bendigo Boulevard to improve safety and traffic flow. This improvement provides an important gateway to the City.
- Also in 2007, WSDOT repaved a 4.5 mile section of SR 202 at a cost of \$2.4 million, with center line rumble strips and guard rails to improve safety, from SR 203 in Fall City to W. North Bend Way, providing an improved linkage to Snoqualmie and Fall City.
- In 2010, the City installed a signal at the intersection of SR 202 and Park Street, a high accident location. Since its installation, accident rates have fallen dramatically.
- In 2011, the North Bend Park and Ride lot was constructed by the City in Downtown North Bend on W. North Bend Way adjacent to the SR 202 corridor with a \$230,000 federal grant from the American Recovery and Reinvestment Act (ARRA).

Traffic Impacts to State Owned Facilities

Traffic impacts on state owned facilities from the City's anticipated development through the 2030 forecast year are shown in the next chapter, Forecasting Future Travel Demand. The projected development is consistent with the Land Use Element of the North Bend Comprehensive Plan.

LOS and Concurrency for Highways of Statewide Significance

I-90 is designated a Highway of Statewide Significance (HSS) by WSDOT who has established a traffic level of service (LOS) standard of "D" for the highway through

the North Bend Planning Area. Local transportation concurrency requirements do not apply to HSS facilities. The Puget Sound Regional Council has adopted a LOS standard of "D" for Tier II regionally significant state highways, which include SR 202 through North Bend. Regionally significant state highways are state transportation facilities that are not designated as being of statewide significance. PSRC took this action to comply with 1998 amendments (HB 1487, the "Level of Service Bill") to the Growth Management Act (GMA). Adoption of LOS standards for regionally significant (also called non-HSS) state highways followed a yearlong process involving WSDOT and the region's cities and counties. For further information, see the PSRC website, psrc.org.

C.4 INTERSTATE TRUCKING

The City of North Bend acknowledges that the I-90 corridor is rated as a significant transportation corridor carrying more than 10,000,000 tons of freight per year and is recognized as a Strategic Freight Mobility Corridor by Washington State Department of Transportation. The city also recognizes that the existing commercial truck facility located at the I-90 exit 34 is the largest commercial truck facility currently located in King County. This commercial truck facility serves the Freight Mobility needs of the I-90 corridor connecting Washington agriculture businesses and other industries with urban markets in northwest Washington and Puget Sound, along with global markets via the ports of Seattle, Tacoma, and Everett. On a typical weekday, approximately 6,500 trucks travel over I-90 at Snoqualmie Pass providing a strategic freight corridor for international and domestic trade. This Regional Freight Mobility Corridor impacts the transportation corridors, economic vitality, safety, health and environmental elements of the City of North Bend and surrounding communities. The City of North Bend is committed to an ongoing effort to conduct, coordinate, and support local and regional efforts to mitigate these impacts from the Regional Freight Mobility activity within the boundaries of the City.

The City of North Bend includes a truck stop facility within its boundary, at Exit 34 on I-90. As of 2012, this truck stop has an average of 175 trucks parked overnight, with about 900 trucks using exit 34 each day. Additionally, approximately 300 - 400 trucks park between exit 32 and 34 when Snoqualmie Pass closes due to weather events or emergencies.

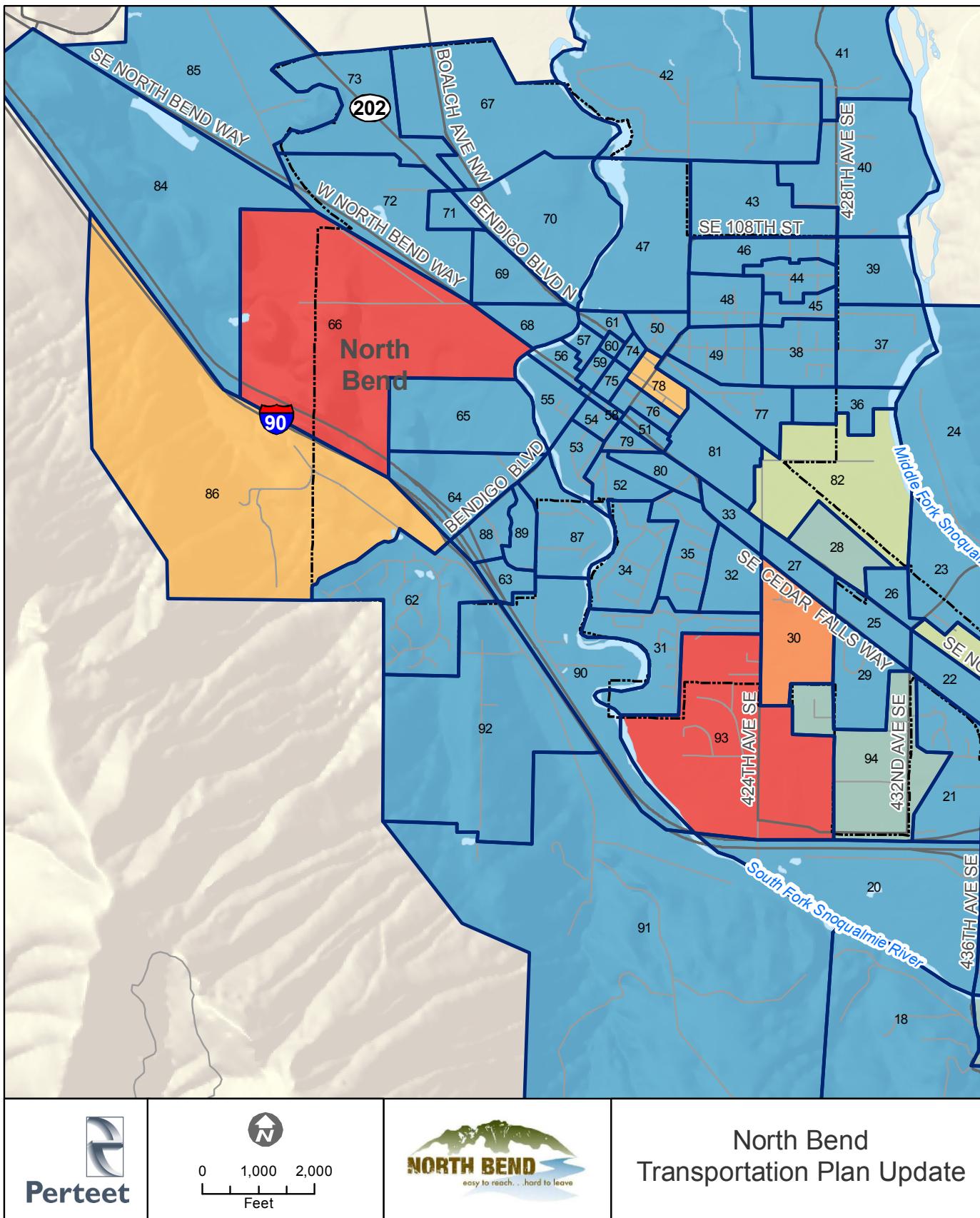
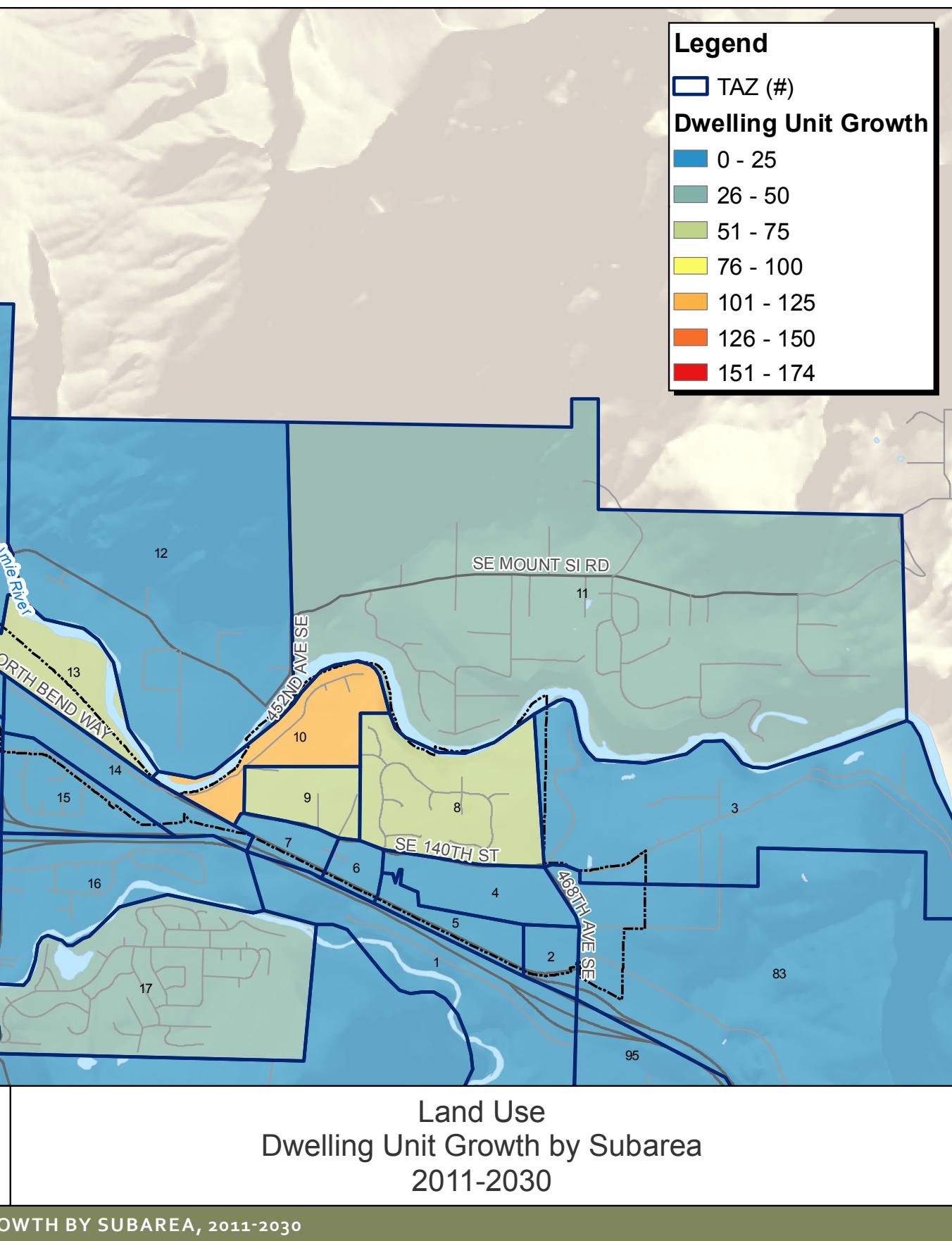


FIGURE 3: DWELLING UNIT GROUPINGS



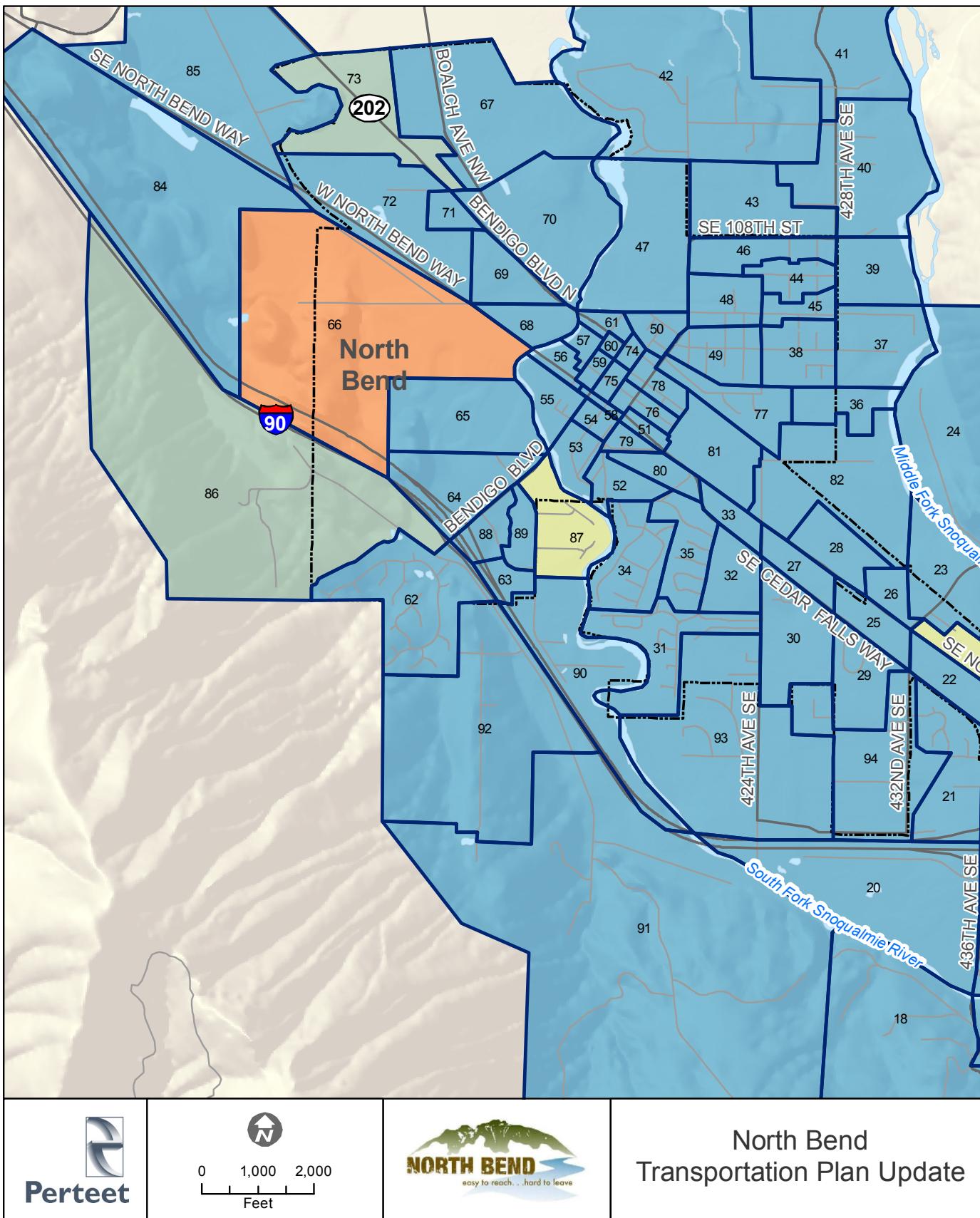
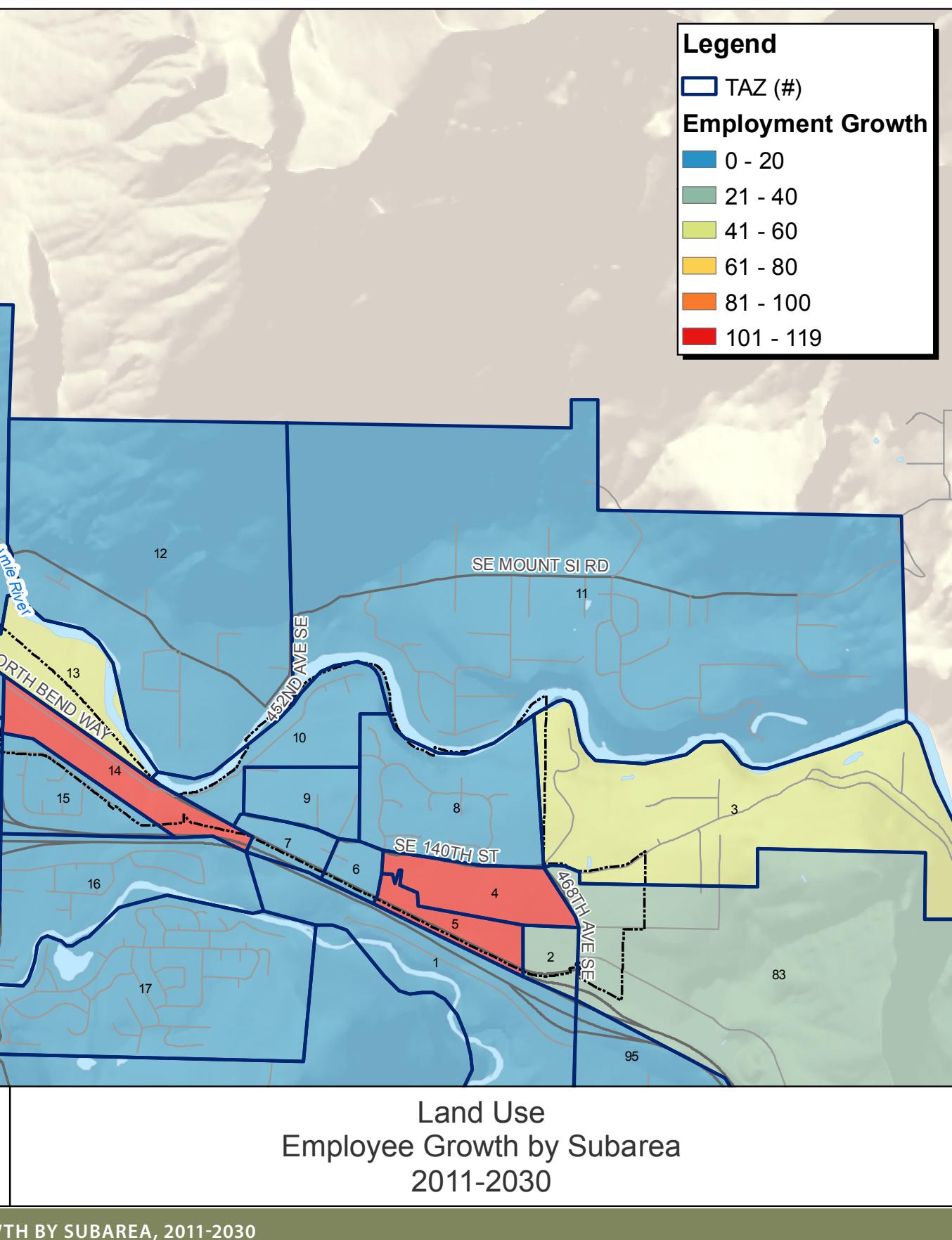


FIGURE 4: EMPLOYEE GROW



This is unpredictable, as shown in the below WSDOT chart of pass closures from 2006 to present. The truck stop serves interstate truck trips including those destined to the greater Puget Sound Area such as the Ports of Seattle and Tacoma, as well as local destinations such as the Cadman mine, Bessemer mine, Terex and other businesses accessed from this exit.

Local citizens have expressed concerns regarding the heavy truck traffic in the Exit 34 area as it relates to the traffic and pedestrian safety of local residents and those accessing the Twin Falls Middle School and the future elementary school site, the increasing traffic accessing State and National Forest lands in the Middle Fork basin, and health concerns regarding emissions from idling at the truck stop facility on local residents.

Future intersection and roadway improvements in this area will need to be planned specifically to address the sizes and needs of heavy truck traffic, and the City will need to coordinate with other agencies and jurisdictions, including the Washington State Department of Transportation, the Port of Seattle, King County, and others, to work toward cooperative solutions to address these unique challenges.

C.5 CITY STREET INVENTORY

Transportation roadway systems consist of a hierarchy of streets that provide the dual functions of access to land and development, and mobility for travelers. Streets are classified based upon the relative degree to which they provide these functions. Land use policies and street standards typically vary according to the street function. For example, most jurisdictions designate minimum right-of-way (ROW) requirements, stopping and entering sight distances, roadway width, design speed, design traffic volumes, access control, and sidewalk requirements in accordance with an adopted classification system. These requirements are usually codified in the jurisdiction's municipal code and/or adopted as street standards. Following is an inventory of the elements of the current roadway system within the city of north bend

C.5.A ROADWAY FUNCTIONAL CLASSIFICATION SYSTEM

Based on state law, cities and counties are required to adopt a street classification system that is consistent with State and Federal guidelines. In the State of Washington, these requirements are codified in RCW 35.78.010 and RCW 47.26.090. Each local jurisdiction is responsible for

defining its transportation system into the following three functional classifications: principal arterial, minor arterial, and collector. All other roadways are assumed to be local access streets.

The North Bend roadway functional classifications, together with the list of streets designated for each functional class, are described below. Figure 5 shows a graphic representation of the City's functional class system as of the 2003 Transportation Element, and the changes to some of those functional designations in this 2012 update process.

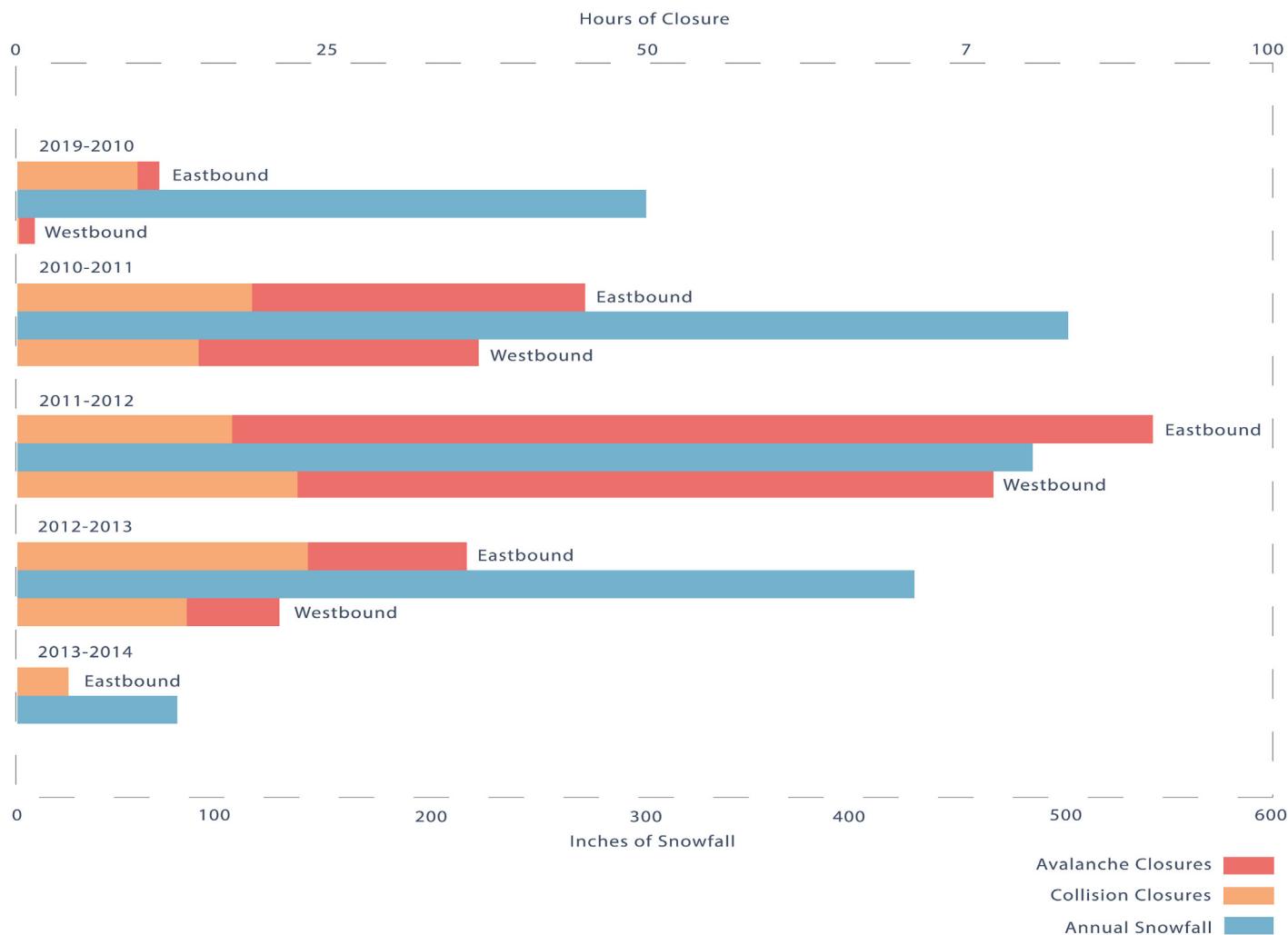
Freeway/Interstate The City of North Bend has one freeway, I-90, which is situated at the southern end of the City Limits. I-90 represents the interstate corridor for traffic to the Seattle-King County metro area and for traffic going east.

Principal or major arterial is a roadway that connects major community centers and facilities, and is often constructed with limited direct access to abutting land uses. The primary function of major arterial streets is to provide a high degree of vehicular mobility; however, they may play a minor role in providing land access. Principal arterials serve high-volume corridors, carrying the greatest portion of through or long-distance traffic within a city, serving inter-community trips that connect major activity centers. The following are the only roadways currently designated as major arterials in the City of North Bend and its UGA, namely:

- SR-202 (Bendigo Boulevard) along its entire length within the North Bend City Limits
- North Bend Way, from the west city limit to 468th Avenue SE
- 436th Ave SE from North Bend Way to I-90
- 468th Ave SE from North Bend Way to I-90

Minor arterial is a roadway connecting centers and facilities within the community and serving some through traffic, while providing a greater level of access to abutting properties. They can typically be found in residential, commercial and industrial areas. Minor arterials connect with other arterial and collector roads extending into the urban area, and serve less concentrated traffic-generating areas, such as neighborhood shopping centers and schools. Minor arterial streets serve as boundaries to neighborhoods and collect traffic from collector streets. They generally have greater right-of-

1-90 SNOQUALMIE PASS SNOWFALL AND HIGHWAY CLOSURE DATA



way and pavement width, and wider traffic lanes than residential streets. They often have continuous left-turn lanes and are normally provided with sidewalks and planting strips. Provision for on-street parking varies by location. Although the predominant function of minor arterial streets is the movement of through traffic, they also provide for considerable local traffic with origins or destinations at points along the corridor. The following is a list of roadways currently designated as minor arterials in the City of North Bend:

- SE Cedar Falls Way—between E North Bend Way and 436th Avenue SE,
- Maloney Grove Avenue SE—between North Bend Way SE and the south City Limits,
- Ballarat Avenue—between E North Bend Way and NE 12th Street,
- NE 4th Street—between Bendigo Boulevard and

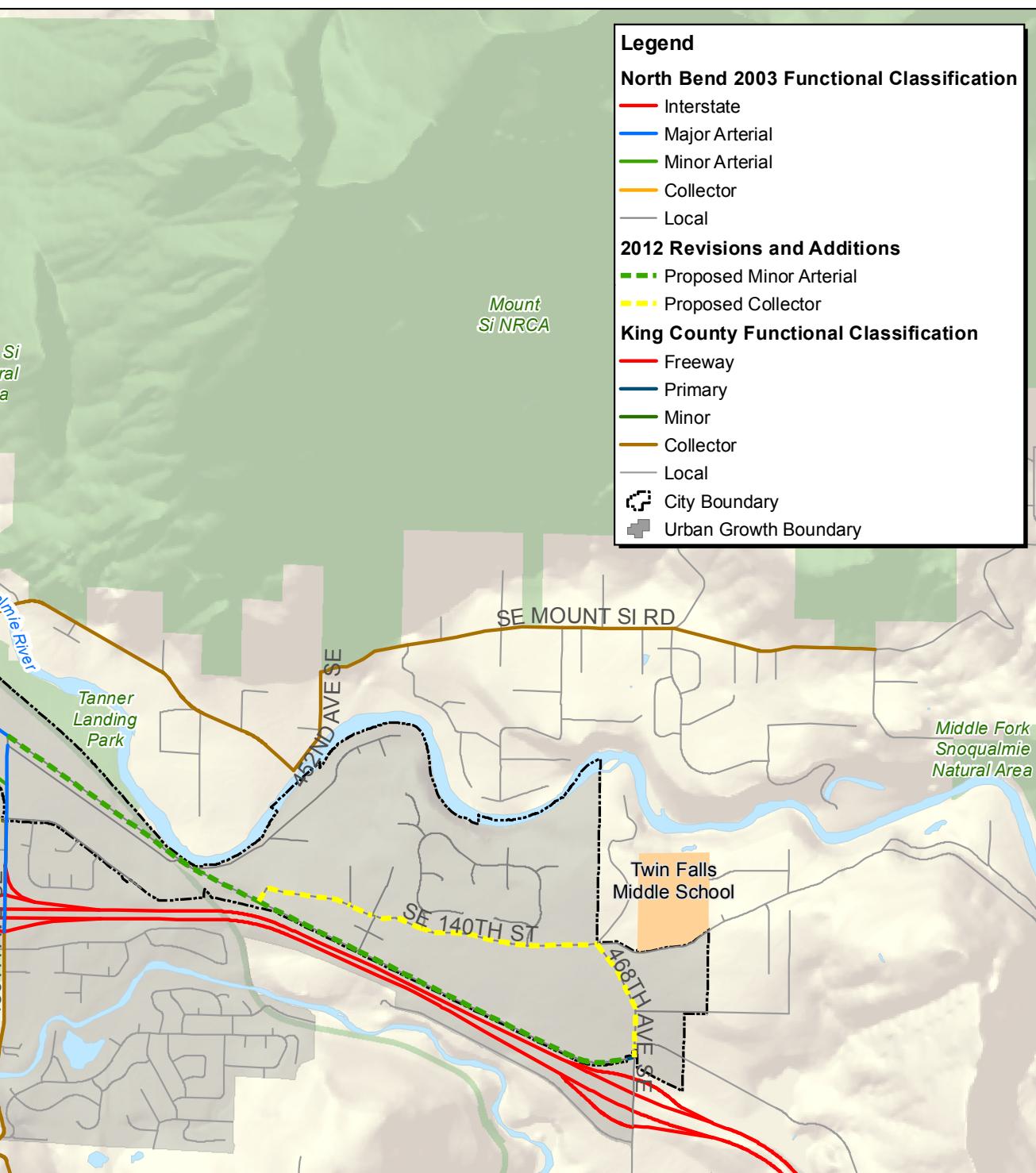
Ballarat Avenue,

- Mt. Si road – North Bend Way to north City Limits,
- South Fork Road – SR 202 to Mt. Si Blvd.,
- 424th Ave SE – North Bend Way to Cedar Falls Way,
- NE 12th Street—between Ballarat Avenue and Pickett Avenue, and
- Boalch Avenue—between SR-202 and the north City Limits.

Collector is a roadway designed to fulfill both functions of mobility and land access. Collectors typically serve intra-community trips connecting residential neighborhoods with each other, or activity centers, while also providing a high degree of property access within a localized area. These roadways “collect” vehicular trips from local access streets and distribute them to higher classification streets. Additionally, collectors provide direct services to residential areas, local parks, churches and areas with



FIGURE 5: 2003 ROADWAY FUNCTIONAL



2003 Roadway Functional Classifications and 2012 Revisions

CLASSIFICATION AND 2012 REVISIONS

similar uses of the land. Collectors may be separated into principal and minor designations according to the degree of travel between areas and the expected traffic volumes. Typically, right-of-way and paving widths are narrower for collectors than arterials. They may only be two lanes wide and are quite often controlled with stop signs.

Some collectors may be further designated as neighborhood collectors. These roadways provide a high degree of access to individual properties. They do not apply to commercial and industrial areas, or to most multi-family residential areas. Left turn lanes are only infrequently used on neighborhood collectors, and then only at intersections with higher traffic volume streets.

The following is a list of roadways currently designated as collectors in the City of North Bend:

- SW Mount Si Boulevard—between Bendigo Boulevard and South Fork Avenue,
- Main Ave—between Park Street and 4th Street,
- 3rd Street—between Sydney Ave and Ballarat Ave,
- Park Street—between Bendigo Boulevard and E North Bend Way,
- Orchard Drive/Healy Ave—between Park Street and E North Bend Way,
- 6th Street—between Ballarat Ave and Pickett Ave, and
- Pickett Ave —between 6th Street and 12th Street.
- 424th Ave SE, 3rd Street to south City limits
- 432nd Ave SE, SE 140th Street to E North Bend Way
- 415th Ave SE – Mt. Si Blvd to south City limits
- West Ribary Way – Bendigo Blvd to west City limits

Local access street is a roadway with a primary function providing access to residences. Typically, local streets are only a few blocks long and are relatively narrow. All roadways in the City of North Bend that have not been designated as an arterial or a collector roadway are considered to be local access streets. Shown in black in Figure 5, local access streets make up the large portion of the miles of roadways in the city.

C.6a ROADWAY DESIGN STANDARDS

The City of North Bend Municipal Code has adopted standards for development of City streets. The *Goals and Objectives* of the Transportation Element relate street design to the desires of the local community, and advise that design be at a scale commensurate with the function that the street serves. Standards are therefore important to provide designers with essential elements of

C.6 TRAFFIC CONTROL

Listed below are key study intersections controlled by traffic signals or those controlled by two-way or all-way stop signs. Currently, there are four intersections within the North Bend City Limits that are signalized. They include:

- Bendigo Boulevard and Mt. Si Boulevard,
- Bendigo Boulevard and South Fork Avenue,
- Bendigo Boulevard and North Bend Way, and
- Bendigo Boulevard and Park Street.

Two intersections are controlled by roundabouts, which require entering vehicles to yield to vehicles already within the approaching roadway. These are located at:

- Bendigo Boulevard and I-90 Eastbound off-ramp/East Ribary Way
- North Bend Way and SE Cedar Falls Way

Intersections that are controlled by two-way stop control on the minor approach leg include:

- Ballarat Avenue and North Bend Way
- Main Avenue and North Bend Way
- Main Avenue and Park Street
- Park Street and North Bend Way
- 4th Street and Bendigo Boulevard
- 6th Street and Ballarat Avenue
- Westbound I-90 off-ramp and Bendigo Boulevard
- 432nd Avenue SE and SE Cedar Falls Way
- 432nd Avenue SE and North Bend Way
- 436th Avenue SE and SE 142nd Street
- 436th Avenue SE and I-90 Eastbound off-ramp
- 436th Ave SE and I-90 Westbound off-ramp
- 436th Avenue SE and SE Cedar Falls Way
- 436th Avenue SE and North Bend Way
- SE 140th Street and SE North Bend Way
- SE 140th street and SE Middle Fork Rd
- 468th Avenue SE and SE 150th Street
- 468th Ave SE and Eastbound I-90 off-ramp
- 468th Aven SE and Westbound I-90 off-ramp
- 468th Aven SE and SE North Bend Way
- 468th Ave SE and SE 146th Street
- 468th Avenue SE and SE 144th Street
- 468th Avenue SE and SE Middle Fork Road

street design as articulated by the community. Essential functions of streets in North Bend should be multimodal and include vehicle mobility, pedestrian access, and bicycle access and lanes.

C.7 TRANSIT SERVICE

C.7a EXISTING BUS SERVICE

Currently the City of North Bend is served with two King County Metro bus routes and Access Paratransit Service for the disabled. Hourly fixed-route bus service is provided Monday through Saturday by local Route 209 between the Premium Outlet Mall and Issaquah TC serving the rural communities en-route. Route 215 provides commuter peak-direction service from downtown North Bend to and from downtown Seattle via Snoqualmie Ridge and Eastgate with five round trips. No Sunday service is provided in North Bend.

BOARDINGS AND ALIGHTINGS

Within the city of North Bend, there are four locations with significant passenger boarding activity. There are very few boardings on Route 215 at the North Bend Park and Ride. The following charts summarize the average weekday boarding activity during the Spring 2011 Service Change time period.

NORTH BEND PARK AND RIDE

The North Bend Park and Ride project, located at North Bend Way and Sydney Ave, was completed at the end of December 2010. There are approximately 80 parking stalls at this location. This was a City of North Bend project in cooperation with King County Metro.

PLANNED SERVICE CHANGES

There are no plans to adjust North Bend service at this time. King County Metro Transit's Strategic Plan and Service Guidelines call for alternatives to fixed-route transit service in urbanized areas surrounded by rural land (strategy 6.2.3). If cuts are required, Route 209 may be reduced to a bus every two hours with no weekday service provided after 7:00 pm. Refer to the King County Metro website for up to date information on routes and schedules.

C.8 PARATRANSIT SERVICE

The Americans with Disabilities Act (ADA) of 1990 requires that some form of paratransit service be provided for individuals with disabilities who are unable to use fixed-route transportation systems. This type of service

also caters to the elderly citizens and to those who have no access to a car or the transit system. Provision of such service varies from place to place, and is usually provided by a non-government entity. (Paratransit is a term that applies to any non-conventional form of mass transportation and typically includes carpools and vanpools as well as the type of service referred to in this paragraph). The Mt. Si Senior Center provides a very limited paratransit service to the Snoqualmie Valley Area. This is a dial-up service catered mainly to senior citizens, as well as disabled adults.

C.9 NON-MOTORIZED MODES

C.9a Bikeways and trail system

The City of North Bend is ideally situated to benefit from regional recreational attractions that surround it on all sides, but especially Rattlesnake Lake and the Iron Horse Trail to the southeast, the Middle Fork-Snoqualmie Recreation Area to the east, the Mount Si Recreation Area to the north, and the Meadowbrook Farm/Tollgate Farm Park and Open Space Area to the northwest. The city's connections to these attractions for non-motorized users such as cyclists and hikers include a combination of off-street trails and pathways and striped shoulders on existing roadways. The City's adopted Comprehensive Plan Trail Plan Map, included in Appendix A, identifies the existing and planned non-motorized system for the city and surrounding area.

The Snoqualmie Valley Regional Trail bisects the city on a diagonal from southeast to northwest, providing a crushed rock surface, off-street non-motorized trail on the right-of-way of the former Chicago, St. Paul and Pacific Railroad's Everett branch line. This regional trail, maintained by King County, connects the City of Snoqualmie on the northwest to Rattlesnake Lake and the Iron Horse Trail to the southeast. Due to its central location within the City, most city residents can reach this trail within a mile or less. There are also off-street trails (unimproved) along the Middle Fork of Snoqualmie River between 432nd Avenue SE and NE 6th Street, and along the South Fork of the Snoqualmie River from south of the city limit at 436th Ave SE to Bendigo Boulevard (SR 202).

C.10a Walkways

Pedestrian facilities are critical elements of a safe and livable community and include sidewalks, crosswalks, pedestrian overpasses, pedestrian street lighting, design features to enhance the pedestrian environment

(e.g., shade trees, benches) and median refuge areas.

Pedestrian facilities provide access to people who cannot or do not wish to drive to places of employment, shopping, and other destinations. They also provide important connections to other modes of transportation.

City policy ([Transportation Policy 3.1.1](#)) states that "the City should construct pedestrian facilities along all streets..." However, there are city streets that currently lack sidewalks or pathways, and locations where existing facilities do not satisfy current design standards. Some of these inadequate sidewalk facilities were identified by citizens attending the June 9, 2011 Planning Commission Workshop ([see Figure 2](#)). In retrofitting existing streets, the City's priority will be to improve pedestrian access to schools, community facilities, commercial areas, employment sites, and other important city destinations along arterial and collector streets before local residential streets. Meanwhile, the City's Design Standards, adopted May 18, 2010 provide for sidewalks along with the construction of all new or improved streets.

In order to facilitate the improvement of pedestrian facilities according to the above-stated priorities, it is recommended that:

- The City annually update its inventory of the pedestrian system, including existing sidewalks, missing sidewalk sections, obstacles and barriers, and the locations of curb ramps and whether or not they comply with applicable ADA design standards; and
- Annually update its Pedestrian Improvement Plan to facilitate programming, funding and construction of pedestrian facilities that address current deficiencies and provide new facilities where there are none.

C.10 TRANSPORTATION MANAGEMENT STRATEGIES

Every city in America is facing major challenges in meeting the mobility needs of its citizens, as well as meeting air quality and environmental requirements. There are major transportation issues facing cities today, which typically include: insufficient funds to meet system improvement needs, increased construction costs for new roadway and transit facilities, increased need to improve operational efficiency, changes in travel patterns, lower densities making traditional transit an inefficient option in many areas, freight mobility impacts and need to reduce transportation related air and water pollution.

Transportation management strategies are essential to building an efficient transportation system. These strategies include Transportation System Management (TSM) and Transportation Demand Management (TDM). TSM and TDM are different methodologies for improving the performance and vehicle carrying capacity of existing roadway and transit systems with little or no construction necessary. TSM consists of low-cost capital projects and operational and institutional actions that improve the operating efficiency of both roadway and transit facilities and services. TDM consists of actions that encourage a decrease in the peak hour demand on existing transportation systems. Complementing TSM and TDM strategies is Intelligent Transportation Systems (ITS). ITS consists of the deployment and use of technologies to improve, manage and share information; provide for the integration of transportation services; provide for improved incident response systems; and provide other system management and operational improvements that enhance efficiency and safety. Recent technological advances have made some ITS techniques cost effective for use in small urban and rural areas. The TSM and TDM approaches are discussed in more detail below.

C.10a TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM refers to an integrated set of strategies designed to reduce travel, particularly during peak travel times, rather than accommodate it with additional road capacity. TDM includes programs and policies that are designed to maximize the people moving capability of the transportation system by increasing the number of persons in each vehicle via carpool/vanpool, increasing transit use, increasing the use of non-motorized travel options, adopting alternative work arrangements such as telecommuting, or by influencing the timing of, location or need to travel.

TDM is an integral part of the City of North Bend Transportation Plan Update because it potentially addresses several policy needs: mobility, accessibility, traffic congestion, air and water quality, and the desire for a sustainable community. However, TDM is not the only solution. The ability to change travel behavior necessitates an appreciation of the fact that not everyone can use a travel alternative due to the complexity and nature of their daily routines.

As communities such as North Bend grow, the growth in

EXISTING BICYCLE LANES (CONSISTING OF A PAVED SHOULDER, SIGNED AND STRIPED FOR BICYCLE USE) ARE PROVIDED ON THE FOLLOWING STREETS

Healy Avenue South, Orchard Drive SE to Park Street
Bendigo Boulevard (SR 202), I-90 to North Bend Way
SE Cedar Falls Way, North Bend Way to 436th Avenue SE
North Bend Way, Bendigo Boulevard to the west city limit
North Bend Way, SE Cedar Falls Way to SE 140th Street
SE 140th Street, North Bend Way to SE Middle Fork Road
SE Middle Fork Road, SE 140th Street to the east city limit
436th Avenue SE, South Fork Snoqualmie River to North Bend Way (a striped shoulder already exists; this important route lacks only signage, and it is a recommended addition to the 2009 Trail Plan Map, included in Appendix A)

THE CITY'S ADOPTED PLAN RECOMMENDS BICYCLE LANES TO BE ADDED ON THE FOLLOWING STREETS

NE 6th Street/SE 114th Street, Thrasher Avenue to Middle Fork River Trail
Pickett Avenue NE, SE 114th Street to the north city limit
Ballarat/East 4th Street to north city limit
NE 4th Street, Ballarat to Thrasher Avenue North
Alm Way, SE North Bend Way to NW 8th Street
SW Ribary Way, SE 122nd Street to Bendigo Boulevard
415th Way SE, Bendigo Boulevard to SE 142nd Street
142nd Street, 415th Way SE to the south city limit
424th Avenue SE/Maloney Grove Avenue, SE 142nd Street to Cedar Falls Way
Orchard Drive SE, Healy Avenue S to SE 5th Street
SE 10th Street, 424th Avenue SE to West of SE 10th Circle
SE 140th Street, 424th Avenue SE to 432nd Avenue SE
432nd Avenue SE, SE 140th Street to SE Cedar Falls Way
SE 136th Street, 436th Avenue SE to East of 440th Place SE
SE 148th Street/442nd Avenue SE, SE 150th Street to 444th Avenue SE
444th Avenue SE, SE 146th Street to SE 144th Street
SE 144th Street/448th Avenue SE, 444th Avenue SE to SE 145th Street

This system of existing and planned facilities, when completed, will provide a linked network that will serve every city neighborhood.

number of vehicles and demand for travel should be accommodated by a combination of road improvements; transit service improvements; bicycle and pedestrian improvements; and a program to reduce travel (vehicle trips and the vehicle miles traveled) via TDM in conjunction with appropriate land use planning.

Within the State of Washington, alternative transportation solutions are further necessitated by the objectives of the

Commute Trip Reduction (CTR) Law. Passed in 1991 as a section of the Washington Clean Air Act (RCW 70.94), the CTR Law seeks to reduce workplace commute trips in the nine most populous counties in the state. This law requires that in designated high population counties, each city within the county adopt a commute trip reduction plan requiring private and public employers with 100 or more employees implement TDM programs. Programs provide various incentives or disincentives to encourage use of alternative transportation modes, other than the single occupant vehicle (SOV). The purpose of CTR is to help maintain air quality in metropolitan areas by reducing congestion and air pollution.

The City can support the CTR law and regional vehicle trip reduction strategies by working with employers to encourage the reduction of SOV commuter use. The City should also encourage King County Metro to enhance transit services in the City and to assist employers in developing plans that meet specific trip reduction needs as required by the CTR law. Local transit service, such as a plan for a transit shuttle system, should also be pushed ahead. Flex time, parking management, vanpooling and carpooling, walking and biking are some other techniques that should be encouraged.

C.10b TRANSPORTATION SYSTEM MANAGEMENT (TSM)

TSM refers to a variety of actions and activities designed to make the existing transportation system more efficient. It includes techniques for increasing efficiency, safety, capacity and/or level of service of a transportation facility without major new capital improvements. Actions may include signal improvements, geometric improvements, access management, HOV lanes, ramp metering, incident response, targeted traffic enforcement and programs that enhance transit operations. TSM must account equally for the needs of all modes of travel, and should ensure that bike, pedestrian and transit movements and safety are not compromised in exchange for improving roadway capacity.

Prior to increasing lane capacity on a roadway, the City of North Bend should ensure that existing capacity is utilized at maximum efficiency through the application of TSM investments. These measures may include, but are not limited to the following:

- Roundabouts and traffic circles versus signalization;
- Addition of turn lanes;
- One-way street system;

- Turning movement restrictions;
- Channelization of turning movements;
- Re-striping lanes;
- Raised medians;
- Signalization and signal coordination; and
- Access management strategies.

TSM allows improvement to the transportation system with relatively minimum investments, and is a logical component of a comprehensive, flexible and cost-effective transportation improvement plan.

C.11 TRAFFIC CALMING

Many communities in the United States are now exploring further measures beyond sidewalks that place pedestrians and bicyclists on a more even playing field with motorized traffic. These measures, collectively called traffic calming, use physical design of the roadway to reduce automobile speeds. They are not intended for roads where the primary objective is to rapidly move large volumes of traffic, though in some circumstances efforts to slow traffic can actually improve traffic flow. Most often they are used in residential areas where residents see the road as part of their neighborhood; or in downtown shopping districts where creating a pleasant pedestrian environment is critical to maintaining the economic vitality of downtown. The potential benefits of traffic calming include reduced traffic speeds, and reduced traffic volumes, achieved by discouraging "cut-through" traffic on residential streets. Traffic calming techniques also typically improve the aesthetic quality of streets, through landscaping of medians, bump-outs, and traffic circles.

C.12 TRANSPORTATION IMPROVEMENT PROGRAM

The City of North Bend's current six-year transportation improvement program (TIP) for 2012 through 2017 is summarized in Appendix C. The TIP is based on the City's transportation system needs considering both traffic service and maintenance of the physical street structure.

D. ROADWAY CONDITIONS AND LEVEL-OF-SERVICE

The purpose of this chapter is to describe and assess existing traffic characteristics, and the operational elements of the existing roadway system that include traffic volume, level-of-service and accident analysis.

D.1 TRAFFIC VOLUMES

TABLE 1: NORTH BEND BUS ROUTE SUMMARY

Route	Destinations Served	Weekday	Saturday	Average Weekday Boardings
209 - to Issaquah Transit Center	North Bend Premium Outlets, Mt Si Senior Center, Bendigo Blvd, city of Snoqualmie, Snoqualmie Falls, Fall City, Preston, High Point freeway stop and Gilman Village	Hourly 5:30am-8:30pm	Hourly 8:30am-9:30pm	102
215 - to Downtown Seattle	Mt Si Senior Center, city of Snoqualmie, Snoqualmie Ridge, Issaquah TC, Eastgate Freeway Station, Rainier Ave Freeway Station	Peak-Periods To Seattle - 5 Trips 5am-7:15am To North Bend- 5 Trips 3:45-6:10pm	No Service	21

TABLE 2: BOARDING ACTIVITY SUMMARY BY ROUTE

Route 209 Bus Stop Locations	Average Daily Boardings	Average Daily Alightings
North Bend Premium Outlet (terminal)	47	43
Stow Ave & Healy Ave	10	6
Main Ave & Park St	25	8
SR 202 & Sidney Ave (WB)	12	2
SR 202 & Sidney Ave (EB)	0	11
Route 215 Bus Stop Locations	Average Daily Boardings	Average Daily Alightings
Stow Ave & Healy Ave	7	19
Main Ave & Park St	8	6
North Bend Wy & Sydney Ave (Park/Ride WB)	4	1
North Bend Wy & Sydney Ave (Park/Ride EB)	0	2

Traffic count data was assembled from several sources, and was supplemented by additional counts taken during April and May of 2011. Historical counts were obtained from King County Public Works, Washington State Department of Transportation, traffic impact study reports provided by the City of North Bend, and additional counts were conducted by TrafStats, Inc. and the City of North Bend. These counts addressed most of the important arterial locations in North Bend, and included 24-hour counts and vehicle classification counts on all the access points to I-90 to provide a detailed hourly breakdown of all vehicles by type (bikes, buses, cars, and trucks by number of axles).

Traffic counts demonstrate a number of variations from year-to-year, over different seasons of the year, hour-by-hour over the 24-hour day, and in the types of vehicles by

area of the city. A comparison of traffic counts taken at the same locations in 2003 and in 2011 shows overall fewer vehicles in 2011. This comparison, included in Table 3: Historical Traffic Volume Change, 2003-2011, may reflect economic cycles and altered traffic control features, as well as societal changes such as increased telecommuting and flexible work hours.

Seasonal variations include traffic fluctuations driven by outdoor recreational opportunities in the surrounding mountains—snow sports in the winter and hiking, fishing, etc., in the summer. Spring and fall seasons are thus relatively low times for external traffic. Also, Bendigo Boulevard, serving as access to the Factory Outlet Mall has a pronounced seasonal shopping peak before Christmas.

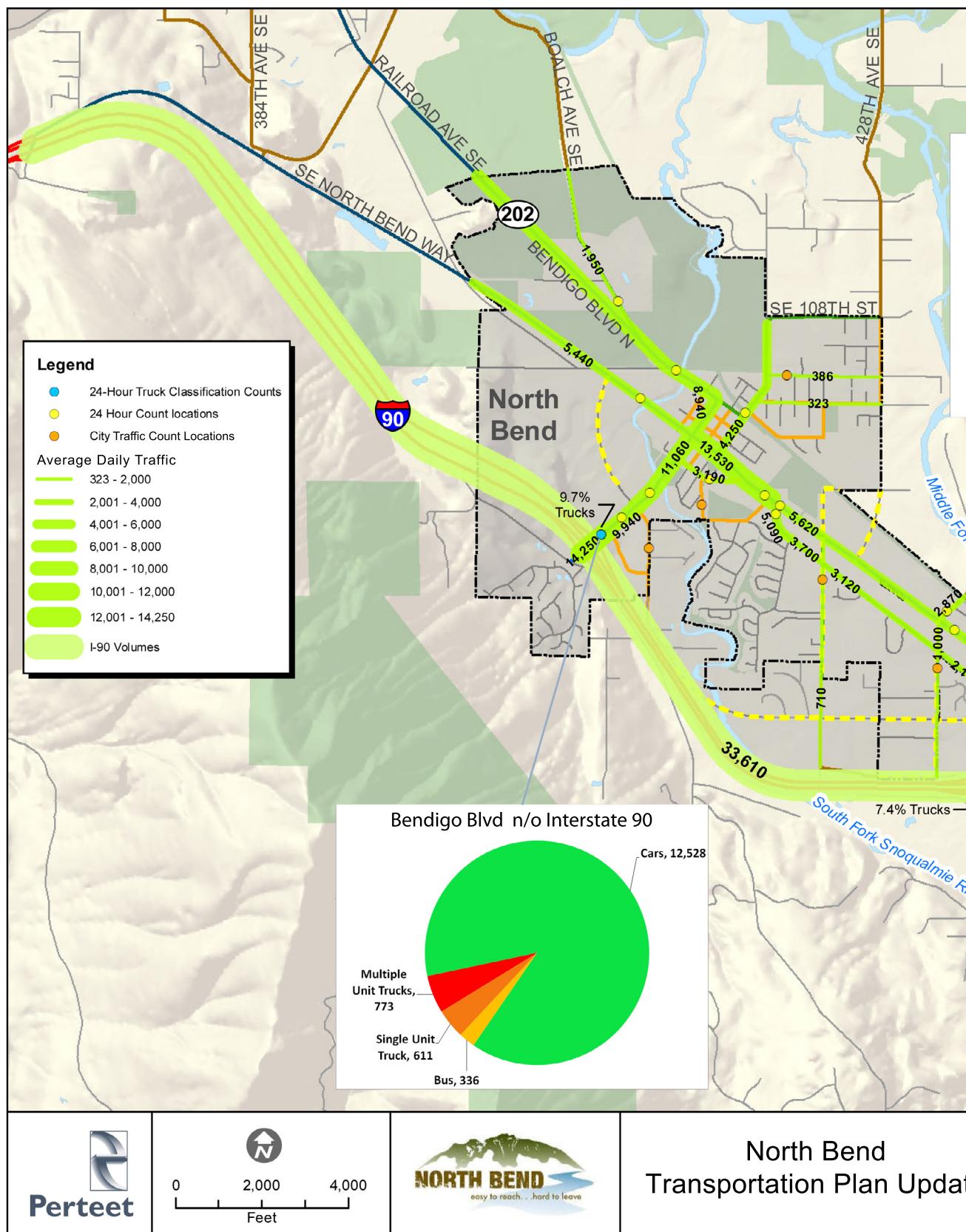
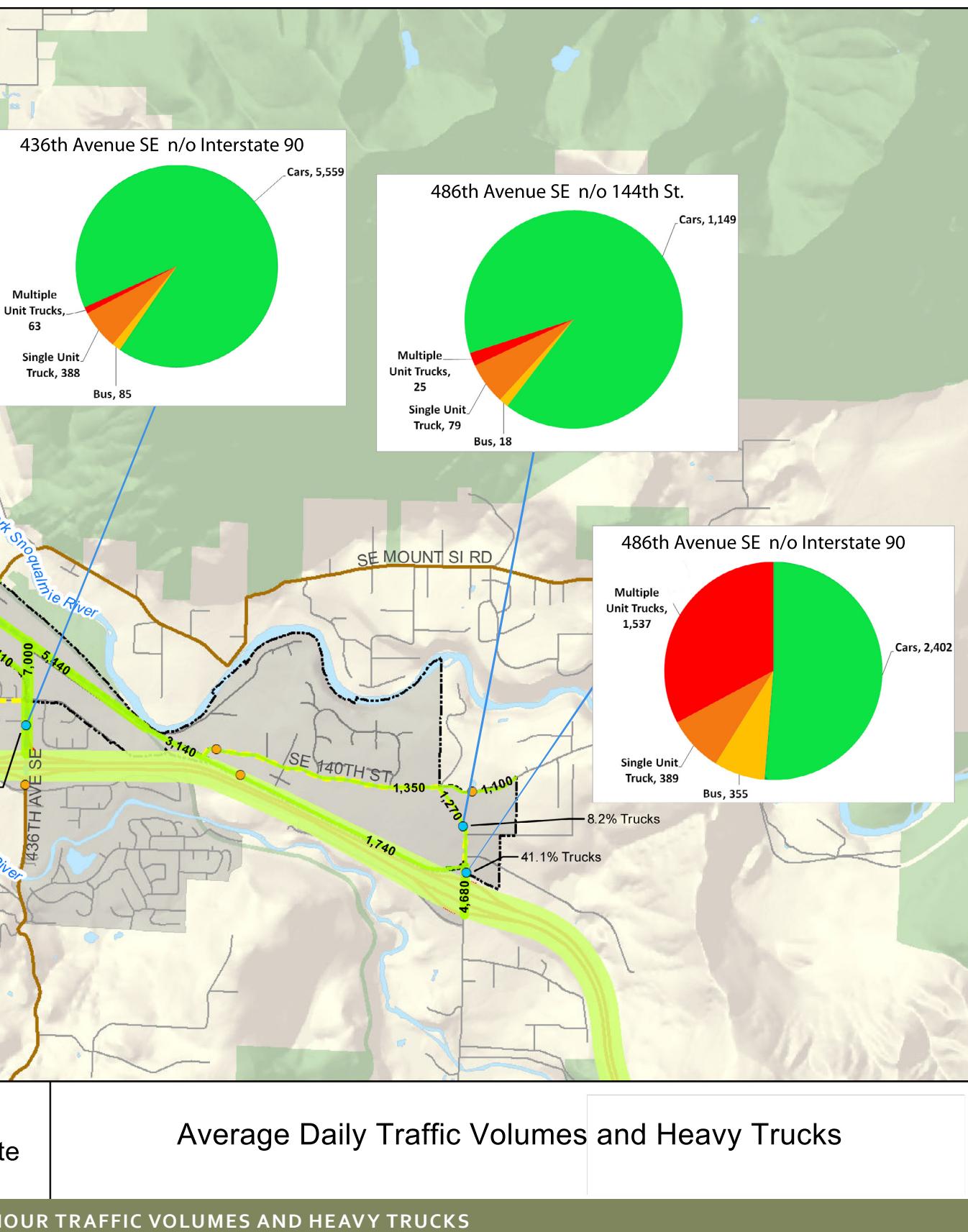


FIGURE 6: AVERAGE WEEKDAY PM PEAK H

1. S=signalized intersection, TWSC=two-way stop-control (at the secondary leg), AWSC=all-way stop-control
2. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, L=Left, LR=Left and Right Movements, LRT=L
3. Delay is measured in seconds per vehicle. At signalized (S) and AWSC intersections, it represents average delay for
4. Level-of-Service based on the methodology outlined in the 2000 Highway Capacity Manual
5. The intersections in lines 20 and 21 are currently outside the City limits and the data are provided for informational



purposes only. These intersections are to be monitored and reevaluated when annexed into the City.

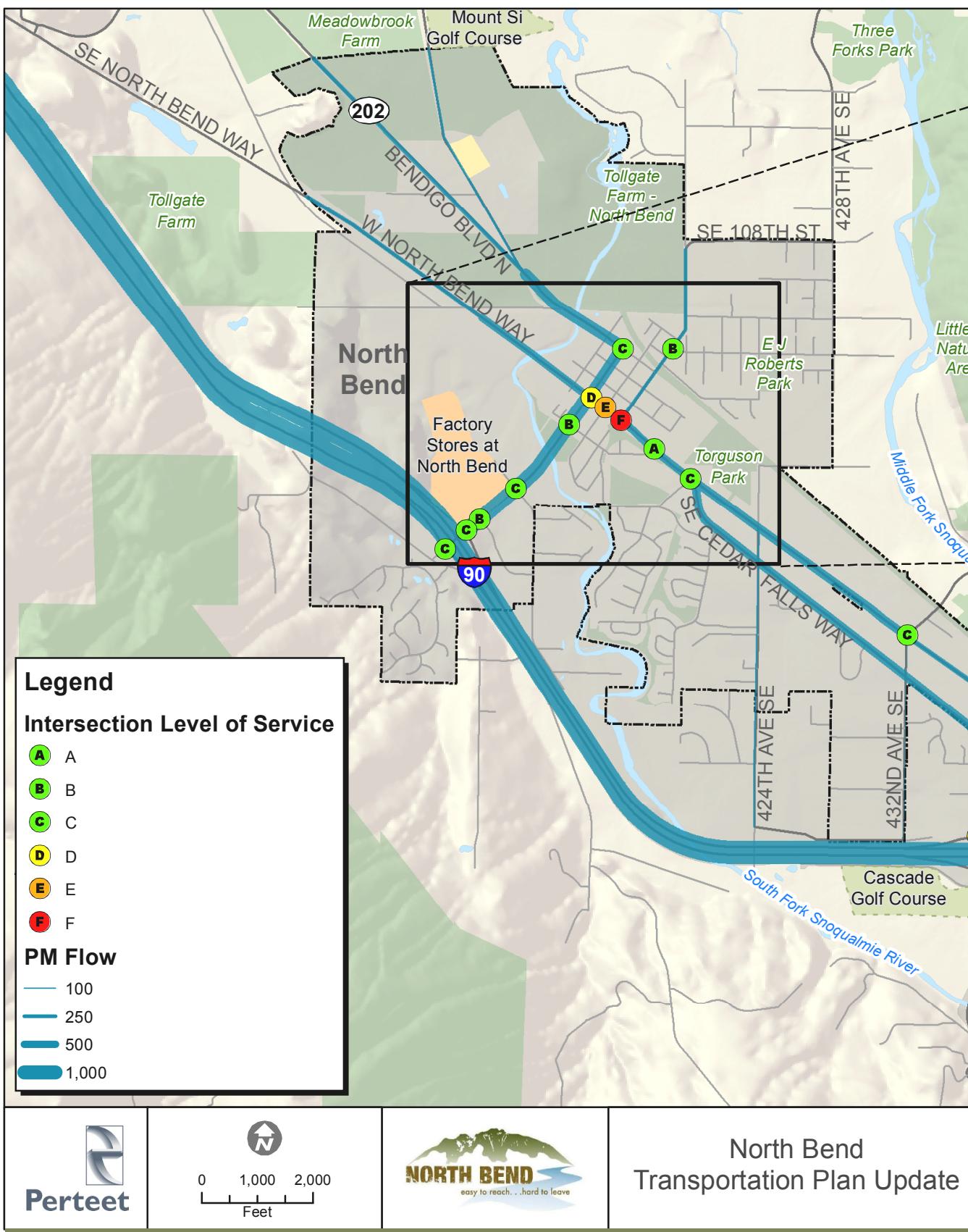


FIGURE 7: WEEKDAY PM PEAK INT



The hourly traffic volume in North Bend over a typical day begins very low during the nighttime hours from after 9 PM until 5 AM. Traffic volumes then build to a peak between 7 AM and 9 AM, increase more over the noon hour, and climb through the afternoon to the highest peak of the day between 3 PM and 5 PM. Hourly volumes steadily decline after 5 PM to their nighttime lows. A similar pattern of hourly variation was observed at two different locations on North Bend Way east and west of Downtown, and on Bendigo Boulevard north of I-90.

Average PM peak hour traffic counts are calculated by averaging the traffic counts of a typical work week. Figure 6 shows the afternoon peak hour count volumes collected in Spring 2011, and used for model calibration purposes. It is typical to use the evening peak hour as the basis for analysis purposes since traffic volumes are at their highest levels of the day as described above. The figure shows the highest volumes of traffic along I-90, Bendigo Boulevard and North Bend Way.

Also shown on Figure 7 are summaries of vehicle types taken from classification counts by direction of flow at four different locations on Bendigo Boulevard, 436th Avenue SE, and 468th Avenue SE at two spots. Trucks constituted 41.1% of the traffic volume on 468th Avenue SE just north of I-90, compared to 9.7% on Bendigo Boulevard, and 7.4% on 436th Avenue SE. For the purposes of this plan, vehicles reported as trucks include 2-axle vehicles with 6 wheels (single unit delivery-trucks), and vehicles with 3- or more axles, including multi-unit vehicles (typically called "semi-trailers" or "18-wheelers", and "double-bottoms" or "pup trailers and doubles", double trailers that may consist of three or four individual units totaling 7 or more axles).

D.2 LEVEL OF SERVICE ANALYSIS

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. A qualitative measure describing traffic conditions and the perception of drivers is needed to assess the degree of congestion on a road. Such a measure is referred to as a "level-of-service" (LOS) and is intended to take account of factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience and safety.

Six levels of service are used for describing traffic flow

conditions. These are designated from A to F with LOS A representing the best operating condition and LOS F the worst.

D.2A LEVEL-OF-SERVICE CRITERIA

Level of service can be measured at intersections and along roadway segments. The Highway Capacity Manual (TRB, 2000) provides level of service calculation methodology for both intersections and roadway segments. Intersection LOS is determined by calculating average vehicle delay at the intersection. Table 4 presents the LOS criteria for signalized intersection while Table 5 describes the LOS for all-way or two-way stop-controlled intersections. In urban areas, if signalized intersections are spaced at intervals of one mile or less, the roadway LOS is controlled by the intersection LOS. In rural areas, roadway LOS is controlled by intersection LOS only if signalized intersections are spaced at intervals of two miles or less.

For roadway segments, LOS is calculated by comparing the actual number of vehicles using a roadway (volume of traffic) to its carrying capacity (which is dependent on the number of lanes, the width of the lanes, the presence of on-street parking, etc.). Level-of-service for signalized intersections is determined by the average delay experienced by vehicles at an intersection. Thus, delay at these intersections refers to the average delay experienced by all motorists at the intersection. Table 4 summarizes the LOS criteria for signalized intersections. LOS "D" or better is generally considered to be acceptable and represents 55 seconds or less of delay.

For two-way stop-controlled (TWSC) intersections, LOS depends on the amount of delay experienced by drivers

Table 3: Historical Peak Hour Traffic Volume change, 2003-2011

Traffic Count Location	Year	Volume	Year	Volume	% Change
Bendigo n/o I-90 WB Ramps	2003	1,547	2011	1,140	-26.3%
Bendigo n/o S. Fork Ave	2003	947	2011	908	-4.1%
North Bend Way w/o Bendigo	2003	616	2011	519	-15.7%
Park s/o North Bend Way	2003	251	2011	307	22.3%
North Bend Way w/o Cedar Falls	2003	1,348	2011	1,273	-5.6%
North Bend Way e/o Cedar Falls	2003	854	2011	583	-31.7%
Cedar Falls s/o North Bend way	2003	507	2011	517	2.0%
468th St s/o North Bend Way (ADT)	2006	8,623	2011	4,683	-45.7%

Table 4: LOS Criteria for Signalized Intersections

LOS	Average Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

(Source: Highway Capacity Manual 2000)

LOS "D" or better is generally considered to be acceptable and represents 55 seconds or less of delay.

For two-way stop-controlled (TWSC) intersections, LOS depends on the amount of delay experienced by drivers on the minor (stop-controlled) approach. For two-way stop controlled unsignalized intersections, "delay" represents the average delay of the worst movement, typically a left turn from the stop-controlled street. All-way stop-controlled (AWSC) intersections require drivers on all approaches to stop before proceeding into the intersection. LOS for AWSC intersections is determined by the average delay for all movements.

The LOS criteria for stop-controlled intersections have different threshold values than those for signalized intersections, primarily because drivers expect different levels of performance from distinct types of transportation facilities. In general, stop-controlled intersections are expected to carry lower volumes of traffic than signalized intersections. Thus for the same LOS, a lower level of delay is acceptable at

stop-controlled intersections than it is for signalized intersections. Table 5 summarizes the LOS average delay thresholds for both two-way and all-way stop-controlled intersections. For unsignalized intersections, LOS "E"

Table 5: LOS Criteria For All-Way or Two-Way Stop-Control

LOS	Average Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

(Source: Highway Capacity Manual 2000) or better is generally considered to be acceptable, representing 50 seconds or less of delay to motorists.

D.2B LEVEL-OF-SERVICE AND CONCURRENCY

Concurrency

Concurrency management ensures that development, in conformance with the adopted land use element of a comprehensive plan, will not cause a transportation facility's LOS to decline below the adopted standard. Concurrency requires transportation system expansion or demand management strategies to offset development impacts. Facilities must be in place or financially planned for within six years of development use.

In order to establish LOS standards for concurrency, the following principles must be considered:

- Ensure adequate facilities to support growth,

Table 6: Existing Weekday PM Peak Hour Levels of Service

	Intersection		Traffic Control ¹	Critical Movement ²	Delay ³	LOS ⁴
	Primary Leg	Secondary Leg				
1	North Bend Way W	Main Avenue	TWSC	NB-L (LOS E)	49.9	E
2	North Bend Way E	Ballarat Avenue	TWSC	SB-LT (LOS F)	80.7	F
3	North Bend Way E	Park Street	TWSC	NB-LR (LOS C)	17.4	C
4	North Bend Way E	SE Cedar Falls Way	Roundabout	EB-LTR (LOS D)	19.6	C
5	North Bend Way W	Bendigo Boulevard	S	WB-L (LOS F)	39.5	D
6	North Bend Way E	SE Mt. Si Road	TWSC	EB-LTR (LOS C)	16.2	C
7	North Bend Way E	436th Ave SE	TWSC	NB-LR (LOS B)	13.3	B
8	North Bend Way E	468th Ave SE	TWSC	EB-LR (LOS B)	11.7	B
9	Bendigo Boulevard	Park Street	S	WB-LTR (LOS C)	13.9	B
10	Bendigo Boulevard	South Fork Avenue	S	SB-L (LOS D)	25.5	C
11	Bendigo Boulevard	Mount Si Boulevard	S	NB-L (LOS C)	16.9	B
12	Bendigo Boulevard	I-90 WB Ramp	TWSC	NB-LTR (LOS C)	21.7	C
13	Bendigo Boulevard	I-90 EB Ramp	Roundabout	SB-LTR (LOS D)	21.6	C
14	Bendigo Boulevard	4th Street	TWSC	WB-L (LOS C)	17.5	C
15	Park Street	Main Avenue	AWSC	NA	NA	NA
16	Ballarat Avenue	6th Street	TWSC	WB-LR (LOS B)	10.1	B
17	436th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS D)	32.4	D
18	436th Ave SE	I-90 EB Ramp	TWSC	EB-LTR (LOS C)	24.3	C
19	436th Ave SE	SE Cedar Falls Way	TWSC	EB-LR (LOS B)	10.4	B
20	468th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS B)	12.7	B
21	468th Ave SE	I-90 EB Ramp	TWSC	EB-LT (LOS B)	12.1	B

1. S=signalized intersection, TWSC=two-way stop-control (at the secondary leg), AWSC=all-way stop-control
 2. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, L=Left, LR=Left and Right Movements, LRT=Left, Through, and Right Movements
 3. Delay is measured in seconds per vehicle. At signalized (S) and AWSC intersections, it represents average delay for all intersection movements. For TWSC intersections, it represents average delay for the worst minor leg movement.
 4. Level-of-Service based on the methodology outlined in the 2000 Highway Capacity Manual
 5. The intersections in lines 20 and 21 are currently outside the City limits and the data are provided for informational purposes only. These intersections are to be monitored and reevaluated when annexed into the City.

- Reinforce development policies,
- Decision-making process that facilitates understanding, administration, and flexibility,
- Strive for maximum uniformity and consistency,
- Enhance transit and non-motorized transportation modes, and
- Ensure financial feasibility.

D.2C EXISTING INTERSECTION LEVEL-OF SERVICE (2011)

Level-of-Service analysis was performed for existing PM peak hour conditions (using the VISUM model). The LOS information, along with the calculated average intersection delay is summarized in Table 6 and illustrated on Figure 7. The results shown in the table represent LOS based upon average delay for all traffic movements at the intersection for signalized and all-way-stop controlled intersections. Thus, there may be longer delays for certain directions of traffic movements than the composite LOS measure shows. A description of the intersections near to or exceeding acceptable operations is provided below. LOS for two-way-stop controlled intersections displays average delay for the worst (or highest delay) minor leg movement. These critical movements are shown in Table 6.

Of the twenty-one intersections in Table 6, 18 are operating within the City of North Bend's acceptable standard at LOS D or better, two below the standard, and one was not analyzed. The signalized intersection at North Bend Way/Bendigo Boulevard is operating at LOS D. The critical movement is westbound left turns on North Bend Way, which backs up queues through Downtown.

Two unsignalized intersections are operating below the standard: The southbound left-through movement is a LOS F at the intersection of North Bend Way/Ballarat; and the northbound left turn at North Bend Way/Main is an LOS E. The remainder of the intersections that were analyzed currently operate at LOS D or better. It is not uncommon for the minor legs at a stop controlled intersection to experience LOS E or F conditions during the peak hour in an urbanized area. Both of the two roundabouts are operating acceptably at LOS C.

D.3 ACCIDENT ANALYSIS

Collision data was obtained from the City of North Bend for a five year recording period. Data covered collisions occurring between January 01, 2006 and December 31, 2010. During this period 275 collisions occurred on North Bend streets and 49 collisions occurred on private, off-street property, for a total of 324 vehicular collisions. A chart showing the number of collisions by type is shown in Figure 8.

Intersections with one or more collisions per year are summarized in Table 7 and the locations are illustrated on Figure 9.

Table 7: Collision History, 2006-2010 (Intersections Averaging One or More Collisions Per Year)

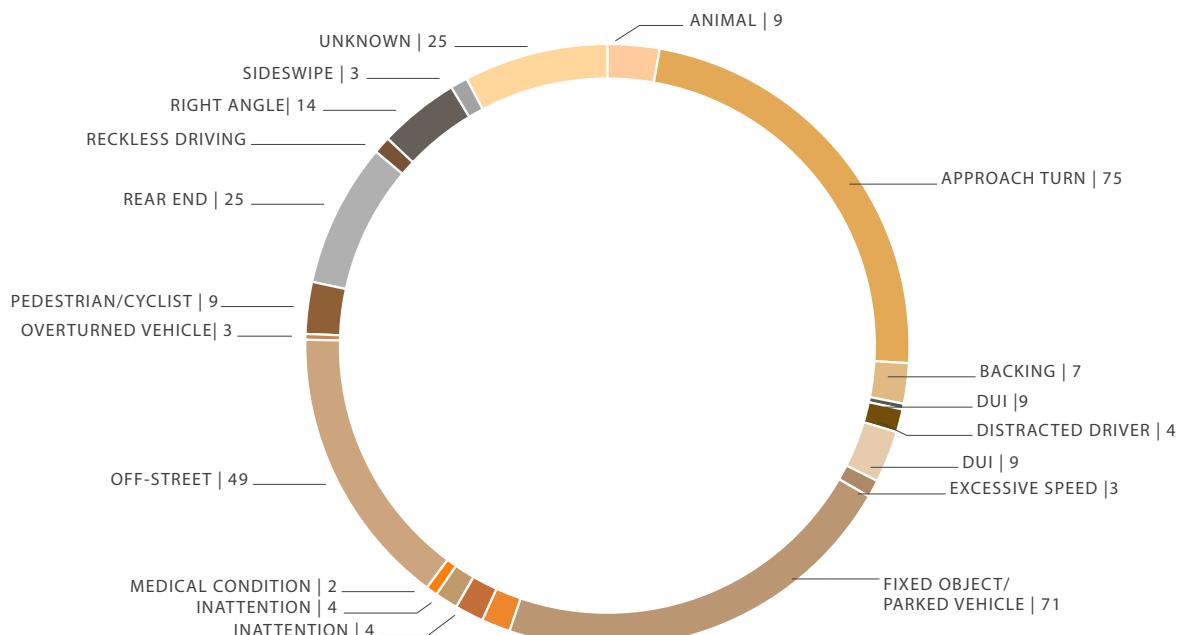
Intersections	Total # Collisions	2006	2007	2008	2009	2010	Collisions per MEV
Bendigo Blvd at W. Park Street	26	11	11	3	1	0	1.15
Bendigo Blvd at North Bend Way	21	8	7	1	3	2	0.63
Bendigo Blvd at SW Mount Si Blvd	18	1	2	4	5	6	0.58
Bendigo Blvd at South Fork Ave SW	15	4	3	0	2	6	0.71
E North Bend Way at SE Cedar Falls Way	8	1	3	1	2	1	0.47
Bendigo Blvd at W. 2nd Street	7	0	3	0	3	1	0.53
E North Bend Way at Ballarat Avenue	5	1	0	1	3	0	0.20
E North Bend Way at E. Park Street	5	0	2	3	0	0	0.21

For analysis purposes, collision data was converted to a collision rate to compare high and low volume intersections on an equal basis. Intersection collision rates are expressed in *Table 7* as collisions per million entering vehicles (MEV). The following equation was used to determine the intersection collision rate using the City's 2009-2010 24-hour traffic count volumes:

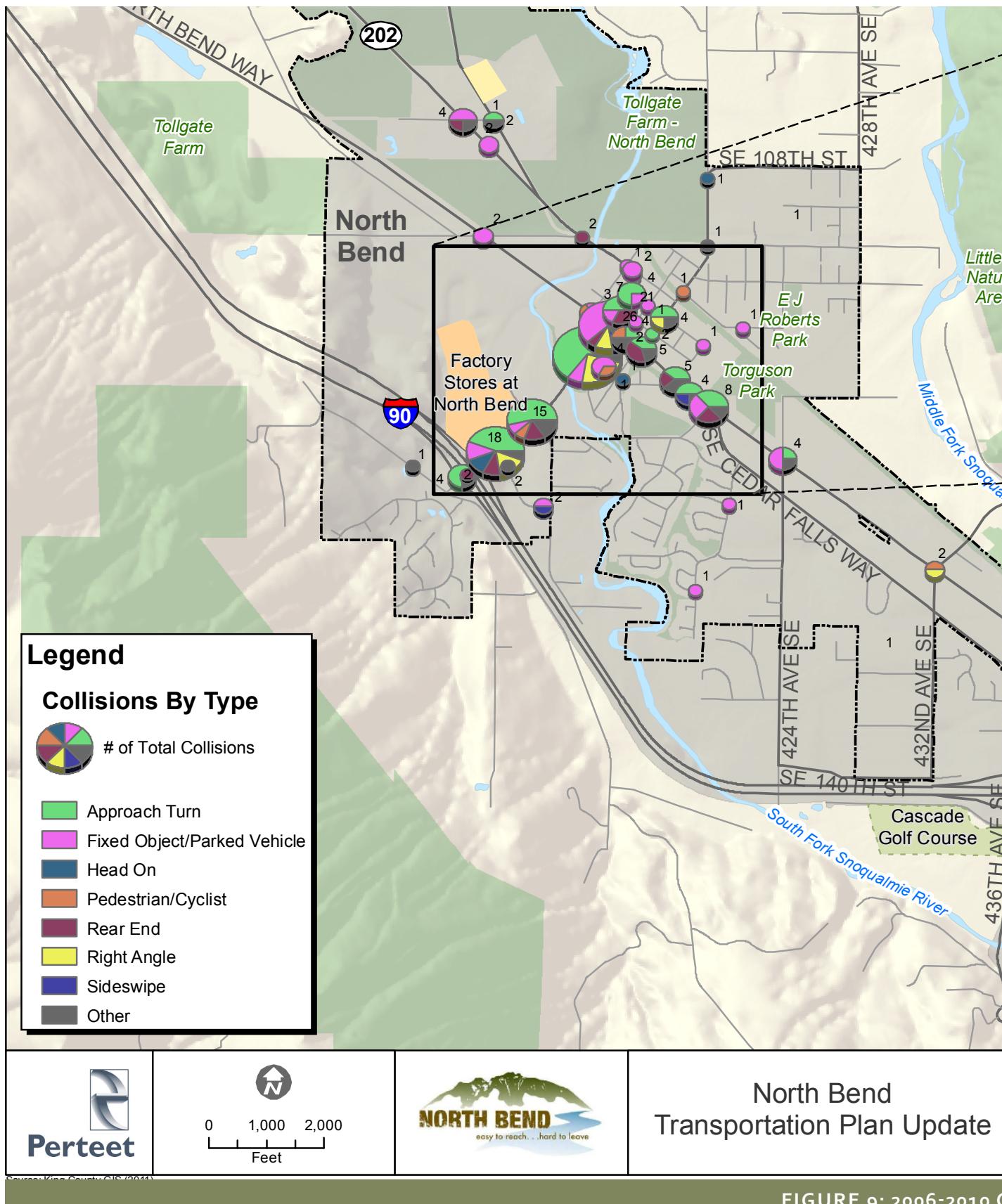
Collision Rate =	Annual number of collisions x 1,000,000
	Vehicles Entering Intersection per day x 365 days/year

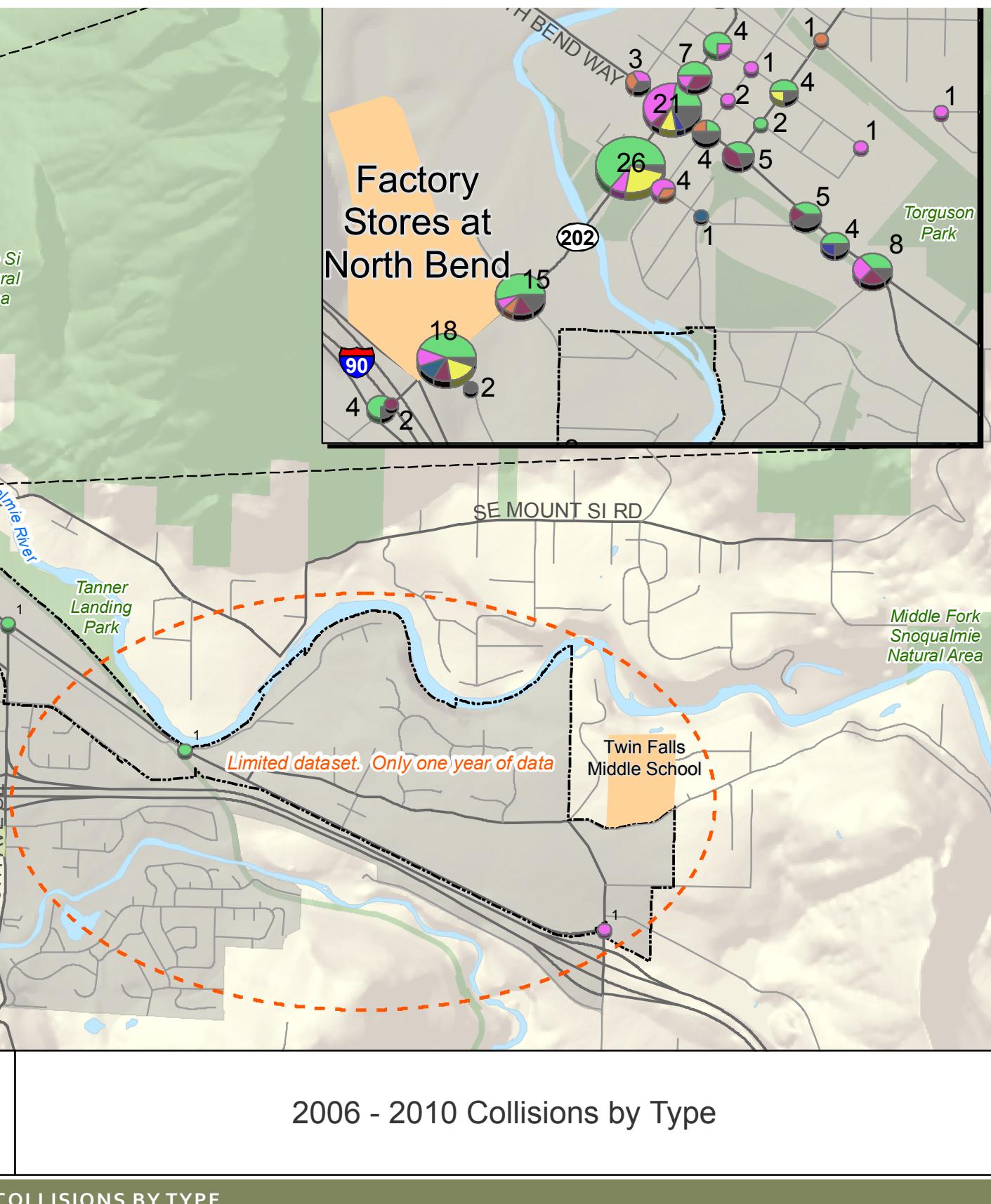
A collision rate of 1.0 collision per MEV or lower is typically considered acceptable. As shown in Table 7, all but one of the listed intersections experienced collisions at a rate below the suggested 1.0 rate criteria. The highest collision rate documented occurred at the intersection of Bendigo Boulevard and W. Park Street where the 26 total collisions produced a rate of 1.15 collisions per MEV. Twenty-two of the collisions (85%) were approach turn (16) or right angle (8) type collisions, which are of concern due to a high potential for injuries. There has been a significant decline in collisions at this intersection since completion of the signalization project in 2008.

FIGURE 8: NORTH BEND COLLISIONS BY TYPE 2006-2010









E. TRAFFIC FORECAST SUMMARY

The purpose of this chapter is to present the methodology used to forecast transportation conditions through the 2030 planning horizon, and assess those future transportation conditions.

E.1 TRAFFIC FORECASTING METHOD

For the City of North Bend Transportation Element, a computerized travel demand model was updated and recalibrated to predict the afternoon peak-hour volume and assess the future transportation conditions. Figure 10 outlines the major components of the traffic forecasting process. Appendix D details the technical aspects of the model.

DEVELOPMENT AND APPLICATION OF TRAVEL FORECASTING MODELS

The travel demand forecasting model developed for the City of North Bend used PTV Vision VISUM version 11.52+. This more modern software served as an update of the previously used TMODEL2 software and was able to import all of the previous model files. Both TMODEL2 and now PTV Vision VISUM have been used by many cities in the state of Washington. The model follows the standard four-step process, with the exception that the modal choice step is omitted as only trips via the private automobiles are considered. The level of transit service in the City makes the proportion of transit trips insignificant compared to auto trips. Trips via other alternatives, such as paratransit and non-motorized modes, are also very limited. Forecasts of future year traffic volumes can be developed with this model by entering new data for assumed future road conditions and land use scenarios.

GEOGRAPHIC SCOPE & TRAFFIC ANALYSIS ZONES

The study area includes the City of North Bend, its Urban Growth Area and some surrounding areas, such as the occupied residential land area of the Upper Snoqualmie Valley and tributaries. The adjacent City of Snoqualmie is not included in the model, but Snoqualmie traffic is included in the external zone representing SR 202 at the northwest edge of the model area.

The study area depicted previously in **Figure 1** was divided into 99 transportation analysis units to enable the linking of information about activities, travel, and transportation to physical locations in the study area. These transportation analysis units are better known as Traffic Analysis Zones (TAZs). The TAZ boundaries for the North Bend Study Area are shown in Figure 11. The small-

size TAZs are used to detail the City of North Bend and the area of high interests. In more distant areas, there is progressively less detail, and the TAZs are larger. The TAZs attempt to bound homogeneous urban activities; that is, a zone may be all residential, all commercial, all industrial, etc. TAZs also consider natural boundaries, census designations, and highway and administration boundaries. It is more important that a TAZ represent an area defined by its accessibility than by its homogenous land use.

MODEL NETWORK

The arterial street system is coded into the computer model network by using links to represent roadways and nodes to represent the roadway intersections. In a travel demand model, trips of each TAZ begin and end on the so-called "centroid", which is considered the central point of activities in the TAZ. These centroids are defined for each TAZ in the model and are connected to nodes in network by "centroid connectors". To form a functional model network, all links and nodes should be attributed by functional classification (designated in the model by Type), length, capacity, speed and other attributes.

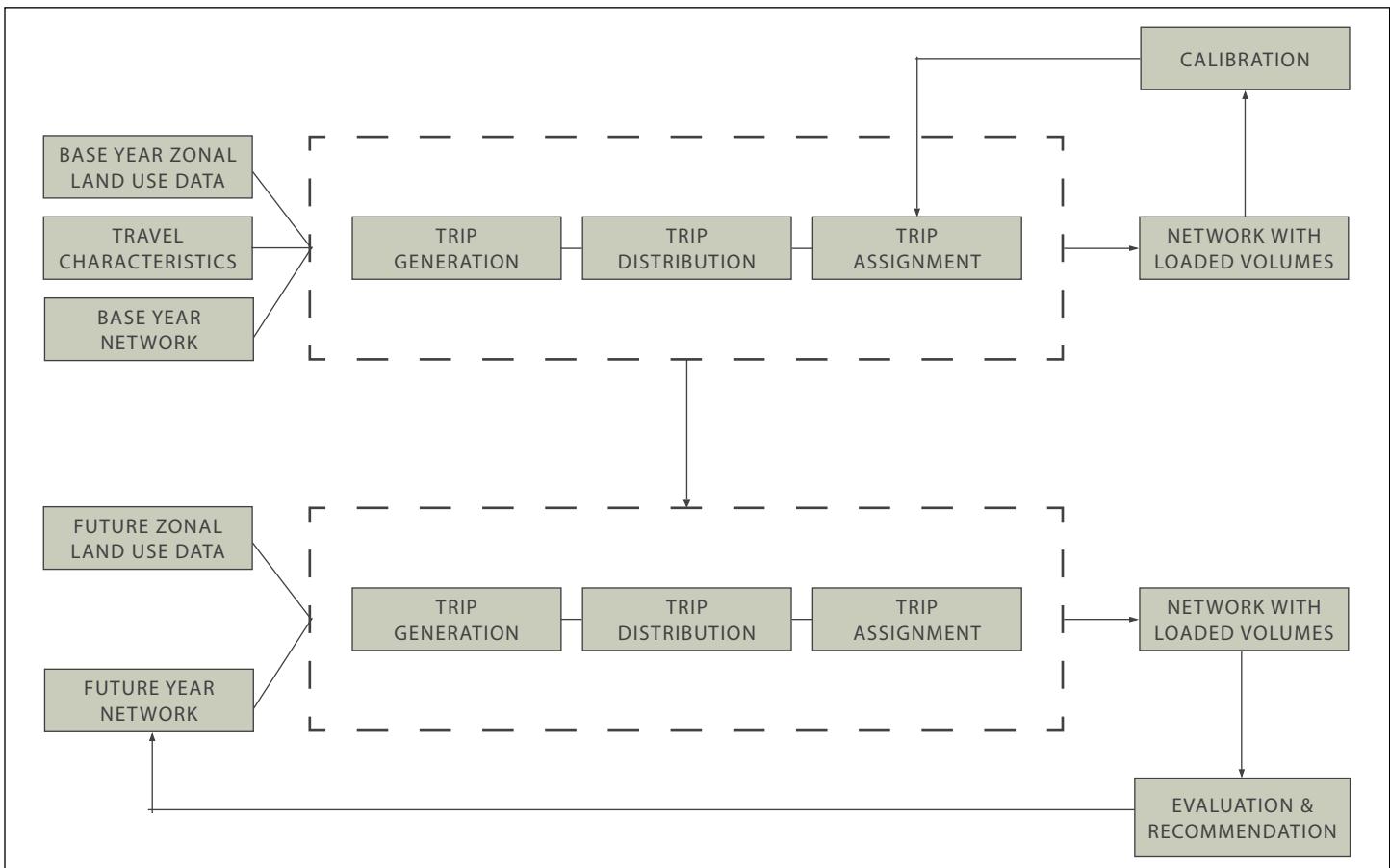
The North Bend model network details the city area and some high-interest areas with all interstates, arterials, collectors as well as many local access roads. In more distant areas, there is progressively less detail, with fewer collectors and minor arterials (if any). At the outer area with less interest only freeways and selected principal arterials are included.

The updated 2011 base year model consists of 99 internal TAZs and 9 external stations, 1056 directional links, 499 nodes, and 286 centroid connectors.

TRIP GENERATION

This step addresses the question, how much travel is made in a TAZ during the peak hour? These trips ends (better known as zonal productions and attractions) are estimated using assumptions about the number of trips typically made by or attracted to each type of land use type. Thus, the trip generation process translates land use quantities (number of dwelling units, employees, etc.) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using appropriate trip generation rates. Because trips made for different purposes have different trip distributions, trip generation results are often stratified into purposes, such as home to work or home to shop or home to school. This categorization is necessary

FIGURE 10: DEVELOPMENT AND APPLICATION OF TRAVEL FORECASTING MODELS



because each trip purpose reflects the behavior of the trip maker. For example, school trips and work trips are fairly regular compared to shopping and recreational trips. Moreover, work trips are usually longer with minimal daily choice to change destinations, while shopping trips are generally shorter and more easily changed.

For this model update, trips are stratified into six directional “trip purposes” to more accurately describe peak hour travel. The additional trip purposes are used to subdivide trips by direction of travel, and to explicitly model “chained trips” involving more than one stop.

1. From Work to Home with no stops (A-WH).
2. From Work to Other for the first part of “chained” trips en route home; for shopping, etc. (B-WK-DVT).
3. From Other to Home for concluding part of “chained” trips en route home (C-DVT-HM).
4. From Home to Other, predominantly to retail shopping, and other local destinations (D-HM-OTH).

5. From Other to Home for the return part of local home-to-other trips (E-OTH-HM).

6. Non-Home-Based for trips between two TAZ's which do not include the driver's residence. This accounts for several types of trips including second- or third-legs of a multi-stop tour of “chained” trips, commercial travel of all types, and truck travel (F-NHB).

Zonal trip productions and attractions by purpose are derived by applying the average generation rates for each land use described in Table 1. The absence of data from travel surveys in the study area justified the use of average generation rates from the 7th edition of the ITE Trip Generation Handbook. Trip generation rates for this model update were imported from the previous model dataset but were not revised. Details of the rates used for the PM peak model is given in the technical documentation in Appendix D.

TRIP DISTRIBUTION

This step of the model process estimates the number of travel from one TAZ in the model to any other TAZ.

Distribution is accomplished through use of the gravity model technique, which distributes trips according to two basic assumptions: (1) more trips will be attracted to larger zones (the size of a zone is defined by the number of attractions estimated in the trip generation phase, not the geographical size), and (2) more trip interchanges will take place between zones that are closer together than the number that will take place between zones that are farther apart. The second assumption is usually measured in terms of travel impedance, i.e., more trip interchanges occur between zones that have the least impedance to travel. Interzonal travel impedance is measured as a weighted average of (predominantly) travel time and (modestly) travel distance between each pair of TAZs.

NETWORK ASSIGNMENT

This information is then used to determine the optimum path between all pairs of TAZs based on some measure of travel cost. Using assignment algorithms the route choices of individual drivers are simulated. Given the number of trip interchanges between zone pairs, the assignment algorithm predicts the best (usually cheapest route) for each driver. The route choice decision is usually represented by the cost involved, where cost is either time or distance, or a combination of both. Usually, travel time is used as a cost measure. If distance component is included, it usually is just a small fraction.

In this process, trips from one zone to another are assigned to specific travel routes in the network, and resulting trip volumes are accumulated on links of the network until all trips are assigned. Network travel times are updated to reflect the congestion effects of the traffic assigned through an incremental assignment process. Congested travel times are estimated using some form of travel impedance functions (better known as "volume/delay functions") that has direct relationship with traffic volumes. There are different forms of volume/delay functions, all of which attempt to simulate the impact of congestion on travel times (greater delay) as traffic volume increases. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed and facility type. This allows the model to reflect conditions somewhat similar to driver behavior.

MODEL CALIBRATION AND VALIDATION

No traffic model is ever totally accurate, due to the practical limitations of input data (incomplete or inaccurate counts, land use, road network data, etc.) as well as the complexity and diversity of human travel

decisions. Calibration of a traffic model consists of adjusting internal formulae and parameters to achieve a good representation of actual base year traffic from the inputs of base year land use and road data. Validation is the process of comparing traffic model outputs to traffic counts and other data, to verify reasonable operation according to available standards of reference. Once the model is calibrated and validated for existing conditions, it can be used as the basis for analyzing future traffic conditions, as well as potential improvements to address existing and future deficiencies. Details of calibration and validation of the North Bend base year model are included in the technical documentation in Appendix D.

MODEL OF FUTURE TRAFFIC CONDITIONS

Using the same general process described for modeling existing conditions, the forecasted land use data is used to estimate the number of trips that will be generated in future travel. These trips are then distributed among the TAZs, and assigned to the street network. The result is model of projected future traffic conditions, under the expected future land use scenario.

INTERSECTION LOS FOR 2030 NO ACTION CONDITIONS

The forecast traffic operating conditions in 2030 are shown in Table 8 for the same 21 intersections that were identified for existing 2011 conditions, assuming no major changes to the roadway network will occur. As indicated in Table 8, seven intersections are forecast to operate with LOS E or F conditions below the City's LOS standard. This is an increase from two in existing conditions, reflecting greater congestion as a result of land use change. The seven intersections that are projected below LOS D conditions in 2030 include:

- North Bend Way/Main Avenue
- North Bend Way/Ballarat Avenue
- North Bend Way/Bendigo Boulevard
- North Bend Way/SE Mt. Si Road
- Bendigo Boulevard/I-90 WB ramp
- 436th Avenue SE/I-90 WB ramp, and
- 436th Avenue SE/I-90 EB ramp

The forecast average delay for motorists at three of the North Bend Way intersections is at about 7 minutes, which will be unacceptable to most motorists. The projected average delays at the 436th Avenue SE ramps to I-90 will be at about 3 minutes. It will be necessary to identify solutions to address these problems to bring the LOS into compliance with the City's adopted LOS

standard and to reduce frustration for roadway users that can lead to collisions and other problems. Solutions may include adding dedicated turn lanes, signalization, or diverting traffic to other streets.

F. SYSTEM ANALYSIS

The purpose of this chapter is to summarize the existing and future transportation issues that must be addressed, and identify various potential improvements that may correct current and future deficiencies in the system.

F.1 SUMMARY OF OPERATIONS ANALYSIS

In the existing (2011) conditions, the City has four signalized intersections and two roundabouts. The rest of the intersections are controlled by two-way stop and four-way stop signs. The signalized intersection at North Bend Way/Bendigo Boulevard is currently operating at LOS D (at the standard) and the other signalized intersections operate at LOS C or better. Both roundabouts are operating at LOS C. Two stop-controlled intersections that are currently below the LOS standard are North Bend Way/Ballarat and North Bend Way/Main. The other unsignalized intersections in the City are operating at LOS D or better.

Analysis shows that the projected future development by 2030 and resulting growth in population and employment will cause increased traffic congestion at intersections on the City's street system. The number of intersections that will operate below LOS standards is projected to increase from two to seven by 2030. Traffic congestion is projected to be most heavy along the North Bend Way corridor from Bendigo Boulevard to Cedar Falls Way, Bendigo Boulevard at the I-90 WB ramp, and 436th Avenue SE at the I-90 interchange. In addition, special attention to heavy truck movements in the vicinity of the 468th Avenue SE corridor will be necessary from I-90 to SE 144th Street.

Four major intersection improvements are included in the 2012-2017 Six-Year TIP (Appendix C):

1. The installation of a roundabout at North Bend Way/Park Street along with a median on North Bend Way is needed to control turning movements from Park Street, Downing Avenue, and major commercial driveways (QFC) in the vicinity. Although the collision history (see Table 7) does not indicate a high accident rate, observed turning movements at this location suggest a problem.

While growing traffic volume is expected to cause greater intersection delay generally, all of the remaining intersections are projected to operate at LOS D or better, satisfying the City's adopted LOS standard.

2. The installation of a dedicated right turn lane for northbound Bendigo Boulevard to Park Street would encourage northbound traffic on Bendigo Boulevard that intends to go east on North Bend Way to avoid that congested intersection.
3. The intersection of W. North Bend Way/NW 8th Street requires improvement prior to the planned extension of South Fork Avenue from Bendigo Way to W. North Bend Way (Nintendo By-Pass) to address limited sight-distance and angle of approach problems that could contribute to a safety problem. Turn lanes may be needed for the approach.
4. The installation of a traffic signal at the intersection of E. North Bend Way/Ballarat will not be needed, given other completed or planned improvements – the recent completion of the Downing Avenue extension from E. North Bend Way to E. 2nd Street, the planned roundabout at E. North Bend Way/Park/Downing, and the planned Downtown Plaza improvements.

The intersections that would experience the greatest deterioration in level of service that need to be addressed by future improvements (in addition to projects in the TIP) are:

- Bendigo Boulevard/North Bend Way, which is predicted to operate at LOS F in 2030;
- 436th Avenue SE/I-90 Eastbound and Westbound Ramps, both of which are forecast for LOS F conditions on the ramp approaches in 2030;
- E. North Bend Way at Main and Ballarat Avenues, both of which have forecast LOS F conditions on the stop-controlled approaches during the peak hour;
- E. North Bend Way/SE Mt. Si Road, which serves heavy recreational demand during the warmer months, has forecast LOS F conditions on the stop-controlled approach.

A number of potential improvements have been identified to relieve existing and projected congestion at the Bendigo Boulevard/North Bend Way intersection, including:

- The South Fork Avenue Extension from Bendigo to W. North Bend Way at NW 8th Street, which is projected to attract nearly 500 trips in the PM peak hour;
- The construction of a dedicated right turn lane for the northbound approach from Bendigo Boulevard to Park;
- The reconfiguration of the Bendigo/NE 4th Street intersection, removing the diverter to allow east-west movements, potentially adding a traffic signal or a roundabout;
- Construction of the proposed roundabout and median improvements at E. North Bend Way/Park/ Downing;
- Implementation of the Downtown Plaza improvements on E. North Bend Way from Bendigo to Park;
- Constructing the Pickett Avenue Extension from E. North Bend Way to NE 6th Street is projected to attract 240 vehicle trips in the PM peak hour; and
- Extending a new east-west roadway on the approximate alignment of South Fork Avenue/SE 20th Street, from Mt. Si Boulevard to 436th Avenue SE, would attract 340 vehicle trips in the PM peak hour, relieving both Cedar Falls Way and North Bend Way.

F.2 OPERATIONS FOR 2030 RECOMMENDED PLAN CONDITIONS

A traffic forecast using the North Bend Travel Model was completed for planned 2030 land use conditions, with all the identified potential roadway improvements in place. Projected intersection LOS conditions are shown in Table 9. The assumed roadway improvements for the planned 2030 network included:

The South Fork Avenue Extension from Bendigo to W. North Bend Way at NW 8th Street;

The Pickett Avenue Extension from E. North Bend Way to NE 6th Street;

Removal of the diverter at Bendigo/NE 4th Street;

Implementation of the Plaza Project on North Bend Way between Bendigo and Ballarat, with an assumed roundabout at North Bend Way/Ballarat;

Implementation of a roundabout at North Bend Way/Park/ Downing; and

South Fork Avenue/SE 20th Street Extension, Mt. Si

Boulevard to 436th Avenue SE with new development.

The conclusion to be drawn from the system analysis summarized in Table 9 is that the recommended improvements would solve much of the projected 2030 congestion that would otherwise occur with no changes in the 2030 Base Network (Table 8). The combination of the proposed new roadway extensions (at South Fork and Pickett Avenues especially) and assumed completion of the Downtown Plaza project, with new roundabouts on North Bend Way in the Downtown core area, would:

Provide alternative routes for trips to avoid Downtown if they don't have a destination there;

Provide alternative routes that would allow a faster travel time than North Bend Way through Downtown; and

Improve the LOS on several Downtown intersections to achieve the City's standard of LOS D or better, including North Bend Way/Bendigo Boulevard, which would improve from LOS F (Table 8) to LOS B (Table 9).

The remaining intersections projected to operate at LOS E or LOS F in 2030 are:

- North Bend Way/SE Mt. Si Road (LOS E),
- North Bend Way/436th Avenue SE (LOS E),
- Bendigo Boulevard/I-90 westbound ramp (LOS E),
- 436th Avenue SE/I-90 westbound ramp (LOS F), and
- 436th Avenue SE/I-90 eastbound ramp (LOS E).

All the above intersections are two-way stop-controlled intersections, which are projected for lengthy delays on the minor approach leg. In all cases, the major arterial legs are projected to operate with a good LOS (of C or better). Notably, the 436th Avenue SE corridor accounts for three of the five projected poorly performing intersections. Traffic growth is expected in this corridor because it serves new development and provides a convenient route to/from I-90. While it is not uncommon to accept a poor level of service on the minor approach in similar stop-controlled situations, a careful analysis of corrective measures should be conducted as traffic volumes build over time. The highest priority for improvements should be focused on locations with increasing collisions. Options for improvement may include signalization, roundabouts, or channelization to restrict movements.

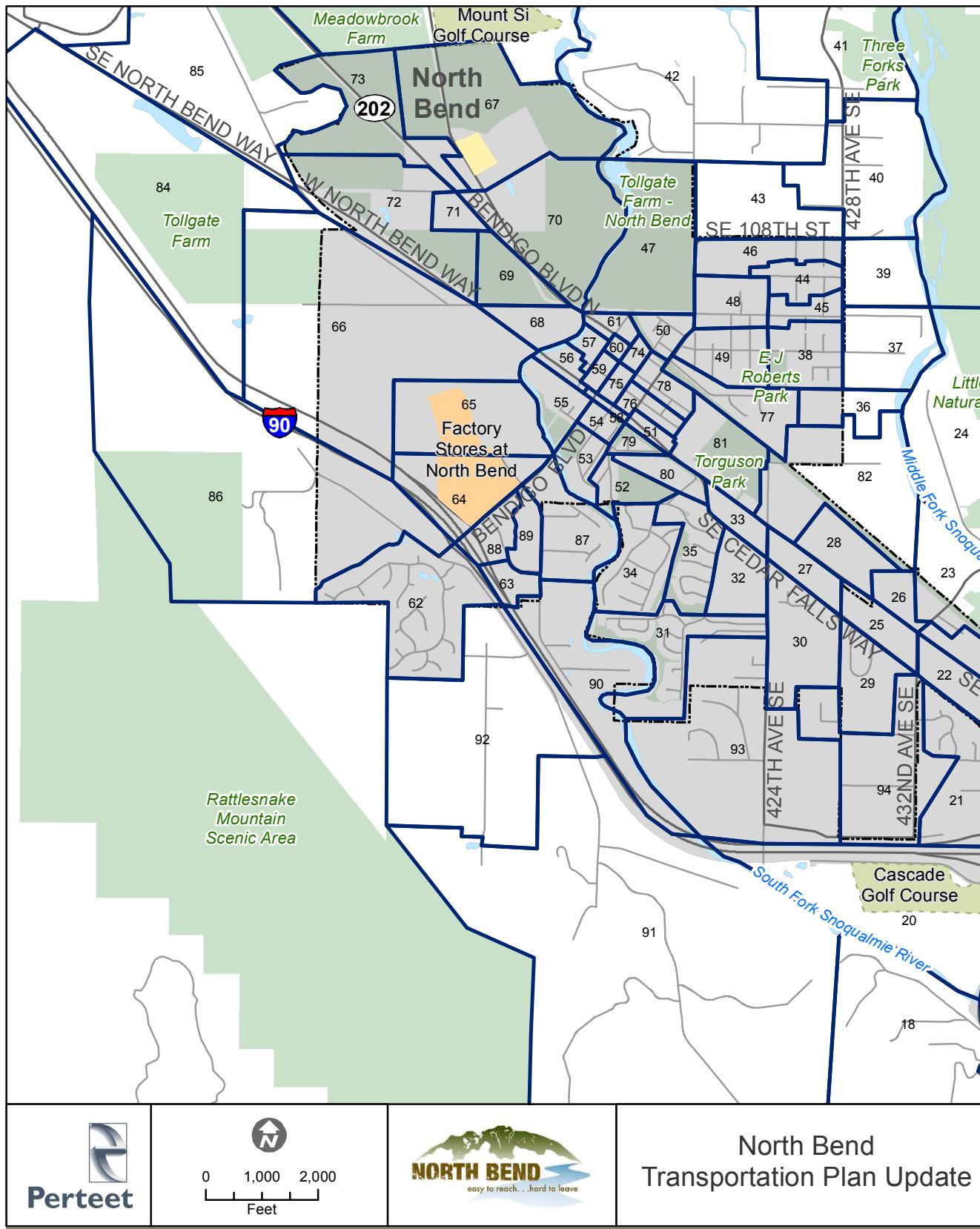
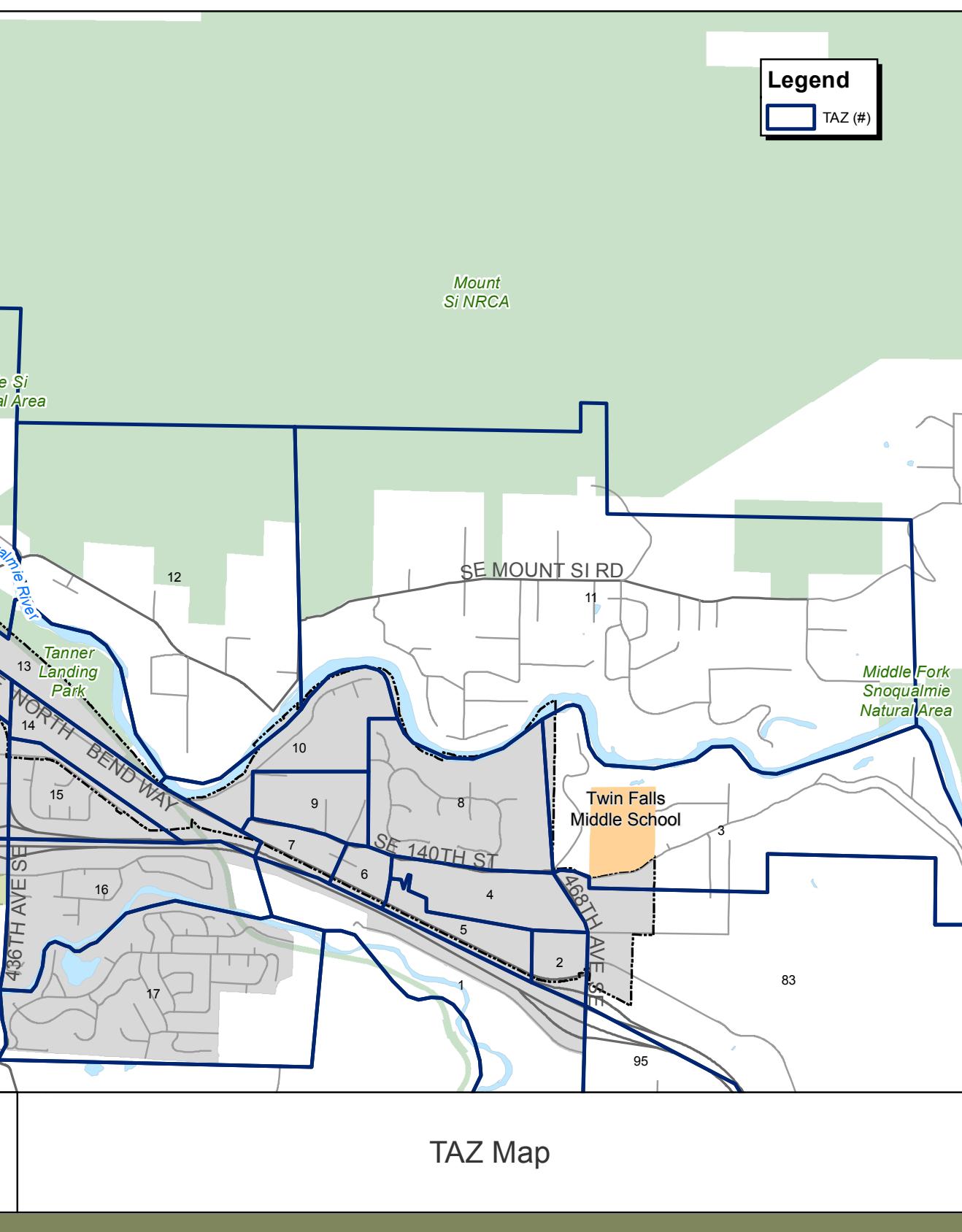


FIGURE 11: 2003 TRAFFIC ANALYSIS



G. RECOMMENDED PLAN

This chapter summarizes the Transportation Plan recommendations to address deficiencies in the transportation system now and through the 2030 planning horizon, while recognizing the fiscal and scheduling complexities of implementing costly facility improvements. This chapter also presents the financing and concurrency elements of the Transportation Plan Update.

G.1 FUNCTIONAL CLASSIFICATION

The determination of the appropriate classification for each street in a city requires a process that examines the relative role each street plays as part of the entire system. Because it is not possible to directly measure the proportion of "mobility" and "access" each street segment provides, the process involves an evaluation of several important criteria that correlate strongly with those primary attributes of mobility and access. The following are five criteria used for determining street classification, and for re-classifying roadways in the City of North Bend:

Average Daily Traffic (ADT). Generally speaking the higher the traffic volume, the higher the classification of the street. The demand for traffic mobility is more likely to outweigh the need for access to abutting land on streets with higher traffic volumes. Conversely, where volumes are lower the access function of the street will generally be more important than mobility for traffic. Volumes in themselves do not define or determine the classification, however the following were used as guidelines:

Functional Classification	Average Daily Traffic (ADT)
Principal Arterial	7,500 and Up
Minor Arterial	2,500 and Up
Collector	500 and Up
Local Access	Less than 500

Non-Motorized Use. The ADT criterion described above provides an easily obtainable measure of the number of vehicles using a given street. While ADT is an important yardstick, another very significant feature of a city's streets is the accommodation of non-auto modes, including walking, bicycling, and transit use. The number of modes of travel using a street is telling of a street's importance in the city's network—the more modes using a street, the more users that street serves, and the more important that street is to the movement of people, goods, and services

throughout the city.

Length of Street. The street length is another important criterion to consider in a street's classification. The longer a street is, the more likely it is that the street will function at a higher classification. This is due to the fact that longer (continuous) streets allow travelers to move between distant attractions with a limited number of turns, stops, and other distractions that discourage them from using streets of lower classification. Longer streets generally supply a higher level of mobility as compared to other streets that are providing more access.

Spacing of Streets. Street spacing is another criterion that relates to the provision of mobility and/or access. Streets of higher classification usually have larger traffic carrying capacity and fewer impediments to travel. Fewer facilities are needed to serve the traffic mobility demands of the community due to their efficiency in moving traffic. Generally, this means that there are fewer streets of higher classification so there will be greater distances between them. Therefore, the farther the distance of a street from a higher classification street, the more likely it is that the street will function at a similar classification. Streets of lower classification are needed to provide access to abutting land. In order to do this, they must be spaced more closely and there must be many more of them. It is considered most desirable to have a network of multiple lower classification streets feeding into progressively fewer higher classification streets.

Roadway Type	Typical Street Spacing
Principal Arterials	1.0 Mile
Minor Arterials	0.3 to .07 mile
Collectors	0.25 to 0.5 mile
Local Access	0.1 mile

Street connectivity. Streets that provide easy connections (or connectivity) to other roads of higher classification are likely to function at a similar classification. This can be attributed to the ease of movement perceived by travelers who desire to make that connection. For example, state highways are generally interconnected with one another, to provide a continuous network of high order roadways that can be used to travel into and through urban areas. Urban minor arterials provide a similar interconnected network at the citywide level. By contrast, collectors often connect local access streets with one or two higher level arterial streets, thus helping provide connectivity at the neighborhood scale rather

Table 8: 2030 BASE (NO CHANGE) WEEKDAY PM PEAK HOUR LEVELS OF SERVICE

	Intersection		Traffic Control ¹	Critical Movement ²	Delay ³	LOS ⁴
	Primary Leg	Secondary Leg				
1	North Bend Way W	Main Avenue	TWSC	NB-L (LOS E)	435.3	F
2	North Bend Way E	Ballarat Avenue	TWSC	SB-LT (LOS F)	407.1	F
3	North Bend Way E	Park Street	TWSC	NB-LR (LOS C)	17.9	C
4	North Bend Way E	SE Cedar Falls Way	Roundabout	EB-LTR (LOS D)	31.1	D
5	North Bend Way W	Bendigo Boulevard	S	WB-L (LOS F)	451.6	F
6	North Bend Way E	SE Mt. Si Road	TWSC	EB-LTR (LOS C)	61.2	F
7	North Bend Way E	436th Ave SE	TWSC	NB-LR (LOS B)	32.8	D
8	North Bend Way E	468th Ave SE	TWSC	EB-LR (LOS B)	15.8	C
9	Bendigo Boulevard	Park Street	S	WB-LTR (LOS C)	17.4	B
10	Bendigo Boulevard	South Fork Avenue	S	SB-L (LOS D)	22.9	C
11	Bendigo Boulevard	Mount Si Boulevard	S	NB-L (LOS C)	16.0	B
12	Bendigo Boulevard	I-90 WB Ramp	TWSC	NB-LTR (LOS C)	38.0	E
13	Bendigo Boulevard	I-90 EB Ramp	Roundabout	SB-LTR (LOS D)	19.9	C
14	Bendigo Boulevard	4th Street	TWSC	WB-L (LOS C)	31.9	D
15	Park Street	Main Avenue	AWSC	NA	N/A	N/A
16	Ballarat Avenue	6th Street	TWSC	WB-LR (LOS B)	11.2	B
17	436th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS D)	193.5	F
18	436th Ave SE	I-90 EB Ramp	TWSC	EB-LTR (LOS C)	156.9	F
19	436th Ave SE	SE Cedar Falls Way	TWSC	EB-LR (LOS B)	13.4	B
20	468th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS B)	13.3	B
21	468th Ave SE	I-90 EB Ramp	TWSC	EB-LT (LOS B)	14.3	B

1. S=signalized intersection, TWSC=two-way stop-control (at the secondary leg), AWSC=all-way stop-control
2. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, L=Left, LR=Left and Right Movements, LRT=Left, Through, and Right Movements
3. Delay is measured in seconds per vehicle. At signalized (S) and AWSC intersections, it represents average delay for all intersection movements. For TWSC intersections, it represents average delay for the worst minor leg movement.
4. Level-of-Service based on the methodology outlined in the 2000 Highway Capacity Manual
5. The intersections in lines 20 and 21 are currently outside the City limits and the data are provided for informational purposes only. These intersections are to be monitored and reevaluated when annexed into the City.

than a citywide level. Local streets also provide a degree of connectivity as a necessary component of property access. However, the street lengths, traffic control, and/or street geometry are usually composed so that anyone but local travelers would consider the route inconvenient. Access to the immediate neighborhood is considered a local trip.

Based upon these guidelines, the roadways that have

been re-classification are presented in Table 10.

G.2 RECOMMENDED IMPROVEMENTS

Project recommendations were identified for existing and projected 2030 traffic volumes based on planned land use growth. Suggested Capital Improvement Projects are shown in Figure 13, identifying vehicular and pedestrian projects, with locations keyed to the project descriptions.

Vehicular Project Recommendations

1. South Fork Avenue Extension – Extend South Fork Avenue from Bendigo Boulevard past the Nintendo site, a new 2-lane collector roadway connection to North Bend Way at 8th Street.
2. Truck Stop Task Force – Support the analysis of potential solutions to address the unique demands of heavy truck traffic circulation and parking in the Exit 34 vicinity, from I-90 to SE 140th Street, including all the intersections and major driveways.
3. Bendigo Boulevard/4th Street Intersection – Reconfigure the intersection to remove the diverter and allow full movements with implementation of a traffic signal or roundabout.
4. North Bend Way/Park Intersection Improvement – Design and construct a roundabout serving Park, Downing and the QFC driveway, with median treatments on North Bend Way.
5. Downtown Plaza Improvement, Bendigo to Ballarat – Construct streetscape improvements along North Bend Way with widened sidewalks, curb bulbs and plantings to create an attractive pedestrian environment and gathering place for special events
6. North Bend Way/Ballarat Traffic Signal – (not needed if Plaza is implemented)
7. Pickett Avenue Extension, NE 6th Street to North Bend Way – Reserve right of way and extend a 2-lane roadway as a collector street to serve future residential development.
8. Bendigo Boulevard/Park Intersection – Construct an exclusive right turn lane for northbound traffic on Bendigo Boulevard to eastbound Park.
9. SE 146th Street, 468th Avenue SE to east city limit – Reconstruct the deteriorated 2-lane roadway with pavement suited to heavy vehicle loads.
10. SE 146th Street at 468th Avenue SE – Intersection control improvements; evaluate the need for installation of a traffic signal consistent with North Bend Gravel Operations FEIS.
11. 468th Avenue SE at Middle Fork Road – Design and construct a roundabout as a truck turnaround with provisions for safe pedestrian and bicycle travel.
12. SE 20th Street Extension – Reserve right of way to extend a collector street from Maloney Grove to 436th Avenue SE to serve future residential

development.

13. North Bend Way at 436th Avenue SE – Construct roundabout to serve growing traffic demand.
14. North Bend Way at Mt. Si Road - Construct roundabout to serve growing traffic demand from residential and recreational travel.
15. South Fork Avenue Extension – Reserve right of way to extend roadway as a collector street to serve future residential development from Mt. Si Boulevard to Maloney Grove Road.

G2. A PEDESTRIAN PROJECT RECOMMENDATIONS

1. Sidewalk Trip Hazard Elimination – Non-specific locations to address ADA compliance issues as they occur due to cracking, heaving or other problems.
2. Tanner Trail Right of Way Acquisition – Acquire abandoned railroad rights of way for Phases 2 and 3, working west from Downtown parallel to the south side of W. North Bend Way.
3. SE 140th Street, North Bend Way to 457th Avenue – Construct sidewalk and or trail to connect to the Twin Falls sidewalk system west to the west end of the walk zone for student safety and improved pedestrian access to schools and pedestrian safety of the community as a whole, consistent with city standards.
4. Old and New Si View Pedestrian GLinkage – Develop new trail connection off 10th Street.
5. 2nd Street Sidewalks – Reconstruct existing substandard sidewalks in Downtown.
6. SE Cedar Falls Way Sidewalks – Construct a continuous sidewalk on south side from North Bend Way to 436th Avenue SE.
7. North Bend Way, Ballarat to Downing – Construct curb, gutter and landscaping both sides.

Ballarat Avenue N, NE 8th to NE 12th Street – Construct sidewalks on east side of roadway.

8. Bendigo Boulevard, SW Ribary Way to South Fork Bridge – Construct missing sidewalk sections, replace substandard sections, especially on west side of roadway and provide pedestrian-scale illumination.

9. Bendigo Boulevard, South Fork Bridge Non-motorized crossing – Construct standard width sidewalk pathway on south side of bridge for pedestrians and cyclists.
10. 468th Avenue SE, SE 144th Street to Middle Fork Road – Construct continuous sidewalk on east side of roadway with pedestrian scale lighting.

G2.b MAINTENANCE PROJECT

RECOMMENDATION

Pavement Overlay Program – Non-specific locations to perform pavement maintenance on annual basis at approximately \$250,000 per year.

G2.c TRAFFIC CALMING PROGRAM

The City of North Bend has a traffic calming program administered by the Public Works Department and the Police Department. It is initiated by citizen complaints or comment and follows a three phase program toward identifying traffic problems and implementing in field solutions based on best available technology.

G.3 LAND USE AND URBAN PATTERNS

Central to the success of a public transportation system is the development of a compatible land use plan. One of the results of the use of the automobile has been land use patterns that can only be served by the automobile. Low-density suburbs and strip development are not designed to accommodate public transportation services. Changing the land use or traditional bus services is difficult and special attention must be given to increase the effectiveness of transit by controlling development and modifying the existing arterial street system and pedestrian facilities to bring passengers to the transit system.

Review of land use policies, development, and regulations should be made to ensure that changes can be accomplished to make the system work more efficiently. The city can influence the public transportation compatibility by considering the following development issues:

- Pedestrian access and facilities
- The amount, cost, and location of parking
- The location of high density residential developments
- The location and design of commercial and employment activities
- The location of transit facilities
- The location of community activity centers

- The design of building complexes and their surroundings

G.4 TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management involves techniques and strategies to reduce traffic. The City of North Bend should apply the following methods to reduce traffic:

Carpools and Vanpools: The City should promote programs to help commuters get together and share cars and/or vans. One approach is to work directly with employers to encourage employees to use alternative modes of transportation to get to work.

Walkways and Bikeways: Street system should provide safe pedestrian walkways and bikeways. These facilities should be developed in accordance with City plan. Special emphasis should be given to pedestrian and bicycle improvements along and connecting to transit corridors and facilities.

G.5 POTENTIAL ENVIRONMENTAL IMPACTS

Environmental Impacts are evaluated on both a plan level (programmatic) and on a project-by-project basis through the State Environmental Policy Act (SEPA) for all Comprehensive Plan amendments. A SEPA checklist document was prepared for this programmatic (non-project) Transportation Plan Update prior to adoption. Individual projects will be subject to separate environmental review as they are advanced for implementation.

G.6 CONCURRENCY MANAGEMENT SYSTEM

A Concurrency Management System (CMS) is a policy procedure designed to enable the City to determine whether adequate facilities are available to serve new development. The transportation element of the Growth Management Act (GMA) requires each local jurisdiction planning department to incorporate a Concurrency Management System into their comprehensive plan. A Concurrency Management System is defined in the GMA as follows:

Local jurisdictions must adopt and enforce ordinances that prohibit development approval if the development causes the LOS on a transportation facility to decline below the standard adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development

are made concurrent with the development. (State of Washington Growth Management Act, RCW 36.70A, 1990).

Concurrent with development implies that public infrastructure improvements that are required to service land development be in place, or financially planned, within six years of development use.

The City of North Bend identifies the following concurrency management system guidelines:

- Identification of the Facilities and Services to be Monitored: Facilities to be monitored within the City of North Bend are the intersections of functionally classified streets (Major, Minor and Collector) and the streets between these intersections.

Establishment of Level of Service Standards: The City of North Bend adopts Level of Service D as standard for Roads and Streets under the City's jurisdiction.

The Growth Management Act stipulates that local agencies must include the adopted LOS for designated Highways of Statewide Significance (HSS) in their local plans. The Washington State Highway System Plan, 2007-2026 has set a goal to manage the State Highway System to achieve maximum throughput. Typically, the maximum throughput of a highway lane occurs at about 2,000 vehicles per lane per hour, at speeds of 42 to 51 miles per hour, or about 70-85 percent of the typical posted highway speed limit. WSDOT has targeted congested operating conditions for the investment of highway capital improvements where speeds fall below 42 miles per hour, or below 70 percent of posted speed. The objective is to restore efficient operating conditions to these "bottleneck" or "chokepoint" highway sections. Given limited available funding, the priority is to improve traffic flow for mainline through traffic and on/off ramps, and the Highway System Plan has identified an extensive list of congested corridor locations across the state for corrective action. The State's analysis does not include congestion associated with local roads, ramps, interchanges, weather conditions, special events, construction, or collisions and incidents. There are no WSDOT highway facilities located within the North Bend planning area that have been identified for congested corridor-related investments by the State.

The Puget Sound Regional Council's Executive Board has adopted LOS standards for regionally significant state highways in the central Puget Sound region. Regionally significant state highways are state facilities that are not

of statewide significance. Adoption of LOS standards for regionally significant state highways followed a year-long process involving WSDOT and the region's cities and counties.

The non-HSS LOS standard is a three-tiered arrangement designed to fit the needs of the Puget Sound region. Tier 1 (LOS E-mitigated) is applied to all of the designated urban centers as well as a three mile buffer around the most heavily traveled freeways (I-5, I-90, I-405, SR 167, and SR 520). Tier 2 (LOS D) is applied to the "outer" urban area outside the three mile buffer area and connecting the principal UGA to the smaller UGAs as applicable to Bendigo Boulevard (SR 202). Tier 3 (LOS C) is applied to rural highway routes that do not fit into the tier 2 category.

While state law exempts highways of statewide significance (HSS) routes from local concurrency regulation, GMA is silent regarding concurrency on regionally significant state highways. These regionally significant state highways must be addressed in local comprehensive plans by listing the LOS standards referenced above, but the law is silent in terms of including or exempting them from local concurrency rules. If the city desires to maintain a reasonable LOS on the non-HSS (SR 202) route, the city and developers should work with WSDOT to prevent the facility from falling below LOS D. Mitigation of impacts can be accomplished through operational or capital improvements. The City should therefore coordinate with WSDOT whenever development lowers or impacts a State facility that is operating at or below LOS D.

Establishment of a Development Approval Process: The City of North Bend should maintain an adopted Concurrency Ordinance.

Concurrency Management System Implementation

Implementation of the Concurrency Management System involves the following steps:

- Set the level of service standards and provide adequate funding as recommended in the Transportation Plan.
- Ration and monitor available transportation capacity.
- Analyze external influences on the Concurrency Management System.
- Make periodic adjustments to the level of service standards as part of the annual Comprehensive Plan amendment process.

- Maintain a mitigation fee system to ensure new development pays its fair share to address its impacts on the transportation system.

G.7 FINANCIAL PLAN

As part of a municipal growth management program, the Transportation Element of the local comprehensive plan must ensure that adequate financial commitments are in place to complete necessary transportation improvements or strategies. The concurrency element of the GMA requires that transportation improvements are in place, or are funded and will be in place within six years.

The transportation finance element is organized using the following seven steps:

- Identify and inventory transportation needs.
- Develop cost estimates.
- Assess the ability to pay for the transportation projects and services.
- Develop financing policies.
- Establish a forecasted cash flow from the various financing resources.
- Develop a financing schedule to match transportation projects and services to cash flow.
- Establish policies to govern the management of the transportation financing program.

G7.a RECOMMENDED IMPROVEMENT COSTS

Preliminary costs were estimated at a planning level based on 2012 dollars. Estimates were prepared by the North Bend Public Works Department based on recent typical unit costs of actual construction. These planning level estimates of probable cost were the basis for the financial plan. The project costs include 20% for contingencies, 15% for design, 10% for construction administration, and 5% for permitting expenses. Table 12 summarizes the estimates for the recommended vehicular and pedestrian improvement projects identified in the previous section.

G7.b REVENUE SOURCES

The City receives several sources of funds for street improvements, estimated to generate approximately \$920,000 per year on average. These funds are described below:

Motor Vehicle Fuel Tax Arterial. The City receives gas tax revenue annually in the amount of approximately \$80,000. This amount is placed into the Arterial Streets Fund (102).

Business & Occupation Tax. The City receives 80% of the B & O tax, implemented in 2003. The City estimates 80% generates \$80,000 per year. This revenue stream is also placed in the Arterial Streets Fund (102) to help finance the 6-Year TIP.

Pavement Overlay Program. Approximately \$150,000 is currently set aside annually from the City's General Fund for pavement preservation, a routine maintenance activity. The eventual goal is to set aside \$250,000 annually with annual adjustments for inflation thereafter.

Transportation Benefit District. Annual estimated revenue of \$387,000 will accrue from the two tenths of one percent (0.2%) increase in the local sales and use tax starting 2012.

Real Estate Excise Taxes. The City has also a Capital Improvement (REET101), Special Revenue Fund with annual estimated revenue of \$120,000. This fund accounts for the Real Estate Excise Taxes (REET) collected by the City. A REET is levied on all city-wide real estate transactions. State law restricts the use of these revenues: The first 1/4 of one percent is restricted to capital projects; the second 1/4 of one percent is restricted to capital projects identified in the Capital Facilities Plan.

Other revenue sources may include:

Grant Sources. Potential sources of grant funds include the Washington State Transportation Investment Board (or TIB including several different grant categories), Washington State's Freight Mobility Strategic Investment Board (or FMSIB focused on truck and rail freight mobility), federal American Recovery and Reinvestment Act (or ARRA), King Conservation Futures, RCO, etc.

Property Ownership Contributions. There are several ways that private property owners may contribute to the implementation of infrastructure projects assessments against the befitting properties, through the dedication of rights of way for planned facilities, or directly constructing the intersection improvements. Other Funding Sources: These may include bonds or the use of Public Works Trust Fund low interest loans.

G7.c ESTIMATED REVENUE AVAILABLE TO TRANSPORTATION PROJECTS

Table 13 presents an estimate of revenue available for transportation projects in the City of North Bend over a 19-year period. For each type of revenue, in other words, this is a rough estimate of what revenue might become

available for roadway projects. The assumptions for this estimation are:

The City's sources of funding including fuel taxes, B&O, Transportation Benefit District, REET and Pavement Overlay Program will generate a total of \$12,458,000 over the 19 years through 2030. To maximize the leverage of these funds, the City needs to use them to match non-local grants, contributions from WSDOT, impact fees and/or development contributions.

WSDOT will fund improving the SR 202 South Fork Bridge to provide a barrier-free pedestrian crossing (\$3,250,000).

The city will obtain approximately \$12,812,300 in grants

from TIB, FMSIB, ARRA and other state and county sources in next 19 years, through 2030.

The city will collect \$1,900,000 in impact mitigation fees for roadway and pedestrian projects over the next 18 years, or \$100,000 per year.

The resulting total estimated revenue available for transportation projects through 2030 is \$30,420,300. This amount falls short of the total estimated project costs of the recommended plan by approximately \$6.66 million, requiring some projects to be moved into the years beyond 2030, or for additional funding sources to be identified.

TABLE 12: RECOMMENDED PLAN IMPROVEMENT COSTS

RECOMMENDED ROADWAY AND PEDESTRIAN PROJECTS	CONSTRUCTION COST
Roadway System Improvements	Estimated \$2012
South Fork Avenue Extension, Bendigo to North Bend Way/8th St	\$2,250,000
Truck Stop Task Force	Not Applicable
Bendigo Boulevard/4th Street Intersection Reconfiguration	\$85,000
North Bend Way/Park/Downing Roundabout & Median Treatments	\$1,545,000
Downtown Plaza Improvement, Bendigo to Ballarat	\$865,000
North Bend Way/Ballarat Traffic Signal (not needed with Plaza)	Not Applicable
Pickett Avenue Extension, NE 6th Street to North Bend Way	\$2,450,000
Bendigo Boulevard/Park Intersection, NB to EB right turn lane	\$149,350
SE 146th Street Reconstruction, 468th Ave SE to east city limit	\$240,000
SE 146th Street at 468th Avenue SE Intersection Traffic Signal	\$375,000
468th Avenue SE at Middle Fork Road Roundabout	\$1,150,000
NE 20th Street Extension, Maloney Grove to 436th Ave SE	\$2,800,000
North Bend Way at 436th Avenue SE Roundabout	\$1,150,000
North Bend Way at Mt. Si Road Roundabout	\$1,150,000
South Fork Avenue Extension, Mt. Si Blvd to Maloney Grove	\$7,400,000
SUBTOTAL ROADWAY SYSTEM IMPROVEMENTS	\$21,609,350
Pedestrian System Improvements	
Sidewalk Trip Hazard Elimination (non-specific locations)	\$78,409
Tanner Trail Right of Way Acquisition, Phases 2 and 3	\$4,000,000
SE 140th Street, North Bend Way to 457th Avenue, N side sidewalk	\$590,000
Old and New Si View Pedestrian Linkage off 10th Street	\$6,500
2nd Street Sidewalk Reconstruction, Downtown	\$108,150
SE Cedar Falls Way Sidewalks, North Bend Way to 436th, S. side	\$1,546,200
North Bend Way, Ballarat to Downing, curb, gutter & landscaping	\$400,000
Ballarat Avenue N, NE 8th to NE 12th St, sidewalks on E side	\$395,000

Table 9: 2030 RECOMMENDED IMPROVEMENTS WEEKDAY PM PEAK HOUR LEVELS OF SERVICE

	Intersection		Traffic Control ¹	Critical Movement ²	Delay ³	LOS ⁴
	Primary Leg	Secondary Leg				
1	North Bend Way W	Main Avenue	TWSC	NB-L (LOS E)	17.7	C
2	North Bend Way E	Ballarat Avenue	TWSC	SB-LT (LOS F)	9.5	A
3	North Bend Way E	Park Street	TWSC	NB-LR (LOS C)	10.4	B
4	North Bend Way E	SE Cedar Falls Way	Roundabout	EB-LTR (LOS D)	16.0	C
5	North Bend Way W	Bendigo Boulevard	S	WB-L (LOS F)	14.2	B
6	North Bend Way E	SE Mt. Si Road	TWSC	EB-LTR (LOS C)	42.4	E
7	North Bend Way E	436th Ave SE	TWSC	NB-LR (LOS B)	43.1	E
8	North Bend Way E	468th Ave SE	TWSC	EB-LR (LOS B)	16.4	C
9	Bendigo Boulevard	Park Street	S	WB-LTR (LOS C)	12.7	B
10	Bendigo Boulevard	South Fork Avenue	S	SB-L (LOS D)	27.1	C
11	Bendigo Boulevard	Mount Si Boulevard	S	NB-L (LOS C)	15.8	B
12	Bendigo Boulevard	I-90 WB Ramp	TWSC	NB-LTR (LOS C)	47.6	E
13	Bendigo Boulevard	I-90 EB Ramp	Roundabout	SB-LTR (LOS D)	28.2	D
14	Bendigo Boulevard	4th Street	TWSC	WB-L (LOS C)	8.6	A
15	Park Street	Main Avenue	AWSC	NA	N/A	N/A
16	Ballarat Avenue	6th Street	TWSC	WB-LR (LOS B)	9.8	A
17	436th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS D)	91.9	F
18	436th Ave SE	I-90 EB Ramp	TWSC	EB-LTR (LOS C)	42.1	E
19	436th Ave SE	SE Cedar Falls Way	TWSC	EB-LR (LOS B)	12.7	B
20	468th Ave SE	I-90 WB Ramp	TWSC	WB-LT (LOS B)	13.3	B
21	468th Ave SE	I-90 EB Ramp	TWSC	EB-LT (LOS B)	14.4	B

1. S=signalized intersection, TWSC=two-way stop-control (at the secondary leg), AWSC=all-way stop-control
2. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, L=Left, LR=Left and Right Movements, LRT=Left, Through, and Right Movements
3. Delay is measured in seconds per vehicle. At signalized (S) and AWSC intersections, it represents average delay for all intersection movements. For TWSC intersections, it represents average delay for the worst minor leg movement.
4. Level-of-Service based on the methodology outlined in the 2000 Highway Capacity Manual
5. The intersections in lines 20 and 21 are currently outside the City limits and the data are provided for informational purposes only. These intersections are to be monitored and reevaluated when annexed into the City.

Bendigo Blvd, SW Ribary Way to S. Fork Bridge, missing sidewalks	\$10,000
Bendigo Blvd, S Fork Bridge Non-Motorized Crossing Upgrade	\$3,250,000
468th Avenue SE, SE 144th St to Middle Fork Road sidewalk E side	\$333,000
SUBTOTAL PEDESTRIAN SYSTEM IMPROVEMENTS	\$10,717,259
Pavement Overlay Program (non-specific locations, \$250k/year x 19 years)	\$4,750,000
GRAND TOTAL RECOMMENDED PLAN IMPROVEMENTS	\$37,076,609

* Projects are not listed in any specific priority.

TABLE 13: ESTIMATED ANNUAL REVENUE FOR TRANSPORTATION PROJECT PERIOD 2012-2030

Funding Source	2012-2017	2018-2023	2024-2030	Total
(in 2012 Dollars)				
Transp. Benefit District	\$2,400,000	\$2,400,000	\$2,800,000	\$7,600,000
Real Estate Excise Tax	\$0	\$24,000	\$84,000	\$108,000
Business & Occupations Tax	\$0	\$0	\$0	\$0
Motor Vehicle Fuel Tax	\$0	\$0	\$0	\$0
Pavement Overlay Fund	\$1,500,000	\$1,500,000	\$1,750,000	\$4,750,000
Impact Mitigation Fees	\$600,000	\$600,000	\$700,000	\$1,900,000
WSDOT project funding	\$0	\$3,250,000	\$0	\$3,250,000
TIB, FMSIB, RCO, King Co & other Grants	\$3,000,300	\$3,312,000	\$3,000,000	\$9,312,300
Rural Set-aside, ARRA & other Federal Grants	\$1,500,000	\$500,000	\$1,500,000	\$3,000,000
TOTAL (IN 2012 DOLLARS)	\$9,000,300	\$11,586,000	\$9,834,000	\$30,420,300

ARRA = American Recovery and Revitalization Act
TIB = Transportation Improvement Board
FMSIB = Freight Mobility Strategic Investment Board (WA State)
Federal Funds = Rural set-aside
King Co = Conservation Futures (Tanner Trail Phases 2 and 3 acquisition)
Impact Mitigation Fees = Development related funds

TABLE 14: 2011-2030 TRANSPORTATION IMPROVEMENT PLAN

Funding Source	2012-2017	2018-2023	2024-2030	(2012 \$)
Sidewalk Trip Hazard Elimination	\$78,409			\$78,409
Second Street Sidewalk Reconstruction	\$108,150			\$108,150
Bendigo/4th Street Intersection Reconfiguration	\$85,000			\$85,000
Bendigo/Park Street NB to EB right turn lane	\$149,350			\$149,350
Bendigo, Ribary to S. Fork Bridge, sidewalk sections west side	\$10,000			\$10,000
North Bend Way/Park/Downing Roundabout and Median	\$1,545,000			\$1,545,000
Downtown Plaza Improvement, Bendigo to Ballarat	\$865,000			\$865,000
South Fork Avenue Extension, Bendigo to North Bend Way/8th St	\$1,850,000	\$400,000		\$2,250,000
Pavement Overlay Program (@\$250,000/year)	\$1,500,000	\$1,500,000	\$1,750,000	\$4,750,000
Tanner Trail – Phase 2 and 3 ROW Acquisition	\$4,000,000			\$4,000,000
SE 146th Street Reconstruction, 468th Ave SE to E city limit		\$240,000		\$240,000
SE 146th Street/468th Avenue SE Intersection Control Improvement		\$375,000		\$375,000
SE 140th Street Sidewalk N side, North Bend Way to 457th Ave SE		\$590,000		\$590,000
Old and New Si View Pedestrian Linkage off 10th Street		\$6,500		\$6,500
468th Avenue SE at Middle Fork Road – Construct Roundabout		\$1,150,000		\$1,150,000
North Bend Way at 436th Avenue SE – Construct Roundabout		\$1,150,000		\$1,150,000
North Bend Way at Mt. Si Road – Construct Roundabout		\$1,150,000		\$1,150,000
North Bend Way, Ballarat to Downing, curb, gutter & landscape both sides		\$400,000		\$400,000

Table 10: 2012 Changes to City Functional Classification FROM 2003 PLAN

Roadway, termini	Revised Classification
North Bend Way, 436th Ave SE-468th Ave SE	Minor Arterial
NE 4th Street, Bendigo Blvd-Ballarat Ave	Minor Arterial to Collector
South Fork Avenue SW Extension, Bendigo Blvd-NW 8th St	Collector
Pickett Avenue NE, E North Bend Way-NE 6th St	Collector
SE 140th Street, SE North Bend Way-468th Ave SE	Collector
SE 140th Street, 428th Ave SE to-432nd Ave SE	Collector
SE 136th Street Extension, 412th Way SE-436th Avenue SE (possible future route)	Collector

Bendigo Blvd Bridge over S. Fork @Tollgate Farm – widen south side sidewalk for peds & cyclists		\$3,250,000		\$3,250,000
Pickett Ave Extension, NE 6th St to North Bend Way – 2 lane collector roadway		\$810,000	\$1,640,000	\$2,450,000
SE 20th St Extension, Maloney Grove to 436th Ave SE – 2 lane collector roadway			\$2,800,000	\$2,800,000
Cedar Falls Way, North Bend Way to 436th Ave SE – Sidewalk S side			\$1,546,200	\$1,546,200
Ballarat, NE 8th to NE 12th St, Sidewalk E side			\$395,000	\$395,000
468th Ave SE, SE 144th St to Middle Fork Rd – Sidewalk E side			\$333,000	\$333,000
South Fork Avenue Extension, Mt. Si Boulevard to Maloney Grove			\$7,400,000	\$7,400,000
TOTAL	\$10,190,909	\$11,021,500	\$15,864,200	\$37,076,609

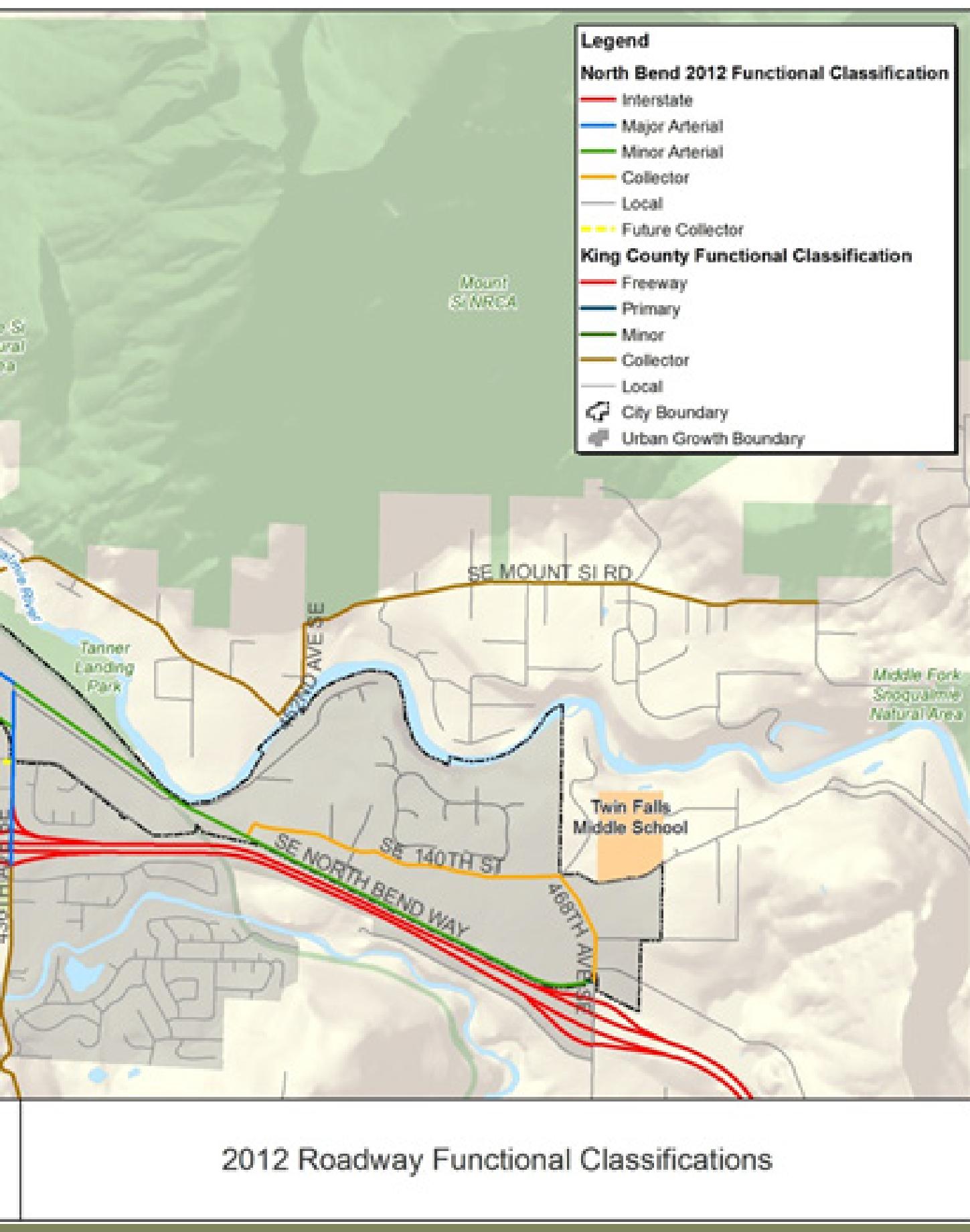
Table 14 provides an outline of a project program to implement the recommended projects that address the existing and projected transportation needs of the City of North Bend and its planning area over the next two decades. The first period includes the 6-year transportation improvement projects, i.e. committed projects. The second period includes the recommended projects with relatively high priority. The last period includes the remainder of the recommended projects that will be needed to serve growth and development in the longer range. The total required project improvement budget is at about \$37.08 million, which is approximately \$6.66 million, or 18% greater than the projected available revenues shown in Table 13.

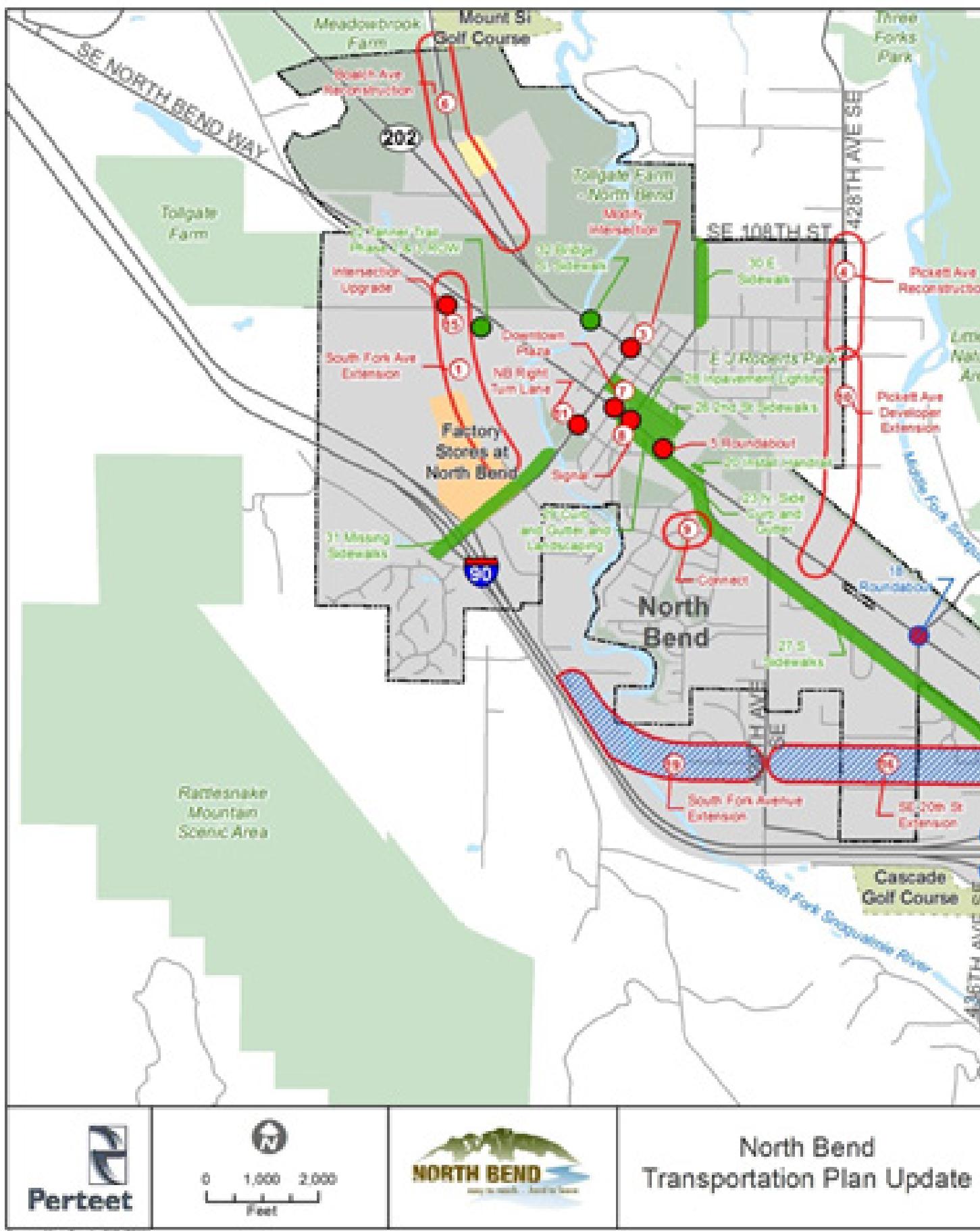
G7.d CONTINGENCY PLANS IN THE EVENT OF REVENUE SHORTFALL

The revenue forecasts identified in the previous section are estimates that should not be considered highly reliable, especially when contributions by other

units of government or property owners is identified. Many funding sources are difficult to predict with confidence, including grants, joint agency funding, and mitigation payments, which fluctuate with the pace of new development. However, these estimates provide a reasonable revenue forecast for planning and project programming purposes. The fact that Transportation Improvement Programs are reviewed, updated and adopted annually provides an ongoing opportunity to check progress and adjust course during the planning horizon. In the event that revenues from one or more of these sources is not forthcoming, the City has several options: lower the level of service standard; add new sources of revenue; increase the funding from existing sources; require developers to provide facilities at their own expense; and/or change the Land Use Element to reduce the amount of development.







Planned Capital Improvements

- Vehicular Projects
- Pedestrian Projects
- Long Range Projects
- See Project Listing



Planned Capital Improvements

H. CONCLUSION

The Transportation Element of the Comprehensive Plan serves to guide the development of surface transportation within the City of North Bend, based upon evaluation of existing conditions, estimation and evaluation of future conditions that result from the adopted future land use alternative, and the priorities stated by North Bend citizens. The Recommended Plan is a comprehensive financially balanced transportation plan that addresses current transportation issues as well as those that are expected to occur through the 2030 planning horizon.



Utility Work along SE North Bend Way

Chapter 5

UTILITIES ELEMENT

Contents

A. Introduction

B. Electric System

- B.1 Description and Inventory
- B.2 Existing Service
- B.3 Future Demand

C. Natural Gas

- C.1 Description and Inventory
- C.2 Existing Service
- C.3 Future Demands

D. Telecommunication, Cable & Internet

- D.1 Telephone
- D.2 Cable Broadband, Television, and Internet

E. Solid Waste & Recycling

- E.1 Description and Inventory
- E.2 Existing Service
- E.3 Future Demand

F. Goals and Policies

A. INTRODUCTION

The Growth Management Act defines electricity, gas, telecommunications, and cable as utilities. It defines water and sewer systems separately as public facilities. Plans for water supply and sewer are found as separate elements of the Comprehensive Plan. Transportation and circulation-related facilities are addressed in the transportation element. The Utilities Element has been developed in accordance with RCW 36.70A.070 of the Growth Management Act, WAC 365-195-320 (Utilities Element Requirements), and the King County Countywide Planning Policies. To fulfill the requirements set forth by the Washington Growth Management Act, the utilities element must include the following information:

1. Inventory the general location of existing utilities.
2. Establish the location of proposed utilities.
3. Examine the capacity of existing and proposed utilities.

The Utilities Element also includes an evaluation of solid waste management in North Bend, focusing on landfill capacity and recycling issues.

King County Countywide Planning Policies (CPPs) provide local direction to implement the GMA mandate for consideration of utilities needs including, but not limited to electrical, communications and natural gas. Following is a paraphrased listing of the CWPP's with direct applicability to North Bend in 2014. The policy number of each referenced policy is cited. Other CWPP's may be indirectly applicable to North Bend and the CWPP's may be revised in the future. The full list of CWPP's is available on the King County DDES website at <http://www.metrokc.gov/ddes/complan/CPP-current.pdf>

Local jurisdictions are to identify the full range of urban services required as growth occurs and how they plan to provide them (CO-1). Service providers shall manage resources efficiently through regional coordination, sharing facilities and conserving resources (CO-2 and CO-3). Aggressive conservation shall be implemented to address the need for adequate supply of electricity (CO-6).

Unlike the Capital Facilities Element, levels of service and concurrency requirements do not apply to private utilities. They are required by state law to provide service

to anyone requesting it who has the ability to pay for the extension. The Washington Utilities Transportation Commission (WUTC) requires that privately owned utilities demonstrate that existing rate payers are not subsidizing new customers. Privately owned utilities are not public facilities although they provide a public service. They are required to provide the same level of service to urban and rural customers. The WUTC regulates utility and transportation providers to ensure safe and reliable service to customers at reasonable rates. Most of Washington State's investor-owned gas, electric, water and telecommunications are regulated by the WUTC.

In addition, due to concerns such as the security of facilities and in keeping with competition practices, the specific locations and specific market needs are not identified. Instead, general locations and general capacities are included in this element.

Financing of Utilities

The principle source of revenue for utility capital financing is charges to customers for utility services provided. Such charges include utility rate charges, other customer charges, fees, and charges for the sale of water and energy to other utilities. Revenue from customer charges is used to finance capital projects on a pay-as-you go basis or through the issuance of revenue bonds. For revenue bonds, principal and interest payments are made with revenue from utility customer charges. The State of Washington statutes permit cities to issue unlimited tax (voter-approved) general obligation debt for utility purposes up to a limit of 2.5 percent of a City's assessed valuation.

Provision of Utility Service

This section discusses the provisions of utility service by the City and by private entities. Each utility section includes a discussion of the existing inventory, existing facility capacity, and an assessment of future facilities, although financial information for privately-owned entities is not included in this plan.

DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

- *kV – kiloVolt, a unit of electric potential equal to a thousand volts*
- *PSE – Puget Sound Energy*
- *V – Volt, The unit for electric potential*

Utility - Goal 1: Provide utilities needed to accommodate growth and development according to adopted plan policies.

Policies:

- U - 1.1 Continue to serve all customers that request utility service in the service area.*
- U - 1.2 Maintain the integrity of the utility infrastructure system to provide service to customers as a high priority for utility capital expenditures.*
- U - 1.3 Work to ensure communication providers are capable of providing advanced communication services utilizing the most current technology.*

Utility - Goal 2: Cooperate with utility suppliers in the development, siting, maintenance, and repair of utilities.

Policies:

- U - 2.1 Provide timely and effective notice to utilities of the construction, maintenance, or repair of streets or other facilities, and coordinate such work with utilities to ensure their needs are met.*
- U - 2.2 Require utilities notify the City before utility work is done to discuss the best means to preserve vegetation from utility work.*
- U - 2.3 Review utility permits simultaneously with development proposals requesting service.*

B. ELECTRIC SYSTEM

B.1 Description and Inventory

Electricity is provided to North Bend by Puget Sound Energy and Tanner Electric Cooperative. Puget Sound Energy (PSE) serves the majority of the electricity users within North Bend, with approximately 2,200 customers. Tanner Electric Cooperative and Puget Sound Energy signed a boundary agreement to define their respective service territories in 2013. The City of North Bend and the surrounding area will continue to be served by both PSE and Tanner Electric Cooperative.

Puget Sound Energy provides electric service to more than 1.1 million customers in eight predominantly Western Washington counties: Island, King, Kitsap, Kittitas, Pierce, Skagit, Thurston and Whatcom.

Tanner Electric Cooperative is a non-profit cooperative serving the electrical needs of its members. Tanner Electric serves members in the Ames Lake area of King County and Anderson Island in Pierce County in addition to its service in and around North Bend. In 2014 Tanner Electric served 4,638 meters overall and 2,037 in and around North Bend. Tanner Electric was formed in 1936 to serve areas deemed not to be economically feasible by the private (for profit) power company. Over the years other areas took advantage of the cooperatives form of business and services and facilities were expanded.

BONNEVILLE POWER

Tanner Electric is a customer of Bonneville Power Administration (BPA). BPA is a federal nonprofit agency based in the Pacific Northwest. It is self-funded and covers its costs by selling its products and services. BPA markets wholesale electrical power from 31 federal hydro projects in the Columbia River Basin, one nonfederal nuclear plant and several other nonfederal power plants. The dams are operated by the U.S. Army Corps of Engineers and the Bureau of Reclamation. About 1/3 of the electric power used in the Northwest comes from BPA.



SNOQUALMIE FALLS HYDRO-ELECTRIC PROJECT

Puget Sound Energy's Snoqualmie Falls Hydroelectric Project is one of the oldest hydropower plants in the United States. The project contains a small diversion structure just upstream from the falls, and two powerhouses. Built in 1898-99, the first powerhouse is encased in bedrock 260 feet beneath the surface and was the world's first underground power plant. The second powerhouse was built in 1910 and is a quarter-mile downstream from the falls. The two powerhouses combined have 54 megawatts of generating capacity (enough to meet the peak electricity needs of about 25,000 households). (<https://pse.com/inyourcommunity/king/Pages/>

The North Bend/Snoqualmie area includes several hydroelectric generating plants owned by PSE and other power producers: Snoqualmie Falls (PSE), Cedar Falls (Seattle City Light), and Weeks Falls, Twin Falls and Black Creek (owned by Independent Power Producers).

In 2002 Tanner Electric built its own power substation just west of North Bend on Alm Way. The North Bend substation is a 12kV system and has a capacity of 25MVA (33MVA during winter peaks). The Tanner Electric load for 2014 is over 13MW. The 115 kV transmission line serving the substation is owned by the Bonneville Power Administration and connected to the Puget Sound Energy transmission system in the Snoqualmie Ridge area. The areas served by Tanner Electric inside the city limits of North Bend are almost exclusively fed by underground circuits including the Factory Outlets, Forster Woods, Rock Creek Apartments and the south fork area.

The North Bend / Snoqualmie electrical sub-area is located east of Preston and between the Cedar River Watershed and the Tolt River Watershed. It includes the Fall City area, but not Carnation or Duvall. Within the sub-area, there are five hydroelectric developments. The generating plants within this area include the Snoqualmie Falls (owned by PSE), Cedar Falls (owned by Seattle City Light), and Weeks Falls, Twin Falls, and Black Creek (owned by independent power producers). Four distribution substations are located in the North Bend / Snoqualmie sub-area.

B.2 Existing Service

Distribution substations reduce voltage from 115 kV to 12 kV, which is Puget Sound Energy's standard distribution voltage. The 12 kV feeders distribute the power from these distribution substations to the individual customers. In residential areas, which is the predominate user in North Bend, winter outage scenarios usually determine when new distribution capacity improvements are needed.

A 115 kV transmission switching station (Snoqualmie Switch substation) is located adjacent to Snoqualmie Falls. This substation is considered a hub because it integrates the Snoqualmie Falls electric generation into the power system as well as providing an interconnection point for the power system. Two existing transmission lines connect to the Snoqualmie Falls generation complex; one line extends north to Fall City, one line

extends south to North Bend continuing south to the Covington area, one line extends west to the Lake Tradition substation in Issaquah, and one line extends west to the Mount Si substation in Snoqualmie.

The Mount Si Substation was built at Snoqualmie Ridge in 2012. It provides both distribution capacity and a connection point for the three transmission lines that intersect at that location. The substation provides improved reliability for PSE's customers in Snoqualmie and North Bend as well as Tanner's North Bend customers.

There are two additional distribution substations (Snoqualmie and North Bend substations) which serve the North Bend area. From these two substations there are six distribution circuits serving the customers in the City of North Bend.

B.3 Future Demand

The forecasted load for the next 30 years will require systems improvements which are listed in this section as construction projects that are in progress, or as plans for the future. A project is considered in progress if specific site selection, preliminary engineering, permitting, or construction activities are currently underway.

New projects can be developed in the future at any time due to:

- new or replacement of existing facilities to increase capacity due to new building construction, as well as conversion of existing homes and businesses to other preferred fuel types (most typically from heating oil to natural gas);
- the need for replacement to facilitate improved maintenance of facilities;
- replacement or relocation of facilities due to municipal and state projects;
- and system upgrades required to accommodate third party interconnection of transmission or generation facilities.

Other system improvements may be needed within a 30 year horizon to serve forecasted load. PSE has two major substation projects planned in the 10 year horizon in the North Bend/Snoqualmie area. One near-term substation improvement project is anticipated to expand and upgrade PSE's existing North Bend substation to enable improved transmission connections. This will provide reliability improvements to customers served by the North Bend substation.

The other near-term substation improvement project is planned to expand PSE's existing Snoqualmie Switching Station to enable interconnection of a proposed small hydro project.

There are three possible long-range issues that need to be addressed in order to best serve the growth in the Snoqualmie/North Bend area:

1. the existing Cedar Falls-Snoqualmie 115 kV transmission line may become inadequate to serve the projected load

DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

- *Btu – British thermal unit, One Btu is the heat required to raise the temperature of one pound of water by one degree Fahrenheit.*
- *cf – Cubic feet*
- *McF – equals the volume of 1,000 cubic feet of natural gas.*
- *Natural Gas is a fossil fuel formed when layers of buried plants, gases, and animals are exposed to intense heat and pressure over thousands of years. The energy that the plants originally obtained from the sun is stored in the form of chemical bonds in natural gas.*
- *psig – pounds per square inch gauge measures a unit of pressure. Psig indicates that the pressure is relative to atmospheric pressure, opposed to psia (absolute) which is relative to a vacuum.*
- *PSE – Puget Sound Energy*
- *Therm – One therm equals 100,000 Btu, or 0.10 MMBtu.*
- *WUTC – Washington Utilities Transportation Commission*

DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

- *DSL services – digital subscriber line (originally digital subscriber loop) is a family of technologies that are used to provide internet access by transmitting digital data over telephone lines.*
- *Optical fiber cable is a cable containing one or more optical fibers that are used to carry light. The optical fiber elements are typically individually coated with plastic layers and contained in a protective tube.*
- *WUTC – Washington Utilities Transportation Commission*
- *KCCSWMP – King County Comprehensive Solid Waste Management Plan prepared by the Solid Waste Division of the Department of Natural Resources and Parks in accordance with Washington State law. It presents proposed strategies for managing King County's solid waste over the next 6 years with consideration of the next 20*

increases in the area;

2. the lack of capacity to get power into the area when local generation may become inadequate to serve the local load; and
3. the existing substations may become insufficient to supply adequate 115-12 kV substation transformer capacity.

Construction projects in progress / Plans for the future/ Recently Completed

Tanner Substation and 115kV Transmission Line.

Tanner recently completed the construction of Tanner substation. In order to operate the substation, BPA built a transmission line tap (extension) from the existing Snoqualmie-Lake Tradition line #1 to the substation. The line is connected from the Mt. Si Substation to the Tanner substation. In the near future, the line will be extended to the new Middle Fork substation.

Additional Small Hydro

There are numerous proposals for small hydroelectric generation plants in the North Bend/Snoqualmie area. Most of these are located on the North Fork of the Snoqualmie River and its tributaries, including Hancock Creek and Calligan Creek. In addition, there are possibilities for others along the Middle Fork and the South Fork of the Snoqualmie River. Puget Sound Energy may need to construct facilities to interconnect these generation plants to the electric transmission system. A possible interconnection substation to integrate new generation would be a Reinig Switching Station located

near the Snoqualmie-Cedar Falls line to connect the existing system to new generation with a new 115 kV line.

Transmission Line Rebuild

The Cedar Falls-Snoqualmie 115 kV line contains low capacity wires. At some point this line will need to be rebuilt.

Rattlesnake-Lake Tradition 230 kV Line

The Rattlesnake-Lake Tradition transmission line is a planned new 230 kV line, which would connect the existing cross-Cascades transmission line near Rattlesnake Lake southeast of North Bend to the existing Lake Tradition substation near Issaquah. This line would allow power generation in Eastern Washington to be supplied to King County as well as strengthen the power system in the North Bend area and the rest of King County.

Lantern Substation and 115 kV Transmission Line

The planned Lantern substation, located south of North Bend at a site to be determined in the future, would provide electric power to customers in the Southeast North Bend area. This would provide a possible interconnection point for existing and future transmission lines to improve reliability and capacity in the North Bend area.

Future Distribution Substations

At present, the timing of future distribution substations cannot be determined due to the uncertainty of load

Utility - Goal 3: Work with citizens, other jurisdictions, and utility providers to ensure cooperation in the siting of utilities and to ensure that reliable and cost effective suppliers of energy are available to meet increasing demands.

Policies:

- U - 3.1 Encourage the multiple use of corridors for trails, transportation right-of-way and utilities.*
- U - 3.2 Encourage the consolidation of utility facilities and communication facilities by prohibiting duplication of electrical substations, above ground electrical transmission lines and communication antenna structures within one mile of another similar facility.*
- U - 3.3 Require installation of fiber optic conduit at locations approved by City Engineer when roads are built or substantially reconstructed to facilitate future construction of local area fiber optic communications networks.*

growth in this area, an island of urban development in a rural area. It is likely that the Snoqualmie/North Bend area may need an additional substation or an additional transformer in an existing substation after 2020.

C. NATURAL GAS

C.1 Description & Inventory

Puget Sound Energy is an investor-owned natural gas utility that supplies natural gas to six Western Washington counties: Snohomish, King, Kittitas, Pierce, Thurston, and Lewis. Puget Sound Energy provides natural gas service to more than 750,000 customers in six Western Washington counties: Snohomish, King, Kittitas, Pierce, Thurston, and Lewis. It is estimated that PSE currently serves over 2,800 customers within the City of North Bend.

Natural gas is not an essential service, and, therefore, is not mandated to serve. Extension of service is based on request and the results of a market analysis to determine if revenues from an extension will offset the cost of construction.

Natural gas comes from gas wells in the Rocky Mountains and in Canada and is transported through interstate pipelines by Williams Northwest Pipeline to Puget Sound Energy's gate stations.

Supply mains then transport the gas from the gate stations to district regulators where the pressure is reduced to less than 60 psig. The supply mains are

made of welded steel pipe that has been coated and is cathodically protected to prevent corrosion. They range in size from 4" to 20".

Distribution mains are fed from the district regulators. They range in size from 1-1/4" to 8" and the pipe material typically is polyethylene (PE) or wrapped steel (STW).

C.2 Existing Service

According to PSE rate department, the average house (using natural gas for both heat and hot water) consumes about 1,000 therms per year. Ten therms equals approximately one "mcf" (thousand cubic feet) of gas so 1,000 therms per house equals approximately 100,000 cubic feet of gas per household per year.

Individual residential service lines are fed by the distribution mains and are typically 5/8" or 1-1/8" in diameter. Individual commercial and industrial service lines are typically 1-1/4", 2" or 4" in diameter.

C.3 Future Demands

When planning the size of new gas mains, PSE uses a saturation model, which assumes all new households will use natural gas since 99% of new homes constructed where builders have the choice are using natural gas. PSE forecasts customer additions using a forecast analysis calculation based on PSE's revenue report which is generated by town tax codes established in our Exception Billings Department and based on historical customer counts.

CEDAR HILLS LANDFILL

Cedar Hills is the only landfill still operating in King County. King County was able to extend the life of Cedar Hills from the expected closure in 2012 to 2025 (lifespan depends on a variety of factors, including tonnage received). The 2013 Solid Waste Plan recommends exploring a range of emerging technologies for future disposal other than exporting waste to a distant landfill when max capacity is reached at Cedar Hills. In 2009 Cedar Hills began operating a gas-to-energy process that burns gas created by the decomposition of waste into pipeline quality gas for the energy market. Bio Energy (Washington) LLC, owner and operator of this facility, has determined that the annual reduction in environmentally harmful carbon dioxide is the equivalent to 22,000 average passenger cars. The facility was generating enough energy to heat approximately 30,000 homes and sales of gas were expected to generate more than \$1 million annually for the division. This will help fund future green disposal of waste in King County.

(2013 King County Comprehensive Solid Waste Management Plan)

Minimum pressure delivery through distribution pressure mains from a design standard is approximately 15 psig. If design pressures fall below 15 psig, there are several methods of increasing the pressure in the line, including:

1. Looping the distribution and/or supply lines to provide an alternative route for the gas to travel to an area needing additional supply. This method often involves construction of supply mains, district regulators, and distribution mains;
2. Installing mains parallel to existing mains to supplement supply of natural gas to a particular service area; and
3. Replacing/upsizing existing pipelines to increase volume.

New projects can be developed in the future at any time due to:

1. New or replacement of existing facilities due to increase capacity requirements due to new building construction and conversion from alternate fuel;
2. Main replacement to facilitate improved maintenance of facility; and
3. Replacement or relocation of facilities due to municipal and state projects.

PSE makes an effort to coordinate construction work with municipal projects in order to minimize cost and impacts to surrounding community. Due to franchise agreements, PSE is required to relocate existing facilities.

Due to the growing popularity of natural gas in the North Bend and surrounding areas, PSE will continually evaluate the necessity of the above projects and alternatives. Changes in project route, construction schedule and detail could occur as they are dependent on budgets and WUTC cooperation.

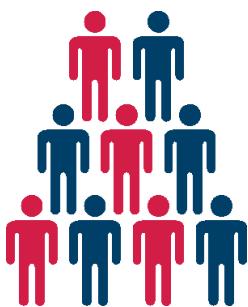
D. TELECOMMUNICATION, CABLE & INTERNET

Telecommunication is a branch of technology that allows communication over a distance by transmission of electrical impulses, electromagnetic waves, or optical pulses, such as telephone, radio, television, or computer network. These services are provided by private firms and are often provided as packages.

D.1 Telephone

The local telephone service is provided by CenturyLink, which currently serves North Bend, Fall City, Carnation and surrounding areas. The system consists of a network of fiber optic cables and copper and other equipment facilities including central office and remote switches that support the fiber and copper infrastructure, which are located throughout the area.

2013 HIGHLIGHTS FOR THE CITY OF NORTH BEND

**1,595**RESIDENTIAL
CUSTOMERS**389**COMMERCIAL
CUSTOMERSRECYCLING
EDUCATION
**RESIDENTIAL
RECYCLING RATE***

*National Average: 30%



GREAT JOB RECYCLING!



LANDFILL RATE

**RECYCLING
PARTICIPATION**Customer Calls
answered
LOCALLY**Safety First**
55 Hours Driver
Safety Training
Each Year**COMMUNITY
PARTNERSHIP**NORTH BEND
FARMERS MARKET
THURSDAYS 4-8PM
AT SI VIEW PARK**1,053**TONS OF RECYCLING
REPURPOSED INTO
NEW PRODUCTS**760**TONS OF ORGANIC WASTE
CONVERTED TO COMPOST

Figure 1: Existing Service, 2013

Utility - Goal 4: Ensure the compatibility of and minimize the environmental impacts associated with the siting, development, and operation of utility services and facilities on adjacent properties.

Policies:

U - 4.1 Work with the utilities to eliminate existing overhead power lines in the Urban Growth Area, with an emphasis on the downtown commercial zoning district.

U - 4.2 Develop regulations for siting and landscape requirements for utility meter cabinets, terminal boxes and similar above ground utility features.

U - 4.3 Where feasible, require installation of new power and communication lines to be placed underground.

To meet North Bend's future needs, CenturyLink follows the policy of extending its lines to serve customer needs within its territory boundary in accordance with its tariffs as filed under the WUTC.

D.2 Cable Broadband, Television, and Internet

Cable television service is offered through Comcast. Internet service is provided by both CenturyLink and Comcast. CenturyLink supplies DSL services and Norstar (telephone key systems for business accounts). Comcast is a global media and technology company as well as the nation's largest video, high-speed Internet and phone provider to residential customers. The system consists of a combination of fiber cable and coaxial cable.

Comcast plans to expand its facilities to new residential subdivisions as they develop throughout the City. Comcast is committed to evolving advanced broadband services to meet the future needs and desires of our cable customers. These advanced services include more digital and high-definition television signals, interactive television like Video-on-Demand and Digital Video Recorders that allow customers to watch what they want in the timeframe that is best for their schedules, and faster Internet speeds.

C. SOLID WASTE & RECYCLING

The 2013 King County Comprehensive Solid Waste Management Plan guides solid waste disposal in King County. The Management Plan proposes strategies for managing the solid waste over the next six years, with consideration of the next 20 years. This is the first management plan that looks at ways to address climate change. The core mission of the KCCSWMP is to ensure the citizens of the county have access to safe, reliable, efficient, and affordable solid waste handling and disposal services.

C.1 Description and Inventory

North Bend, like most cities in King County, has signed an Interlocal Agreement with King County to provide solid waste planning within the City. The terms of the Solid Waste Interlocal agreement are in effect from March 19, 2013 through December 31, 2040. A number of responsibilities are designated to the County and cities in order to implement the King County Solid Waste Management Plan. The plan identifies that cities need to provide for collection of solid waste and ensure the provision of the minimum levels of collection service for recyclables and yard waste. Cities are also directed

to implement requirements for new construction to accommodate recycling collection systems such as the following: a procurement policy (a policy favoring the use of recycled products and recyclable materials), variable can rates and a monitoring program. Cities are also asked to enforce City litter control ordinances. The cities are authorized under the plan to regulate and plan for the collection of special waste, to adopt and implement the solid waste plan, and to participate in the Solid Waste Advisory Committee and Regional Policy Committee.

C.2 Existing Service

Under the Interlocal Agreement, King County is responsible for solid waste management, planning, and technical assistance to cities. North Bend is responsible for solid waste collection. Republic Services is under contract with North Bend for weekly solid waste and curbside recyclable collection, and for every other week, collection of yard debris and disposal/recycling.

Toxic and hazardous wastes are disposed of at facilities in South Seattle and Bellevue. Waste collected in North Bend that cannot be recycled is transported by Republic Services to King County's Factoria Transfer Station in Bellevue or to their own Transfer Station in Seattle. King County and Republic Services then trucks the garbage to the Cedar Hills landfill; this facility received all of the mixed municipal solid waste (MMSW) generated in King County.

C.3 Future Demand

The City of North Bend and King County will continue offering service to existing and new residents meeting the standards found in the KCCSWMP. Refer to most recent edition of King County Comprehensive Solid Waste Management Plan for additional information regarding County inventory and policy.

D. RECYCLING

D.1 Description and Inventory

"King County and the entire Puget Sound region are recognized for successful efforts to collect recyclable waste. Continuing to reduce and reuse waste will require concerted and coordinated efforts well in the future. It is important to reduce the waste stream going into area landfills. This can be done by promoting recycling practices." (2013 King County Comprehensive Solid Waste Management Plan)

Utility - Goal 5: Promote conservation through cooperative efforts of regulations, programs, and educational literature.**Policies:**

U - 5.1 Work with the County and utility suppliers to develop public education and information materials that promote conservation.

U - 5.2 Handle and dispose of solid waste in ways that minimize pollution and protects the public health.

U - 5.3 Work with the City's solid waste collection agencies to establish cost-effective policies and regulations designed to minimize waste generation and meet King County's adopted waste reduction goals.

U - 5.4 Encourage utility providers to convert to cost effective and environmentally compatible alternative technology and energy sources.

U - 5.5 Require the provision of recycling opportunities in new construction projects.

U - 5.6 Encourage utility providers to develop outage reduction plans, develop initiatives to lower energy costs, create clean power sources and reduce greenhouse gas emissions.

North Bend is served by Republic Services for recycling needs. Republic Services is an American company that was incorporated in 1998. Through a series of mergers and acquisitions, they became one of the largest waste and recycling companies in the United States. Republic Services serves 1,595 residential customers and 389 commercial customers in the City of North Bend. In 2013 Republic Services processed 1,053 tons of recycling repurposed into new products and converted 760 tons of organic waste to compost.

In addition, in an effort to reduce wastes, Republic Services implements a variety of public education programs. These programs include distributing flyers and brochures on reducing waste as well as monitoring garbage in order to advise customers on what can be recycled.

D.2 Existing Service

Refer to Figure 1: Existing Facility Service for Republic Service's synopsis of the year 2013 and services provided.

D.3 Future Demand

The City of North Bend and Republic Services will continue offering service to existing and new residents meeting the standards found in the KCCSWMP. Refer to Republic Services for additional information about existing and future goals and policies.

PSE - Tanner - North Bend

Property of Puget Sound Energy
3355 110th Ave. NE. Bellevue, WA. 98004
Maps, Records and Technology

The information on the attached maps is subject to change without notice. Page Sound Energy makes no warranty, expressed or implied, concerning the suitability of this information for any purpose. This map is not to be used for determining the actual location of any PSE facilities.

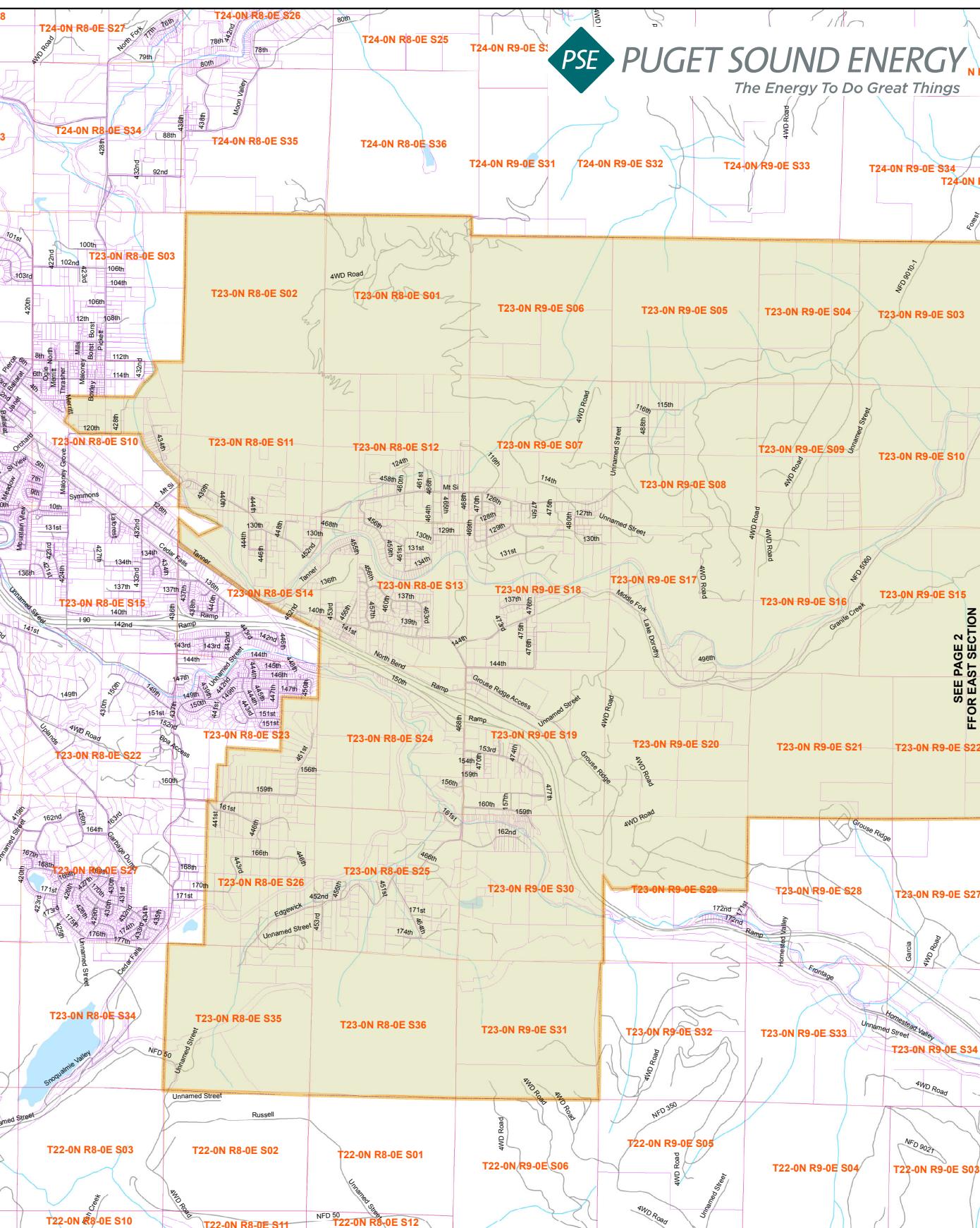
Drawn By:Bob Forbes

Legend

The diagram illustrates the spatial relationship between three areas: ProposedBound5-17 (yellow border), king_parcel_7Jul10 (purple border), and PSE Area (green border). The PSE Area is located within the king_parcel_7Jul10 area, which is itself within the ProposedBound5-17 area.

N

0 0.5 1
Miles



PSE - Tanner - North Bend

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355 110th Ave. NE, Bellevue, WA 98004
Maps, Records and Technology
Date: 06-14-11
Drawn By:Bob Forbes

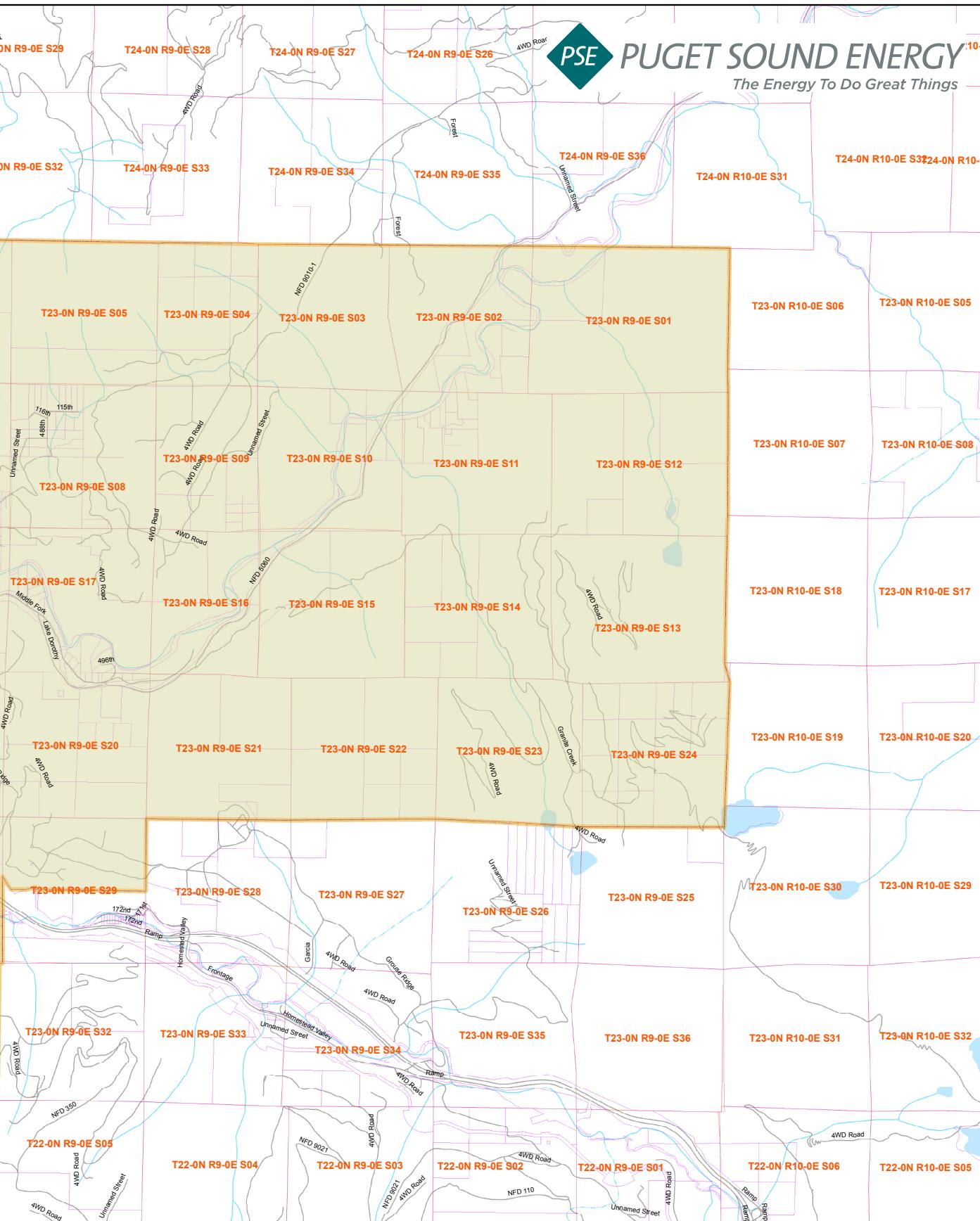
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Legend

A scale bar representing distance in miles. It features a horizontal line divided into three segments: a black segment on the left, a white segment in the middle, and another black segment on the right. Below the bar, the word "Miles" is written in a serif font.

Note:
The Overhead circuit map shows the original Tanner boundary lines which were drawn before Maps, Records & Technology scanned and rubber sheeted the mylar maps to the township, range and section corners according to the counties public land survey system. As a result, some boundaries and facilities are offset from where it was originally drawn using the old mapping system.





chapter 6

CAPITAL FACILITIES ELEMENT

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A. INTRODUCTION

The Capital Facilities Element ensures that "capital facilities" (i.e. structures, improvements, infrastructures, land or other major assets), that have a useful life of at least 10 years, are in place and performing at the appropriate level of service standards and are developed concurrently with future development specifically for: streets, pedestrian, water, storm, and sewer, schools, police, fire, parks, and recreational facilities.

The Capital Facilities Element is developed in accordance with the Growth Management Act, RCW 36.70A.070(3), WAC 365-196-415 (Capital Facilities Requirements), and the King County Countywide Planning Policies per RCW 36.70A.210 and WAC 365-196-304(3).

To fulfill requirements set forth by the Washington Growth Management Act, the Capital Facilities Element includes the following information:

1. An inventory of existing capital facilities owned by public entities, showing the locations and the capacities of the public facilities;
2. A forecast of the future needs for such capital facilities;
3. The proposed locations and capacities of expanded or new capital facilities;
4. At least a six-year plan to finance such capital facilities within projected funding capacities that clearly identify sources of funds for such purposes;
5. A requirement to reassess the land use element if probable funding falls short of meeting needs and to ensure that the land use element, capital facilities element, and financing plan within the capital facilities element are coordinated and consistent; and
6. A statement that no local Comprehensive Plan or development regulation may preclude the siting of essential public facilities.

The Growth Management Act also requires that the Comprehensive Plan include a process and criteria for siting of essential public facilities (RCW 36.70A.200). Goals and policies for the siting of essential public facilities are included in this element.

The purpose of the Capital Facilities Element is to determine the availability of existing capital facilities, forecast future needs for such facilities based upon the projected growth in the community described in the Land Use Element, and determine how such facilities will be financed. Future needs should also be planned to maintain a locally determined level of service to be provided by those facilities. This concept of maintaining level of service standards throughout the planning period is embodied within Goal 12 of the Growth Management Act. Goal 12 states that public facilities and services necessary to support development shall be adequate to serve the development at the same time the development is available for occupancy, or within six years for transportation facilities, and the level of service should not be below local minimum standards. This concept is known as "concurrency." In North Bend, concurrency applies to transportation, water, sewer, and stormwater facilities. Specific standards and procedures to implement concurrency are addressed in concurrency regulations adopted pursuant to the Growth Management Act and the policies of the Capital Facilities Plan. Service levels are established in the Capital Facilities Plan for water, sewer, and stormwater, plus fire, schools, police, and libraries. Impacts to these facilities may be mitigated by following concurrency and/or impact mitigation regulations adopted pursuant to this Plan.

B. CAPITAL FACILITY INVENTORY AND CAPACITY

This section discusses each facility and contains information about the facility provider, existing facilities, and current service. Functional plans provide further details for a number of these capital facilities and are incorporated by reference into this Capital Facilities Element.

B.1 Water System

Water facilities serving the City of North Bend are developed and maintained by the City water utility and Sallal Water Association. Potable water is supplied through a combination of groundwater and local springs, both privately and publicly owned. The sources are as follows:

- City of North Bend Water System – The City maintains a water distribution system of almost 38 miles of pipe ranging from 1 to 20 inches in diameter. The City water system serves approximately 1,892 connections in a service area of about 9 square miles including certain adjoining areas in unincorporated King County. About 34% of the City's distribution system is asbestos cement (AC) pipe, much of which is undersized and is nearing the end of its useful life. The other major distribution components are ductile Iron (DI), PVC, and/or Cast Iron (CI). Although capital improvements are fully shown in the City's current Water Comprehensive Plan (2010, or as amended), which is incorporated by this reference, system priorities include replacing aging and leaking water pipe to reduce breaks and protect water quality. City water sources include the following:
 - Mt Si Springs is the City's senior water right and primary source; use of the spring is limited by the need to provide 3 cfs (cubic feet per second) discharge to the Snoqualmie River.
 - The Centennial Well is the City's groundwater supply which requires mitigation for impacts to surface water flows based on instream flow regulated downstream from Snoqualmie Falls.
 - Mitigation water, which replaces ground water that would have otherwise entered the Snoqualmie River system, is purchased from Seattle Public Utilities from a spring near Rattlesnake Lake and is discharged into Boxley Creek when necessary.
- Sallal Water Association - Sallal Water Association serves the City of North Bend and its Urban Growth Area east of SE 428th Street. The Sallal Water Association is a private cooperative system that borders the City of North Bend's current service area on the southeast. As of 2015, the Sallal Water Association provides approximately 2,400 service connections.
- Private Wells - Approximately 85 private wells provide water to homes and other uses within the City and Urban Growth Area. It is anticipated that as development occurs, many of these wells will be decommissioned as new homes and other uses are required to connect to public water (either the City's water system or Sallal Water Association, depending on the location of the use).

Level of Service

The following level of service (LOS) standards shall be used to determine the adequacy of water resources and services (from

City of North Bend Water System Plan, October 2010, or as updated):

- A. Water Rights – Certificates as issued to the City of North Bend by Washington State Department of Ecology.
- B. Conveyance – Group A Public Water System Waterworks Standards, Washington State Department of Health, 1999
 - 1. A residual pressure of 30 p.s.i. (pounds per square inch) at all points in the system during peak hour demand.
 - 2. A residual pressure of 20 p.s.i. at all points in the system during maximum daily demand plus a fire flow.
 - 3. A 6-inch minimum diameter pipe for supply.
- C. Storage – Waterworks Standards, Washington State Department of Health, 1996.
 - a. Adequate equalizing, standby, and fire suppression storage in the system based on system characteristics.

B.2 Sewer Facilities

Through its sewer utility, the City of North Bend is the sole sewer service provider within City limits. Some properties in the City are served by private septic systems. The City's current Comprehensive Sewer Plan, which is incorporated by this reference, provides a detailed description of the sewer facilities and systems.

The City owns and operates a municipal sewage collection and treatment system with associated force mains and a water reclamation facility that is capable of producing reuse quality effluent and Class A biosolids. The collection system currently serves approximately 1,246 customers comprised of residences and businesses. The wastewater treatment plant is located at 400 Bendigo Boulevard North, North Bend, Washington. The National Pollutant Discharge Elimination System (NPDES) permit allows the City to discharge treated wastewater to the South Fork of the Snoqualmie River.

In the next 20 years, the wastewater flow rate to the city's treatment plant and the Biological Oxygen Demand (BOD) loading from residential, business/commercial, and industrial sources are anticipated to increase as growth occurs within the City's Urban Growth Area (UGA). The City will continue to make investments in capital improvements to meet this anticipated growth and conduct regular rate studies to ensure that sufficient funding exists for such improvements.

Capital improvements, focused on providing additional capacity for expected development with the City of North Bend and its UGA, are fully articulated in the City's current Sewer Comprehensive Plan.

Level of Service

See the North Bend Sewer Comprehensive Plan, 2001 or as updated, which establishes sewer system levels of service. The following level of service (LOS) standards shall be used to determine the adequacy of sewer resources and services:

Adopted Plans

*City of North Bend Comprehensive Sewer Plan, 2001, or as updated (update anticipated in 2016)
Sewer 6-Year Priority Plan (anticipated in 2016)*

In addition to the Sewer Comprehensive Plan, the City is presently developing a 6-year priority plan, which identifies the necessary priority improvement at the Waste Water Treatment Plant (Table 1 on the next page).

TABLE 1.
IMMEDIATE AND NEAR-TERM CAPITAL IMPROVEMENTS

	Construction Costs (\$1,000s)			
	Immediate		Near Term	
	Priority 1	Priority 2	Priority 3	Priority 4
A. Monitoring Improvements				
1 HW - Add gate to separate sewage & RAS @ headworks	Done			
2 ULID6 PS - Re zero flow meter	Done			
3 Upgrade Sampler power and controls	\$33			
4 Old IPS- revise piping to separate sewage & recycle flows from solids handling bldg	\$114			
	SUBTOTAL	\$146	\$0	\$0
B. Hydraulic Improvements				
5 Oxidation Ditch - add new ML outlet weir and 30" pipe to eliminate aerator overloads	\$261			
6 Old IPS - reprogram to prevent simultaneous pumping with ULID6 PS; route plant & trailer park raw sewage to ULID6 PS	\$81			
7 ULID6 PS - replace small pump for lower flows, better grit removal & less pump wear	\$65			
8 ULID6 PS - add bar rack to protect pumps from large solids	\$21			
9 Headworks - reroute RAS to reduce headworks surcharging	\$16			
10 Small Clarifiers - Refurbish clarifier mechanisms & replace RAS pumps for DOE capacity rating	\$348			
	SUBTOTAL	\$261	\$532	\$0
C. Aeration				
11 Oxidation Ditch - Repair brush aerators for more reliable operation	\$395			
12 Oxidation Ditch - Add DO and ORP control for better, more reliable effluent quality	\$29			
	SUBTOTAL	\$395	\$29	
D. Washwater				
13 Washwater - provide reservoir in chlorine contact tank for more reliable UV cooling and sludge dryer odor control	\$14			
14 Washwater - provide new strainer to prevent clogging sprays especially at sludge dryer quenching nozzles			\$42	
	SUBTOTAL	\$14		\$42
E. UV Disinfection				
15 UV disinfection - add low flow cooling loop with plant water	\$14			
16 UV Disinfection - provide automatic pacing of UV dose with flow, transmittance and turbidity	\$40			
17 UV Disinfection - add 3rd & 4th UV unit to provide higher dose			\$406	
18 UV disinfection - add cooling fans to UV panels for safety				\$15
	SUBTOTAL	\$54	\$406	\$15
F. SCADA				
19 Provide SCADA alarms & controls for Centrifuge, Sludge Dryer, Washwater, Liquids Process, Old IPS	\$244			
	SUBTOTAL	\$244		
G. Scum Control				
20 Big Clarifier - provide scum aging tank for better scum and grease control	\$50			
21 Big Clarifier - repair clarifier scum collection system and fix clarifier controls	\$13			
22 Big clarifier - upgrade surface spray system for better scum removal and lower washwater use	\$14			
	SUBTOTAL	\$77		
H. Sludge Handling				
23 Sludge Dryer - Add dried sludge distributor and purchase haul truck		\$367		
24 Sludge thickening - convert small clarifiers to sludge thickeners and aerated holding tank for more sludge handling capacity			\$324	
25 Standby Power - provide standby power for sludge dryer for more reliable operation and odor control				\$349
26 Sludge Tank - Add decant pump for gravity thickening and more sludge handling capacity				\$23
27 Sludge Dryer - Provide backup water supply to quench tank for more reliable drying and odor control				\$47
28 Sludge Dryer - exhaust fan control improvements for more reliable drying and odor control				\$12
29 Dewatered sludge truck/container loading conveyor for alternate sludge disposal when dryer is insufficient	\$200			
	SUBTOTAL	\$200	\$367	\$349
Preliminary Total Construction Cost (1)	\$1,313	\$1,005	\$755	\$462
Preliminary Total Project Cost by Priority (2)	\$1,672	\$1,280	\$961	\$589
Preliminary Total Project Cost (Sum of Priorities 1-4)			\$4,502	
Notes:				
(1) Construction Cost includes a 30% contingency and 8.8% Sales Tax				
(2) Project Cost includes Construction Cost plus 15% Engineering, 15% Construction Management)				

In addition to the above improvements, water temperature will also be addressed through improvements to the plant such as a shading structure, trees, or flow equalizer. Budgeting for this improvement will be determined prior to completion of the 6-Year Sewer Priority Plan.

B.3 Stormwater and Surface Water Facilities

The North Bend Department of Public Works manages drainage systems, stormwater facilities and surface water systems for the City. The current City of North Bend Stormwater Comprehensive Plan ("Stormwater Plan") is adopted herein by this reference and provides a detailed description of the City's stormwater system, as well as a Stormwater Capital Improvements Plan and funding mechanisms.

The City of North Bend is situated within the Three Forks area of the Upper Snoqualmie River Valley Floodplain in King County. The City lies between the Middle and South Forks of the Snoqualmie River. Local flooding may occur as a result of the flatness of the City's topography, large amounts of rain, surfacing groundwater and inadequate storm drain infrastructure in certain areas.

A stormwater utility has been created to provide a funding source, to supplement special fees, Capital Facilities Charges (CFCs), special grants and loans, and debt when needed to implement the Stormwater Plan. The utility is currently comprised of 1,977 ratepayers. In addition to the Stormwater Plan, the City also developed a separate Flood Hazard Management Plan which evaluates and describes system improvements to reduce flood hazards from the Snoqualmie River ("Hazard Plan"), which is incorporated by this reference.

Level of Service

The following level of service (LOS) standards shall be used to determine the adequacy of stormwater resources and services (*See North Bend Comprehensive Stormwater Management Plan*.):

- A. Surface Water Design Manual, King County, Washington, except that off-site system capacity shall be analyzed and sized for conveying the 25-year peak flow runoff from contributing areas for the quarter-mile downstream reach from the developing site.
- B. Runoff detention with discharge flows controlled to match pre-developed flows for 50% of the 2-year through the 100-year storm events.
- C. An 80% removal of total suspended solids for a typical rainfall year assuming typical pollutant concentrations between 30 and 100 mg/l.

Adopted Plan

City of North Bend Stormwater Comprehensive Plan, December 2013, or as updated

B.4 Transportation Facilities

The Transportation Element of this Plan provides a detailed discussion of the transportation facilities in North Bend, including an inventory of facilities, street functional classifications, levels of service, accident analyses, and a 20-year project list of capital improvements. The City prepares and adopts a six-year Transportation Improvement Plan (TIP) as part of the Capital Improvement Plan (CIP) each year. The TIP lists both street and non-motorized projects and can include both funded and unfunded projects. Funding for the transportation projects are set forth in the TIP. This plan is prepared for transportation project scheduling, prioritization and grant eligibility purposes. Both the current Transportation Element and the TIP are adopted by reference as part of this Capital Facilities Element.

Level of Service

(See Transportation Element)

Adopted Plans

Transportation Element of the Comprehensive Plan, 2012, or as updated

6-Year Transportation Capital Improvements Plan, as updated annually

B.5 Municipal Buildings

The City's primary building infrastructure includes City Hall, the Public Works facility, the Community and Economic Development Office, the Fire Station (owned jointly with Fire District 38 and described separately under the Fire Protection section of this Element), and the Wastewater Treatment Plant (described under the *Wastewater section* of this Element).

The Public Works Facility was constructed in 2002 and houses all public works staff, including public works administrative staff, streets, stormwater, and parks staff. No additional building facility needs are anticipated at the Public Works facility within the 6-year timeframe.

The Community and Economic Development Office was originally built in 1958 as the North Bend Library. When the new library was constructed in 1994, the building became a municipal office, and currently houses the Community and Economic Development (CED) Department, containing planning and building staff. Planning and Building Department staffing needs within the 20-year timeframe are anticipated to grow by a small margin (2 to 3 employees). The existing building does not have space to accommodate the future staffing levels. However, the CED staff are anticipated to move to a new City Hall and Municipal Campus described below. When that occurs, the existing Community and Economic Development Office may be used for records and other municipal storage. A deed on the property requires that the building be used solely for municipal purposes.

City Hall was originally constructed in 1938 as the City's fire station. The building has been remodeled a number of times, but is showing its age and has become structurally and functionally deficient. The City plans to construct a new Civic Center or remodel the existing facility. Planning, cost comparisons and cost evaluations are underway as of the adoption of this plan.

B.6 Parks and Open Space

The Parks Element of the Comprehensive Plan provides a detailed description of the City's park and recreational facilities system, including an inventory of existing facilities, level of service standards, and a forecast of anticipated future needs to meet levels of service standards. The Parks Element also includes a 20-year Parks Capital Facilities Program for long-term improvements to the City's park, recreation and open space facilities, and a 6-year Parks Capital Facilities Plan with anticipated funding sources. The Parks Element is incorporated by reference as a part of the City's Capital Facilities Element.

Level of Service

(See Parks Element, updated 2015)

Adopted Plan

Parks Element of the Comprehensive Plan, 2015, or as updated.

B.7 Police Service

In September 2012, the Cities of North Bend and Snoqualmie entered into an Interlocal Agreement (ILA) for the City of Snoqualmie to provide Police services to North Bend. The agreement lasts through March 2019.

Per the ILA, and subject to an amendment in 2015 for additional service, Snoqualmie has hired eight additional full time-equivalent police officers, one additional records administration person, and acquired four additional fully equipped patrol vehicles to provide a minimum of two officers on duty within North Bend city limits at all times for 18 hours a day, and a minimum of 1 officer at all other times of the day. These officers, as with the rest of the Police Department, are stationed at the Snoqualmie Police Station at 34825 SE Douglas Street in Snoqualmie, though spend substantial time on patrol in North Bend.

The Snoqualmie/North Bend Police Department provides law enforcement services to both Cities including traffic safety, community policing, accident and crime investigation, crime prevention, and public education. The department presently employs 14 officers and 3 support staff. The police station can accommodate up to 21 personnel at any given time if offices are shared during a shift, or roughly 39 for occupation throughout the day. Dispatch and jail service is provided through contract by the Issaquah Police Department; inmate management services are contracted with the City of Issaquah and King County.

No expansion or modification of the Police Station is anticipated within the next six years, though depending on call service growth and priority call response times that necessitate additional police staff, the station may need additional work space within the next 15 years. The facility was designed for a future expansion via a 3,360 square foot ground-level addition, which would accommodate an additional 21 officers and support staff. Alternative scenarios include a second-story expansion over the current station parking lot, or construction of a new police station on the municipal campus location next to the Fire Station on the SE Snoqualmie Parkway. Barring expansion or relocation, the police station's estimated replacement year is 2047. The Police Department's patrol vehicles are shared among the officers, with a vehicle assigned to every two officers. Patrol vehicles are on a 5-year rotational replacement schedule.

In 2015, the Snoqualmie/North Bend Police Department operates 10 patrol vehicles (including 4 for North Bend), 1 jail transport vehicle, and 2 supervisory/patrol vehicles.

Level of Service

Average response time for police emergencies: Call to arrival 5 minutes; Dispatch to arrival 3 minutes.

Adopted Plan

Police Service Contract Snoqualmie/North Bend Police Department, September 2012, or as updated – Reevaluation of the Contract 1 year prior to its expiration should be a priority to ensure community needs continue to be met.

B.8 Fire Protection

The City of North Bend has its fire protection provided by Eastside Fire & Rescue, which was formed in 1999 as the consolidation of a number of Eastside fire departments to create a new fire and emergency medical service agency. A board of directors consisting of elected officials representing each of the agencies served governs the department. This includes a board member from the North Bend City Council.

A new North Bend Fire Station (station 87) was completed in 2013, located at 500 Maloney Grove Ave. SE. Station 87, owned jointly by the City of North Bend and Fire District 38, is a 13,166 Square foot facility with five apparatus bays, one of which is a double length bay that can accommodate two vehicles or one longer ladder truck. The building is anticipated to accommodate the staffing and facility needs over the 20-year planning period. The station currently houses one of each: ladder truck, engine, tender, aid car, and medic unit.

Eastside Fire & Rescue staffs the station with three Firefighter/EMTs 24 hours a day throughout the year. Bellevue Fire Department, under contract with King County EMS, additionally staffs a Medic Unit with two Firefighter/Paramedics 24 hours a day throughout the year at the station. This full time staff is supplemented by reserve (volunteer) firefighters who report to the station on an on-call basis.

The services provided to the City of North Bend by Eastside Fire & Rescue include: fire protection and suppression, emergency medical service consisting of both advanced life support and basic life support, rescue, hazardous material mitigation, public education, and a fire prevention division. Emergency radio dispatch service is provided by North East King County Regional Public Safety Communication Agency (NORCOM), which is tied into the King County 9-1-1 system.

In addition to these services, special operation teams provide technical rescue, swiftwater rescue, and wildland firefighting capabilities. The fire prevention division includes review of development proposals and construction plans, construction site inspections, and fire safety (fire code enforcement) inspections. The fire prevention division also provides basic fire investigation, while arson investigation is through a contract with King County. Public education programs include fire station tours, school programs, and informational and educational presentations on a variety of subjects such as home and business safety, CPR and First Aid Training, and emergency preparedness.

All fire department agencies in King County Washington have an automatic mutual aid agreement in place. In essence, this agreement means that any fire department within the county that needs additional resources due to a particular emergency incident or multiple incidents can request resources from other agencies within the county. This mutual aid assistance is provided automatically and without cost to the requesting agency. The City of North Bend / Eastside Fire & Rescue falls under this automatic mutual aid agreement.

Level of Service

Average response time – 5 to 6 minutes

Adopted Plan

Eastside Fire and Rescue Interlocal Agreement, January 1, 2015, or as updated.

B.9 Public Schools

The Snoqualmie Valley School District #410 serves the City of North Bend. School District facilities within the City include North Bend Elementary School, Opstad Elementary School, and Two Rivers Alternative School. The District currently does not have plans for additional school facilities within the City of North Bend, but does own property just outside of the City's Urban Growth Boundary adjacent to Twin Falls Middle School, that has been identified as a future elementary school site.

In 2015, voters approved a 20-year Snoqualmie Valley School District bond for district-wide improvements to existing school facilities, the construction of a new Elementary School in Snoqualmie (on Snoqualmie Ridge), a major reconstruction and expansion of the Mount Si High School, and conversion of the Mount Si Freshman campus back to a Middle School. No new schools within North Bend are provided in this bond measure.

King County Code Title 21A.43 refers to "standard of service" that each school district must establish in order to ascertain its overall capacity. The standard of service identifies the program year, the class size, the number of classrooms, students and programs of special need, and other factors determined by the District that would best serve its student population.

The Snoqualmie Valley School District Capital Facilities Plan includes the standard of service as established by the

Snoqualmie Valley School District's Board of Directors, which serves as the basis for the City's collection of School Impact Fees on behalf of the School District. The City of North Bend adopts by reference the Snoqualmie Valley School District's Capital Facilities Plan as a part of this Capital Facilities Element, unless the City Council adopts an ordinance contrary to the District's Capital Facilities Plan within a given year concerning the collection of school impact fees.

Level of Service

Please refer to the current adopted version of the Snoqualmie Valley School District Capital Facilities Plan which provides standards of service for class size.

Adopted Plan

(Adopted by Snoqualmie Valley School District): *Snoqualmie Valley School District Capital Facilities Plan, as updated annually*

B.10 Solid Waste Plan Summary

The City's Solid Waste Management Plan and waste contracts are guided by RCW 70.95 Solid Waste Management – Reduction and Recycling. This statute establishes a comprehensive statewide program for solid waste handling, and solid waste recovery and/or recycling which will prevent land, air, and water pollution and conserve the natural, economic, and energy resources of the State of Washington.

King County's 2013 Comprehensive Solid Waste Management Plan presents the County's strategy for managing the solid waste systems, garbage, and recycling services over the next 20 years.

To comply with the *State of Washington RCW 70.95* (Solid Waste Management – Reduction and Recycling) and the King County *Comprehensive Solid Waste Management Plan*, the City of North Bend has a contract with Republic Services as the service provider for the collection of curbside recyclables, compost, and garbage (mixed municipal solid waste). The City allows Republic Services to bill the customers directly for the contracted waste collection service. North Bend also has a signed agreement with King County for the dumping of the solid waste. Further information on solid waste management and the City's contract with Republic Services can be found in the Utilities Element.

Level of Service

Routine waste collection and disposal program, including curbside waste, recycling, and compost (yard/food waste) for all single-family residences.

Adopted Plan

City Contract with Republic Services, June 1, 2012, or as updated.

C. GUIDELINES AND CRITERIA FOR SITING ESSENTIAL PUBLIC FACILITIES

The Growth Management Act and the King County Countywide Planning Policies (CPPs) require that each city and county establish a process for identifying and siting all essential public facilities, including federal, state, regional, or local proposals. The CPPs state that the Growth Management Planning Council shall establish a process by which all jurisdictions shall cooperatively site public capital facilities of a countywide or statewide nature. The process should include the following:

1. *A definition of the facilities;*
2. *An inventory of existing and future facilities;*
3. *Economic and other incentives to jurisdictions receiving facilities;*
4. *A public involvement strategy;*

5. Assurance that the environment and public health and safety are protected; and
6. Consideration of alternatives to the facility, including decentralization, demand management, and other strategies.

C.1 Criteria for Siting Essential Public Facilities

Per [RCW 36.70A.200](#), essential public facilities are those facilities that are typically difficult to site such as airports, state education facilities, and state or regional transportation facilities as defined in RCW 47.06.140, state or local correctional facilities, solid waste handling facilities, and in-patient facilities including substance abuse facilities, mental health facilities, group homes, and secure community transition facilities as defined in [RCW 71.09.020](#). No local comprehensive plan or development regulation may preclude the siting of essential public facilities.

Criteria for siting public facilities shall include the following components:

- The State shall provide a justifiable need for the public facility and its location in North Bend based upon forecast needs and a logical service area.
- The State shall establish a public process by which residents of North Bend have an opportunity to participate in a meaningful way in the site selection process.

The City of North Bend will continue to work with King County and other jurisdictions in the decision making process for the siting of county, regional, or state public capital facilities. The City will be a strong advocate for early involvement and broad public participation and will not preclude the siting of essential public facilities within its boundaries. For the siting of local public capital facilities, the City will follow a process that includes the six steps as outlined above.

D. GOALS AND POLICIES

CF - Goal 1: Provide adequate capital facilities and services necessary to serve the community's existing and future development while maintaining adopted level of service standards.

Policies:

<i>CF - 1.1</i>	<i>Ensure new development meets the required level of service through a concurrency test consistent with the City's concurrency regulations.</i>
<i>CF - 1.2</i>	<i>Work to ensure facility costs do not exceed the projected revenue. If facility costs exceed revenue then consider alternatives: reduce the level of service to be provided, reduce the cost of proposed facilities, and/or revise the Land Use Element of the Comprehensive Plan to balance the demand for facilities with revenue sources.</i>
<i>CF - 1.3</i>	<i>Require that development proposals be reviewed for available capacity to accommodate development and needed system improvements by the various providers of services, such as sewer, water, streets, flood protection, police, fire department, parks, general governmental services, and schools.</i>
<i>CF - 1.4</i>	<i>Ensure ample public opportunity to participate in the planning for capital facility improvements.</i>

D. GOALS AND POLICIES

CF - Goal 2: Ensure that the Capital Facilities Plan anticipates and provides for the ongoing maintenance and operation.

Policies:

CF - 2.1

Emphasize the following concepts in the management of capital facilities:

- 1. Provide preventative maintenance and provide cost-effective and timely replacement of aging elements;*
- 2. Plan for the orderly extension and upgrade of capital systems while recognizing that system extensions associated with new development should be the responsibility of those desiring service;*
- 3. Regularly inspect systems to ensure conformance with design standards; and*
- 4. Reduce the potential for service rate increases through effective fiscal management and fair and equitable rate structures.*

CF - 2.2

Identify established priorities and replace existing sewer lines that are in poor condition in order to reduce inflow and infiltration and to increase the availability of capacity in the sewage treatment system.

CF - 2.3

Establish and maintain a regular backflow prevention device inspection program to prevent contamination of the water system.

CF - 2.4

Establish and maintain a regular inspection and maintenance program for catch basins, oil and water separations, and detention ponds to keep the storm damage system functioning properly

CF - 2.5

Establish and maintain a sewage pretreatment program for users that contribute heavy metals to the wastewater treatment plant.

CF - Goal 3: Develop capital facilities in a manner that minimizes adverse impacts, encourages public participation, and maximizes opportunities.

Policies:

- CF - 3.1 Implement best management practices available to ensure discharge of wastewater is handled to the highest environmental standard available ensuring river health.*
- CF - 3.2 Support and encourage the joint development and use of cultural and community facilities and co-location of facilities with other governmental or community organizations where these are areas of mutual concern and benefit.*
- CF - 3.3 Promote high quality design and site planning for the construction of capital facilities.*
- CF - 3.4 Provide outreach and notification to encourage the involvement of citizens in the siting of capital facilities.*
- CF - 3.5 Require that new capital facilities, including road improvements, are designed to enhance adjacent community assets such as parks, landmarks, and historic sites.*
- CF - 3.6 Encourage the multiple-use of corridors for major utilities, trails, and transportation rights-of-way.*
- CF - 3.7 Investigate the opportunity to use an exclusive utility franchise agreement to work with the local utility providers to develop a plan that will eliminate overhead utility lines.*
- CR - 3.8 Ensure opportunities are available to incentivize citizens to address failing septic systems and increase awareness of existing programs to residents, especially those bordering sensitive areas.*

D. GOALS AND POLICIES

CF - Goal 4: Finance North Bend's needed capital facilities in the most economic, efficient, and equitable manner possible.

Policies:

- CF - 4.1 Ensure that the burden for financing capital improvements is borne by the primary beneficiaries of the facility.*
- CF - 4.2 Consider long-term borrowing appropriate for financing capital facilities that benefit more than one generation of users.*
- CF - 4.3 Determine which services or facilities are most cost-effectively delivered by the City and which services should be contracted.*
- CF - 4.4 Where possible, use special assessment, revenue, and other self-supporting bonds instead of tax-supported general obligation bonds.*
- CF - 4.5 Adopt impact fees when legally authorized to mitigate the economic impacts of development.*
- CF - 4.6 Review the growth projections and capital facilities plans at least every other year before the City budget process to ensure that development does not out-pace the City's ability to provide and maintain adequate public facilities and services.*
- CF - 4.7 Ensure adequate staffing to enable the City to provide improvements necessary to the City's capital facilities to maintain adopted level of service standards.*
- CF - 4.8 Phase the development of capital facilities to provide sufficient lead-time in financing, planning, and construction in order to provide the facilities when needed.*
- CF - 4.9 Coordinate the City's land use and public works planning activities with an ongoing program of long-range financial planning to conserve fiscal resources available to implement the Capital Facilities Element.*
- CF - 4.10 Ensure that fiscal policies to direct expenditures for capital improvements are consistent with other Comprehensive Plan elements.*
- CF - 4.11 Ensure that all city departments review changes to the Capital Facilities Element.*
- CF - 4.12 Monitor annually school, fire, police, park, waste disposal, and other capital facilities to ensure that existing and future needs are met.*
- CF - 4.13 Annually consider adoption by reference the Snoqualmie Valley School District Capital Facilities Plan. The City of North Bend shall collect on behalf of the District the most current school impact fee.*
- CF - 4.14 Achieve a bond rating of A+ or better to lower the cost for securing funding for capital improvements.*

CF - Goal 5: Provide a full range of cost-effective services to residents within North Bend city boundaries and the Urban Growth Area as annexed.*Policies:*

CF - 5.1 Coordinate with water districts and surrounding jurisdictions to ensure that requirements for future water supply and water quality will be met.

CF - 5.2 Provide an adequate water supply and distribution system at all times for all domestic use and for fire flow and fire protection.

CF - 5.3 Develop a long-range capital facilities program that anticipates the extension of public sewer and water to all residential areas of the City of North Bend.

CF - 5.4 Extend utility service to the North Bend UGA only pursuant to a pre-annexation agreement.

CF - Goal 6: Protect the interests of the City and its residents in the siting of essential public facilities as defined in RCW 36.70A.200.*Policies:*

CF - 6.1 Base decisions for siting of essential public facilities upon criteria including, but not limited to, the following:

a. Justification of need and location in area of North Bend;

b. Specific facility requirements (acreage, transportation access, etc.);

c. Land use compatibility;

d. Potential environmental impacts;

e. Potential traffic impacts;

f. Consistency with the Comprehensive Plan;

g. Public process for meaningful participation of the residents of North Bend;

h. Essential public facilities that are countywide or statewide in nature (e.g., solid waste and/or hazardous waste facilities) must meet existing state law and regulations requiring specific siting and permitting requirements; and

i. Impact on public health, safety, welfare, and property values by siting of essential public facilities.

CF - 6.2 Participate in regional processes for determining the location of essential facilities.

E. SIX-YEAR FINANCING PLAN

Under the *Growth Management Act (GMA)*, the Capital Facilities Element is required to address all public facilities except transportation which is addressed separately in the Transportation Element. According to the GMA, public facilities and services shall be adequate to serve the development without decreasing the level of service described in the Comprehensive Plan. This section includes a discussion of existing and potential revenue sources, debt capacity, options for using debt financing to fund needed improvements, and an overall Capital Facilities summary of the finance plans for individual facilities. North Bend uses a number of different financing sources to pay for capital projects. The following paragraphs contain a summary of such potential funding sources: grants; loans; taxes; endowments; special improvement districts; bonds; capital facility charges; and impact fees.

E.1 General Fund Taxes

General fund taxes may be used to pay for construction of public facilities not financed by other dedicated funds. Streets, police buildings, and general governmental buildings such as a City Hall, are often funded in part by general fund taxes.

E.2 Special Improvement Districts

Road Improvement Districts, Business Improvement Areas, Utility Local Improvement Districts, and Special Assessment Districts are used to finance projects within a specific geographic area, as opposed to those that will serve the entire city. These projects are paid by assessments against the properties benefited by the improvements. For instance, Utility Local Improvement Districts (ULID) financing is frequently applied to water or sewer system extensions. Typically, ULIDs are formed by the City at the written request of the property owners within a specific area. Upon receipt of a sufficient number of signatures on petitions, the local improvement area is defined, needed improvements are identified, and an assessment system is designated for that particular area in accordance with state law. Each separate property in the ULID is assessed in accordance with the special benefits the property receives from the system improvements.

E.3 Special Revenue Funds

Special revenue funds account for revenues derived from specific taxes, grants, loans, or other sources that are designated to finance particular activities of the City. An

example is the Real Estate Excise Tax which taxes real estate transactions.

E.4 Washington State Public Works Trust Fund Loans

Public Works Trust Funds are also considered special revenue funds for capital projects. They are loans from the State Department of Community, Trade, and Economic Development.

E.5 Bonds

As of 2015 the city has earned an A+ bond rating which allows the City to secure lower rates on loans and bonds. The City should endeavor to maintain or improve this rating. Such bonds include:

General Obligation Bonds

General Obligation (GO) Bonds are backed by the value of the property within the jurisdiction (its full faith and credit). There are two types of General Obligation Bonds: voter-approved and councilmanic. Voter approved bonds will increase the property tax rate with the increased revenues dedicated to paying principal and interest on the bonds. The North Bend City Council could approve councilmanic bonds without the need for voter approval. Principal and interest payments for councilmanic bonds come from general government revenues without a corresponding increase in taxes. This method does not use a dedicated funding source. As a result, general fund moneys required for pay back will not be available for other government operations.

Revenue Bonds

The revenue received from the utility for which the bonds are issued finances the capital facility or infrastructure. A portion of the utility charge is set aside to pay off the bonds as well as capital facility charges designated for each utility.

E.6 Grant and Loan Programs

North Bend may use various grants and loans to fund facilities. Potential sources are as follows:

- Community Development Block Grants
- Interagency Committee for Outdoor Recreation (IAC)
- Farmers Home Administration (Water & Wastewater Development Program; Community Facilities Program)
- Community Economic Revitalization Board
- Centennial Clean Water Fund Program
- Non-Point Water Quality Grants Program
- Transportation Improvement Board

E.7 Facility Connection Charges

State law allows Cities to charge a fee for connection to a sewer, water, or storm drainage system which the City presently does. The fee may be calculated based on reimbursement for a share of the cost for facilities already constructed and facilities that the utility will need to construct in the future.

E.8 Impact Fees

The Growth Management Act (GMA) authorizes cities to impose certain types of impact fees on new development. These fees should pay for the development's proportionate share of the cost of providing the public facilities needed to serve the development. Impact fees are collected for schools, transportation projects (including streets and sidewalks), parks and open space, and fire protection.

E.9 SEPA Mitigation

The State Environmental Policy Act authorizes cities to identify project impacts and require mitigation consistent with adopted policies and standards as a condition of development approval. This mechanism is commonly used where specific facility charges and impact fees do not adequately address mitigation of development impacts.

E.10 Endowments

Capital facilities can be funded with a grant of money from donors set aside specifically to fund the construction of particular designated facilities.

E.11 Limitations on Municipal Indebtedness

The Washington State Constitution places limits on the amount of general obligation debt that any city may incur. As prescribed by statutes of the State of Washington, the unlimited tax general obligation indebtedness permitted for cities, subject to an approving 60 percent majority vote of registered voters at an election at which 40 percent of those who voted at the last general election cast a ballot, is limited to 2.5 percent of assessed value for general purposes, 2.5 percent for certain utility purposes and 2.5 percent for open space, park facilities and capital facilities associated with economic development. Within the 2.5 percent of assessed value for general purposes, a city may, without a vote of the electors, incur general obligation indebtedness in an amount not to exceed 1.5 percent of assessed value. Additionally, within the 2.5 percent of assessed value for general purposes, a city may, also without a vote of the electors, enter into leases if the total principal component of the lease payments, together with

the other non-voted general obligation indebtedness of the city, does not exceed 1.5 percent of assessed value. The combination of unlimited tax and limited tax general obligation debt for general purposes, including leases, cannot exceed 2.5 percent of assessed value, and for all purposes cannot exceed 7.5 percent of assessed value. The City intends to always pursue the highest bond rating possible, therefore reducing indebtedness is a priority.



chapter 7

NATURAL RESOURCES ELEMENT

Contents

- A. INTRODUCTION
- B. NATURAL RESOURCE LANDS PROTECTION
- C. CITY OF NORTH BEND AGRICULTURAL AND FOREST LAND DEFINITIONS
- D. AGRICULTURAL LANDS IN THE NORTH BEND UGA
- E. FOREST LANDS AROUND THE NORTH BEND UGA
- F. NATURAL RESOURCE LANDS ELEMENT - GOALS AND POLICIES

A. INTRODUCTION

The natural resource based agriculture and timber industries influenced the historical development pattern of the City of North Bend and played a significant role in the economic growth of the community. Beginning with the Meadowbrook hop farm in 1885 and continuing with logging, sawmills, dairies, truck farms, and ranches, through the present, the agricultural and forest lands have proven their importance to the City of North Bend. The protection of agricultural and forest land for economic and aesthetic reasons is a goal of the State of Washington, King County, and the City of North Bend.

North Bend's beautiful physical setting and the high quality of its natural environment make it an attractive location in which to live. Maintaining the visual quality of the dominant wooded landscape of Rattlesnake Ridge and the surrounding Upper Snoqualmie Valley floor, while conserving the views of Mount Si are important in sustaining the rural character of North Bend. The natural resource lands (agricultural and forest) directly contribute to the high quality of life enjoyed by the citizens of North Bend by providing bountiful aesthetic, recreational, and economic benefits. The protection of these natural resource lands is essential if the residents of North Bend are to maintain the present character of the community.

The City of North Bend Resolution No. 773 identified that one of the top priorities of amending the Comprehensive Plan and Development Regulations is to provide greater agricultural land use protection.

B. NATURAL RESOURCE LANDS PROTECTION

The protection and management of natural resource lands both inside and outside the North Bend Urban Growth Area (UGA) is a concern of the City of North Bend. The rural character of North Bend is directly linked to the natural resource lands and the rural character they provide.

The Growth Management Act (GMA) in [RCW 36.70A.020\(8\)](#) addresses Natural Resource Industries in planning goal # 8 in order to:

Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forestlands and productive agricultural lands, and discourage incompatible uses.

[RCW 36.70A.170](#) directs the City to designate both agricultural land and forest land properties that are not already characterized by urban growth and which have long-term significance for commercial resource production. [RCW 36.70A.060](#) directs the City to adopt development regulations to assure protection of lands designated under [RCW 36.70A.170](#), including lands within five hundred feet of such lands.

King County Countywide Planning Policies (CWPP) provide local direction to implement the GMA mandate for protection of resource lands. Following is a paraphrased listing of the CWPP's with direct applicability to North Bend in 2004. The policy number of each referenced policy is cited. Other CWPP's may be indirectly applicable to North Bend and the CWPP's may be revised in the future. The full list of CWPP's is available on the King County DDES website at <http://www.metrokc.gov/ddes/complan/CPP-current.pdf>

At the highest level, adoption of the City's Urban Growth Area's protects resource lands by preventing "urban" growth outside of the UGA (FW-6). Jurisdictions are to minimize impacts to resource lands outside of their jurisdiction (LU-1), preserve resource lands inside their jurisdiction and adopt a Transfer of Development Rights (TDR) program for designated resource lands (LU-2). Designated Agricultural Production District Lands shall not be annexed by Cities (LU-2A) and existing mineral extraction or processing sites can only be annexed if there are policies in place for their protection (LU-3). Finally, all jurisdictions shall encourage compatible land uses adjacent to natural resource areas to minimize conflicts, require a 500 foot notice as required by [RCW 36.70A](#) (LU-4), and require resource operation to implement "best management practices" (LU-5).

A case law decision made by the Central Puget Sound Growth Management Hearings Board (CPSGMHB) in *Green Valley v. King County* ([Case No. 98-3-0008](#)) states that the Growth Management Act imposes an affirmative duty on local governments to designate and conserve agricultural lands to assure the maintenance and enhancement of the agricultural resource industry.

The City of North Bend has taken a variety of steps to protect resource lands including defining farm and forestry, adopting a right to farm and forestry ordinance, require a notice on title of farm or forestry operations at the time of development approval within 500 feet of the operation, require buffers around farms designated in the

Comprehensive Plan, establish an urban separator overlay zone to protect farms, and create a transfer of development rights program to implement the urban separator overlay zone.

RCW 36.70A.030 (10) defines long-term commercial significance as:

The growing capacity, productivity, and soil composition of the land for long-term commercial production, in consideration with the land's proximity to population areas, and the possibility of more intense uses of the land.

C. CITY OF NORTH BEND AGRICULTURAL AND FOREST LAND DEFINITIONS

The definitions for both agricultural land and forest land characterize the land use and the long-term commercial productivity of the agricultural or forestry activity on the land.

Agricultural Land

Agricultural land is that land meeting any one or more of the following definitions: (1) Land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by *RCW 84.33.100* through *84.33.140*, finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production, and (2) Land that is currently in use for agriculture as evidenced by its current enrollment in the open space taxation program pursuant to *RCW 84.34*.

To define agricultural land productivity, the City of North Bend uses the following criteria:

1. Any parcel of land that is twenty or more acres or multiple parcels of land that are contiguous and total twenty or more acres:

- (a) Devoted primarily to the production of livestock or agricultural commodities for commercial purposes;
- (b) Enrolled in the federal conservation reserve program or its successor administered by the United States department of agriculture; or
- (c) Other similar commercial activities as may be

established by rule.

2. Any parcel of land that is five acres or more but less than twenty acres devoted primarily to agricultural uses, which has produced a gross income from agricultural uses equivalent to, as of January 1, 1993:

(a) One hundred dollars or more per acre per year for three of the five calendar years preceding the date of application for classification under this chapter for all parcels of land that are classified under this subsection or all parcels of land for which an application for classification under this subsection is made with the granting authority prior to January 1, 1993, and

(b) On; or after January 1, 1993, two hundred dollars or more per acre per year for three of the five calendar years preceding the date of application for classification under this chapter,

3. Any parcel of land of less than five acres devoted primarily to agricultural uses which has produced a gross income as of January 1, 1993, of:

(a) One thousand dollars or more per year for three of the five calendar years preceding the date of application for classification under this chapter for all parcels of land that are classified under this subsection or all parcels of land for which an application for classification under this subsection is made with the granting authority prior to January 1, 1993; and

(b) On or after January 1, 1993, fifteen hundred dollars or more per year for three of the five calendar years preceding the date of application for classification under this chapter.

Agricultural lands shall also include any parcel of land of one to five acres, which is not contiguous, but otherwise constitutes an integral part of farming operations being conducted on land qualifying under this section as "farm and agricultural lands"; or the land on which housing for employees and the principal place of residence of the farm operator or owner of land classified pursuant to (a) of this subsection is sited if:

- 1) the housing or residence is on or contiguous to the classified parcel; and



2) the use of the housing or the residence is integral to the use of the classified land for agricultural purposes.

Forest Land

Land primarily devoted to growing trees for long-term commercial timber production on land that can be economically and practically managed for such production, including Christmas trees subject to the excise tax imposed under [RCW 84.33.100 through 84.33.140](#), and that has long-term commercial significance. In determining whether forest land is primarily devoted to growing trees for long-term commercial timber production on land that can be economically and practically managed for such production, the following factors shall be considered:

- (a) The proximity of the land to urban, suburban, and rural settlements;
- (b) surrounding parcel size and the compatibility and intensity of adjacent and nearby land uses;
- (c) long-term local economic conditions that affect the ability to manage for timber production; and
- (d) the availability of public facilities and services conducive

to conversion of forest land to other uses.

To define forest land productivity, the City of North Bend uses the following criteria from [RCW 84.34.020](#):

“Timber land” means any parcel of land that is five or more acres or multiple parcels of land that are contiguous and total five or more acres which is or are devoted primarily to the growth and harvest of forest crops for commercial purposes. A timber management plan shall be filed with the County legislature authority at the time (a) an application is made for classification as timber land pursuant to this chapter or (b) when a sale or transfer of timber land occurs and a notice of classification continuance is signed. Timberland means the land only.

D. AGRICULTURAL LANDS IN THE NORTH BEND UGA

Map 7-2 shows existing prime farmland soils with the best potential to be used for agriculture as identified by the USDA Soil Conservation Service Survey of the Snoqualmie Pass Area.

An examination of Map 7-2 shows that most of the land inside the present City limits, with the exception of the foothills to Rattlesnake Ridge, is classified as prime farmland by the USDA Soil Survey. Much of the agricultural land in the City has been converted from commercial production

of agricultural products and is now characterized by urban growth. However, numerous pastures, fields, and including the designated Stringfellow Farm still exist adjoining the North Bend Urban Growth Area. The Stringfellow Farm adjoining the UGA to the east of the Silver Creek neighborhood is the designated farm shown on Map 7-1.

The Stringfellow Farm, located south and east of the Silver Creek neighborhood, is presently preserved in the open space taxation program pursuant to RCW 84.34. Mr. Stringfellow has repeatedly advised the City of his concerns that development inside the Urban Growth Area will result in incompatible land uses that will preclude the long-term operation of his farming operation. Potential conflicts that he has identified from his beef ranching operation include air borne lime dust, noise, odors, and sights of animals being slaughtered. To protect his operation he has advised the City to consider adopting protections including a right to farm ordinance, placing a notice on title of land developing adjacent to the farm advising of the farming operation, and revised zoning on lands adjacent to the farm to ensure development of compatible land uses and densities.

E. FOREST LANDS AROUND THE NORTH BEND UGA

There are no forest resource lands designated by the City of North Bend. The King County Comprehensive Plan designates Forest Production Districts where the primary use is commercial forestry. Lands within the King County Forest Production District shall remain in large parcels and in ownership conducive to forestry. Existing forest land designated by King County adjacent to the North Bend UGA is shown on Map 7-3.

RIGHT TO PRACTICE FARMING AND FORESTRY

A right to farm or right to forestry ordinance is a state law or local ordinance that protects farming and forestry operations from private or public nuisance lawsuits. A private nuisance involves actions that interfere with the reasonable use or enjoyment of an individual's property. A public nuisance involves actions that threaten the public health, safety, or welfare or damages community resources. The Right to Farm and Right to Forestry ordinances are intended to protect agricultural and forest lands as an element of rural character and natural resources production potential within the North Bend UGA.

The Right to Farm and Right to Forestry ordinances help to educate residents about the needs of commercial agriculture

and forestry and reassures farmers and foresters that the City of North Bend supports farm and forestry operations. The ordinance serves as a formal policy statement that agriculture and forestry is a valuable part of the City of North Bend's economy and culture. Adoption of a Right to Farm / Right to Forestry ordinance in North Bend would:

- (1) strengthen the legal position of farmers and foresters when neighbors sue them for private nuisance,
- (2) protect farmers and foresters from anti-nuisance ordinances and unreasonable controls on farming and forestry operations,
- (3) apply a city-wide right to farm / right to forest ordinance to any property meeting the City of North Bend definition of agricultural land (farm) or forest land,
- (4) protect existing agricultural land (farm) and forest land,
- (5) provide an opportunity for establishing future farms,
- (6) require that a notice be placed on the deed to all properties adjacent to designated agricultural or forest areas as shown on Map 7-1 and Map 7-3, cautioning potential buyers that they may experience noise, dust, odors and other inconveniences due to farming and forestry operations.

NOTICE ON TITLE FOR AGRICULTURAL AND FOREST LANDS

The purpose of the Notice on Title is to implement notice provisions and set forth the contents of such notice to be placed upon the title of property that is adjacent to agricultural or forest land uses. The Notice on Title would show the presence of agricultural or forest land activities on an adjoining property. The notice provides a tool by which any property owner would be notified of a potentially incompatible situation. The Notice on Title of a property would show the owner the potential for limitations on development due to the agricultural or forest activities on an adjacent parcel. The notice would be applied to any property adjoining designated agricultural or forest land in the Comprehensive Plan. The Stringfellow Farm as shown on Map 7-1 is the designated agricultural land. The Notice on Title would apply where a property is within a 500-foot buffer of an adjoining agricultural or forest land activity. The filing of the notice would be required by a developer as a condition of permit approval upon development of any property that is adjoining agricultural or forest land.

APPLICATION OF BUFFERS TO AGRICULTURAL LANDS

The GMA encourages the conservation of productive agricultural lands and discourages development of incompatible uses. The City of North Bend should use buffers as a method of protecting productive agricultural lands. The application of buffers citywide provides a uniform method of protecting incompatible land uses adjacent to agricultural lands throughout the North Bend Urban Growth Area. The City is requiring a 150-foot wide buffer area that will include landscaping in combination with berms or fences to create a visual screen of the farm area. In addition, the

buffer area can include any combination of the following: right of ways, access routes, recreation areas (excluding play areas), parking, outdoor storage, utilities including drainage systems, existing non-conforming occupied structures or non-occupied accessory structures, provided the landscape visual screen is accomplished. Existing occupied structures located in the 150 foot buffer area will be treated as non-conforming uses and regulated under Chapter 18.30 of the North Bend Municipal Code. Areas to be buffered include existing farm operations as designated on Map 7-1 in the Comprehensive Plan. Additions or deletion of a farm area will be accomplished through an amendment to the Comprehensive Plan.

F. NATURAL RESOURCE LANDS ELEMENT - GOALS AND POLICIES

NRL Goal 1: Protect Existing Resource Lands.

Policies:

- NRL - 1.1 Work with King County to develop incentives that help retain agriculture and forest related land uses within the North Bend Urban Growth Area.*
- NRL - 1.2 Create criteria for resource lands that lie within the North Bend Urban Growth Area that acknowledge the City of North Bend's interest in retaining agriculture or forestland uses.*
- NRL - 1.3 Adopt definitions of agriculture and forest lands consistent with state law as presently written or as modified in the future.*

NRL - Goal 2: Establish Right-to-Farm and Forestry Policy.

Policies:

- NRL - 2.1 Establish Right-to-Farm and Forestry ordinance to support maintenance of natural resource lands within and around the North Bend UGA and protect farm and forestry operations from nuisance laws.*

NRL - Goal 3: Establish a Notice on Title Policy.*Policies:*

NRL - 3.1 Require Notice on Title of properties adjacent to any agricultural or forest lands to notify owners of potentially incompatible activities at the time of development approval.

NRL – Goal 4: Establish a Landscape and Use Buffer on Property Adjoining Agricultural Operations.*Policies:*

NRL - 4.1 Require landscaping and the use of buffers on properties adjacent to any agricultural lands at the time of development approval to protect agricultural activities occurring on the resource land from potentially incompatible future urban land uses.

NRL - Goal 5: Work with the County to encourage retention of a productive agricultural, pasture and forestlands that lie within the City's Potential Impact Area.*Policies:*

NRL - 5.1 Encourage the County to limit development by retaining farming and grazing activities in areas outside of the UGA to help retain the area's historic rural setting.

NRL - 5.2 Encourage the County to create incentives to set aside productive agricultural lands in order to help prevent development of these areas.

NRL - 5.3 Encourage the County to define setbacks, buffers, and other land use controls to encourage continuation of existing agricultural pursuits.

NRL - 5.4 Establish criteria for the review of development proposals under review by King County but within the City's designated UGA and joint planning areas, and work with the County to coordinate such reviews.

NRL - 5.5 Seek opportunities for City-County cooperative acquisition, development or shared maintenance of key sites that provide scenic and recreational benefits for City Residents.



chapter 8

PARKS AND OPEN SPACE ELEMENT

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A. INTRODUCTION

The Parks and Open Space Element ("Parks Element") serves as the City's guide for acquiring, developing and maintaining parks, recreation facilities, trails, and wildlife habitat lands. In addition, certification of this Element by the Washington State Recreation and Conservation Office will maintain the City's eligibility for state and federal funds that are administered by that agency.

The element incorporates the findings and recommendations from the numerous planning processes undertaken by the City since the adoption of the previous version of the plan in 2010. All of these planning processes involved extensive public involvement opportunities.

A.1 Overview

The City has a good parks, recreation and open space system, complemented by the wide array of outdoor resources and opportunities provided by county, state and federal agencies. In fact, over 628 acres, or about 21% of the land inside the City limits and Urban Growth Boundary (UGA) are in public ownership as parks, public facilities, wildlife habitat or open space areas.

As such, the outdoor recreation opportunities in and around North Bend are outstanding. Hiking, fishing, horseback riding, mountain and road bicycling, rock climbing, skiing, river sports, observation of nature, and the presence of scenic areas abound, all within only a short distance of the City limits. Mount Si rises dramatically above the Valley floor, with its popular trailheads only a five-minute drive from downtown North Bend. Snoqualmie Pass, a major ski resort destination, is only thirty minutes away. This area provides access to year around recreational activities in the Mt. Baker-Snoqualmie National Forest, including access to the nationally recognized Alpine Lakes Wilderness Area and Pacific Crest Trail.

Residents choose to live in North Bend, and visitors travel here, in large part because of the rural atmosphere and outstanding local and regional outdoor recreation and open space amenities. In numerous surveys conducted by the City and other relevant recreation agencies over the years, respondents have stated the top community goals should be retaining rural character and the preservation of natural areas.

Given the significant growth rate that is occurring, the

City of North Bend will have important outdoor park, recreation, wildlife habitat and open space needs. Adequately providing for these needs will allow North Bend to remain a desirable rural community.

A.2 Purpose of the Parks and Open Space Element

The primary purpose of the Parks and Open Space Element is to direct actions related to the conservation, development, and management of North Bend's park, recreation, wildlife habitat and open space infrastructure. Actions are intended primarily to benefit residents while also playing a key role in continuing to attract visitors and enhance the local economy.

This Element is focused on outdoor park and recreation needs and opportunities. Although the City realizes the need to plan for indoor recreation programs and activities, this Element does not specifically address those needs, and such needs are largely addressed by the Si View Metropolitan Parks District. The Element has a six-year time frame and will need to next be updated in 2021 to meet State Recreation and Conservation Office park and recreation grant eligibility requirements. The list of park projects to be constructed and their anticipated funding sources will be updated periodically as projects are completed and additional projects are prioritized.

A.3 Relationship to Comprehensive Plan and Regulatory Role

The Growth Management Act (GMA) requires a park and recreation element that implements, and is consistent with, the City's Capital Facilities Element as it relates to park and recreation facilities. The park element shall include:

- (a) estimates of park and recreation demand for at least a ten-year period;
- (b) an evaluation of facilities and service needs; and
- (c) an evaluation of intergovernmental coordination opportunities to provide regional approaches for meeting park and recreational demand.

King County Countywide Planning Policies (CPP) provide local direction to implement the GMA mandate for consideration of park and recreation needs including open space. *CPP policy EN-4* calls jurisdictions to identify and preserve regionally significant open space networks and develop strategies and funding to protect them.

The City of North Bend implements this policy through the City's existing park and open space resources and planned improvements.

The North Bend City Council adopted the current update of this plan upon the recommendations of the Planning Commission and Parks Commission, and following a public workshop and public hearing. As such, it is recognized as providing an official basis for legislative, quasi-judicial and administrative decisions on matters relating to the area of parks, recreation, wildlife habitat and open space acquisition, development, and maintenance falling within City limits and the urban growth area.

B. DESCRIPTION OF THE PLANNING AREA

B.1 Service Area

The planning or service area for the Parks and Open Space Element is the city limits of North Bend and its Urban Growth Area (UGA). (Hereinafter, the North Bend UGA is defined as including the city limits of North Bend and its Urban Growth Area.) However, it is recognized that surrounding residents in the Upper Snoqualmie Valley also have an impact on the demand for North Bend services. Therefore, unincorporated areas of King County that are adjacent to North Bend's UGA will be considered. These "potential impact areas" include areas that, when developed, may have an effect on parks and recreation services or the quality of life for North Bend residents.

B.2 Population Trends

North Bend's population remained essentially static for the decade of the 2000s due to the 10-year long water moratorium that occurred during that period. However, significant new development is now occurring, together with corresponding substantial population growth.

In 2015, the City updated the Land Use Element of the Comprehensive Plan, which includes 2035 population projections based on development of the remaining vacant and re-developable land within the city and its UGA, subject to growth assumptions. This analysis determined that based on current zoning and growth assumptions, the City and existing UGA have the capacity to accommodate an additional 2,331 dwelling units. Factoring 2.22 persons per renter-occupied household (39.2% of units based on current proportions) and 2.8 persons per owner-occupied household (60.8% of units based on current proportions), this translates to an additional 5,978 people added to North Bend's 2010 population of 5,731 (US Census 2010) and estimated 2010 UGA population of 2,692, totaling 14,401 people in 2035.

Table 1 shows the population projections that will be used for the purpose of the Parks and Open Space Element. For the 6-year growth estimate for this plan (through 2021), it is assumed that 2/3 of the remaining growth through 2035 will occur, based on the residential development projects currently under review or in the pipeline (anticipated to be submitted within the next few years).

TABLE 1 -POPULATION PROJECTIONS

	2010 US Census, City Limits	2014 US Census Estimate, City Limits	Forecast 2021 (2/3 of 2035 Forecast of City and UGA)	2035 Forecast (City and UGA)
City Population	5,731	6,578	9,601	14,401

Table 2 shows that the residents in the City of North Bend are fairly young, with 61% of the population being under the age of 45. The median age is 38.7 years, and 67% are family households (2010 Census). The past decade has seen an increase in the percentage of children that make up the population and a decrease in the percentage of senior citizens (over 65 years). The household size within the City is expected to drop, consistent with national trends.

TABLE 2 - NORTH BEND AGE DISTRIBUTION IN 2010

AGE RANGE	POPULATION	% OF TOTAL
0 - 19 years	1,688	29.4%
20-44 years	1,815	31.8%
45-64 years	1,688	29.4%
65+ years	540	9.4%
TOTAL	5,731	100%

Source: 2010 Census, City of North Bend

B.3 Wildlife Habitat

Most of North Bend is located on the floodplains of the South Fork and Middle Fork of the Snoqualmie River, and includes significant areas of riparian forest on public lands and within the critical area buffers of rivers and streams. Many species use these riparian forests for cover, foraging and breeding. Elk, deer, river otter, mink and beaver most commonly use this habitat type. Other species that may be present or pass through include black bear, cougar, bobcat, weasel, deer mice and other rodent species, shrews, and bats.

Wetlands throughout the floodplain provide habitat and flood control benefits within North Bend, especially on the western edge of the city. Many animal species use these wetlands for all or part of their lives. The more structurally diverse wetlands (i.e., more tree and shrub cover) provide the most optimum habitat. Many species of birds and amphibians are particularly dependent on wetlands for critical breeding habitat.

Early settlers described much of the floodplain as "prairie." This large open area was maintained by Native Americans in order to perpetuate certain edible plant species such as camas and berries. Fire was used to remove invading shrubs and trees. Today, what remains of the former prairies are largely farm fields, bisected by roads and highways. These transportation corridors are significant barriers for wildlife movement.

These farm fields provide habitat for small mammals and birds and are regularly patrolled by raptors, owls and coyote. In some areas, larger mammals such as deer, elk and black bear forage or use the fields to move to areas providing better habitat and cover. The largest remaining area of this particular habitat type occurs in the western end of the city. It includes Meadowbrook Farm, Tollgate Farm, miscellaneous intervening properties, and the field south to the Nintendo complex. Because of the presence of multiple large protected public fields, the local elk population has been increasing dramatically over the last several years. Addressing the management of this elk herd and the attendant damage that elk can cause to property has become a significant concern in the valley. Land use and park and recreation planning should be done consistent with the objectives of protecting the needs of this herd while minimizing the potential for human and elk conflicts.

The South Fork and Middle Fork Snoqualmie Rivers provide a special aquatic habitat. In spite of dikes along portions of the rivers, they still provide excellent habitat for such fish species as cutthroat trout, rainbow trout, whitefish, and sculpin. Although the rivers are still listed as possibly having habitat for the federally listed bull trout, the species no longer appears to exist in the rivers. Habitat for fish spawning is particularly good where the river is still connected with its off-channel floodplain. Parts of Ribary Creek provide excellent spawning habitat for cutthroat trout because of its heavily vegetated banks and clean sediments. Gardiner Creek also supports a healthy population of cutthroat trout.

C. EXISTING AREAS AND FACILITIES

C.1 Overview

The City of North Bend lies in close proximity to hundreds of thousands of acres land owned by city, county, state, and federal agencies. These lands are depicted on *Figure 8.3*. Information on key sites, located in the proximity of North Bend, is provided below, including more detailed information on the wildlife habitat values of these lands and the parks and recreation facilities inside the North Bend UGA.

C.2 City of North Bend Areas and Facilities

City-owned parks, recreation, open space and wildlife habitat areas and facilities are depicted on *Figure 8.1*. Table 3 in Section IV summarizes recreational facilities in the North Bend UGA.

E.J. Roberts Park: This is a 4.9-acre neighborhood park. Improvements include playground areas, two tennis courts, a practice basketball court, restrooms, paved pathways, landscaping, and paved parking for ten vehicles. The park lies east of downtown within the Silver Creek neighborhood.

Gardiner-Weeks Memorial Park: This 3.3 acre neighborhood park has approximately 200 feet of frontage on the South Fork of the Snoqualmie River and is located on Bendigo Boulevard, a key gateway to the City. The Snoqualmie Valley Historical Museum and the Mount Si Senior Center are located within the park boundaries. Other facilities include a gazebo, picnic tables, and a short, paved walking path. A paved parking lot is provided at the Senior Center and a small gravel parking lot is provided at the corner of Park Street and Bendigo Boulevard.

Meadowbrook Farm Park: Meadowbrook is a 460-acre, historic farm property located in the cities of North Bend and Snoqualmie that commands sweeping views of Mount Si and the Cascade Mountain Range. In the late 1800's, it was a thriving hop ranch and was later used for vegetable crops and dairy farming through the 1960's. Meadowbrook Farm is owned by the Cities of North Bend and Snoqualmie, and is managed by the Meadowbrook Farm Preservation Association.

A Master Plan for Meadowbrook Farm was adopted in 1999 and updated in 2013. The 460-acre property offers passive recreational opportunities, including nature appreciation, trails, environmental interpretation and native habitat protection. The fields on the property are also used for recreational and community events that require large spaces. A 2,400 square foot Interpretive Center building is located on the property, providing meeting space for public and private events, classes and the like.

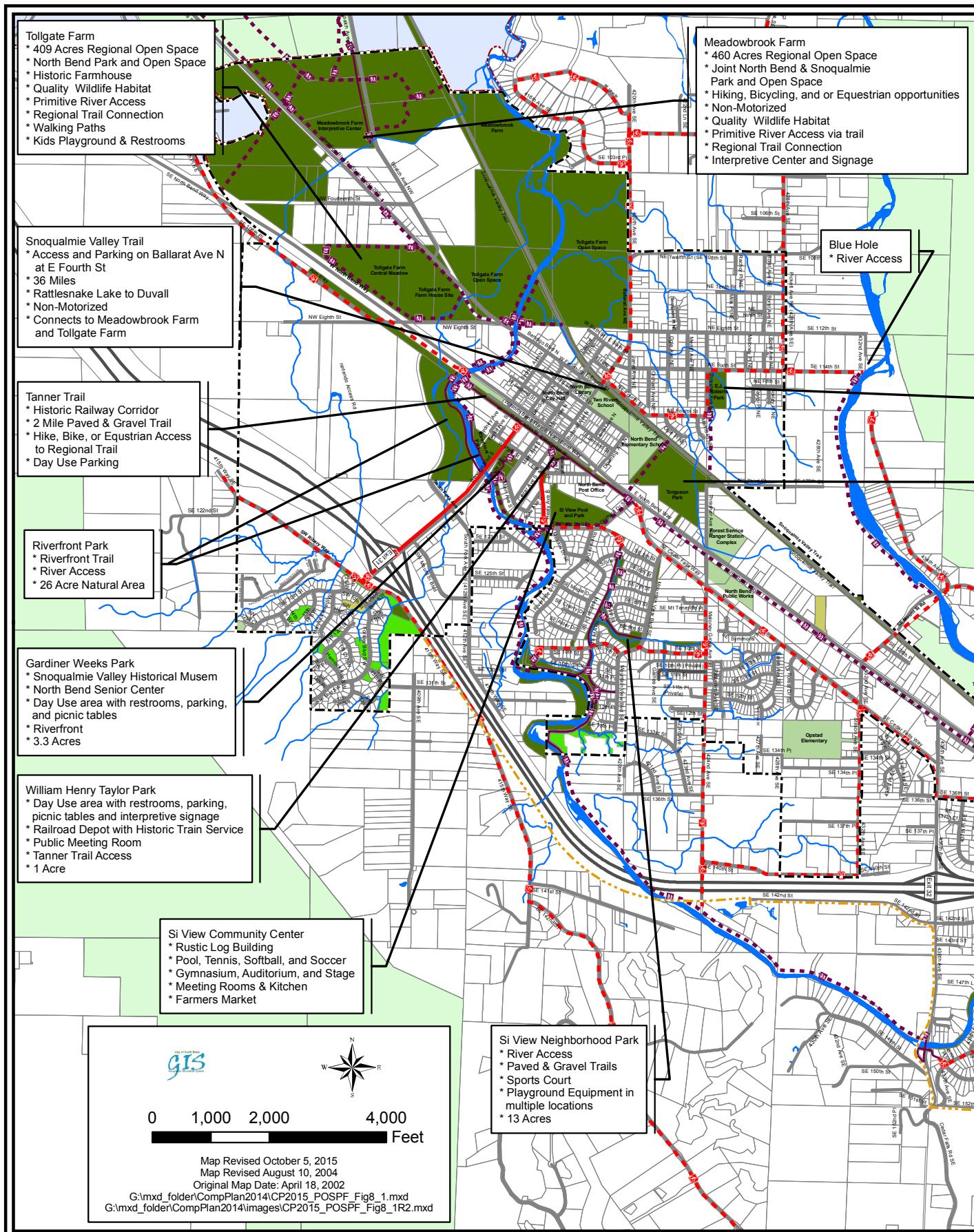
Meadowbrook Farm is part of a wildlife corridor in the Upper Snoqualmie Valley connecting numerous protected lands surrounding the City, and supports a diversity of habitats. Elk herds use many of the habitats on the site and are routinely seen grazing on Meadowbrook Farm. They are a popular attraction with local residents and visitors to the area. Wildlife habitats and habitat values on Meadowbrook Farm are further described in the Meadowbrook Farm Master Plan.

Riverfront Park: This 26.8 acre undeveloped property has approximately 1,000 feet of frontage on both sides of the South Fork of the Snoqualmie River between Bendigo Boulevard and W. North Bend Way, including 4 acres on the right bank and 22.8 acres on the left bank. The park includes informal trails along the levees and access to the shoreline for fishing and swimming. The northern portion of the levee on the right bank, and the southernmost portion of the levee on the left bank remain private property. This undeveloped and protected river riparian corridor is important for all kinds of wildlife, particularly birds, and helps to maintain habitat and water quality critical to fish in the upper basin. The City, together with the Mountains to Sound Greenway Trust, has worked hard over the last few years to clear this forested area of invasive English ivy and English holly, improving the health of the forest for diversity and wildlife habitat.

Si View Subdivision Park: This 13 acre park includes river access on the top of the flood levee, paved walkways, playgrounds and a multi-purpose sports court.

Tannerwood Park: This 0.8 acre park is located within the Tannerwood Subdivision, and includes paved walkways, large lawn areas, as well as city-owned stormwater infrastructure.

Tanner Trail: The Tanner Trail is a partially city-owned railway and trail corridor located on the south side of





City of North Bend

Comprehensive Plan 2015

Parks / Open Space / Public Facilities Map

Figure 8.1

E. J. Roberts Park
 * Day Use Area with restrooms, parking, and picnic tables
 * Tennis and Basketball Courts
 * Playground Equipment
 * 5 Acres

Torguson Park
 * Climbing Wall
 * 6 Baseball/Softball Fields
 * Soccer Field
 * Skateboard Park
 * Playground Equipment
 * BMX Bicycle Trail
 * Day Use Area with restrooms, parking, and picnic tables
 * 17 Acres

Legend

	Existing Trails		Proposed Trails
	Existing Bike Routes		Proposed Bike Routes - "Sign Only"

City of North Bend Parks / Open Space / Public Facilities Zoning

	Parks / Open Space with Public or Assumed Public Ownership		Park / Open Space with Private Ownership
	Public Facilities Public or Assumed Public Ownership		Public Facilities Private Ownership

Other Nearby Parks / Opens Space / Public Facilities

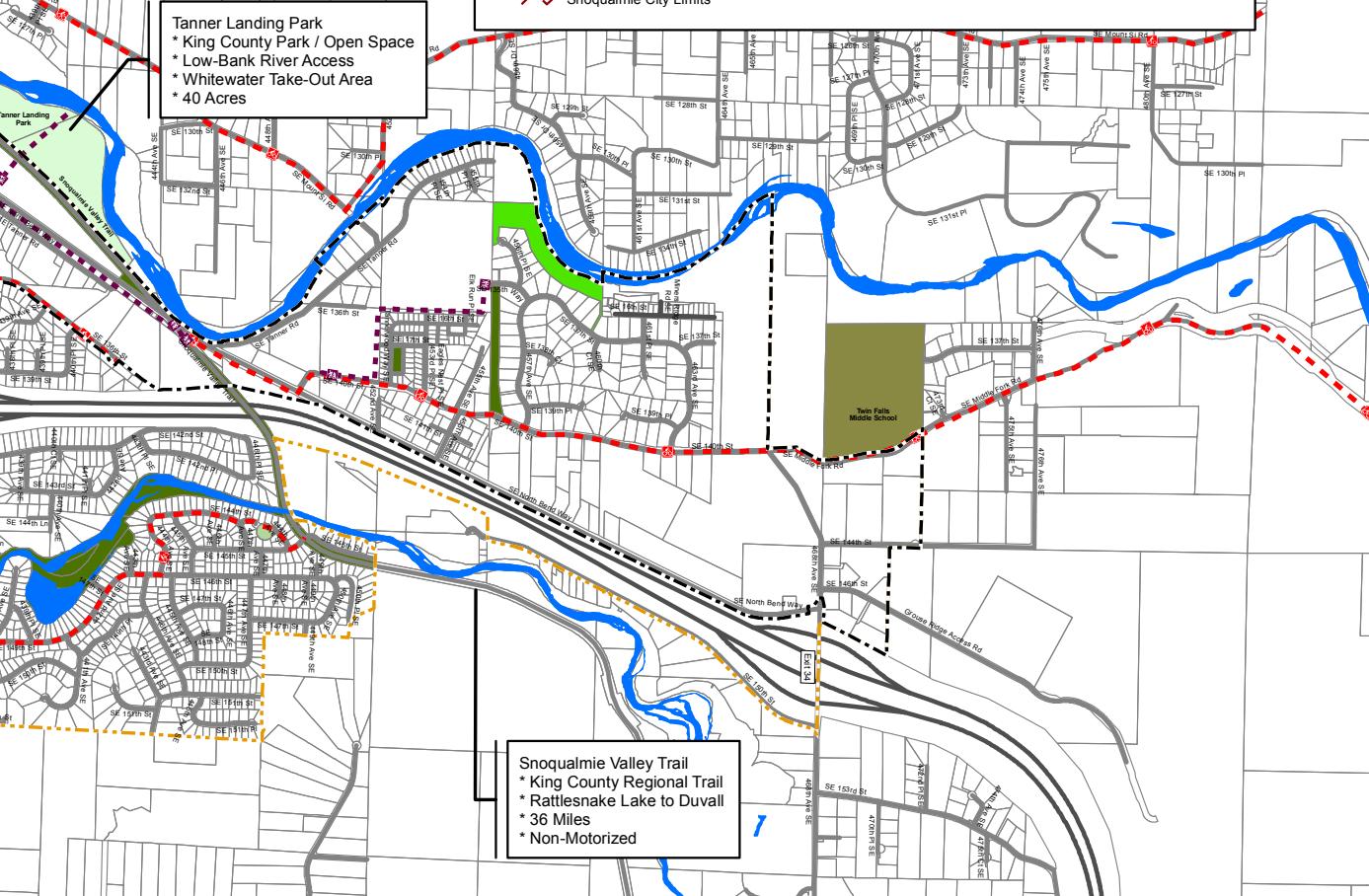
	Other Park / Open Space with Public or Assumed Public Ownership		Other Public Facilities with Public or Assumed Public Ownership
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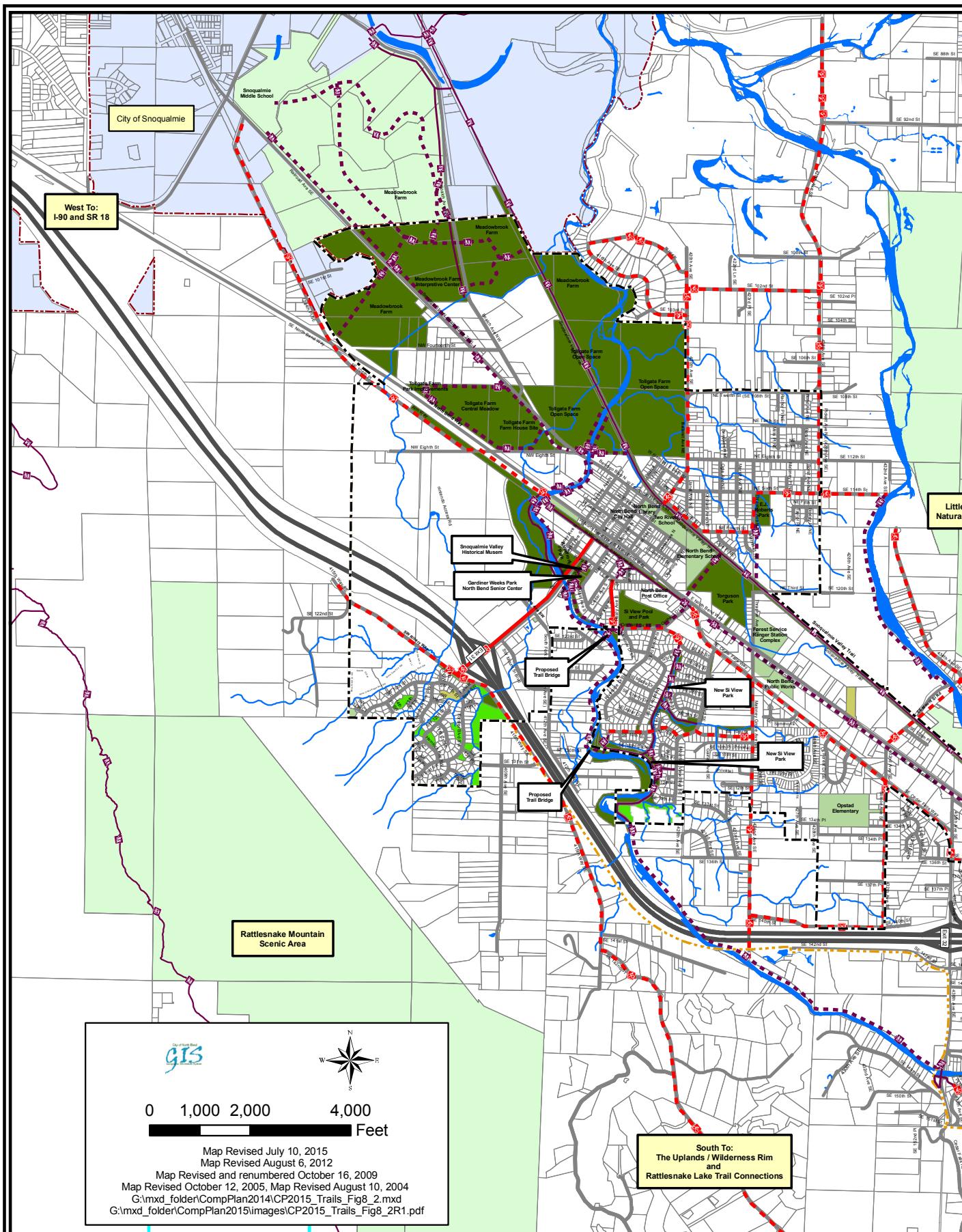
Other City Limits

	North Bend		Bodies of Water
	Urban Growth Area Limits		Creeks, Streams, and or Drainage Conveyance
	Snoqualmie City Limits		

Tanner Landing Park
 * King County Park / Open Space
 * Low-Bank River Access
 * Whitewater Take-Out Area
 * 40 Acres

Snoqualmie Valley Trail
 * King County Regional Trail
 * Rattlesnake Lake to Duvall
 * 36 Miles
 * Non-Motorized





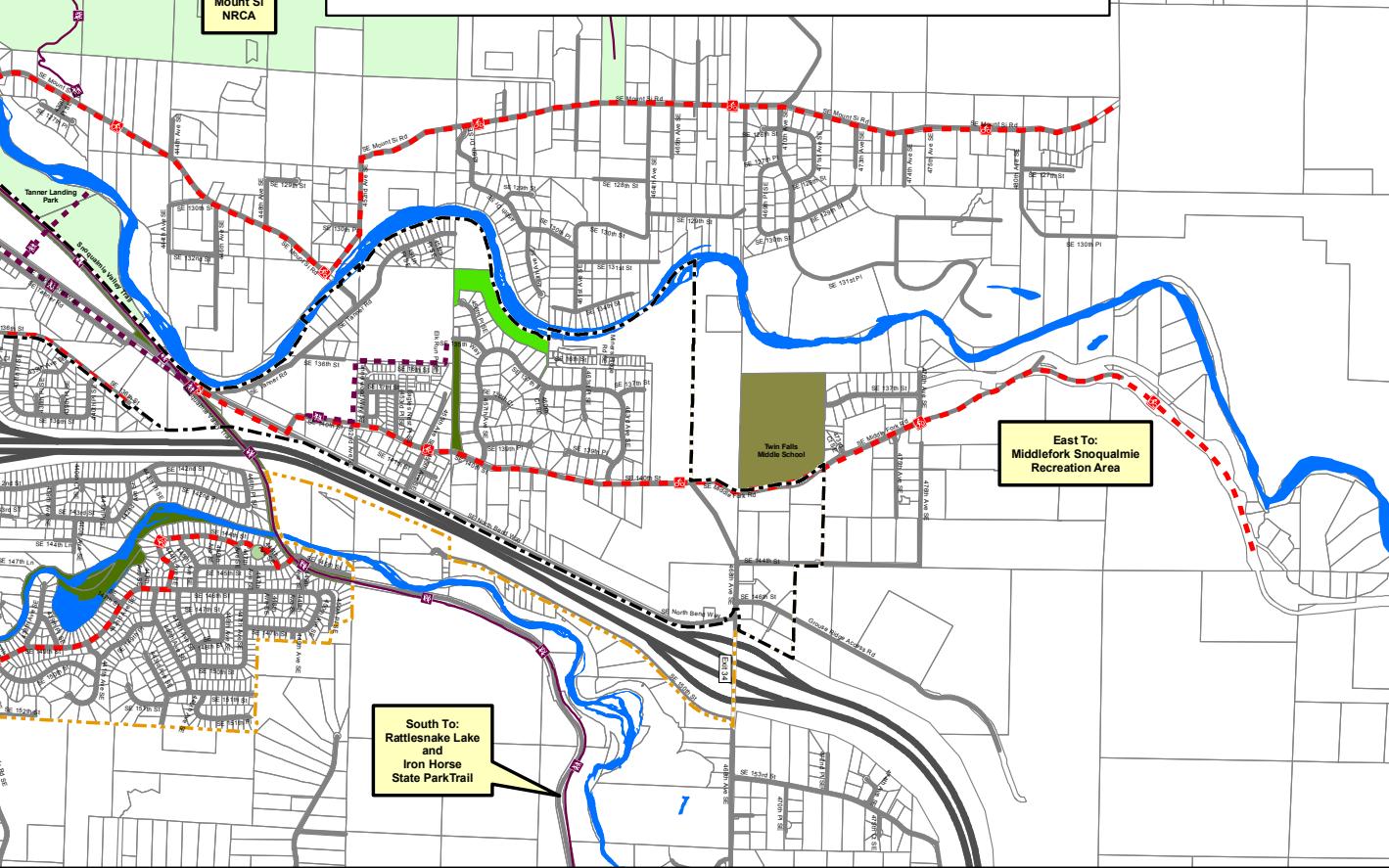
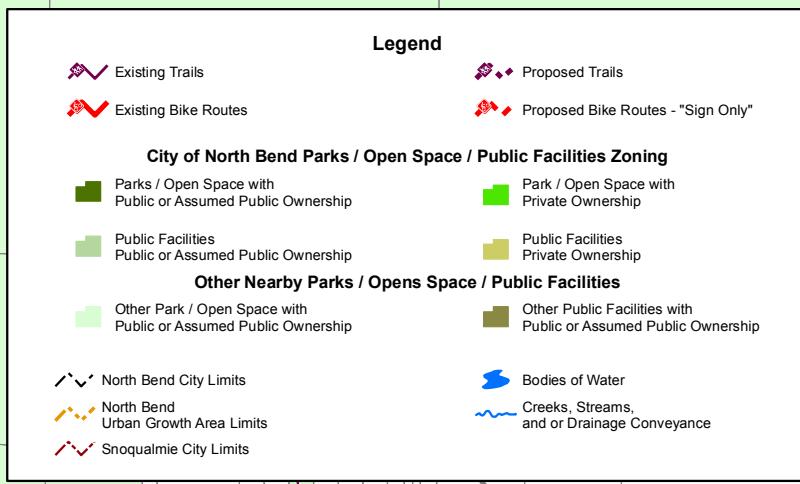


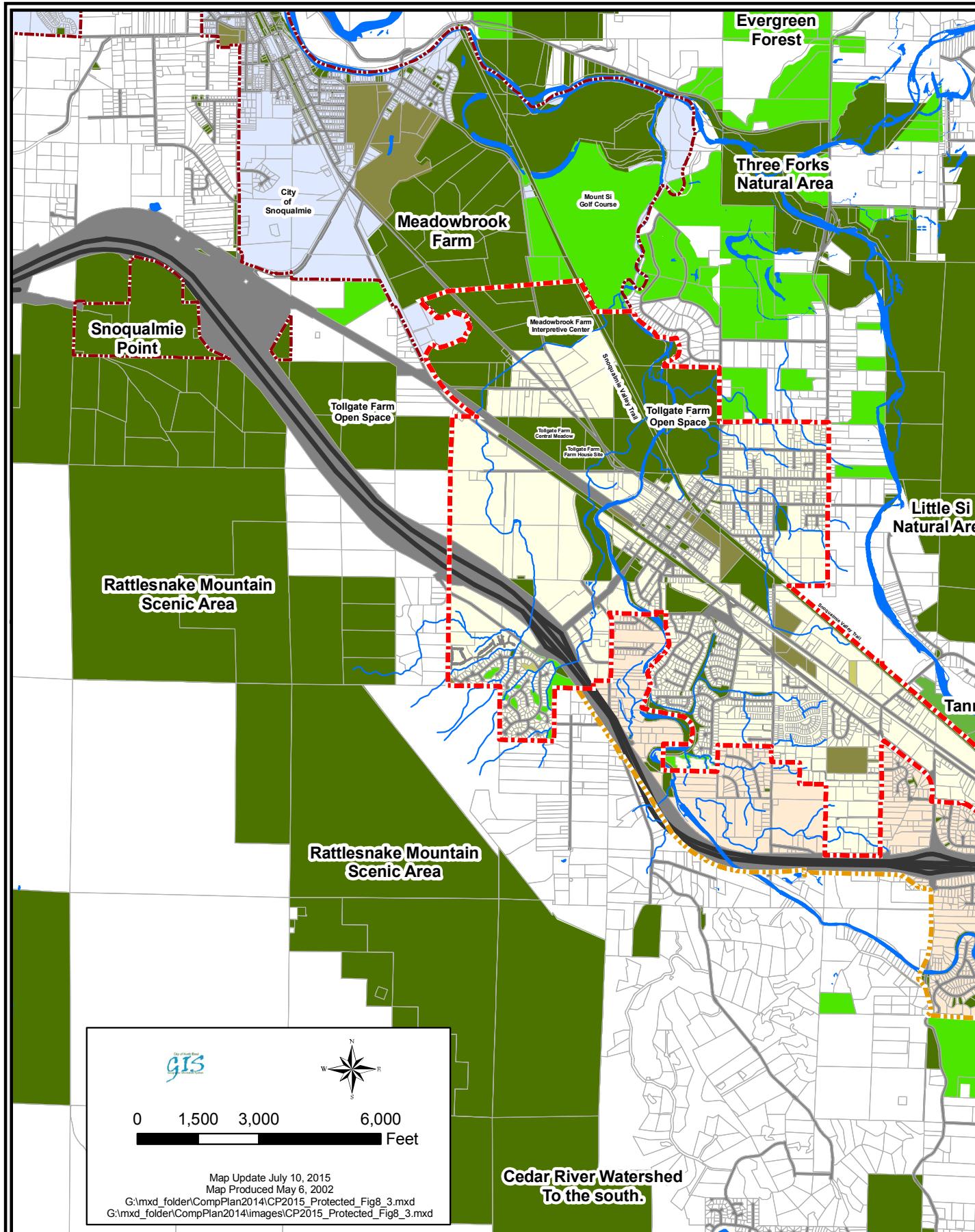
City of North Bend

Comprehensive Plan 2015

Trail Plan Map

Figure 8.2





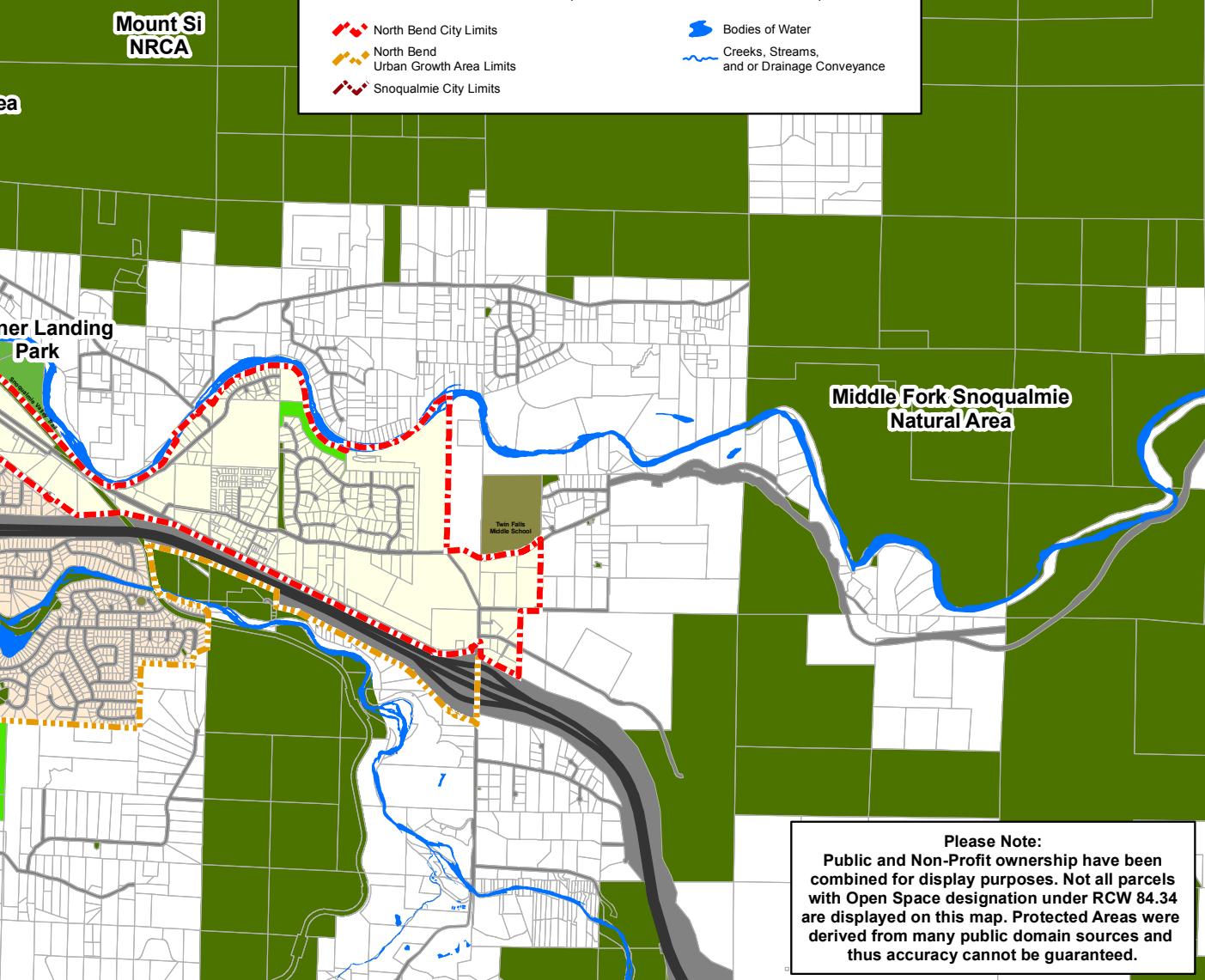


City of North Bend

Comprehensive Plan 2015

Protected Areas Map

Figure 8.3



Please Note:
Public and Non-Profit ownership have been
combined for display purposes. Not all parcels
with Open Space designation under RCW 84.34
are displayed on this map. Protected Areas were
derived from many public domain sources and
thus accuracy cannot be guaranteed.

North Bend Way. The 100-foot right-of-way runs from the western limits of the City to the Tanner Road/Tanner Mill site where it intersects with the King County Snoqualmie Valley Trail. The Northwest Railway Museum operates the historic tourist railroad in the summer and during the winter holiday season between Snoqualmie and North Bend. A pedestrian and bicycle trail runs parallel to the railroad tracks. This trail links downtown North Bend with residential areas, medical and social services and recreational river frontage. The Tanner Trail is paved and landscaped from East Park Street to Main Avenue North. The remainder of the trail surface is gravel.

Tollgate Farm: Tollgate Farm is a historic 410-acre farm and open space property owned by the City of North Bend and King County. All portions of Tollgate Farm located within the City limits of North Bend are owned by the city, with the remainder owned by King County. Tollgate Farm is adjacent to Meadowbrook Farm and preserves important agriculture, wildlife, open space, archeological and historic resources.

In 2001, the City and County purchased 380 acres of the 410-acre Tollgate Farm for public park, open space and natural area purposes. King County purchased 330 acres, of which 165 acres is located outside the North Bend UGA. An additional 40 acres, containing most of the central meadow portion of the farm, was purchased jointly by King County and the City of North Bend. The remaining ten (10) acres in the Central Meadow, containing the 100-year-old historic Tollgate Farmhouse, was purchased by the City of North Bend. In 2008, through the Intergovernmental Land Transfer Agreement, King County transferred the remaining 204 acres under their ownership that were located within the City limits to the City of North Bend.

Tollgate Farm Park, within the broader Tollgate Farm property, is a 49-acre park owned by the City of North Bend and managed by the Si View Metropolitan Park District, through an interlocal agreement with the City. The scenic agricultural pasture has unobstructed views of Mt. Si and the Cascade Mountains and is considered a local and regional icon. The park contains restrooms, a playground, picnic tables, and a loop trail surrounding 24-acres of grazing pasture.

Future development, consistent with the May 2004 Central Meadow Master Plan, will include multi use sport fields in the open space field in the far northwest corner of

the site. The 1904 Queen Anne farmhouse and immediate surrounding grounds are historically significant and provide an opportunity for interpretation and education related to some of the earliest Euro-American history in the upper Snoqualmie Valley. The 2004 Central Meadow Master Plan envisions that the farmstead would be used as public gathering space for community events in addition to supporting the agricultural operations of the cattle grazing. Ribary Creek, in the southeast corner of the site, is a wooded natural area. Re-vegetation efforts over the last several years by the City and the Mountains to Sound Greenway Trust have restored this area to a more natural condition, previously afflicted by invasive plant communities and cattle crossings. Restoration efforts will continue, as guided by the Central Meadow Master Plan.

The protected Tollgate Farm property includes approximately 2,400 feet of frontage along the South Fork of the Snoqualmie River with accompanying high quality fish and wildlife habitat values. There are another 900 feet of frontage along Ribary Creek and other smaller tributary streams to the South Fork of the Snoqualmie River. Tollgate Farm is part of a critical connecting link that provides a low-elevation wildlife corridor between the Kimball Creek wetlands, Rattlesnake Mountain and the Cedar River Watershed to the south and west and Three Forks Natural Area, Mount Si NRCA and the Hancock Timber lands to the north and east. A further analysis of the wildlife habitats and habitat values present on the farm can be found in the May 2004 Tollgate Farm Central Meadow Master Plan.

Torguson Park: This 17.3-acre facility is located adjacent to the North Bend Elementary School. The Park consists of six ball fields with bleachers and concession stand, a soccer field, restrooms, an 8,100 square foot skateboard park, picnic facilities, bike racks, informal BMX dirt bike track, tot lot, climbing tower, and a parking lot for 190 vehicles. The fields are used for league play, tournament play and sport camps. They are in use from mid-May through Thanksgiving. Torguson Park is a very popular and heavily used facility.

William Henry Taylor Park: This 1.0-acre park houses the North Bend Railroad Depot. The Depot was constructed in 1988. It serves as the eastern terminus for the Puget Sound and Snoqualmie Valley Historical Railway train, which runs in the summer and Christmas season between Snoqualmie and North Bend. Depot facilities include a

ticket office, meeting rooms, and restrooms. Parking is provided along McClellan Street. A landscaped lawn area with benches and picnic tables extends south from the Depot to adjoin senior citizen and multi-family housing developments. The Tanner Trail, including its only paved section, runs east-west through the park.

Dahlgren Family Park (future): As a part of the City's development regulations for the Tanner Landing Master Plan Overlay District (North Bend Municipal Code 18.10.025), upon development of a 21-acre property between SE North Bend Way and the Snoqualmie Valley Trail, the developer will be required to dedicate 2.5 acres to the City for a public park, and provide a public roadway connecting into King County's Tanner Landing Park immediately to the north. The park will serve as a neighborhood park to this area, as well as an extension of Tanner Landing Park.

Tanner Road Shoreline Park (future): A preliminary plat condition of the Segale Tanner Road subdivision on SE Tanner Road requires dedication of a 2.2 acre tract between SE Tanner Road and the Middle Fork Snoqualmie River to the City for a public shoreline access and open space park. The park is intended to remain largely undeveloped, aside from a trail to access the shoreline, picnic tables, and a restroom.

C.3 School District Facilities

Snoqualmie Valley School District #410 encompasses approximately 400 square miles in eastern King County and includes the cities of North Bend, Snoqualmie, and Fall City. Opstad Elementary, North Bend Elementary, and Two Rivers Alternative High School are within the North Bend city limits. Twin Falls Middle School is located just east of the City's Urban Growth Area on the Middle Fork Road. The Opstad and North Bend Elementary School sites include paved playground areas with equipment, tennis courts, and informal youth ball fields. The Two Rivers School has an adjacent large field containing two youth baseball fields. This field is also seasonally used for soccer practice by sports organizations. The only school district facilities that have been included in the City's parks inventory and level of service analysis are the baseball fields at Two Rivers School. This is because they are directly adjacent to a public street, readily accessible, and are of sufficient size for competitive youth games. No other school district facilities are counted toward the City's park and recreation inventory and level of service standards because they are located within school grounds,

are not built with typical facilities or dimensions, and are available to the public only after school hours.

C.4 City of Seattle Watershed

The City of Seattle owns the upper 90,546 acres of the Cedar River Watershed; this area serves as a major part of the City of Seattle's municipal water supply. The Watershed is located south and east of North Bend and is partially inside the Mount Baker-Snoqualmie National Forest.

Recreation opportunities are limited in the Cedar River Watershed. The main recreational area is at Rattlesnake Lake, located just five miles from downtown North Bend and near the edge of the City of Seattle's property. This area is open to the public for swimming, fishing and hiking; informal day-use facilities are provided. The Cedar River Watershed Education Center, located just above Rattlesnake Lake, includes an exhibit hall, heritage library, learning laboratories, and auditorium/meeting rooms (www.seattle.gov/util/crwecc). The remainder of the City of Seattle's watershed is off-limits to recreational users. King County's Snoqualmie Valley Trail commences near the lake, as does the John Wayne Trail.

C.5 Si View Metropolitan Parks District Facilities

Si View Community Center: A 10.7-acre site owned and operated by the Si View Metropolitan Parks District, Si View Community Center is located near downtown North Bend in an area of multifamily and single-family residential development. Developed facilities include a youth baseball field, an open field used for soccer and football, playground equipment, outdoor restrooms, and picnic tables. A historic log building houses a 15,000 square-foot indoor swimming pool, gymnasium/basketball court, and classrooms. Services offered in this facility include swimming lessons, lifeguard training, recreation classes, and a summer day camp program. Si View Community Center serves residents of the entire Snoqualmie Valley, and is also the site of the North Bend Farmers Market. www.siviewpark.org

Shamrock Park: Shamrock Park is a half-acre undeveloped mini-park owned and maintained by the Si View Metropolitan Parks District located on Healy Avenue across the street from the Si View Community Center. The park provides 200 feet of frontage on the South Fork Snoqualmie River. The Metropolitan Parks District also owns an additional parcel of land directly across the river from Shamrock Park, offering a future opportunity for a

pedestrian bridge at this location.

C.6 King County Areas and Facilities

Blue Hole: In 1998, King County acquired two properties for flood control purposes on the Middle Fork of the Snoqualmie River. These properties are adjacent to the "Blue Hole", a favorite local swimming hole, beach and river access point. Informal parking is provided at the end of 6th Street.

Middle Fork Snoqualmie Natural Area: This is a 645-acre area owned by King County, located about 5 miles east of North Bend within the Middle Fork Valley. As a natural area, the site is managed to protect natural systems, maintain and enhance wildlife habitat and corridors, preserve scenic areas, and provide for low-impact public recreation. King County and the Mountains to Sound Greenway Trust are developing significant public access improvements within this area, including trailheads, day-use sites and river access points.

Snoqualmie Valley Trail and Connections: The Snoqualmie Valley Trail, designated as a National Recreation Trail, is a 36-mile, gravel surface trail that follows an abandoned railroad right-of-way from Duvall to North Bend. The trail is designated for non-motorized use, and is primarily used for walking and bicycling. The trail passes through or is close to several key area destinations, including Meadowbrook Farm, Tollgate Farm, Three Forks Park, downtown North Bend, Torguson Park, Two Rivers Alternative School (trail parking available on the weekends), North Bend Elementary School, and the North Bend Library. The Snoqualmie Valley Trail ties into an unused railroad right-of-way that connects to the City's Tanner Trail, trails in the City of Snoqualmie, the John Wayne Trail at Rattlesnake Lake, and to much of King County's 300 mile regional trail system.

Three Forks Natural Area: The Three Forks Natural Area is a natural area owned by King County containing over 400 acres at the confluence of the North, Middle, and South Forks of the Snoqualmie River, about two miles north of downtown North Bend. It contains informal fishing trails, native habitat and wildlife areas. The area serves as a sanctuary and corridor for elk, black bear, deer, cougar, bobcats, river otters and eagles. Its riparian habitat provides sloughs and wetlands for many bird species, small mammals and amphibians. The Three Forks Natural Area provides a critical link in a wildlife

corridor connecting the large, protected wildlife habitat area of the Mount Si NRCA and the Hancock Timber lands in the north with wildlife habitat to the south including Meadowbrook Farm, Tollgate Farm, Rattlesnake Mountain Scenic Area and the City of Seattle Cedar River Watershed. Parking for river access is provided at the intersection of Reinig Road and 428th Ave. SE.

Tanner Landing: The Tanner Landing property is a 40 acre passive recreation site located on the south side of the Middle Fork of the Snoqualmie River, adjacent to the Snoqualmie Valley Trail and North Bend Urban Growth Area. The site was purchased by King County in 2003 to serve multiple purposes, including riverfront recreation access for the growing number of kayakers on the Middle Fork of the Snoqualmie River. The site is being developed to accommodate multiple passive and active recreation uses, subject to the environmental constraints associated with the waterfront location, including regular river flooding. Careful planning should be undertaken regarding the relationship of the adjacent Dahlgren property (between North Bend Way and the King County Trail) to Tanner Landing to ensure that future uses constructed on this site are compatible to the park uses as much as possible.

C.7 Joint Agency Areas and Facilities

Rattlesnake Mountain Area: Rattlesnake Mountain is located south of North Bend on the south side of Interstate 90. The public ownership of Rattlesnake Mountain, over 3,165 acres, lies almost exclusively on the northward side of the Mountain, facing I-90 and North Bend. In 1993, King County and the Washington Department of Natural Resources (DNR) jointly purchased approximately 1,800 acres. This area is managed by both agencies as the "Rattlesnake Mountain Scenic Area" under a management plan that has ecological protection as its top priority and low-impact recreation as a secondary priority.

In 1997, 1,100 acres on the western end of the Rattlesnake Mountain Scenic Area were purchased as a "working forest" using combined King County and federal Forest Legacy funds. No development will occur in this forestland area. The majority of this acreage is owned by DNR and managed as Trust Lands on behalf of King County. The remaining, protected land on Rattlesnake Mountain is owned by the U.S. Forest Service (USFS).

The Rattlesnake Mountain Trail is an 11-mile trail that

links Rattlesnake Lake to Snoqualmie Point. Future plans call for creating a trail that would link the Rattlesnake Mountain trail to the Tiger Mountain trail system. The south end of Rattlesnake Mountain connects to the Cedar River Watershed. Southwest of Rattlesnake Mountain is the 1,700-acre Taylor Mountain Forest, owned by King County Parks. Taylor Mountain provides a critical landscape connection between the Cedar River Watershed and Tiger Mountain, a 4,430-acre conservation area owned by DNR, and the City of Issaquah, with the surrounding lands being managed by DNR as state trust and forest land.

Snoqualmie Point Park: This vantage point for sweeping views of the region was slated for office park development. In 2000, the 130-acre site was purchased by the USFS. Ten acres, at the site of the former Snoqualmie Winery, is managed by the City of Snoqualmie as a public park, scenic viewpoint and event amphitheater. The USFS manages the remaining 120 acres for its forestland conservation values.

Currently, undeveloped land with wildlife habitat value is found on both sides of I-90 adjacent to Rattlesnake Mountain. There are a number of crossings that allow wildlife to pass under I-90 onto these undeveloped lands. Although there are large areas of publicly protected land on both sides of I-90, this important wildlife corridor is tenuous as many of the key habitat linkages remain in private ownership.

C.8 Washington State Areas and Facilities

John Wayne Pioneer Trail (aka Iron Horse Trail): Washington State Parks manages this cross-state trail that follows an abandoned railroad right-of-way from Rattlesnake Lake near North Bend, east across Washington State to the Idaho border. This non-motorized, level grade trail is ideal for mountain bikers, equestrians and hikers. Major local access points are found at Rattlesnake Lake (exit 32) and Ollalie State Park (exit 38). The Trail is connected to the Snoqualmie Valley Trail at Rattlesnake Lake. The John Wayne Trail also connects with the Pacific Crest Trail, running between the Canadian and Mexican borders, near Snoqualmie Pass.

Mount Si Natural Resources Conservation Area: This 20,753-acre conservation area owned by the Department of Natural Resources, showcases the 4,167 foot Mount Si. The extremely popular Mount Si trail is 4 miles long and has an elevation gain of 3,500 feet. The trailhead,

located about three miles from downtown North Bend off Mount Si Road, includes a picnic area, vault toilets, a handicapped accessible loop trail and a large parking area. The 2.5-mile Little Si trail, also off the Mt. Si Road, leads to the summit of Little Si (elevation gain of 1,250 feet). Future plans call for the development of a number of new trailheads and trails. Mountain bikes and equestrian uses are permitted on specified roads and trails. The Mount Si NRCA provides a sizable area of wildlife habitat. It is well known for its herd of mountain goats, which at times can be seen from roads at the base of the Mountain. The cliff faces of Mount Si are habitat for the threatened peregrine falcon and at least one nesting pair uses the area.

Middle Fork Snoqualmie Natural Resources

Conservation Area: This 10,828-acre conservation area owned by the Department of Natural Resources contains extensive lowland and montane forest areas along the Middle Fork Snoqualmie River, protecting wildlife habitat and scenic views, and providing low-impact recreation opportunities, including the Mailbox Peak and Granite Lakes trails, and several day use areas along the river.

Twin Falls Natural Area: This State Natural Area contains a 1.3-mile forested trail (each way), that runs along the South Fork of the Snoqualmie River and leads to a spectacular view of the upper and lower Twin Falls. The trail crosses the river between the two waterfalls on a 75-foot free-span bridge and continues on to connect with the John Wayne Trail. Interpretive signs describe the run-of-river subterranean power plant underneath Twin Falls. The trailhead is located off Exit 34 from I-90.

Ollalie State Park: The 520-acre Ollalie State Park is a day use park. A trail, suitable for young children, runs along the river. There is a fish weir at Weeks Falls with good viewpoints, interpretive signs describing the run-of-river power plant at Weeks Falls, fishing opportunities, and a 1/4-mile interpretive trail. Access and parking is provided off Exit 38 from Interstate 90.

C.9 Federal Lands

Mount Baker-Snoqualmie National Forest: The Mount Baker-Snoqualmie National Forest includes hundreds of thousands of acres east of North Bend and north and south of Snoqualmie Pass and includes over 200 miles of hiking trails, and 3 campgrounds within the Snoqualmie Pass and Middle Fork Snoqualmie River Valley areas. Alpine and Nordic ski entities lease property from the Forest Service at Snoqualmie Pass. The Nordic Center

offers over 55 kilometers of cross-country and snowshoe opportunities. There are numerous facilities for alpine skiers. For snowboarders, Snoqualmie Pass has several terrain parks and half-pipes. Wildlife habitat abounds on the national forest, with the full range of species typically dependant on old growth and successional forests. www.fs.usda.gov/mbs

C.10 Other Regional Areas and Facilities

Mountains-to-Sound Greenway: The Mountains-to-Sound Greenway concept originated with regional leaders in the summer of 1990. The concept is to connect and protect open space in a scenic greenway along Interstate 90. The Greenway runs from the shores of Puget Sound, over the Cascade Mountains, to the Kittitas Valley foothills, and incorporates both public and private lands. The Greenway will include continuous trail connections along mountain hillsides and ridgelines and link these with community trail networks and destinations. Major elements of the system include Cougar, Squak and Tiger Mountains; Lake Sammamish State Park; Meadowbrook and Tollgate Farms; Rattlesnake Mountain and Mount Si, along with lands protected by the U.S. Forest Service east of North Bend. www.mtsgreenway.org

Hancock Timber Lands: The Hancock Timber Company owns 104,000 acres of working forestland along the western edge of the Cascade Range just north of the Three Forks Natural Area. This land was previously known as the Weyerhaeuser Snoqualmie Tree Farm. It includes two major rivers (North Fork Snoqualmie and Tolt), numerous smaller rivers and streams, more than 500 acres of lakes and ponds, more than 6,000 acres of riparian areas, and 4,000 acres of wetlands. Recreation access is allowed via permit from Hancock Timber. www.hancockrecreationnw.com

Mount Si Golf Course: This 18-hole golf course lies within the city limits of Snoqualmie, off Meadowbrook Road. It is adjacent to the Meadowbrook Farm property, and is open to the public. Although largely an open area, the golf course does provide some wildlife habitat continuity along the South Fork with nearby Three Forks Natural Area and on Meadowbrook Farm. www.mtsigolf.com

Cascade Golf Course: This 9-hole golf course is also open to the public. It is located off 436th Avenue SE, just south of Interstate-90, and borders North Bend's urban growth area. www.cascadegolfcourse.com

Snoqualmie Falls: Snoqualmie Falls is reported to be the second largest tourist destination in the state (*Snoqualmie Valley Visitor's Guide*, 2000) drawing 1.2 million visitors a year. Snoqualmie Falls itself has a 268-foot drop, which is 100 feet higher than Niagara Falls. There is a trail to the base of the Falls that is open to the public.

Common Use Areas on Private Lands: North Bend has several informal park, recreation, and open space areas that, although not in public ownership, are used and/or recognized by North Bend area residents as important for recreation. These areas include dikes and selected riparian parcels along the South Fork and Middle Fork of the Snoqualmie River.

The left bank of the Middle Fork is diked intermittently from the "Blue Hole" (see King County areas and facilities) upstream to Mount Si Road. The South Fork of the Snoqualmie River is diked more extensively than the Middle Fork. Levees extend from Gardiner Weeks Park downstream on both banks to the Meadowbrook Trestle (the Snoqualmie Valley Trail extension), and upstream past Interstate 90. Many portions of these dikes are privately owned.

Along some reaches of the river, the public makes informal use of the dikes. In other areas, landowners prohibit access across the dikes. Dikes offer long-term river access and trail opportunities if the City, County and landowners can agree on access, management and public use.

D. PUBLIC INVOLVEMENT

D.1 Introduction

Citizen involvement in the development of this Element was accomplished through a variety of mechanisms, including review by the North Bend Parks Commission and Planning Commission (open public meetings), as well as through surveys and a Parks Workshop, as described below.

D.2 2012 Si View Metropolitan Parks District Survey

In 2012, the Si View Metropolitan Parks District ("Si View MPD") hired a consultant to conduct a Community Interest and Opinion Survey to help establish priorities for the future development of parks and recreation facilities, programs and services within the community. In addition to questions more specific to the Si View MPD's operations, the survey asked broader questions regarding

respondents level of satisfaction with park-related facilities, programs and services in the community, their level of need for various parks and recreation facilities, the importance of different types of parks and recreation facilities to their households, and actions they are most willing to fund with their tax dollars.

Of the 2000 surveys mailed to households within the service area, 403 were returned, providing a 95% level of confidence with a precision of at least +/- 4.9%. Because the MPD encompasses North Bend, the survey should be considered valid for determining park and recreation interests of residents of North Bend as well as the larger MPD service area.

Results indicated a strong preference of respondents for additional open space and trails, and a broader preference for more opportunities for passive forms of recreation over active forms of recreation. Primary results of the survey applicable to the City of North Bend's update to its Parks Element include the following:

- The top 5 (highest preference) outdoor park and recreational facilities identified as a need by respondents was walking and biking trails (77%) followed by natural areas/wildlife habitats (70%), large community parks (66%), outdoor fair/festival space (62%), and picnic shelters (59%).
- The bottom 5 (lowest preference) included baseball fields (18%), softball fields (14%), football fields (10%), pickle ball courts (9%), and lacrosse fields (5%).
- Additional questions identifying how well park and recreational facilities meet the needs of households and park and recreational facilities that are most important to households reflected the same general trends identified in the findings above.

D.3 2015 Parks Workshop

The Parks Commission held a Parks Workshop on June 24, 2015. The open house was attended by members of the general public, the Parks Commission, and representatives of the Si View Metropolitan Parks District. City staff presented a summary of the Parks Element and needed updates and a summary of the findings of the 2012 Si View MPD survey results and 2012 Statewide Recreation Survey results pertinent to the city's Parks Element update. Staff and the Parks Commission also provided display boards of each of the parks and the trail system within

the City of North Bend, seeking input of the attendees on their satisfaction with the condition of the existing parks and their preferences for potential improvements and additional facilities. Common feedback included strong support for additional trail development (particularly in providing trail linkages), constructing a spray park, and providing disc golf facilities at an existing large park or open space area.

D.4 2015 North Bend Parks Survey

The City of North Bend conducted a community survey in June and July of 2015 to obtain feedback on resident satisfaction with existing park facilities and need for additional facilities. A total of 184 survey responses were received, with 77% of respondents living within City limits. The survey results indicated that the City's parks are frequently used, with 52% of respondents visiting a City park at least once a week. The majority of respondents indicated that they primarily use parks for passive recreational activities (top 4 activities included 65% for time with family and friends, 64% for walking/running, 50% for relaxing, and 48% for walking the dog.)

For assessing park facility needs within the community and determining the adequacy of the existing parks levels of service, questions were asked regarding whether respondents felt there were enough of particular facilities, or needed additional. The majority of respondents felt there are currently enough softball fields, soccer fields and football fields, and neighborhood and community parks with children's play equipment. The majority however, expressed that North Bend needs more tennis courts and multiple recreation courts. The most significant desire expressed by survey participants was for more passive parks and wildlife corridors (which lands may include trails), with 60% of respondents stating that North Bend needs more of these areas.

The survey asked respondents to list any additional park facilities they would like to see in North Bend. The largest number of common responses was for additional trails (including biking and walking trails), followed by a splash park, off leash dog park, pool, additional passive open space, and covered picnic areas.

The survey also asked for specific comments, concerns or suggestions regarding the City's parks and open space. The largest number of common responses was for better maintenance and care at our existing parks, particularly with regard to replacing aging and dilapidated

equipment at EJ Roberts Park and Si View Neighborhood Park. Additional common comments included the need to better maintain landscaping within parks, and better/added restrooms within parks. The full results of the survey are available on file at the Community and Economic Development Office.

E. DEMAND AND NEEDS ASSESSMENT

E.1 Introduction

As highlighted in Section C, North Bend is near a significant number of regionally significant park, wildlife habitat, open space, and recreation areas. These areas serve important needs and benefit North Bend residents and the local economy. Continued growth in North Bend will require additional local parks and recreation facilities such as trails, sports fields, playgrounds, water access, and developed park areas. Following is a brief summary of current outdoor recreation trends in Washington State and North Bend. This is followed by the needs assessment for parks and recreation areas and facilities, wildlife habitat and open space.

E.2 Outdoor Recreation Trends

The Washington Recreation and Conservation Office keeps track of park and recreation trends over time. Its most recent analysis consists of the 2012 Washington State Comprehensive Outdoor Recreation Plan, prepared following the collection and analysis of significant data about recreational participation, expectations and needs from participants across the state. Key findings of the 2012 plan include that Washington residents participate most often in activities that are low-cost, less strenuous, and close to their homes. These activities include walking, hiking, jogging, nature activities and picnicking. It likewise found that residents are less likely to participate in activities that are more specialized, require more equipment, or that require extensive travel. A state-wide survey conducted for the plan, in comparison with earlier surveys conducted in 2002 and 2006, indicated increases in outdoor-related activities (such as firearms, fishing, horseback riding, and hiking) and relative declines in participation in team-based activities (such as soccer, baseball, basketball and football). The top three ranked activities from the 2012 statewide survey were (1) picnicking, barbequing, and cooking out, followed by (2) walking, and (3) wildlife viewing and photographing.

Relating to this, recreation professionals continue to emphasize the demand for greenbelt and linear recreation

areas, areas that accommodate high-participation activities (e.g. trails for walking and hiking), recreation sites in natural settings, water-related sites, including access to rivers and lakes, and recreation opportunities that are readily accessible and close-to-home.

The above cited recreational opinions and trends are very similar to those expressed by North Bend area residents through the public involvement mechanisms identified above. Given its geographic setting and natural resource amenities, North Bend is in an excellent position to satisfy these needs.

E.3 Parks and Recreation Needs Assessment

In the past, both the National Recreation and Park Association (NRPA) and the Recreation and Conservation Funding Board (formerly the Washington Interagency Committee for Outdoor Recreation) have provided level of service (LOS) guidelines for park and recreation facilities. Today, the general position being taken in the park and recreation field is that a community is better served by determining its own specific needs based on the input from the public, parks board members, and knowledgeable staff and other professionals. Recent input from area residents indicates that North Bend's parks and recreation facilities are generally considered to be adequate. The level of service standards provided below were developed based on input gathered in the public participation process for the 2002 update to the Parks Element. These standards were re-affirmed as appropriate to North Bend resident's priorities and interests through evaluation of the 2012 Si View Metropolitan Park District survey results and 2015 City Park Survey results.

A category called "Passive Parks and Wildlife Corridors" was created to address the high priority North Bend residents place on maintaining the rural character of their community and protecting the open space and natural areas within and surrounding it. This category is intended for passive recreational opportunities and facilities such as wildlife viewing areas, dog parks, usable but informal open fields, forested recreational areas and picnic areas, as well as corridors necessary for protecting the movement of significant wildlife through limited areas of the City. These areas are anticipated to contain trails linked to the City and regional trail system. Due to the acquisitions over the last decade of both Tollgate Farm and Meadowbrook Farm, North Bend will not need additional passive parklands during the duration of this

6-year Parks Element.

Outdoor youth field sports continue to be very popular in the North Bend community. The North Bend community consists of a relatively young population with a relatively high percentage of people being under the age of 18 years. City park staff, sports league directors and Park Commission members indicate that use of the existing fields is extremely high. Many fields are used interchangeably for softball, baseball and soccer. This means that the season for most field sports is of limited duration and that the need for both practices and games often create a scheduling problem.

In addition, according to the Snoqualmie Valley Youth Soccer Association and Snoqualmie Valley Little League, recent years have seen a significant shift in youth participation from standard soccer and baseball teams to participation on select sports teams. Select sports have a longer playing season and practice throughout much of the year, which creates additional need for field availability. This increases the demands for fields and the problems for scheduling, as the seasons for these select sports also now overlap considerably. The increased demand resulting from greater select sports team use suggests the need for additional facilities, but also suggests a greater responsibility by the sports leagues in funding the construction of such facilities. If more fields were available, a larger number of young people and adults would likely become involved in team sports in North Bend. More fields would allow more teams to play at the same time, allow longer playing seasons, and reduce the need for teams, especially adults, to travel to facilities outside of North Bend.

The City of North Bend will continue to track the growth

of the community and stay current on resident's views on parks and recreation facilities to ensure that adequate areas and facilities are being provided.

TABLE 3: NORTH BEND PARK AND RECREATION FACILITY INVENTORY (USED TO HELP DETERMINE THE LEVEL OF SERVICE STANDARDS)

FACILITY TYPE	PARK OR AREA WITH FACILITY	TOTAL NUMBER	NOTES
Playground	E.J. Roberts; Si View Comm. Center (2); Si View Neighborhood Pk (2); Torguson Park	6	No service standards exist for playgrounds.
Baseball/Softball Fields	Torguson (6); Si View Community Center (1); Two Rivers School Fields (2)	9	Si View Community Center and Torguson ballfields are also lined out for soccer fields later in season. Two Rivers fields counted because they are open and unfenced, not associated with school grounds.
Soccer Fields	Si View Community Center (1); Torguson (1)	2	Si View C.C. field is for 14+ years; Torguson ballfields are also lined out for soccer fields later in season.
Football Fields	Si View Community Center (1)	1	Si View C.C. field sometimes used for football.
Outdoor Basketball Courts	Si View Community Center; E.J. Roberts; Si View Subdivision Park (1/2 court)	2.5	Si View subdivision court is part of multi-purpose court.
Tennis Courts	E.J. Roberts (2);	2	
Multi-purpose Recreational Court (adjustable net for volleyball/pickleball)		0	
Recreation Center	Si View Community Center	1	Regional use facility.
Golf Courses	Mi. Si (18-hole); Cascade (9-hole)	2	Both courses are open to the public, and are regional use facilities (Mt. Si course included as it is directly adjacent to City limits and is a regional use facility).
Pool - Indoor	Si View Comm Center (15,000 sq. feet)	1	Regional use facility.
Neighborhood and Community Parks	E.J. Roberts (4.9 ac); Torguson (17.3 ac); Gardner Weeks (3.3 ac); Si View Community Center (10.7 ac); Si View Neighborhood Park (13.2 ac), Tannerwood Park (0.8 ac). (Tollgate Farm Park classified below)	6 parks, 50.2 ac total	There are 5 existing, developed parks that are over 3 acres in size
Passive Parks and Wildlife Corridors (including trails within these areas)	Meadowbrook Farm (204 ac); Tollgate Farm (215 ac); Riverfront Park (26.8 ac); Si View Levee Trail (4.4 ac); Snoqualmie Valley Trail (49 ac); Tanner Landing Park (40 ac, outside UGA, but immediately adjacent and therefore included)	4 parks, 539 ac. total	Meadowbrook has 255 more acres in Snoq. City limits. Tollgate has 165 more acres outside UGA. Other popular regional parks include Mt Si, Ollalie, Rattlesnake Lake, 3 Forks Park, & others near North Bend.

TABLE 4: PARKS AND RECREATION LEVEL OF SERVICE STANDARDS

Facility/Activity	North Bend Standard	2015 Current Supply	2014 Need (6,578)	2021 Need (9,601)	2035 Need (14,401)
Baseball/Softball Field	1 per 1,000	9	0		5
Soccer Field	1 per 2,000	2	1	2	5
Tennis Courts	1 per 2,000	2	1	2	5
Basketball Court (outdoor)	1 per 2,500	2.5	0	2	3
Multiple Recreation Court (adjustable net for volleyball/pickleball)	1 per 4,000	0	1	2	3
Golf (9-hole)	1 per 25,000	1	0	0	0
Golf (18-hole)	1 per 35,000	1	0	0	0
Pool (indoor)	1 per 11,000	1	0	0	0
Football Field (youth)	1 per 5,000	1	0	0	2
Neighborhood and Community Parks with childrens play equipment	1 Park (3+ ac) /1,500 plus 4 ac land/1,000;	5 parks and 50 acres	0	1 park and 0 acres	4 parks and 7 acres
Passive Parks and Wildlife Corridors (trails may be located in these areas)	40 acres per 1,000	539 acres (b)	0	0	37 acres

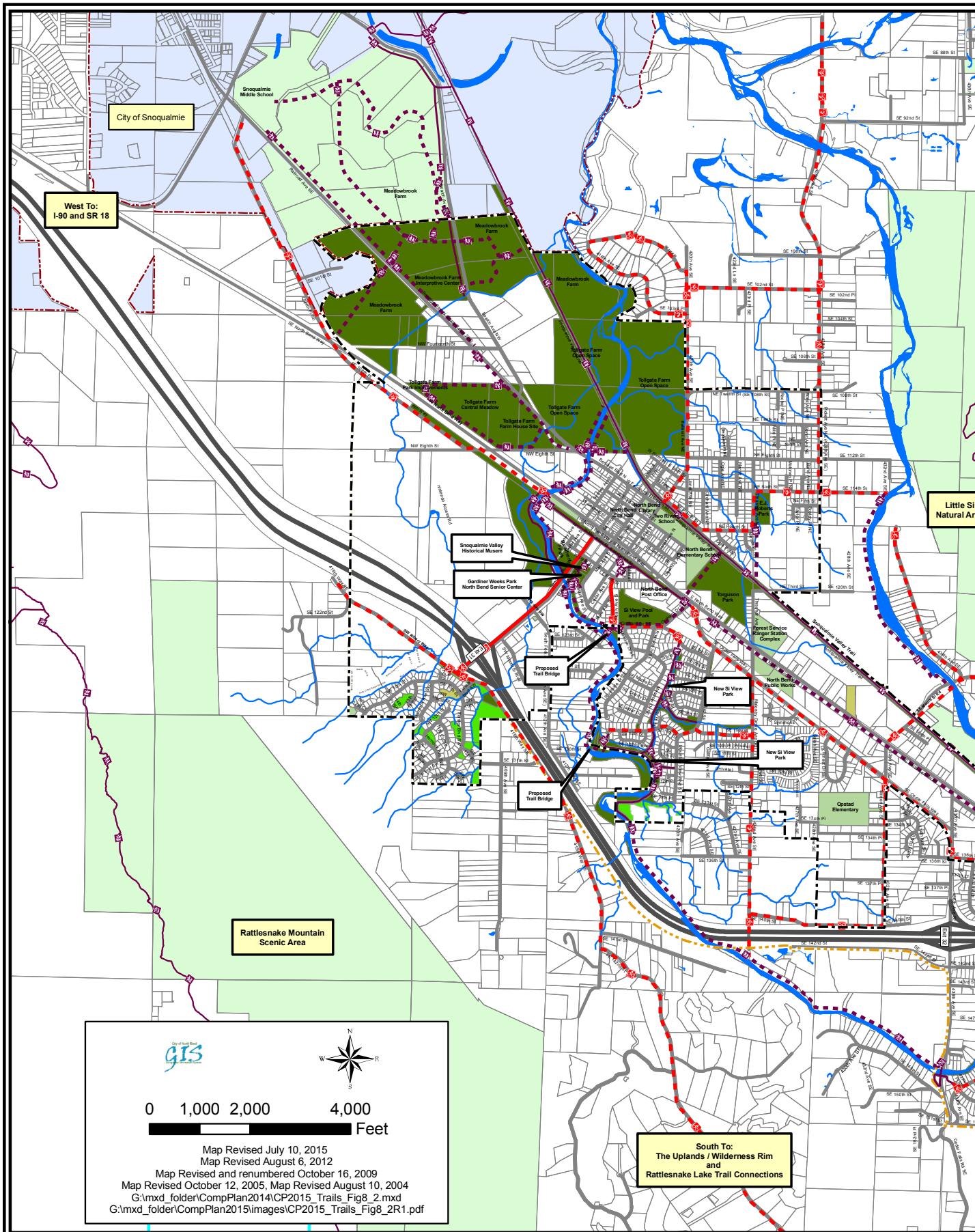
(a) Neighborhood and Community park standards combined; (b) Tollgate and Meadowbrook Farms have additional acreage outside the Urban Growth Boundary.

E.4 Trails System Needs Assessment

The North Bend community has exceptional opportunities to tie in to hundreds of miles of county, state and federal trails. Public input consistently requests additional trail opportunities, particularly for walking and bicycling, as demonstrated through the 2012 Si View MPD Survey. This survey indicated that trails are, by far, the park and recreation facility most important to local residents, and the facility that residents wish to see more construction of. This was echoed in the 2015 City Parks Survey, where respondents indicated the greatest use of parks was for walking/running, and the greatest need was for open space areas (including trails). As a result of these findings, a number of trail projects have been placed on the 6-year Parks Capital Facilities Plan. In addition to City construction projects, significant additional trail opportunities can be met by developing and/or signing existing trails found along the public roads, on dikes, and on publicly owned, abandoned railroad rights-of-way. Please refer to the Trail Plan Map, [Figure 8-2](#).

Proposed improvements and/or new trails within and adjacent to the North Bend UGA include the river levees on the South and Middle Forks of the Snoqualmie River. Future trail surfacing is envisioned to be gravel, with paving in higher-use areas. Many of the trails along the levees are in private ownership. Opening these areas for public use would require negotiating easements or acquiring property.

In 2009, the City adopted updated Residential Recreation and Common Space standards that included trail requirements pertaining to new residential development. The regulations require that new residential developments of 5 or more units provide connections to existing adjacent trails, and provide construction of new trails when a future trail corridor, as identified on the Trail Plan Map of this Element, is located on the property. These regulations will enable the



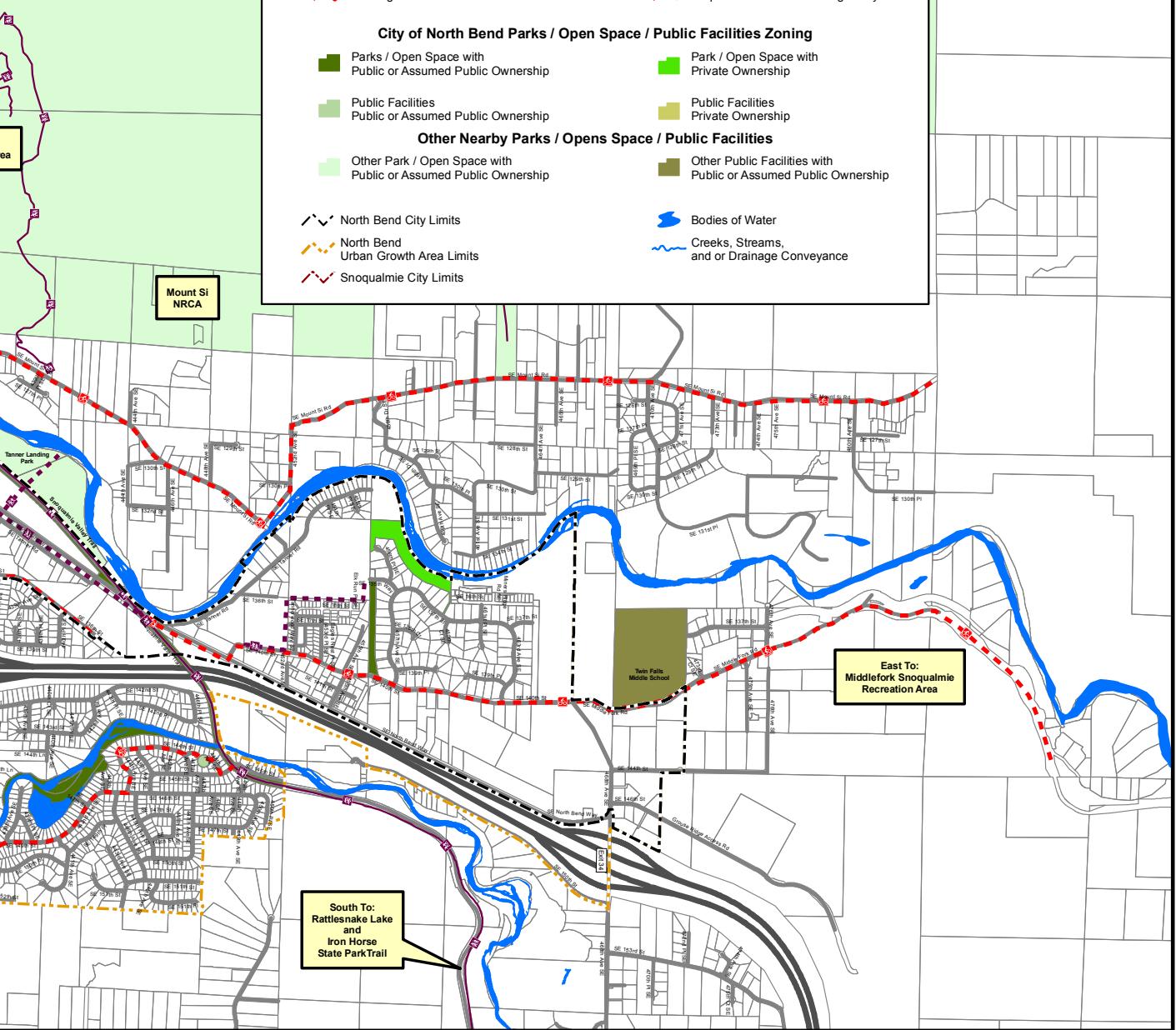
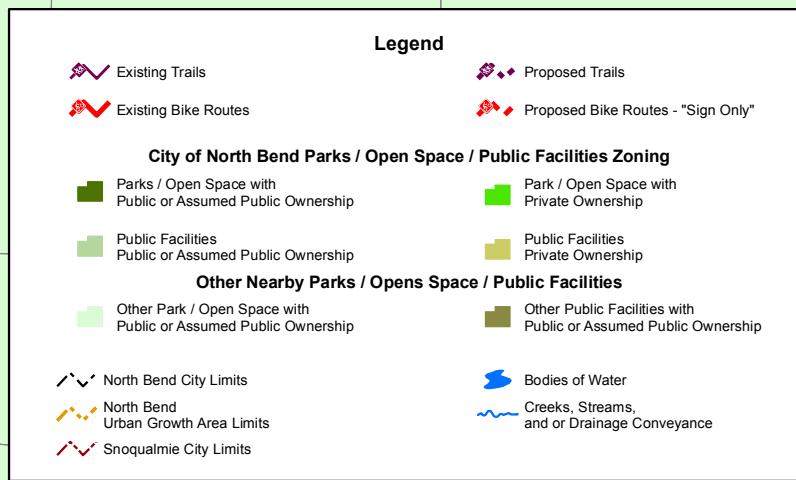


City of North Bend

Comprehensive Plan 2015

Trail Plan Map

Figure 8.2



growth of the North Bend Trail System as development occurs. Focus for City efforts therefore shifts to public property and in filling in gaps where new development will not be providing construction of the trail system, such as through easements on property that has already been developed. The City should actively pursue bridging “missing links” of the trail system wherever possible.

E.5 Wildlife Habitat Needs Assessment

Stunning natural beauty and significant wildlife habitat surrounds North Bend. The City is near a confluence of the three forks of the Snoqualmie River, and two of the forks are within and adjoin the UGA. These river corridors provide rich wildlife habitat and species diversity, as described in the wildlife habitat section above. Additionally, large blocks of protected land important for wildlife surround the North Bend community; these blocks include hundreds of thousands of acres. Where possible, riparian habitat should be protected, restored and enhanced to provide more effective wildlife cover. Enhancement of stream vegetation will also positively benefit fish species in the river. Protection of significant undeveloped land along the river would contribute important habitat to wildlife species that use the river corridor. Significant opportunities exist to enhance the riparian shoreline habitats, as identified in the *Shoreline Restoration Plan for the City of North Bend's Shorelines: South Fork and Middle Fork Snoqualmie River*, October 2011.

One of the last remaining and viable, west side, low-elevation terrestrial wildlife corridors across Igo and the developed areas of the upper Snoqualmie Valley is located between Rattlesnake Mountain, Three Forks Natural Area and Mount Si NRCA, consisting primarily of Tollgate and Meadowbrook Farms. The main components of this wildlife corridor are in place, as can be seen on the Protected Areas map in Figure 8.3. Strategic protection of appropriate lands connecting these habitats will provide a permanent corridor for the passage of many species of wildlife from south to north and east to west. It would also provide a rich wildlife experience for the citizens of North Bend and Snoqualmie that would not entail driving long distances.

E.6 Open Space Needs Assessment

The highest need for more facilities indicated in the 2015 Parks Survey was for additional passive parks and wildlife/trail corridors, generally referred to as open space. Open space means many things to many people. For the purpose of this Element, open space includes

protected parks, greenway and trail corridors, wildlife habitat, wetland, river, stream, lake and riparian areas and corridors, and publicly-owned farm and forest lands. Sites such as Tollgate Farm and Meadowbrook Farm provide a variety of open space functions, including wildlife habitat, viewshed protection, farmland, forestland, wetland and riparian areas, and parkland.

One of the City's mission statements, consistently ranked as one of residents' highest priorities for North Bend, is to preserve the rural character of the community. A significant means to accomplish this key goal is to protect open spaces in the community and surrounding area through the provision of passive parks and wildlife habitat areas. Many of the goals and policies in the Comprehensive Plan relate to the protection of open space to help retain the City's rural character and uniqueness.

To reach its open space protection goals, North Bend should encourage King County and the Department of Natural Resources to purchase additional strategic properties along the river and adjacent to existing protected areas, such as the Three Forks Natural Area, Mount Si, Rattlesnake Mountain, and the Middle Fork of the Snoqualmie Natural Area.

G. IMPLEMENTATION METHODS

Three general implementation methods can be utilized to meet selected actions of the Parks Element: non-regulatory, regulatory, and taxation. Municipalities are empowered to exercise any one or a combination of these under Washington State law. In seeking to implement Plan actions, North Bend could utilize a variety of these methods as well as other general authorities.

Non-regulatory approaches include purchase of lands in fee-simple (outright purchase, purchase of less than fee-simple interest (easements or development rights) and private sector initiatives like nonprofit land trusts that preserve and steward lands. Acquisition moneys can be raised or received from a number of sources, including bonds, revenue sharing, grants, impact fees and other taxes. Non-regulatory techniques are the most expensive to implement in the short-term but also provide long-term protection of land parcels, including public access and management capabilities. North Bend could seek conservation funds from county, state and federal sources.

F. GOALS AND POLICIES

Parks Element - Goal 1: Preserve and enhance the visual and physical accessibility of significant natural resources having scenic and public recreational value.

Policies:

- PE 1.1 Integrate a balance of passive and active park and wildlife habitat areas throughout the City designed to serve the needs of all segments of the population.*
- PE 1.2 Incorporate elements of open space, parks and street trees into all City-sponsored projects in order to help create visual unity for the downtown and its neighborhoods.*
- PE 1.3 Ensure that organized open space is a part of all residential project designs.*
- PE 1.4 Ensure the historic, ecological, social, agricultural and recreational values of Tollgate Farm and Meadowbrook Farm are appropriately protected and enhanced through the implementation of the plans developed for those Parks.*

Goal 2: Enhance North Bend's river shoreline recreation values by creating a natural linked greenway system.

Policies:

- PE 2.1 Acquire or obtain access rights, dedications, and easements to riverfront parcels, including levees and dikes, as available, and develop and enhance such access for the public benefit and enjoyment of the shoreline.*

Goal 2: Enhance North Bend's river shoreline recreation values by creating a natural linked greenway system.

Policies:

- PE 2.1 Acquire or obtain access rights, dedications, and easements to riverfront parcels, including levees and dikes, as available, and develop and enhance such access for the public benefit and enjoyment of the shoreline.*

Parks Element - Goal 3: Provide for active and passive recreation and wildlife habitat areas necessary to serve increases in population and development and maintain design and landscape standards for public and private projects to enhance the livability of the City.

Policies:

PE 3.1 Require that all new development projects contribute to public open space improvements either on- or off-site as identified in the adopted Parks Element.

Establish park, recreation, wildlife habitat and open space standards for residential development, including on-site and/or off-site dedication requirements, and adopt them in land use codes. Such standards should require that all new single-family and multi-family developments provide a minimum percentage, to be determined, of net site area for appropriate park, recreation, wildlife habitat and open space areas and improvements. Standards should address the percentage required for both passive and active uses. Net site area shall be exclusive of street/utility rights of way, setbacks, parking areas, and utility facilities, including but not limited to storm, water, or sewer.

PE 3.2 Evaluate public acquisition of private open spaces as opportunity and funding is available, and pursue the concept of tax incentives for privately held open space.

Pursue protection of strategic open space properties by using a variety of protection methods. Methods should include non-regulatory methods (e.g. fee-simple purchase, conservation easements, donations, purchase and leaseback, etc.); regulatory methods (e.g. limited development, land dedication, site design, cluster design, impact-fees); and incentive approaches (e.g. current use taxation; transfer of development rights, land-transfers; user fees).

The City and its partners should pursue grants and other outside funding to enable proactive resource protection and development. Continue to implement an impact fee system for new development that provides for acquisition and development of new parks, recreation, and wildlife habitat areas and facilities.

PE 3.3 Meet annually with the Si View Metropolitan Parks District, City of Snoqualmie and County Parks Boards to discuss common park planning and recreation interests, goals and policies, and to ensure coordinated and interconnected parks and trails.

PE 3.4 Coordinate with the Si View Metropolitan Parks District, sports organizations, and other recreation providers to maximize efficiency in the management of park and open space resources and provision of recreation opportunities.

PE 3.5 Use sensitive area lands when appropriate as part of a network of an interconnected open space, parks and trail system.

PE 3.6 Establish a pedestrian and bicycle network connected to a greenway system which links commercial areas, neighborhoods, parks and public lands and facilities, and regional trails.

Prioritize funding to implement the Trail Plan Map shown in Exhibit 3. As funding and

opportunities permit, protect critical trail linkages and design, construct and/or enhance trail segments identified in the Trails Plan.

Develop links between off-road and on-road pedestrian and bicycle facilities to provide an interconnecting system of trails.

Design portions of the trail system to accommodate a variety of non-motorized users, including pedestrians, road and mountain bicycles, equestrians, rollerblades, wheelchair users, strollers and others, recognizing that not all trails will accommodate all users.

Create and implement development regulations that require that all new development provide connections, or payments in lieu, to the City's bicycle/walkway trails system.

Create and implement development regulations that require that new residential developments provide for construction of new trails as identified on the Trail Plan Map as a part of the development's recreational and common space requirements.

Pursue obtaining trail easements from owners of existing developed lots located within trail corridors identified on the Trail Plan Map for construction of missing trail linkages.

Promote separated walkways and bikeways within new residential developments that can be linked to existing or proposed trails or walkways.

Parks Element - Goal 5: Encourage public participation as a key component of all future planning activities, which help implement the Parks and Open Space Element.

Policies:

PE 5.1 Provide regular information on City parks' activities and issues.

PE 5.2 Establish a trails work group (including representatives from city staff, the Parks Commission, Planning Comission, Council, and others as appropriate) to develop timelines and strategies for the development of the highest priority trail facilities from the 6-year Park Capital Facilities Plan. Report to the City Council as to their progress, including identification of barriers to their development, and recommendations to address these barriers.

PE 5.3 Develop a parks and recreation resident survey to foster communication about park development, programs and activities and solicit input from residents, including students, young adults, family households and seniors.

a. Every five years, survey area residents to get input on parks, recreation, and wildlife habitat needs.

PE 5.4 Seek local service organizations and clubs to sponsor, assist, develop and maintain the City's park facilities through an adopt-a-park program.

Parks Element - Goal 6: Protect, conserve and enhance the historic and cultural heritage of North Bend.

Policies:

PE 6.1 Coordinate and cooperate with local, state and national historic and cultural preservation organizations in order to promote historic and cultural preservation within the City.

Develop an interpretive kiosk or signs for key sites, including South Fork area, old Tanner Mill site, Tollgate Farm, and other points of scenic and historic interest in order to enhance visitor experience and promote the City's built and natural history

Support the location of the Snoqualmie Valley Historical Museum within Gardiner-Weeks Park as an appropriate use of the park site and a beneficial location for both the Museum and the residents of North Bend.

PE 6.2 Work with the Snoqualmie Tribe to preserve significant cultural and historic sites.

PE 6.3 Promote a mutually supportive relationship between historic and cultural preservation and economic development.

PE 6.4 Incorporate the preservation of sites and structures of historic, cultural, and archeological significance as a part of the aesthetic and environmental consideration in site design and subdivision plan reviews.

Regulatory techniques include planning, zoning (including innovative techniques like cluster zoning), subdivision regulations and environmental regulations. Regulatory approaches include actions that protect habitat in critical areas, such as establishing wetland and stream buffers, and actions that protect against development that may pose a threat to human health and safety, such as the prohibition on new residential or commercial structures within the floodway. Regulatory techniques include requirements for subdivisions to dedicate areas within the development for parks and open space. Unless tied to dedication for public purposes, regulatory techniques do not provide for management capability or opportunity for public access to sites.

Taxation techniques are often linked with non-regulatory approaches. For example, taxes can be raised by government to fund land acquisition or other capital-improvements. Both King County and the State have programs to fund open space and recreation land

purchases for which North Bend is eligible to apply. North Bend has two real-estate excise taxes on the sale of property that are dedicated to a capital improvement fund that can be allocated to a variety of City capital expenditures, including streets, public works projects, and parks. North Bend has also established a park-impact fee that requires dedicated payments by new growth to pay its fair-share costs of demand for new park and recreation sites. This fee was established in 1994. Taxation can also be utilized as an incentive to conserve lands. For example, lands left in open space can receive reduced or current-use assessments which may alleviate a demand to sell or develop them. Likewise, donating lands for conservation purposes or selling them at reduced prices can provide tax benefits.

H: 20-YEAR CAPITAL FACILITIES PROGRAM

Parks Element - Goal 7: Protect and enhance wildlife habitat areas within the City and its Urban Growth Area.

Policies:

PE 7.1 *Protect and enhance important wildlife corridors within North Bend and its Urban Growth Area, in coordination with the state and county, to create a network of wildlife corridors which link habitat areas together to encourage the natural movement of plant and animal species. Focus habitat protection efforts on areas that: include a diversity of habitat types, enhance the value of existing protected areas, or have been identified by the City and King County as critical areas.*

a. *Encourage protection of habitat corridors along the South and Middle Forks of the Snoqualmie River and adjacent streams to facilitate the movement of wildlife and maintain suitable fish and wildlife habitat.*

b. *Encourage private and public organizations to help complete the wildlife corridor between the Protected Areas shown on Exhibit 8-3.*

PE 7.2 Establish development performance standards that limit site clearing to minimize adverse impacts to native habitats.

PE 7.3 Encourage community involvement and education in the creation, enhancement, management, interpretation and enjoyment of wildlife habitat areas.

PE 7.4 Encourage access to sites of wildlife interest when not in conflict with wildlife protection goals.

H.1 Overview

The recommended 20-Year Parks Capital Facilities Program has been developed by staff and the North Bend Parks Commission in consideration of the level of service standards identified in this plan and in consideration of the public input provided to the Parks Element update process, including evaluation of recreation trends, survey information, and the public workshop. A 6-Year Parks Capital Facilities Plan developed from selected projects below, including anticipated revenue sources, follows in section I.

H.2 Project Descriptions

Park Signage Improvements: New entry signs will be constructed at the City's parks to replace existing deteriorated signs, of a common design to provide consistent, recognizable and attractive messaging to park

users. Additionally, orientation signs will be provided within larger parks to identify key park features. Estimate \$20,000.

Downtown Civic Plaza: A public plaza, associated with the proposed City Hall and Civic Center in the downtown core, will provide space for public events such as art walks, farmer's markets, and outdoor concerts. Estimate \$500,000.

Torguson Park Landscaping w/ Picnic Tables: To compliment the recreational fields, supplemental landscaping will be provided to enhance/beautify the park. Areas to be landscaped include around the soccer field, the tot-lot area, the climbing structure area, in and around the parking lot, and along the Snoqualmie Valley Trail. In areas of lawn or along trails, picnic tables will be provided. Estimate \$35,000.

Torguson Park Backstops and Training Area: The backstops and fencing for the 5 most westerly ball fields needs to be replaced and larger canopies placed over the home plate. Training areas would also be added around the baseball fields consisting of batting and pitching cages of a more permanent nature, including fencing and netting. Estimate \$114,260.

Torguson Park New Restroom and Concession Building: A new restroom and concession building should be built within the center of the four western quad fields to enable easier restroom access for ballfield users. Estimate \$233,500.

Torguson Park Trails: A multi-purpose loop trail is to be constructed through the park, providing connection to the Snoqualmie Valley Trail and the various entrances to the park, consistent with the layout established in the 2010 Torguson Park Master Plan. The trail is to be constructed of asphalt to allow the use of bicycles, strollers, wheelchairs, etc. Estimate \$113,000.

Torguson Park Plaza and Sidewalk Improvements: At the northern end of the parking lot, a concrete or brick paver plaza area should be provided, with concrete sidewalks connecting to the restroom building, parking lot, tot lot and the proposed picnic shelter, consistent with the conceptual design in the 2010 Torguson Park Master Plan. Estimate \$60,000.

Torguson Park Turf Improvements: The existing westerly five fields are to be refurbished and upgraded to a sand base to eliminate trip hazards and uneven surfaces through stripping, re-grading, re-seeding, etc. and the fields installed with irrigation and drainage systems. Estimate \$2,120,450.

Torguson Park Southwest Entry and BMX Park Improvements: The southwest pedestrian entrance to Torguson Park should be improved to coordinate with the adjacent private development, including landscaping and pathway improvements, and reconfigured and improved BMX park. The BMX park should be improved with viewing/seating areas, more durable and stable ramp supports, improved drainage, and water and power connections for maintenance and repair of the track. A small lockable tool shed should be provided for BMX park volunteers. The BMX park should be expanded to the east to provide a junior course separate from a more

advanced course. Cost estimate \$50,000. Volunteer labor is anticipated for much of the BMX project work.

Torguson Park Entry-Area Acquisition: The property bordering the western boundary of the primary vehicular entrance to Torguson Park should be acquired for a more visible entry to the park, as well as to provide expanded park entrance features, landscaping and parking. Acquisition \$300,000. Development cost estimate not yet determined.

Torguson Park Skate Park Improvements: The existing skate park is a popular and heavily used facility, and should be expanded or improved with additional features and facilities to accommodate increased usage from new growth. Cost estimate not yet determined.

Torguson Park Maintenance Building: A new maintenance building is needed to replace the maintenance building destroyed by the 2014 explosion of the adjacent commercial building on North Bend Way, and to provide much needed space for park maintenance equipment and supplies. Estimate \$100,000.

Torguson Park Boundary Line Adjustment for Minor Park Expansion: Les Schwab has agreed to donate property at the northwest corner of their site to the City for a minor expansion of Torguson Park, which will enable a direct connection of the BMX area of Torguson Park to a new pedestrian connection from North Bend Way (via a trail connection through the adjacent development.) A boundary line adjustment is necessary to add this area to Torguson Park. Estimate \$3,000.

E.J. Roberts Park Bridge: A new pedestrian bridge is needed to replace the existing bridge, which has deteriorated beyond the ability to provide repairs. Estimate \$75,000.

E.J. Roberts Park Picnic Shelter: A picnic shelter is needed for this popular park for group picnic events. Estimate \$35,000.

EJ Roberts Park Playground Replacement: New playground equipment should be installed at EJ Roberts Park to replace the old and deteriorated play equipment currently at the park. Estimate \$60,000.

Si View Neighborhood Park Play Equipment Replacement: The existing play equipment at this park is old and in deteriorating condition and should be replaced

with new equipment, together with new soft surface area borders. Estimate \$60,000.

Tanner Trail Phase 2 and 3 Right-of-Way Acquisition:

Tanner Trail, Phase 1 was constructed in 2002 and begins at Bendigo Blvd, proceeds along the abandoned BN Railroad right-of-way, and terminates at Orchard Street. Additional BNRR right-of-way is available out to 436th Avenue SE for further extension of the trail system and interconnection with the Snoqualmie Valley Trail. This will complete the preservation of the proposed trail system through the southerly portion of the city with links to regional facilities. This system will also provide for the pedestrian needs along the south side of North Bend Way in lieu of requiring a sidewalk next to or close to the street on that side. Estimate \$4,150,000 (majority of funding anticipated through grants).

Tanner Trail Construction: A paved or gravel trail will be constructed within the Tanner Trail right-of-way adjacent to North Bend Way, described above. Estimate \$400,000 (based on gravel).

Tanner Trail / Snoqualmie Valley Trail Junction

Improvements: The junction of the Snoqualmie Valley Trail, Tanner Trail, and North Bend Way is an important junction for both local and regional trail users and is also an important corridor for elk and other wildlife crossing under I-90 at this location. Improvements would be made to make the Snoqualmie Valley Trail crossing of North Bend Way more visible and safe for pedestrians and motorists. A small parking lot would be built for trail users with formalized trailheads to the Snoqualmie Valley Trail and Tanner Trail. Native landscape improvements would be provided to enhance wildlife cover for the crossing area. The project is anticipated as a joint city/King County project. Additional planning and coordination with King County needs to be done and a site plan developed with cost estimates before this facility can be formally placed in the capital facilities plan. Cost estimate not yet determined.

Dahlgren Family Park:

Upon dedication to the City, the 2.5-acre park to be dedicated through the Tanner Landing Master Plan Overlay District Regulations in NBMC 18.10.025 should be developed with park and picnic facilities. Park facilities should be designed consistent with that provided by King County in the adjacent Tanner Landing Park such that the two adjacent parks work as one cohesive whole. Estimate

\$1,000,000.

Tollgate Farmhouse Restoration: Purchased as part of the Tollgate Farm, the farmhouse is in need of repair and restoration. In 2003, a restoration plan was developed by Tonkin Hoyne Architects. The first item to be addressed was the sealing of a large hole in the roof and subsequent re-roofing of the entire structure. This prevented water from entering through the top of the house. However, additional exterior improvements are needed to keep the structure sound. These include reconstructing the foundation, repairing the outside, painting the exterior, and installing windows and secure doors. Further phases include interior reconstruction and exterior entry improvements. Estimate \$250,000.

Tollgate Farm Phase 2 Improvements - Athletic Fields, Parking, Landscaping: Per the Tollgate Master Plan, the athletic fields would be graded and constructed at the west end of the central meadow. Work would include necessary backstops, fencing, ground preparation, seeding, irrigation, drainage and bleachers. Additionally, the heirloom apple trees along North Bend Way would be restored through proper pruning, thinning, fencing for protection, and clearing of the areas around the trees. Estimate \$1,500,000.

Tollgate Water & Sewer Extensions/Connections:

To serve the expanded use of Tollgate Farm upon development of the Phase 2 Improvements, water and sewer mains and services need to be extended to the site. The extension would proceed under the railroad tracks and under West North Bend Way to the Tollgate site. The main would then proceed east along West North Bend Way and tie into the existing main at the intersection of West North Bend Way/Sydney Avenue. Sewer would be extended from the main to be installed on NW 8th Street and then proceeding along West North Bend Way to the site of the bathrooms at the Tollgate athletic fields. The utility extensions are anticipated to occur through a ULID for both water and sewer, formed to assist in financing the facilities in the general area with other contributing property owners. Estimate \$400,000.

Tollgate Farmstead Improvements: The Tollgate Farm Master Plan anticipates the area around the Tollgate Farmhouse as an interpretive and multi-use farmstead area that can be used as a venue for activities and events such as the North Bend Farmers Market, weddings and other small-scale outdoor gatherings. The site is also

anticipated for a pea-patch garden and/or demonstration garden and a small interpretive apple orchard. Additional facility planning and a site plan with cost estimates needs to be developed before this can be formally added to the 6-year Capital Facilities Plan.

Tollgate Farm to Downtown Trail: From the west end of the West North Bend Way bridge over the South Fork Snoqualmie River, along West North Bend Way, and then to the driveway entrance to the parking lot, with an intermediate connection to the on-site trail, a sidewalk would be extended for pedestrian access from downtown to the farm/athletic fields. Work would include approximately 3,300 linear feet of curb, gutter, landscape strip, street trees, and 8-foot wide concrete sidewalk for the entire length of the improvement. Estimate \$350,000.

Meadowbrook Farm Trail, Phase 2 Snoqualmie Valley Trail Connector: A trail would be constructed east across Meadowbrook Farm from the Meadowbrook Farm Interpretive Center building and Boalch Avenue Trail to the Snoqualmie Valley Trail. The trail would provide connectivity of the interpretive center to the heavily used Snoqualmie Trail, and would allow fieldtrips and groups at the Interpretive Center access to the trail to the big cedar, located east of the Snoqualmie Valley Trail. Estimate \$210,000.

Meadowbrook Farm to Tollgate Farm Connector Trail: A trail would be constructed from the Interpretive Center west across SR-202 connecting through the forest preserve area of Meadowbrook Farm west to North Bend Way, then south within the right-of-way of North Bend Way to connect to the trail system within Tollgate Farm Park. Estimate \$150,000.

Meadowbrook Farm Disc Golf Course: Facilities for a disc golf course would be constructed along the Dike Road fields (east of Boalch Ave.) at Meadowbrook Farm, consisting of 18 anchored removable poles with disc golf chain target/baskets, and minor signage identifying the course. Regular mowing needs for the course would need to be arranged prior to installation. Estimate \$20,000.

Meadowbrook Farm Interpretive Center Commercial Kitchen Addition: A commercial kitchen will enable the Interpretive Center building to host a greater number of events and activities, particularly attractive for wedding users and cooking classes, which would increase revenue to the Farm. Estimate \$200,000.

Meadowbrook Farm Interpretive Center Wedding Plaza/Garden: Improvements to the grounds immediately adjacent to the Interpretive Center would enable events to better utilize the space, particularly attractive for wedding users. Improvements would include a paved plaza area with associated landscaping and furnishings. Estimate \$60,000.

Meadowbrook Farm Picnic Shelter: A picnic shelter added to another field area away from the Interpretive Center will enable additional group rental of Meadowbrook Farm and associated fields by additional users such as corporate picnics, increasing revenue to the Farm. Estimate for 12-table shelter \$200,000.

Meadowbrook Farm Elk Viewing Area and Swing Rock Interpretive Site: The site of the original Meadowbrook Barn, adjacent to the Swing Rock west of SR-202 and just south of the city limit line between North Bend and Snoqualmie, is anticipated as an area for elk viewing and interpretation of the Swing Rock, a location of great significance in the origin story of the Snoqualmie Tribe, and interpretation of the history of the Meadowbrook Dairy Farm. The project is anticipated as a joint project of the Cities of North Bend and Snoqualmie, the Snoqualmie Tribe, and the Meadowbrook Farm Preservation Association. Improvements anticipated include a small parking area, elk viewing platform (likely atop the old silo foundation), a trailhead crossing under SR-202 through the existing cattle underpass, interpretive signage, and native landscape improvements. Additional facility planning and a site plan are needed with cost estimates before this facility can formally be placed in the 6-year capital facilities plan.

William H. Taylor Park Improvements: A new platform/track crossing and park entry would be constructed at the terminus of Ballarat Avenue, in association with the proposed right-of-way improvements at that location, creating a more visible and direct access to the depot from Ballarat and McClellan, and improving pedestrian access and safety. In association with the new crossing, the platform plaza area would be extended from the depot to the new crossing, and the landscaping in this area (west of the depot) would be reconfigured to improve visibility and create a terminal viewpoint into the park from Ballarat Avenue (providing a better connection to the downtown). The proposal would include a veteran's memorial flagpole in association with the landscape improvements.

Improvements to the park would also be made at Park Street to improve pedestrian access and safety and better link the park with Si View Park to the south. Estimate \$100,000.

William H. Taylor Park Railroad Enclosure: A covered outdoor enclosure may be constructed, immediately east of the terminus of the existing tracks and within the railroad corridor, to house a locomotive or other railroad artifact, similar to the log pavilion in Snoqualmie. The Northwest Railway Museum would secure the funding for the design and installation, and be responsible to maintain the railroad-related enclosure. The design shall be approved by the City. The City and the Northwest Railway Museum would partner on funding the platform and outdoor enclosure improvements, and would enter into an ILA agreeable to both parties for the outdoor enclosure. Estimate \$100,000.

William H. Taylor Park to Si View Community Park Trail Connection: A property immediately north of the Si View Community Park that is currently owned by King County Roads Division should be acquired and a trail constructed to connect this park with William H. Taylor Park to the north. Estimate \$130,000 property acquisition and \$34,000 development.

Si View Community Park Eastern Expansion: The property currently owned by WSDOT and King County between Si View Community Park and Cedar Falls Way should be acquired and developed as a park. The park should include a trail connection to Cedar Falls Way, as well. Estimate - \$300,000 for acquisition, \$700,000 for development of trails, lawn and landscaping.

Playground Surfacing Improvements: A pour-in-place soft surface base should be installed under the playground at Tollgate Farm Park and at the two existing playgrounds at Si View Community Park. This surfacing creates less mess and requires less maintenance than chips. Estimate \$133,000.

Spray Park Feature: A spray park feature should be installed at a park for summer water play. The feature could be a simple conventional spray park, or an accessible water fountain where people can get wet. The specific park has yet to be determined, but could be located at the Si View Community Park or a future park acquisition such as the Dahlgren Family Park or Si View Community Park Eastern Expansion. The cost would

be shared with the Si View Metropolitan Park District. Estimate \$750,000.

North Bend Roundabouts Re-landscaping: Additional landscaping and boulders would be added to supplement the existing landscaping within the roundabouts. Landscaping should be of a naturalistic design consisting principally of native species and species consistent with mountain habitats, reflective of North Bend's mountain-culture atmosphere. Estimate \$5,000, presumes volunteer labor.

Riverfront Park Improvements and South Fork

Snoqualmie Right Bank Levee Trail: Improvements to Riverfront Park would be minimal in nature to maintain the natural, forested character of the site. Small clearings could be made to provide spaces for picnic tables. In addition, improvements would be provided to formalize the trail along the levee between Bendigo Boulevard and W. North Bend Way, including graveling, bollards, signage, and benches. An easement is necessary from the adjacent property owner for access across a portion of private property along the levee. Estimate \$150,000.

South Fork Snoqualmie Left Bank Levee Trail: The existing informal levee trail between Bendigo Boulevard and W. North Bend Way would be improved with a gravel surface. In addition, approximately 500 feet of new trail would be constructed around the private property on the southern end of the route. Estimate \$75,000.

Tanner Road Shoreline Park Restroom: Upon dedication of this park to the City, a small, basic restroom should be constructed at this park to provide facilities for whitewater users that frequent this access location. Estimate \$100,000.

I: 6-YEAR CAPITAL FACILITIES PLAN

The 6-Year Parks Capital Facilities Plan prioritizes the top projects from the 20-year Parks Capital Facilities Program, based on the needs analyses in this element and public input provided during its update. Of note, more projects are listed on the 6-year Parks Capital Facilities Plan than are anticipated to occur. This has been intentionally done to provide flexibility in allocating resources in order to be able to take best advantage of opportunities as they may arise, including grant availability, possible partnerships with other agencies and organizations, and community

interest and support. To determine anticipated available funding for projects, the City has projected 6 years of residential growth to estimate park impact fee revenue, utilizing known developments over this period, as well as a small additional growth estimate for residential projects not yet known. The 6-Year Parks Capital Facilities Plan should be reviewed and updated every other year in conjunction with revenue projections and implementation of projects.

TABLE 5: 6-YEAR CAPITAL FACILITES PLAN

#	Project Name	Cost Est.	Funding Sources	2016	2017	2018	2019	2020	2021		
Trail Construction:											
1	Meadowbrook Trail Phase II (Int.Ctr. to SVT)	210,000	TL/G/IF/REET/MFPA/MPD	210,000							
2	Meadowbrook Farm to Tollgate Farm Trail	150,000	IF/G/REET/MFPA						150,000		
3	Riverfront Park Improvements and South Fork Snoqualmie Right Bank Levee Trail	150,000	IF/G/REET						150,000		
Park Improvements:											
4	Roundabout Relandscaping	5,000	IF	5,000							
5	Park Signage Improvements	20,000	IF	20,000							
6	Torguson Park Improvements (Loop Trail, Plaza, Exercise Stations, Landscaping)	254,700	IF/G/REET	254,700							
7	Torguson Park Backstops and Training Areas	114,260	IF/SO	114,260							
8	Torguson Park New Restroom/Concession Building	233,500	IF/REET	233,500							
9	Torguson Park SW Entry and BMX Course Expansion and Improvements	50,000	IF/REET		50,000						
10	Torguson Park Boundary Line Adjustment for Minor Park Expansion	3,000	IF	3,000							
11	Spray Park /play fountain feature (location TBD)	750,000	G/IF/REET						750,000		
12	18-Basket Disc Golf Course at Meadowbrook Farm	20,000	IF/REET			10,000					
13	William H. Taylor Park - Landscape, Memorial and Platform improvements	100,000	IF/G/REET/NWRM		100,000						
14	William H. Taylor to Si View Community Park Trail Connection (land costs below)	34,000	IF/G/REET/MPD		34,000						
15	Playground Surfacing - Tollgate Farm Park and Si View Community Park	133,000	IF/REET/MPD	133,000							
16	EJ Roberts Park Picnic Shelter	35,000	IF/G/REET	35,000							
17	EJ Roberts Park New Pedestrian Bridge	75,000	IF	75,000							
18	EJ Roberts New Playground Equipment	60,000	IF/REET				60,000				
19	Tollgate Farmhouse Restoration (60,000 out of total anticipated \$250,000 remaining)	60,000	G/IF				30,000		30,000		
20	Restroom at Tanner Road Shoreline Park	100,000					100,000				
Park and Open Space Land Acquisition:											
21	Tanner Trail R/W Acquisition, CF Way to Sno Valley Trail (half of total cost of project - rest anticipated from Transportation Impact Fees and Grants)	2,075,000	G(RCO/CFT)						2,075,000		
22	Torguson Park Entry Property Acquisition	300,000	IF/REET				300,000				
23	Land for William H. Taylor Park to Si View Community Park Trail	130,000			130,000						
24	Downtown Civic Plaza Acquisition, Design, and Construction	500,000	IF/G/Bond/REET					500,000			
TOTAL project costs:				5,562,460		873,460	524,000	110,000	390,000	1,400,000	2,255,000
Anticipated Park Impact Fee Revenue, 2016-2021*				3,059,793		1,239,818	916,538	579,111	162,160	81,080	81,080
Anticipated Grant Revenue**				442,341		169,345	137,481	86,868	24,324	12,162	12,162
Anticipated Si View MPD Revenue***				325,000		75,000	50,000	50,000	50,000	50,000	50,000
Total Project Revenue:				3,827,134		1,484,163	1,104,019	715,985	236,484	143,242	143,242
Balance				-1,735,326		610,703	580,019	605,985	-153,516	-1,256,758	-2,111,758
Key											
Grant Key											
IF - Impact Fees		ALEA		RCO-Aquatic Lands Enhancement Account							
TL - City Share of King County Trails and Open Space Levy		YAF		RCO-Youth Athletic Facilities							
MPD - Si View Metropolitan Parks District Funds		LWCF		RCO-Land and Water Conservation Fund							
SO - Sports Organizations		SRTS		WDOT-Safe Routes to Schools							
G - Grant		USP		TIB-Urban Sidewalk Program							
DM - Development Mitigation Contribution		NWRM		Northwest Railway Museum secured funds							
REET - Real Estate Excise Tax		MFPA		Meadowbrook Farm Preservation Association secured funds							

* Park Impact Fee Revenue determined based on 2016-2021 anticipated residential building permits. 2016 figure includes carryover balance from 2015.

** Anticipated Grant Revenue - 2016 - Based on LWCF Grant and 2009-2013 KC Trail and Open Space Levy Proceeds. 2017-2021 - Based on assumption of additional 15% above Park Impact Fee Revenue.

*** Constitutes funding identified on Si View MPD CIP list for projects that are City Projects, as well as a portion of community collaboration funds.



chapter 9

ECONOMIC DEVELOPMENT ELEMENT

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A. INTRODUCTION AND PURPOSE

The Economic Development Element for the North Bend Comprehensive Plan is a required Element by the State of Washington through the GMA. Inclusion of this Element in the North Bend Comprehensive Plan ensures compliance with the State of Washington Growth Management Act (GMA) RCW 36.70A.070.

In 1996, the City Council established an Economic Development Commission (EDC) to coordinate and advise the City about development opportunities and economic growth strategies. Policies and efforts recommended by the EDC, and adopted by the City Council, have made significant improvements in North Bend and its Downtown. An example of this is the public incentive programs that have been created for private investment in the Landmark Historic Commercial District.

Therefore, the purpose of the Economic Development Element is to establish the goals and policies decision-makers will utilize in order make important decisions regarding economic growth, vitality and quality of life for North Bend.

B. ECONOMIC TRANSITION AND LOCAL ECONOMY

In the distant past, the economy of North Bend was reliant upon its abundant natural resources of timber, where the harvested logs were converted into lumber by a variety of small, private mills. The harvested timber primarily was on its way to the large Weyerhaeuser Mill in Snoqualmie. Mill workers, woodsmen, foresters and a large compliment of mill staff, making a good wage, lived in North Bend and the outlying areas. This robust timber industry, which was at its highpoint in the 1950's and '60, has since slowed significantly and is now predominately limited to timber harvest and forest management in Eastern King County.

More recently, North Bend's natural resource based economy has transformed into a retail and outdoor recreation tourism oriented economy. Accessibility to Interstate 90, close proximity to the greater Puget Sound Region, livable neighborhoods, preeminent public schools and world class recreational options continue to bring people to recreate and live in North Bend.

In addition, because North Bend is strategically located at

the western base of the Cascade Mountains on Interstate 90, it will remain a desirable location for regional and transcontinental overland freight heading into and out of the deep water Ports of Tacoma and Seattle. The City of North Bend is feeling the adverse impacts of this industry.

The economic center, which was once the Historic Town of North Bend, has grown to include the Premium Outlet shopping center and freeway oriented retail located at Exit 31 and 34 of Interstate 90.

C. NORTH BEND BRAND, VISION AND ECONOMIC DEVELOPMENT

The City of North Bend asserts that economic development will be achieved through the sustained, concerted actions of community organizations, policy makers, investors, businesses and citizens that promote and grow the standard of living and economic health of the City based on a common vision. The result of this effort will be business growth, job creation, business retention and recruitment, tourism development and generally increased economic opportunity for all.

In 2006, the City engaged citizen volunteers in a process to establish a branding and tagline to establish a tourism identity and serve as a guideline for city marketing decisions.

C.1 Brand Statement:

We are the small town that is creating the premiere outdoor adventure destination in the Puget Sound region.

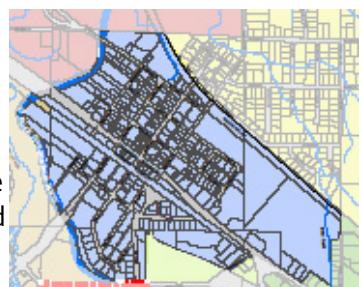
C.2 Brand Tagline:

Easy to reach...Hard to leave.

D. COMMERCIAL, EMPLOYMENT AND INDUSTRIAL DISTRICTS

D.1 Downtown Commercial and Historic District

Downtown offers a desirable opportunity to live, work and recreate all within walking distance. Downtown North Bend will continue to be the community's heart and core as it progresses into a mature civic center and historic commercial center. Downtown and its compact style of



development provide fantastic opportunities for residents and visitors to gather, interact and conduct commerce in a small town atmosphere.

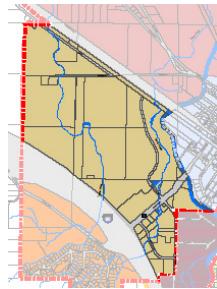
The DC zone includes a mix of residential and commercial uses occupying many small older homes in addition the Commercial Historic District. Nineteen properties contribute to the Historic Commercial District located in the 2-plus-block central area of Downtown North Bend. Many businesses have performed renovations, and received incentives and grant monies for some of the improvements made to the building and/or local façade design. These incentives continue to be available as a way to encourage further revitalization.

In recent years, a number of residential structures have converted to commercial use; however a healthy mix of both uses currently exists within the Downtown zoning district.

D.2 South Fork Interchange

The South Fork Interchange area is located at Exit 31. The South Fork Interchange area is a key retail anchor for the City, with the presence of the North Bend Premium Outlet Mall and the freeway oriented services. It also functions as a vital gateway to Downtown North Bend via Bendigo Boulevard and the South Fork of the Snoqualmie River. Bendigo Boulevard is a Heritage Corridor adopted in 1999. The Heritage Corridor Plan and the Downtown Master Plan together establish an attractive streetscape and "graduated gateway" concept for this corridor. These plans promote a visual and physical connection between the downtown commercial district, the river and businesses near the freeway. These enhancements to the area will help provide a transition from the highway scale of the interchange development to the pedestrian scale of downtown.

The employment and services in the area east of Bendigo Boulevard are focused on convenience food, retail, groceries, and automotive uses. The 100,000 square foot regional commercial shopping plaza located at this interchange provides services for the community, upper Snoqualmie Valley, and passing travelers of Igo.

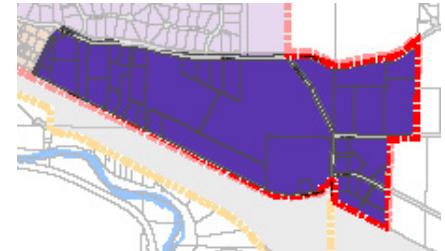


On the west side of Bendigo Boulevard lies the North Bend Premium Outlet Mall and the Nintendo 225,000 square foot warehouse and distribution facility. Nintendo employs approximately 360 full and part time employees. The Outlet Mall gross leasable area totals 223,383 square feet and, in 2014, employed approximately 142 full and 240 part-time employees.

Adjoining the current Nintendo site is approximately 110 acres of vacant, buildable land now zoned as Employment Park 1. Much of this land is located in the 100 year FEMA floodplain. Its location adjacent to Exit 31 and the downtown, makes this area ideal for development of employment generating uses.

D.3 East North Bend and Tanner Employment Opportunity Area

The East North Bend and Tanner Interchange area is located southeast off Igo Exit 34 at the east end of the City.



This area of town currently contains a large truck stop and restaurant facilities as well as numerous services (gas stations, motel, etc.) that support this use. In addition, Genie Industries, an American company owned by Terex, who manufactures work lifts and platforms used in construction, maintenance, warehouse stocking, and equipment installation is also located in this area of town. Additional employment park style development opportunities are plentiful in this area due to the amount of vacant and underdeveloped parcels in the East North Bend Tanner Area.

The eastern portion of North Bend is enhanced by the Middle Fork Natural Area and its natural beauty and abundant recreational opportunities. The Middle Fork Natural Area is located along the Middle Fork of the Snoqualmie River and is easily accessed via North Bend at Exit 34. It contains primarily forested lands along the Middle Fork and its tributary streams, providing important habitat for terrestrial and aquatic wildlife. The Middle Fork Natural Areas offer a tremendous amount of outdoor recreational opportunities for the greater Puget Sound

region and Washington State.

The City's vision for this is to grow the neighborhood scale commercial uses (i.e. retail, restaurant, hotel etc.), designed to serve nearby residents, and attract tourists and visitors of the Middle Fork and nearby natural recreation areas. To achieve this vision, the City plans to work with State and regional players to relocate the Truck Stop to a more appropriate location within King County.

E. PROMOTING AND ACCOMODATING TOURISM

The City of North Bend is situated in close proximity to hundreds of thousands of acres of publicly owned lands offering a tremendous amount of outdoor recreational opportunity for the entire Puget Sound region and Washington State. Mount Si Trail, Middle Fork Natural Area, Rattlesnake Lake/Ledge and Snoqualmie Falls, are four of the most visited recreational opportunities in the State and are all located within five miles of downtown North Bend. The potential of economic growth in tourism related businesses is tremendous. The City should develop a Tourism Growth Plan to ensure the City captures the economic opportunities these natural assets provide in the form of visitors.

F. GOALS AND POLICIES

The goals and policies of this Element reflect the work conducted by previous Economic Development Commissions during the city-sponsored Economic Summit, and the current Economic Development Commission, which spearheaded the Marketing and Branding effort. The North Bend Planning Commission provided extensive contributions through a very in-depth amendment process in 2015.

F.1 Economic Development Goals

Goal 1: Advance the revitalization of the downtown commercial area as the historic center and heart of the community.

Goal 2: Create public and private opportunities for economic development that encourage and enable redevelopment of underperforming commercial sites.

Goal 3: Support the development of commercial services and attractions that serve tourism and strengthen the North Bend Brand and Vision.

Goal 4: Encourage retention and recruitment of business and industry which provide living-wage employment.

F.2 GOALS AND POLICIES

ED - Goal 1: Advance the revitalization of the downtown commercial area as the historic center and heart of the community.

Policies:

- ED - 1.1 Develop an architectural design plan for the downtown commercial core consistent with the City's Downtown Master Plan and Design Standards.*
- ED - 1.2 Prepare a Downtown streetscape plan, which provides for community gathering spaces, connected sidewalks and trails, healthy and attractive landscaping and pedestrian amenities that promote human interaction and activity.*
- ED - 1.3 Encourage a diverse mix of commercial and residential uses within the Downtown Core to strengthen pedestrian interaction and activity.*
- ED - 1.4 Encourage multi-use projects that incorporate street level retail with office and residential above.*
- ED - 1.5 Market the area's extensive natural amenities, public lands, and open spaces to develop strategies that encourage tourism and promote viability of the downtown to the tourist.*
- ED - 1.6 Work with the existing power utilities to eliminate overhead power lines in the downtown commercial area.*
- ED - 1.7 Encourage a bike friendly environment throughout the City to support multi-model transportation network.*
- ED - 1.8 Continue to encourage the revitalization of the Commercial Historic District through promotion of existing incentives including Special Evaluation Tax, Historic Rehabilitation Credits, Public Benefit Rating System, Façade Assistance Grants, special low-interest loans and historic preservation grant opportunities.*

ED - Goal 2: Create public and private opportunities for economic development that encourage and enable redevelopment of underperforming commercial sites.

Policies:

- ED - 2.1 Seek private and/or public investments to address under-performing commercial sites.*
- ED - 2.2 Continue to pursue innovative transit options with other organizations within the Snoqualmie Valley as a means to promote economic development and tourism.*
- ED - 2.3 Encourage the downtown merchants, building owners, and other groups to pursue creative revitalization strategies and funding.*

ED – Goal 3: Support the development of commercial services and attractions that serve tourism and strengthen the North Bend Brand.

Policies:

- ED - 3.1 Continue to strengthen the North Bend Brand and Brand Statement.*
- ED - 3.2 Collaborate with tourism oriented groups such as the Snoqualmie Valley Chamber of Commerce, Meadowbrook Farm Preservation Association, Puget Sound Railway Association, Snoqualmie Valley Historical Museum, Washington Trails Association, the US Forest Service, Mountains to Sound Greenway, Snoqualmie Tribe, City of Snoqualmie and others as appropriate.*
- ED - 3.3 Expand and develop a design plan and maintenance program for each of the City's gateways that provides a strong welcoming feeling of arrival.*
- ED - 3.4 Promote Mt. Si and the Snoqualmie River as a community economic asset which can be integrated into projects along the Snoqualmie River through architectural and landscape elements.*
- ED - 3.5 Support the promotion of the City through special events such as local festivals.*

ED - Goal 4: Encourage retention and recruitment of business and industry which provide living-wage employment.

Policies:

- ED - 4.1 Promote tourism related industry which will provide local employment within the Employment Parks and appropriate overlay zoning districts.*
- ED - 4.2 Promote employment park development and industry within the EP1 and EP2 zoning districts which provide living wage jobs.*
- ED - 4.3 Promote commercial development at I90 Exit 31 which provide services to local residents and attract visitors.*
- ED - 4.4 Promote commercial development at I90 Exit 34 which will provide services to local residents, attract visitors, and provide tourism related services to recreational users.*
- ED - 4.5 Promote growth of industrial, manufacturing, and tourism activities that provide jobs which pay livable wages.*
- ED - 4.6 Create incentives in the zoning code for projects that produce a higher number of living wage jobs.*



chapter 10

SHORELINE ELEMENT

Contents

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A. INTRODUCTION

Purpose and Relationship to GMA

Washington State's citizens voted to approve the Shoreline Management Act (SMA) of 1971 in November 1972. The SMA seeks to provide environmental protection for shorelines, preserve and enhance shoreline public access, and encourage appropriate development that supports water-oriented uses, particularly on shorelines of statewide significance, such as the Middle Fork Snoqualmie River, with a flow greater than 1,000 cubic feet per second (cfs).

A Shoreline Master Program (SMP) contains goals, policies, regulations, and a use map that guide the development of shorelines in accordance with the SMA (RCW 90.58), Washington State Department of Ecology (Ecology) SMP Guidelines (WAC 173-26), and Shoreline Management Permit and Enforcement Procedures (WAC 173-27).

The provisions of this element implement the requirements of the SMA. The City's SMP is integrated with the City's land use regulation system. Consistent with RCW 36.70A.480, the goals and policies contained in this SMP shall be considered an element of the City's comprehensive plan required by the Growth Management Act. All other portions of this SMP, including the use regulations, are considered a part of the City's development regulations required by the Growth Management Act.

Profile of the Shoreline Jurisdiction in North Bend

In accordance with state law, the jurisdiction of North Bend's SMP encompasses the South Fork Snoqualmie River and the Middle Fork Snoqualmie River; their floodways; land within 200 feet of the ordinary high water mark (OHWM) of these waterways and associated wetlands within the 100-year floodplain. In addition North Bend has adopted the floodway for plus 200 feet of the floodplain, as mapped by the Federal Emergency Management Agency (FEMA) and shown on the Preliminary FIRM dated November 6, 2010. The North Bend shoreline jurisdiction including the City and its Urban Growth Area (UGA), not including aquatic area, is approximately 647 acres (1.01 square miles) and encompasses approximately 7.96 miles of shoreline. The City is pre-designating shorelines in its unincorporated UGA such that if and when the areas are annexed they would be subject to the City of North Bend's SMP. The Silver Creek area is not considered floodway for shoreline jurisdiction purposes since it was determined to be outside the range of "reasonable regularity" per RCW 90.58.030 (2) (b) floodway

definition. A thorough analysis was provided to Ecology and is documented in Appendix A (Assessment of Shoreline Jurisdiction) within the final Shoreline Analysis Report for the City of North Bend's Shorelines: South Fork and Middle Fork Snoqualmie River.

Current land uses in the shoreline jurisdiction tend to be public parks/open space, low-density residential, and vacant land. Based upon a review of the North Bend Comprehensive Plan land use designations, most shoreline acres are planned for residential, public, or employment purposes.

B. DEVELOPMENT OF GOALS AND POLICIES

Goals express broad value statements that reflect the City's vision of its shorelines. Goals also provide a framework upon which the more detailed SMP shoreline use environments, policies, regulations, and administrative procedures are based in subsequent chapters. Policies are more detailed statements reflecting the City's vision for its shorelines. Policies provide detail to the broader goals with which they are associated and act as a bridge between the goals and implementing regulations.

The goals and policies of the SMP described in this element are categorized according the Master Program elements mandated in the SMA. The general goal and policy statements found within each element of the Master Program are intended to provide the policy basis for administration of the City's SMP.

Preserving and maintaining Snoqualmie Valley's aquatic and riparian ecosystem is an important goal, and the spirit behind this Shoreline Master Program. We envision that our SMP will be used as a guide to bring forth this common initiative; and to be successful, both public and private interests must be represented and protected. Thus, when the need arises to adopt or interpret policy, procedure, or best practice models from this instrument, it is vital that a balance can be struck between public interest and the environment, and private property owners. The North Bend SMP provides the groundwork for a cooperative roadmap that leads us towards a collective good – preservation, protection, and a healthy utilization of our unique and treasured landscape- North Bend Planning Commission 2011.

Economic Development Element

Goal A: Support the development of water-oriented commercial services and attractions that serve tourism and support the community's economy and river environment.

Goal B: Allow for commercial, industrial and manufacturing uses designed with sensitivity to the environment and aesthetic character that incorporate low impact technologies and provide opportunities for public enjoyment of the shoreline.

General Economic Policies

ED P-1 Promote the South and Middle Forks of the Snoqualmie River as a community economic asset.

ED P-2 Develop a means of identifying the additional economic benefit gained by shoreline location such as recreational or tourism benefits.

ED P-3 Give preference to economic activities which either leave natural shoreline features such as trees, shrubs, grasses and wildlife habitat unmodified, or which modify them in a way which enhances human awareness and appreciation of the river's beauty and relation to other natural and non-natural surroundings.

ED P-4 Give first preference to water-dependent uses, second preference to water-related or water-enjoyment economic activities, and last preference to non-water-oriented uses in areas where limited commercial or industrial development space along shorelines is in demand for a number of competing uses.

ED P-5 Where possible, developments are encouraged to incorporate low impact development techniques into new and existing projects and integrate architectural and landscape elements that recognize the river environment.

ED P-6 Require non-water-oriented commercial or industrial development to provide for ecological restoration and public access as appropriate.

ED P-7 Assure that commercial and industrial development will not result in a net loss of shoreline ecological functions or have significant adverse impacts on navigation, recreation and public access.

Commercial Development

ED P-8 Promote water-oriented commercial uses in shoreline areas with current or planned commercial uses, such as Downtown North Bend.

ED P-9 Explore ways in which the downtown retail shopping area might be further enhanced and linked to the South Fork Snoqualmie River.

ED P-10 Encourage multi-use commercial projects that include some combination of ecological restoration, public access, open space, and recreation.

Industrial Development

ED P-11 Allow for infill or new industrial development when consistent with shoreline master program guidelines. As mitigation for impacts on shoreline resources and values, ensure industrial development incorporates shoreline restoration or public access where feasible and consistent with security needs.

ED P-12 Avoid designating lands for industrial development that include shoreline areas with severe environmental limitations.

Public Access and Recreation Element

Goal A: Enhance North Bend's river shore recreation value by creating a natural linked greenway system.

Goal B: Implement a public access system in accordance with the City's Parks, Recreation, Wildlife Habitat and Open Space Plan that increases the amount and diversity of public access consistent with private property rights, public safety and the natural shoreline character.

Public Access

Recognize shoreline public access opportunities and recommendations contained in the City's adopted Parks, Recreation, Wildlife Habitat and Open Space Plan and the Si View Metropolitan Park District *Comprehensive Plan*.

PAR P-1

Public access should be located and designed to respect private property rights, maintain privacy of private property, be compatible with the shoreline environment, protect ecological functions and processes, and protect aesthetic values of the shoreline.

PAR P-2

Acquire or obtain access rights, dedications, and easements to riverfront parcels, including levees and dikes, as available. Such rights should be pursued as opportunities and funding becomes available. Partner with other jurisdictions for funding and obtaining easements.

PAR P-3

Where appropriate, promote the development and enhancement of public access to the river to increase fishing, kayaking and other water-related recreational opportunities.

PAR P-4

Develop guidelines for creating contiguous greenways that protect the riparian environment and related wildlife habitats when opportunities arise.

PAR P-5

As a part of the SMP, prepare and implement a Shoreline Restoration Plan that includes identification of key areas for public access, restoration, protection and improvement projects, consistent with the City of North Bend Shoreline Analysis Report.

PAR P-6

Provide public access in the shoreline jurisdiction in association with the following uses: developments with five or more dwellings; commercial development; industrial development; and public agency development. Ensure public access is consistent with the City's adopted Parks, Recreation, Wildlife Habitat and Open Space Plan.

PAR P-7

Ensure developments, uses, and activities on or near the shoreline do not impair or detract from the public's access to the water or the rights of navigation.

PAR P-8

Provide public access as close as possible to the water's edge of the Middle and South Forks of the Snoqualmie River without causing significant ecological impacts and consistent with appropriate trail standards.

PAR P-9

Identify opportunities for public access on publicly owned shorelines. Preserve, maintain and enhance public access afforded by shoreline street ends, public utilities and rights-of-way.

PAR P-10

Design public access to provide for public safety and comfort and to minimize potential impacts on private property and individual privacy.

PAR P-11

Provide public access and interpretive displays as part of publicly funded restoration projects where significant ecological impacts are addressed.

PAR P-12

Maintain and enhance City parks, trails and public access facilities adjacent to shorelines in accordance with City and County plans.

PAR P-13

Encourage waterfront development to provide a means for visual and pedestrian access to the shoreline area wherever feasible.

PAR P-14

Encourage the acquisition of suitable upland shoreline

properties to provide access to publicly owned shorelands. Encourage public access to the South Fork Snoqualmie and Middle Fork Snoqualmie on shoreline street ends, public utilities and rights of way.

Recreational Development

PAR P-15

Allow for passive and active shoreline recreation that emphasizes location along shorelines in association with the City's Parks, Recreation, Wildlife Habitat and Open Space Plan and Si View Metropolitan Park District Comprehensive Plan.

PAR P-16

Give priority to shoreline recreational development in order to provide access, use, and enjoyment of North Bend's shorelines.

PAR P-17

Encourage the coordination of local, state, and federal recreation planning to satisfy recreational needs.

PAR P-18

Promote recreational developments and plans that conserve the shoreline's natural character, ecological functions, and processes.

PAR P-19

Encourage a variety of compatible recreational experiences and activities to satisfy diverse recreational needs.

PAR P-20

Give water-dependent recreation priority over water-enjoyment recreation uses. Give water-enjoyment recreational uses priority over non-water-oriented recreational uses.

PAR P-21

Integrate and link recreation facilities with linear systems, such as hiking paths, bicycle paths, easements, and scenic drives.

PAR P-22

Pursue opportunities to expand the public's ability to enjoy the shoreline in public parks or public open spaces through dining or other water-enjoyment activities.

PAR P-23

Promote non-intensive recreational uses which avoid ad-

verse effects to the natural hydrology of aquatic systems, do not contribute to flood hazards, and avoid damage to the shoreline environment through modifications such as structural shoreline stabilization or native vegetation removal.

Circulation Element

Goal A: Implement multi-modal transportation improvements that provide for mobility and access and that minimize adverse impacts on the shoreline environment.

C P-1

Allow for maintenance and improvements to existing roads and parking areas. Allow for necessary new roads and parking areas where other locations outside of shoreline jurisdiction are not feasible.

C P-2

Plan and develop a circulation network which is compatible with the shoreline environment, and respects and protects ecological and aesthetic values in the shoreline of the state as well as private property rights.

C P-3

Include in circulation system planning systems for pedestrian, bicycle, and public transportation where appropriate. Circulation planning and projects should support existing and proposed shoreline uses that are consistent with the SMP.

C P-4

Where possible, locate new roads, railroads, and parking as far from the shoreline as feasible to reduce interference with natural shoreline resources or appropriate shoreline uses.

C P-5

Ensure, when existing transportation corridors are abandoned, they are reused for water-dependent uses or public access.

C P-6

Encourage relocation or improvement of those circulation elements that are functionally or aesthetically disruptive to the shoreline, public waterfront access, and ecological functions.

C P-7

Plan parking to achieve optimum use. Where possible, parking should serve more than one use (e.g. serving recreational

use on weekends, commercial uses on weekdays).

C P-8

Where feasible, provide parking outside shoreline jurisdiction.

C P-9

Encourage low-impact parking facilities, such as those with permeable pavements and bio-swales.

C P-10

Encourage trail and bicycle paths along shorelines in a manner compatible with the natural character, resources, and ecology of the shoreline.

C P-11

Establish a pedestrian and bicycle network connected to a greenway system which links commercial areas, employment centers, neighborhoods, public facilities, parks, recreation and open space properties, and regional and state-wide trails.

- A. *Adopt and implement the Trail Plan in the City's Parks, Recreation, Wildlife Habitat and Open Space Plan. As funding and opportunities permit, protect critical trail linkages and design, construct and/or enhance trail segments identified in the Trail Plan.*
- B. *Develop links between off-road and on-road pedestrian and bicycle facilities to provide an interconnecting system of trails.*
- C. *Design portions of the trail system to accommodate a variety of non-motorized users, including pedestrians, road and mountain bicyclists, equestrians, skaters, wheelchair users, and others, recognizing that not all trails will accommodate all users.*
- D. *Create and implement development regulations that require that all new development provide connections, or payment in lieu, to the City's bicycle/walkway trails system.*
- E. *Create and implement development regulations that require that new residential development provide for construction of new trails as identified in the Trail Plan Map as part of the development's recreational and common space requirements.*
- F. *Pursue obtaining trail easements from owners of*

existing developed lots located within trail corridors identified on the Trail Plan Map for construction of missing trail linkages.

- G. *Promote separated walkways and bikeways within new residential developments that can be linked to existing or proposed trails or walkways.*

Shoreline Uses and Modifications Element

Goal A: Encourage shoreline development that recognizes North Bend's natural and cultural values and its unique aesthetic qualities offered by its riverine environment.

SHORELINE ENVIRONMENT DESIGNATIONS

SUM P-1

Provide a comprehensive shoreline environment designation system to categorize North Bend shorelines into environments based upon the primary characteristics of shoreline areas to guide the use and management of these areas.

SUM P-2

Designate properties as Natural in order to protect and restore those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions that are sensitive to potential impacts from human use. Natural areas should be managed consistent with the following policies:

- A. *Any use or development activity that would potentially degrade the ecological functions or significantly alter the natural character of the shoreline area should be severely limited or prohibited.*
- B. *Development activity in the Natural environment should only be permitted when no suitable alternative site is available on the subject property outside of shoreline jurisdiction.*
- C. *The improvement or alterations of existing roads or creations of new roads to meet public safety needs are allowed when no other location is feasible.*
- D. *Development, when feasible, should be designed and located to preclude the need for shoreline stabilization, flood control measures, native vegetation*

removal, or other shoreline modifications.

- E. Development activity or significant vegetation removal that would reduce the capability of vegetation to perform relevant ecological functions should be prohibited.
- F. Limited access may be permitted for scientific, historical, cultural, educational and low-intensity water-oriented recreational purposes, provided there are no significant adverse ecological impacts.

SUM P-3

Designate properties as *Urban Conservancy* to protect and restore ecological functions of open space, parks, floodplains and floodways, other critical areas, and other undeveloped areas with low levels of alteration, while allowing a variety of compatible uses. This designation is appropriate for lands such as parks, open space, public property or high-functioning areas of private property, and low-density residential areas, provided specific management policies to guide development and use of these areas are created. The *Urban Conservancy* environment contains two sub-environments - *Urban Conservancy-Residential* for areas with moderate to high levels of ecological function that can or do appropriately accommodate shoreline priority residential uses, or *Urban Conservancy-Recreation/Open Space* for areas that are highly valued for recreation and public access, contain critical areas such as wetlands or floodplains, and/or have low levels of alteration corresponding to moderate to high ecological function. All *Urban Conservancy* environments should be managed consistent with the following policies:

- A. Allowed uses should be those that preserve the natural character of the area and/or promote preservation and restoration within critical areas, public and private open spaces, and other moderate- to high-functioning areas, either directly or over the long term.
- B. Restoration of shoreline ecological functions should be a priority.
- C. Development, when feasible, should be designed to ensure that any necessary shoreline stabilization, flood control measures, native vegetation removal, or other shoreline modifications do not result in a net

loss of shoreline ecological function or further degrade other shoreline values.

- D. Public access and public recreation objectives should be implemented whenever feasible and significant ecological impacts can be mitigated.
- E. Water-oriented uses should be given priority over non-water-oriented uses.
- F. Recognize that single-family residential development is a preferred use.
- G. Commercial and industrial uses, other than limited commercial activities conducted accessory to a public park, should be limited.

SUM P-4

Designate properties as *Shoreline Residential* to accommodate higher-density residential development and recognize existing and proposed land uses. This designation is appropriate for residential uses on lands with zoning classifications for detached and attached residential. The following management policies should guide development within these areas:

- A. Standards for buffers, lot coverage limitations, shoreline stabilization, vegetation conservation, critical area protection, and water quality should mitigate adverse impacts on maintain shoreline ecological functions.
- B. Access, utilities, and public services should be available and adequate to serve existing needs and/or planned future development.
- C. Visual and physical access should be implemented whenever feasible and adverse ecological impacts can be avoided. Within attached residential developments, continuous public access along the shoreline should be provided, preserved or enhanced.
- D. Water-dependent recreational uses should be permitted.
- E. Limited water-oriented commercial uses which depend on or benefit from a shoreline location should also be permitted provided the underlying zoning classifications permit such uses.

SUM P-5

Designate properties as Commercial Conservancy to accommodate intensive land uses, such as commercial, office, retail, transportation, warehouse, manufacturing, and mixed-use developments. The following management policies should guide development within these areas:

- A. *Manage development so that it enhances and maintains the shorelines for a variety of urban uses, with priority given to water-dependent, water-related and water-enjoyment uses. Non-water-oriented uses should not be allowed except as part of an existing development, unless such uses would not conflict with or limit opportunities for water-oriented uses or on sites where there is no direct access to the shoreline.*
- B. *Visual and physical access should be implemented whenever feasible and adverse ecological impacts can be avoided. Continuous public access along the shoreline should be provided, preserved or enhanced when feasible.*
- C. *Aesthetic objectives should be implemented by means such as sign control regulations, appropriate development siting, screening and architectural standards, and maintenance of natural vegetative buffers.*

SUM P-6

Designate properties as Aquatic to protect, restore, and manage the unique characteristics and resources of the areas waterward of the OHWM. The following management policies should guide development within these areas:

- A. *Provisions for the management of the Aquatic environment should be directed towards maintaining and restoring shoreline ecological functions.*
- B. *Shoreline uses and modifications should be designed and managed to prevent degradation of water quality and alteration of natural hydrographic conditions.*
- C. *All developments and uses should be located and designed to protect public recreational uses of the water; to minimize adverse visual impacts; and to allow for the safe, unobstructed passage of fish and wildlife,*

particularly those species dependent on migration.

- D. *New overwater structures for public access and public infrastructure are permitted provided they are the minimum size necessary to support the structure's intended use and will not preclude attainment of ecological restoration.*
- E. *Underwater pipelines and cables should not be permitted unless demonstrated that there is no feasible alternative location based on an analysis of technology and system efficiency, and that the adverse environmental impacts are not significant or can be shown to be less than the impact of upland alternatives.*

AGRICULTURE

SUM P-7

Allow existing agricultural activities as part of the community's heritage.

SUM P-8

Design new agricultural uses and expansions of existing uses consistent with the SMP to minimize impacts on shoreline environments.

SUM P-9

Prohibit the creation of agricultural land by diking, draining, or filling wetlands or channel migration zones.

SUM P-10

Maintain a vegetative buffer between agricultural lands and waterbodies or wetlands in order to reduce harmful bank erosion and resulting sedimentation, enhance water quality, reduce flood hazard, and maintain habitat for fish and wildlife.

SUM P-11

Use appropriate farm management techniques to prevent contamination of nearby waterbodies and adverse effects on valuable plant, fish, and animal life from fertilizer and pesticide use and application.

SUM P-12

Encourage agricultural-recreation activities on the Tollgate and Meadowbrook Farms.

AQUACULTURE

SUM P-13

Give preference to aquaculture operations that minimize environmental impacts through use of fewer visible structures or less extensive substrate and vegetation modifications.

SUM P-14

Do not allow aquaculture in areas where it would degrade water quality, result in a loss of shoreline ecological function, impair navigation, or conflict with other water-dependent uses.

SUM P-15

Design aquaculture facilities to minimize nuisance odors and noise, as well as visual impacts on surrounding shoreline development.

BOATING FACILITIES (BOAT LAUNCHES)

SUM P-16

Limit new boating facilities to public or community launches for canoes, kayaks or other hand-powered vessels.

SUM P-17

Locate new boating facilities and allow expansion of existing facilities at sites with suitable environmental conditions, shoreline configuration, access, and neighboring upland and aquatic uses.

SUM P-18

Require restoration activities when substantial improvements or repair to existing boating facilities is planned.

SUM P-19

Boating facilities that minimize the amount of shoreline modification are preferred.

SUM P-20

Over-water boating facilities are prohibited.

SUM P-21

Boat moorage is prohibited.

BREAKWATERS, JETTIES, GROINS AND WEIRS

SUM P-22

To the extent feasible, limit the use of breakwaters, jetties, groins, weirs or other similar structures to those projects

providing ecological restoration or other public benefits.

DREDGING AND DREDGE MATERIAL DISPOSAL

SUM P-23

Dredging and dredge material disposal should avoid and minimize significant ecological impacts. Impacts which cannot be avoided should be mitigated.

SUM P-24

Design and locate new shoreline development to avoid the need for dredging.

SUM P-25

Limit dredging and dredge material disposal to the minimum necessary to allow for shoreline restoration, flood hazard reduction, and maintenance of existing legal moorage and navigation. Dredging to provide for new navigation uses is prohibited.

SUM P-26

Allow dredging for the primary purposes of flood hazard reduction only as part of a long-term management strategy consistent with an approved flood hazard management plan.

FILL

SUM P-27

Limit fill waterward of the OHWM to support ecological restoration or to facilitate water-dependent or public access uses.

SUM P-28

Allow fill consistent with floodplain regulations upland of the OHWM provided it is located, designed and constructed to protect shoreline ecological functions and ecosystem-wide processes, including channel migration, and is the minimum necessary to implement an approved project.

FOREST PRACTICES

SUM P-29

Ensure compliance with the State's Forest Practices Act for all forest management activities including Class IV, general forest practices, where shorelines are being converted or are

expected to be converted to non-forest uses.

SUM P-30

Conduct forest practices within shoreline areas to ensure water quality and the maintenance of vegetative buffer strips to protect fish populations and avoid erosion of stream banks.

SUM P-31

When forest lands are converted to another use, assure no net loss of shoreline ecological functions or significant adverse impacts on other shoreline uses, resources and values such as navigation, recreation and public access.

IN-STREAM STRUCTURES

SUM P-32

Locate, plan and permit in-stream structures only when consistent with the full range of public interests, ecological functions and processes, and environmental concerns, with special emphasis on protecting and restoring priority habitats and species.

MINING

SUM P-33

Locate mining facilities outside shoreline jurisdiction whenever feasible.

SUM P-34

Do not allow mining in any location waterward of the OHWM.

SUM P-35

Design and locate mining facilities and associated activities to prevent loss of ecological function. Give preference to mining uses that result in the creation, restoration, or enhancement of habitat for priority species.

RESIDENTIAL DEVELOPMENT

SUM P-36

Consider single-family residential development as a priority use only when developed in a manner consistent with the control of pollution and prevention of damage to the natural environment.

SUM P-37

Locate and construct residential development in a manner that assures no net loss of shoreline ecological functions.

SUM P-38

Ensure the overall density of development, lot coverage, and height of structures is appropriate to the physical capabilities of the site and consistent with the comprehensive plan.

SUM P-39

Ensure new residential development provides adequate buffers or open space from the water to protect or restore ecological functions and ecosystem-wide processes, to preserve views, to preserve shoreline aesthetic characteristics, to protect the privacy of nearby residences, and to minimize use conflicts.

SUM P-40

Make adequate provisions for services and infrastructure necessary to support residential development.

SUM P-41

Design and locate new residences so that shoreline stabilization will not be necessary to protect the structure. The creation of new residential lots should not be allowed unless it is demonstrated the lots can be developed without:

- A. *Constructing shoreline stabilization structures (such as bulkheads).*
- B. *Causing significant erosion or slope instability.*
- C. *Removing existing native vegetation within shoreline buffers.*

SHORELINE HABITAT AND NATURAL SYSTEMS ENHANCEMENT PROJECTS

SUM P-42

Include provisions for shoreline vegetation restoration, fish and wildlife habitat enhancement, and low impact development techniques in projects located within shoreline jurisdiction, where feasible.

SUM P-43

Encourage and facilitate implementation of projects and programs included in the Shoreline Master Program Shore-

line Restoration Plan.

Goal 1. *Protect and restore the natural hydraulic, hydrologic, and habitat functions, scenic as well as recreation values of North Bend's shorelines.*

Objective A. Protect shoreline processes and ecological functions through regulatory and non-regulatory means that may include acquisition of key properties, conservation easements, regulation of development within shoreline jurisdiction, and incentives to private property owners to encourage ecologically sound design.

Objective B. Work with other jurisdictional agencies in the region and with the private sector to deal effectively with regional and watershed-wide natural environment issues and the protection, preservation, and enhancement of all shorelines as fish and wildlife habitat.

Objective C. Enhance and restore areas which are biologically and aesthetically degraded to the greatest extent feasible while maintaining appropriate use of, and public access to, the shoreline.

Objective D. Conserve and protect critical areas within shoreline jurisdiction from loss or degradation.

Objective E. Protect and restore critical freshwater habitat and other areas that provide habitat for endangered, threatened or sensitive fish and wildlife species.

Objective F. Protect and restore vegetation to maintain and enhance habitat, aesthetic and recreational values. Retention and planting of conifers is particularly desired as a source of future large woody debris recruitment.

Objective G. Protect and preserve water quality in the South Fork and Middle Fork Snoqualmie Rivers.

Objective H. Preserve and enhance public access

opportunities to and along the shoreline consistent with protecting shoreline processes and ecological functions.

SHORELINE STABILIZATION

SUM P-44

Locate and design new development, including subdivisions, to eliminate the need for new shoreline modification or stabilization.

SUM P-45

Design, locate, size and construct new or replacement structural shoreline stabilization measures to minimize and mitigate the impact of these modifications on the City's shorelines.

SUM P-46

Give preference to non-structural shoreline stabilization measures over structural shoreline stabilization, and give preference to soft structural shoreline stabilization over hard structural shoreline stabilization.

SUM P-47

Encourage fish-friendly shoreline design during new construction and redevelopment by offering incentives and regulatory flexibility.

UTILITIES

SUM P-48

Allow for utility maintenance and extension with criteria for location and vegetation restoration as appropriate.

SUM P-49

Plan, design, and locate utility facilities to minimize harm to shoreline functions, preserve the natural landscape, and minimize conflicts with present and future planned land and shoreline uses while meeting the needs of future populations in areas planned to accommodate growth.

SUM P-50

Do not permit new primary utility production and processing facilities, or parts of those facilities, such as power plants, solid waste storage or disposal facilities that are non-water-oriented within shoreline jurisdiction unless no other options are feasible. Primary utility facilities, such as wastewater treatment plants and including expansion of existing facilities, should be located in shoreline jurisdiction only if no

practical upland alternative or location exists. Such facilities and expansions should be designed and located to minimize impacts on shoreline ecological functions, including riparian and aquatic areas, and to the natural landscape and aesthetics. Public health and safety should be the highest priority for the planning, development and operation of primary utility facilities.

SUM P-51

Locate utility transmission facilities for the conveyance of services, such as power lines, cables, and pipelines, outside of shoreline jurisdiction where feasible. Where permitted within shoreline jurisdiction, such facilities should be located within existing or approved road crossings or in such a way as to minimize potential adverse impacts on shoreline areas.

SUM P-52

Locate new utility facilities so as not to require extensive shoreline protection works.

SUM P-53

Locate utility facilities and corridors to protect scenic views from public parks and trails. Whenever possible, such facilities should be placed underground, or alongside or under bridges.

SUM P-54

Design utility facilities and rights-of-way to preserve the natural landscape and to minimize conflicts with present and planned land uses.

EXISTING USES

SUM P-55

Allow nonconforming existing legal uses and structures to continue in accordance with this SMP. Residential structures and appurtenant structures that were legally established and are used for a conforming use, but that do not meet standards for the following should be considered a conforming structure: setbacks, buffers, or yards; area; bulk; height; or density.

SUM P-56

Allow alterations of nonconforming structures, uses, and lots in consideration of historic development patterns, when occupied by preferred uses, and when consistent with public safety and other public purposes.

SUM P-57

Encourage transitions from nonconforming uses to conforming uses.

SUM P-58

Allow for nonconforming structures to expand when they do not increase the nonconformity according to SMP requirements.

SUM P-59

Allow for existing roads, driveways and utility lines to continue and expand when they do not increase the nonconformity according to SMP requirements.

SUM P-60

Consider the no-net-loss of ecological function objective to guide review of proposed expansions or other changes to nonconforming uses and new development on nonconforming vacant lots. This objective may be addressed in an area-wide manner consistent with the SMP cumulative impacts analysis.

Conservation Element

Goal A: Protect the natural hydraulic, hydrologic and habitat functions, scenic as well as recreational values of North Bend's shorelines.

ENVIRONMENTAL PROTECTION

Con P-1

Protect shoreline processes and ecological functions through regulatory and non-regulatory means that may include acquisition of key properties, conservation easements, regulation of development within shoreline jurisdiction, and incentives to private property owners to encourage ecologically sound design.

Con P-2

Work with other jurisdictional agencies in the region and with the private sector to deal effectively with regional and watershed-wide natural environment issues and the protection, preservation, and enhancement of all shorelines as fish and wildlife habitat.

Con P-3

Enhance and restore areas which are biologically and aesthetically degraded to the greatest extent feasible while

maintaining appropriate use of the shoreline.

CRITICAL AREAS

Con P-4

Conserve and protect critical areas within shoreline jurisdiction from loss or degradation.

Con P-5

Locate and design public access within and adjacent to critical areas to ensure that ecological functions are not adversely impacted.

Wetlands

Con P-6

Protect and manage shoreline-associated wetlands, including maintenance of sufficient volumes of surface and subsurface drainage into wetlands, to sustain existing vegetation and wildlife habitat.

Streams and Fish and Wildlife Habitat Conservation Areas

Con P-7

Protect critical freshwater habitat, including channel migration zones, and other areas that provide habitat for endangered, threatened or sensitive fish and wildlife species.

Geologically Hazardous Areas

Con P-8

Manage development in geologically hazardous areas, including channel migration zones, to avoid risk and damage to property and loss of life from geological conditions.

Floodplain Management

Con P-9

Regulate development within the 100-year floodplain to avoid risk and damage to property and loss of life.

SHORELINE VEGETATION CONSERVATION

Con P-10

Protect and restore vegetation to maintain and enhance habitat, aesthetic and recreational values. Retention and planting of conifers is particularly desired as a source of

future large woody debris recruitment.

Con P-11

Plan and design new development or substantial redevelopment to retain or provide shoreline vegetation.

Con P-12

Prohibit the introduction of invasive plant species along shorelines, and encourage the removal of noxious and invasive weeds.

Con P-13

Protect, enhance, and maintain healthy trees and vegetation consistent with the value North Bend places on trees and other vegetation as integral to community character and quality of life. Minimize tree clearing and thinning activities in shoreline jurisdiction and require mitigation for trees that are removed. Selective pruning of trees for safety and view protection may be allowed.

Con P-14

Recognize the most recent inter-agency guidance on levee vegetation management to maintain levee safety and address aquatic habitat needs.

WATER QUALITY, STORMWATER MANAGEMENT, AND NONPOINT POLLUTION

Con P-15

Protect and preserve water quality in the South Fork and Middle Fork Snoqualmie Rivers.

Con P-16

Manage stormwater quantity to ensure protection of natural hydrology patterns and avoid or minimize impacts on streams.

Con P-17

Encourage use of low impact development techniques in all new development and redevelopment proposals.

Con P-18

Support public education efforts to protect and improve water quality.

Historic, Cultural, Scientific, and Educational Resources Element

Goal A: Recognize cultural and historical resources as an essential part of North Bend's identity and heritage.

Goal B: Encourage educational and scientific projects and programs that foster a greater appreciation of the importance of shoreline management, river-oriented activities, environmental conservation and local historic connections with North Bend's rivers.

HCSE P-1

Due to the limited and irreplaceable nature of the resource, prevent public or private uses, activities, and development from destroying or damaging any site having historic, cultural, scientific or educational value as identified by the appropriate authorities and deemed worthy of protection and preservation.

HCSE P-2

Protect, preserve, or restore buildings, sites, and areas of shoreline having scientific or educational values or significance.

HCSE P-3 Flood Hazard Management Element

Goal A: Protect public safety within river floodways and floodplains and protect natural systems by preserving the flood storage function of floodplains.

HCSE P-4

Manage development proposed within floodplains, floodways and channel migration zones consistent with the Shoreline Management Act, the Federal Emergency Management Agency (FEMA) standards, and this SMP, including the Critical Areas Regulations for frequently flooded areas and geologically hazardous areas.

HCSE P-5

Work with other cities, King County, and state and federal agencies to deal effectively with regional flooding issues.

HCSE P-6

Control stormwater runoff in a manner consistent with low impact development practices which utilize natural detention, retention and recharge techniques to the maximum extent possible.

HCSE P-7

Prohibit any development within the floodplain which would individually or cumulatively cause any increase in the base flood elevation. Encourage purchase of properties that have experienced repetitive loss.



Photo by Dave Battey, Snoqualmie Valley Historical Museum

chapter 11

ENERGY AND SUSTAINABILITY ELEMENT

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A. INTRODUCTION

The City of North Bend has an incredible setting. The rugged backdrop of Mt. Si, the green forested slopes of Rattlesnake Mountain, the wide open fields of Meadowbrook and Tollgate Farms, and the clear flowing mountain waters of the South Fork and Middle Fork Snoqualmie Rivers form our community's character and unique identity, while enhancing its vitality. The desire to pass these resources to our future generations is at the center of the idea of sustainability.

The North Bend Energy and Sustainability Element provides incentive-based policy direction for municipal operations, new development, and outreach to the community to promote the balance of environmental, community, and economic goals for the long term health and prosperity of the City and its future residents. The policies of this Element are additionally intended to support greenhouse gas emissions reductions which enable the City to compete effectively for important sources of grant and loan funding that favor such factors.

Other Elements of this Comprehensive Plan contain objectives and policies that address additional measures of sustainability. These include:

- **Critical Areas Element** – addressing the protection of our physical environment, including wetlands, streams, wildlife habitat, and air and water quality.
- **Transportation Element** – addressing impacts of vehicular mobility on multiple social and environmental factors.
- **Land Use Element** – addressing creating compact mixed-use, walkable communities with an appropriate jobs/housing balance.

A.1 What is Sustainability?

Sustainability is widely recognized by the following definition:

"Sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs."¹

The concept of sustainability describes a condition in which human use of natural resources, required for the continuation of life, is in balance with nature's ability to

replenish them. This concept also extends to economics, as financial decisions must consider balance and the ability to replenish or demonstrate the appropriate payback of expenditures in a timely effective manner. More recently, sustainability has been further expanded to recognize the interdependence of three primary factors or pillars - that of economic vitality, social equity, and environmental quality. A project or action can be considered sustainable when it achieves a balance of these three pillars. When a community maintains a balance of these interdependent pillars, the long-term result is prosperity for the current population and prosperity for its future generations.



A.2 Why is Sustainability Important to North Bend?

Addressing factors of sustainability is necessary for the environmental, economic, and social well-being of North Bend's current and future generations. By proactively addressing issues of sustainability, the City of North Bend gains the opportunity to:

- Resolve issues prior to adverse impacts becoming more costly and difficult;
- Effect positive change through incentive-based policies;
- Compete effectively against other communities for State and Federal grant funds;
- Provide efficient and cost effective government decision making for citizens and tax payers.
- Proactively address energy and sustainability-related issues rather than

¹Definition created by the Brundtland Commission, established by the UN in 1983 to consider the impacts of environmental degradation on the human environment, natural resources, and economic and social development.

reacting to future legislation, allowing the City to drive its destiny.

A.3 Proactively Responding to Legislative Requirements

Measures of sustainability are regularly addressed by the Washington State Legislature. The following are some of the more significant sustainability-related state requirements passed in the last few years.

Green Building Requirements for State-Funded Buildings

During the 2005 legislative session, Washington State passed the country's first law requiring that all new buildings and renovation projects of state public agencies and school districts that receive state funding be built to one of three green building standards ([Chapter 39.35D RCW](#)). Projects that receive funds from the state capital budget must achieve at least the Leadership in Energy and Environmental Design (LEED) Silver standard.

Electric and Biofuel Vehicle Operations Requirements

In 2009, the legislature enacted [RCW 43.19.648](#), which requires that by June 1, 2018, local governments must satisfy 100% of their fuel usage for operating publicly owned vehicles and construction equipment from electricity or biofuel, to the extent determined practicable by rules to be adopted by the Department of Commerce by June 1, 2015. While these rules have yet to be clarified and there is likely to be a phase-in period, the City should consider this regulation when replacing and acquiring new vehicles.

Statewide Greenhouse Gas Reduction Goals

The Washington State Legislature in 2009 passed statewide greenhouse gas reduction limits, codified as [RCW 70.235.020](#). These goals include reduction of statewide greenhouse gas emissions to 1990 levels and a reduction in vehicle miles traveled by 18% by 2020 (and further reductions by 2035 and 2050), require the Department of Ecology to inventory and track greenhouse gas emissions state-wide, and require industries of a certain size to report greenhouse gasses to the Department of Ecology. While not directed at Cities, municipal operations, land use planning, and local transportation decisions will play a strong role in achieving these limits.

Local Greenhouse Gas Reduction Goals

Starting in 2010, [RCW 70.235.070](#) requires that all state agencies providing competitive grants for economic

development and infrastructure must consider whether cities receiving state capital funds have adopted policies to reduce greenhouse gas emissions. This is perhaps the most impactful legislative action for our local government funding as it represents a significant amount of grant and loan funding to the City, including such sources as the Public Works Trust Fund (transportation and infrastructure grants and loans), and competitive grants from the Department of Ecology (environmental policy grants), Department of Commerce (land use policy and economic development grants), and Washington State Recreation and Conservation Office (Park and trail grants), among others. Having goals and policies in place to address greenhouse gas reduction will help ensure that the City is positioned for a primary source of funding opportunities for local projects.

B. SUSTAINABILITY AND PROPERTY RIGHTS

Sustainability involves striking a balance between protecting individual and public interests. In the case of this Energy and Sustainability Element, the focus is on creating incentives rather than regulations, and providing the public with information for wise decision making, rather than mandates for code compliance.

ES Goal 1: In city operations and in the development of policies and regulations, ensure an appropriate balance between individual property rights and the public interest.

ES 1.1	Wherever possible, foster wise and sustainable land use decisions in the community through incentives rather than regulations.
ES 1.2	Regularly seek to streamline permit and approval processes and remove regulations that are no longer applicable.

C. EDUCATION AND OUTREACH

Education is a core purpose of this element and a key to achieving sustainability goals. Education should occur through cost effective methods to tax payers, such as the City website, use of existing Boards and Commissions, and partnerships with other governmental agencies, schools and community groups. Education and outreach should include:

- City employees –To reduce municipal operating costs; to utilize economies of scale between city departments with regard to city resources; to learn methods of doing business in ways that are both economically wise and environmentally sound.
- City officials –To develop awareness of strategies for sustainable municipal operations and programs; to gain support and understanding of the latest techniques and methods
- Residents - To raise awareness regarding personal and collective sustainability actions individuals can take on their own; to gain support and understanding of the techniques and methods being proposed and applied

Partnering with other governmental agencies, schools, community groups and utility providers will ultimately conserve money while promoting participation in sustainability throughout the community.

ES Goal 2: Increase individual and public awareness of, and participation in, efforts to foster greater sustainability.

Policies:

ES 2.1 Help to recognize and make transparent the ecological and economic impacts of City land use, transportation and budget decisions.

ES 2.2 Help direct people to resources available from other agencies, utility providers and organizations that address issues of sustainability.

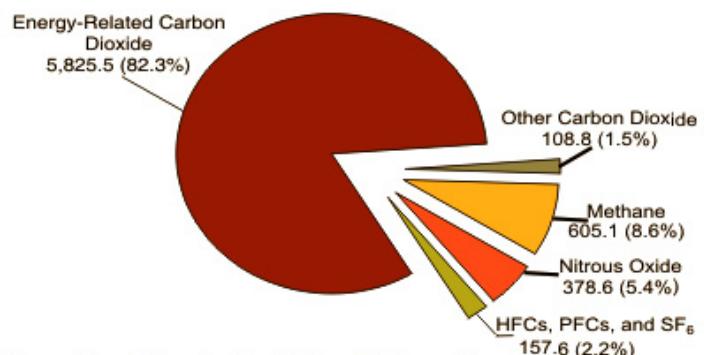
ES 2.3 Maintain a sustainability page on the City's website identifying measures the City is taking to reduce costs, increase services, reduce greenhouse gas emissions, energy and resource consumption, and other environmental impacts, and ways that residents can further reduce their own impacts.

ES 2.4 Encourage local organizations, community groups, and businesses to organize events and activities that incorporate sustainable measures.

ES 2.5 Publicize and recognize the accomplishments of the City's and community's sustainability efforts.

D. GREENHOUSE GAS EMISSIONS REDUCTION

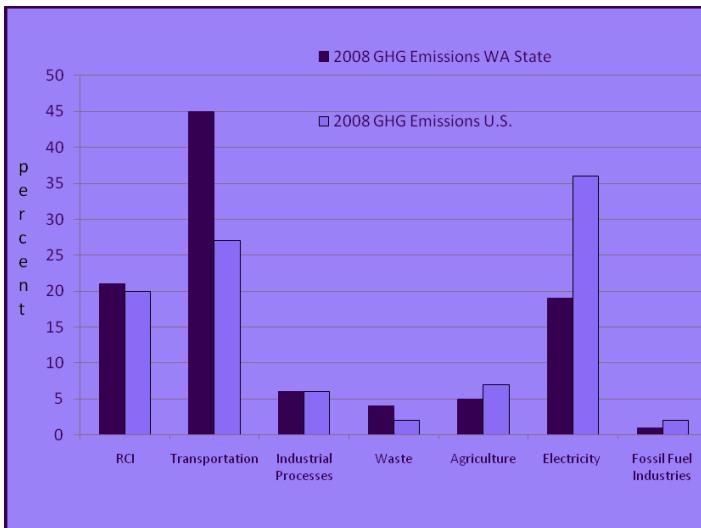
Greenhouse gases are substances that contribute to warming of the climate by trapping heat in the atmosphere. Carbon dioxide is the most dominant greenhouse gas; however a number of other gases also contribute significantly to climate change, including methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrochlorofluorocarbons (HFCs) and perfluorocarbons (PFCs). Greenhouse gasses are emitted from both natural sources and anthropogenic (human activity related) sources, but it is the emissions from anthropogenic sources contributing to global warming which we have the ability to address.



Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2006* (Washington, DC, November 2007)

Statewide, transportation is the largest share of greenhouse gas emissions, followed by use of fuels to heat residential, commercial and industrial buildings (RCI), as depicted in the chart below (Washington's transportation emissions percentage is skewed above the national average due to the generation of most electricity in our state from hydropower sources, which does not contribute to greenhouse gas emissions. Electricity generation is typically the largest source of greenhouse gas emissions.). These percentages are likely to be similar within the City of North Bend.

Percent GHG Emissions by Sector - 2008, Washington State and U.S.



Source: *Washington State Greenhouse Gas Emissions Inventory, 1990-2008*, Department of Ecology Pub. 10-02-046, December 2010

Actions related to the reduction of greenhouse gas emissions are found throughout this **Energy and Sustainability Element**, as well as in the **Land Use Element** and **Transportation Element** of the Comprehensive Plan.

E. SUSTAINABLE ECONOMY

E.1 Local Economy and Environmental Quality

With significant natural attractions surrounding the City of North Bend and a local economy supported by tourism, it is particularly important to recognize the interrelationship between a healthy environment and healthy economy. Supporting local economic growth in a manner that complements the natural environment is a key to maintaining sustainability. Likewise, supporting job growth improves overall sustainability by improving the City's jobs/housing balance, which is currently off-balance by way of far more residences than local jobs. Additional policies and direction for supporting economic development are found in the **Economic Development Element**.

ES Goal 4: *Foster a vibrant, balanced, and resilient local economy that supports local production of sustainable goods and services.*

Policies:

- ES 4.1 Where possible, support local businesses when awarding municipal contracts and in purchasing supplies and equipment for municipal operations, unless the cost of the product or service offered locally outweighs the benefits of buying local.
- ES 4.2 Foster local job creation to improve the City's jobs/housing balance.
- ES 4.3 Promote economic development strategies that capitalize on the characteristics of the property, resources, and labor available to the North Bend community, and additional industries compatible with North Bend's scenic and recreational environment.
- ES 4.4 Support the farmers market as a means to promote local food production and local economic development generation.
- ES 4.5 Support the use of suitable public lands (such as repetitive loss floodplain buyout lots) and underutilized private lands for local food production.
- ES 4.6 Encourage community pea patch gardens and their stewardship and management by local residents and community groups.

E.2 Economic Values of Government Sustainability
Resources and measures to address sustainability need to be practical and achievable.

ES Goal 5: *Ensure careful stewardship of the City's finances and resources in pursuing sustainability in City operations.*

Policies:

- ES 5.1 Utilize measures of sustainability that bring the greatest cost benefit ratio, or "bang for the buck."
- ES 5.2 In choosing materials or equipment for municipal operations, consider long-term operational costs over short term capital expenditures.

ES 5.3 Maintain existing municipal equipment and facilities in optimal condition to reduce the need for costly repairs or replacement.

ES 5.4 Consider the purchase of used rather than new vehicles and equipment that otherwise meet energy and resource conservation objectives.

F. ELECTRICAL ENERGY CONSUMPTION, CONSERVATION AND LOCAL GENERATION

The City's role in electricity conservation comes through monitoring and reducing consumption in its own operations, and in establishing incentives applicable to new development for constructing buildings utilizing energy efficient practices and materials.

For many cities, street lighting is the largest fixed annual general-fund expense. By replacing 21,000 conventional streetlight bulbs with LEDs, Seattle reduced its streetlight bill by 50%, saving the City more than 1.2 million annually.

Boston Globe, Aug. 2, 2012

ES Goal 6: Reduce energy consumption and encourage energy efficiency and conservation in City operations and in the community.

F.1 Municipal Operations

Municipal buildings, equipment, and infrastructure (including pump stations, street lights, and wastewater operations) collectively use a significant amount of electricity. Because of all the energy uses a City is responsible for, conservation measures can provide substantial cost savings to taxpayers and reduced greenhouse gas emissions and other environmental impacts.

Policies:

ES 6.1 Foster energy conservation practices among City employees.

ES 6.2 Make energy efficiency a priority in City

operations and facilities, retrofitting city facilities with energy efficient lighting and equipment as practical. Participate in rebate and incentive programs from Puget Sound Energy and others to offset the costs of retrofits.

ES 6.3 Where practical, conduct energy audits of existing municipal buildings to identify high-priority retrofits and repairs for increasing energy efficiency and cost savings.

ES 6.4 When installing new or retrofitting existing street and public area lighting, select fixtures and bulbs that minimize energy use and prevent over-lighting.

ES 6.5 Evaluate the selection of US EPA Energy Star certified equipment and appliances when purchased for City use, and make such selection when the business case justifies the cost.

F.2 New Development and Community Energy Use

Electricity in the City of North Bend is provided by Puget Sound Energy and the Tanner Electric Cooperative, both of which have programs to promote energy conservation by their customers.

The City can additionally influence energy use in the community by providing incentives for providing energy efficient materials and construction, and by enabling the development of private local generation projects, such as solar arrays and wind turbines on buildings.

Policies:

ES 6.7 Provide incentives for energy efficiency in new development, including Energy Star certified homes, buildings and plants.

ES 6.8 Encourage opportunities for local energy generation, including the installation of local solar and wind facilities. Evaluate potential sites and partnerships with other agencies, such as the school district, parks district, King County and other agencies with land and facilities that could accommodate local energy generation facilities.

ES 6.9 Review and revise building and development

codes, design guidelines, and zoning ordinances to remove barriers to the installation of local-site energy generation facilities.

Burning a gallon of gasoline emits almost 20 pounds of carbon dioxide. A typical late-model, mid-sized sedan produces about 9,500 pounds of carbon dioxide each year, while a hybrid car generates less than half that, about 4,300 pounds.

Environmental Protection Agency

flex-time schedule when appropriate.

- ES 7.3 Implement a no-idling policy with all City vehicles.
- ES 7.4 Educate the public about the benefits of not idling vehicles.
- ES 7.5 Limit idling in certain circumstances and locations.
- ES 7.6 Support the installation electric vehicle charging infrastructure by the private market..

H. WATER CONSERVATION

The City of North Bend impacts water use both through its own operations and through public use of water from the City's service area and the Sallal Water Association, which also serves portions of North Bend. Reducing municipal and public water use not only benefits in-stream flows, it benefits the financial bottom line, as treating and pumping domestic water and wastewater is one of the most energy intensive municipal operations. The less water that residents use, the more energy the City can save. Water consumption and conservation is addressed in Chapter 5 of the City's **2010 Water System Plan**, which provides a Water Use Efficiency Program and includes a section on water conservation measures.

G. FOSSIL FUEL CONSUMPTION

The global environmental impacts of extracting, processing and burning of fossil fuels are numerous, including significant habitat destruction, air and water pollution, and greenhouse gas emissions. The City can implement strategies designed to reduce the City's fossil fuel consumption, ultimately saving money and improving air quality. One strategy is by addressing RCW 43.19.648, by planning for and transitioning the City's fleet as vehicles reach the end of their practical life.

Another strategy is through establishing densities and land use design that supports the use of public transit, encourages walking and bicycling, and other alternatives to single-occupant vehicle trips. This can be done by providing complete streets (interconnected streets with sidewalks and bicycle lanes) and pedestrian pathway networks. These issues are addressed through the **Land Use Element** and **Transportation Element** of the Comprehensive Plan.

ES Goal 7: Optimize the efficiency of fossil fuel use in City operations and encourage measures in the community which reduce fuel use and emissions.

Policies:

- ES 7.1 Increase the fuel efficiency of the City's vehicle fleet and implement a policy to consider "right-sizing" for the right application in vehicle purchase decisions.
- ES 7.2 Consider alternative work schedules to reduce employee commutes, i.e. telecommuting and



BUILT GREEN™

I. GREEN BUILDING

The efficiency and environmental impacts of building materials and practices can have a substantial impact on energy, water and resource consumption, as well as human health. A number of third-party independent certifying organizations have developed standards that measure the efficiency and environmental impacts of building construction, the two most common of which include the US Green Building Council's *Leadership in Energy and Environmental Design* (LEED) program, used

for commercial and residential buildings, and the *Built Green* program, which focuses principally on residential construction.

Both LEED and Built Green are point-based ratings systems that address energy, water and resource conservation, indoor air quality, site sustainability, and use of sustainable building materials.

The most efficient way that the City can foster sustainable building practices is by encouraging participation by developers in these existing certification programs, and participating directly in these programs in the construction of public buildings.

ES Goal 8: Encourage the construction of green buildings in the public and private sectors.

Policies:

- ES 8.1 Utilize green building techniques and measures in municipal projects when the economics of a project demonstrate appropriate payback on investment.
- ES 8.2 Provide incentives to the private sector for the development of green and energy efficient buildings, utilizing programs such as Built Green, Leadership in Energy and Environmental Design (LEED), Energy Star, or equivalent. Incentives can include awards or recognition, expedited review, reduced permitting costs or impact fees, density bonuses, or other measures as appropriate.
- ES 8.3 Identify and remove regulatory or procedural barriers to implementing green building practices, such as updating codes, guidelines, and zoning, and ensure that plan review and building inspection staff are trained in green building materials, practices, and techniques as appropriate.

J. RESOURCE CONSUMPTION

The City uses a considerable amount of resources in its day-to-day operations, through the purchase of supplies and equipment, and in cleaning and maintaining its facilities. The City can take a number of simple measures that reduce resource consumption and waste through environmentally preferable purchasing. Environmentally

preferable purchasing is the procurement of goods and services that have lower negative impacts on the environment and human health compared with conventional products that serve the same purpose.

ES Goal 9: Reduce unnecessary and/or unwarranted consumption to minimize the cost of City operations, and the environmental and human health impacts of the resources used in City operations.

Policies:

- ES 9.1 Develop an environmentally-preferable purchasing strategy for municipal equipment, vehicles, office supplies, and other products purchased by the City, that considers durability, environmental and carbon footprint, local sourcing, waste reduction, and minimization of toxic and hazardous substances, and weighs the cost benefit in those purchasing decisions. Support environmentally-preferable purchases when the cost is equivalent to the conventional alternative.
- ES 9.2 Purchase recycled, reused or refurbished supplies, equipment and vehicles for City departments where appropriate.
- ES 9.3 Substitute, reduce, and where possible, eliminate the use of toxic materials in municipal operations, such as synthetic fertilizers, pesticides, preservatives, solvents, and other materials that have negative environmental and human health impacts.
- ES 9.4 Whenever possible, extend the useful life of products and buildings through repairs and remodels rather than replacement.
- ES 9.5 Give priority to implementing actions that save both costs and resources. For example, provide pitchers of tap water rather than bottled water for City meetings and functions.
- ES 9.6 Reduce the City's use of paper by using double-sided printing where appropriate.
- ES 9.7 Consider implementing paperless City Council meetings.

K. WASTE REDUCTION AND RECYCLING

In 1985, recycling 25% of overall waste was considered the maximum level feasible. By 2008, Washington State residents recycled or diverted an average of 47.5% of all solid waste (Washington State Department of Ecology), and there is still significant opportunity to increase well beyond this rate. Waste *reduction* is perhaps an even more important goal – reducing the amount of waste generated in the first place. Both the City and its residents have roles to play in the well-known mantra, “reduce, reuse, recycle.”

ES Goal 10: Reduce waste and increase recycling and waste diversion in City operations and in the community.

K.1 Municipal Operations

City operations involving solid waste collection and recycling includes secure shredding and recycling of office waste paper, regular recycling of other materials and waste disposal from office use, and garbage and recycling collection at parks and during special events. The City does not currently offer recycling at public parks, which represents an opportunity for community participation in recycling, and a focus for future improvement.

Policies:

- ES 10.1 Reduce waste production and increase recycling and waste diversion in City operations, in public parks, and other public places.
- ES 10.2 Place recycling containers adjacent to garbage containers in all areas where public waste receptacles are provided. Ensure that recycling containers are clearly indicated for recycling purposes only, to discourage disposal and mingling of trash with recyclables.
- ES 10.3 Develop operating procedures to ensure that outdoor recycling pickup and management at City parks and other public spaces is time and resource efficient for City personnel.
- ES 10.4 Provide recycling and food waste composting bins at public events and festivals.

Recycling just one aluminum can saves enough energy to run a TV for three hours -- or the equivalent of a half a gallon of gasoline.

Recycling-revolution.com

K.2 Community Waste Reduction and Recycling

The City of North Bend provides its residents and businesses with solid waste and recycling services through a contract with a waste management service provider. The City can influence resident participation in waste reduction and recycling through outreach and education, and by ensuring that its solid waste contracts include full recycling services, including recycling of yard and food waste.

Policies:

- ES 10.5 Reduce waste production and increase recycling rates in the community.
- ES 10.6 Ensure that solid waste contracts provide complete and convenient opportunities for resident participation and education in recycling and waste diversion, including curbside pickup of comingled recycling and food and yard waste recycling. Ensure that these services are available to single and multi-family homeowners, apartment residents, and businesses alike.
- ES 10.7 Provide for hazardous waste collection, to ensure proper recycling or disposal of materials not suitable for curbside pickup.
- ES 10.8 Incentivize building moving and building deconstruction and material re-use rather than building demolition when practical.

L. SUSTAINABLE MOBILITY

In Washington State, transportation accounts for 45% of all greenhouse gas emissions (Greenhouse Gas Emissions Inventory, Department of Ecology, 2010). Municipalities have a strong role to play in reducing transportation-related greenhouse gas emissions and addressing health-related transportation issues, as the built environment influences how far and by what mode

people will travel on a daily basis. Goals and policies addressing the relationships between transportation and multiple measures of sustainability are found within the **Transportation Element**. Goals and policies addressing the overall densities and development patterns of the City that foster walking, bicycling and transit use, as well as policies addressing the jobs/housing balance to reduce regional commuting, are found in the **Land Use Element**.

M. EQUITY

Municipal government and land use decisions are made with consideration of input from the public as provided through the public process. It is very important for the overall balance of sustainability to ensure that all voices are heard or represented through local government. Issues of equity that can be addressed by a City include equitable public input and decision making, ensuring community facilities and infrastructure address the needs of all ages and abilities, and geographic and economic equity in locating community facilities. Additional issues of equity involve housing affordability and the provision of affordable housing, which are addressed in the goals and policies of the **Housing Element**.

ES Goal 11: Develop a robust out-reach program to all populations to build trust and strengthen relationships between the City and its residents, and ensure that municipal actions are transparent, equitable, and just.

Policies:

- ES 11.1 In outreach and education activities, and in the public process for land use decision making, strive to reach out to underrepresented populations, including youth, minorities, people with disabilities, and people that are poor, and encourage their participation.
- ES 11.2 In land use decision making, ensure that the City takes into consideration the interests of underrepresented populations, even when their voices are not heard at the table.
- ES 11.3 Partner with the Snoqualmie Valley School District and youth organizations on projects that provide opportunities for youth participation in public decision making and volunteerism, and as a means to provide community outreach and education.

- ES 11.4 Provide opportunities for members of city boards and commissions to share and confer on cross-organizational and inter-organizational matters, to ensure informed decision making and recommendations.
- ES 11.5 Continue to foster youth participation in the public process by providing a youth-position on the Parks Commission, and other boards and commissions as appropriate.
- ES 11.6 Consider economic and geographic equity in locating municipal facilities that can cause negative or positive impacts on the surrounding neighborhood, such as parks, road improvements, wastewater treatment, and utility stations.
- ES 11.7 Partner with educational, governmental and community organizations to encourage community access to information and education. Examples include the Snoqualmie Valley School District, King County Library System, Encompass, the North Bend Food Bank, and the Snoqualmie Valley Chamber of Commerce.
- ES 11.8 Develop and encourage volunteer opportunities, community projects and events that promote community health and interaction. Examples include habitat restoration projects, community races and festivals, and the Adopt-a-Park Program.

100 mature tree crowns intercept about 100,000 gallons of rainfall per year, reducing runoff and flooding, and providing cleaner water.
US Forest Service, Northeastern Area

N. URBAN FORESTRY

In addition to providing beauty, trees play a role in a number of factors of environmental and economic sustainability, including carbon sequestration, air quality improvement, shading of both buildings and habitat, reducing erosion, uptake of stormwater, and increasing

property values. The City of North Bend provides for and enhances its urban forest through the provision of street trees on all public streets, protections of existing significant trees in clearing and land development, and via landscaping requirements applicable to new development. The care and management of public trees is addressed by the City's *Urban Forestry Plan*.

O. LOW IMPACT DEVELOPMENT STORMWATER MANAGEMENT

Low Impact Development (LID) Stormwater Management refers to the use of techniques that manage stormwater runoff through small-scale, on-site infiltration measures rather than through the construction of traditional drainage facilities such as pipes, stormwater vaults and ponds that are connected to a larger centralized point-discharge stormwater system. LID stormwater management techniques can provide cost savings to developers by reducing or eliminating the need for costly "hard" infrastructure such as pipes, vaults and ponds, which also take up valuable developable area. Using greater LID stormwater management techniques also provides cost savings to the City in minimizing downstream investments for capacity upgrades to the City's stormwater infrastructure, extending the life and function of the current system and reducing future maintenance burdens.

ES Goal 13: Maintain infiltration to the City's aquifer and minimize stormwater runoff impacts to surfaces waters through the use of Low Impact Development stormwater management techniques.

Policies:

- ES 13.1 Incentivize use of LID stormwater management techniques that minimize impervious surfaces and capture, treat, and infiltrate stormwater, including vegetated roofs, cisterns, rain gardens, and biofiltration swales, or such other techniques which may be developed and approved for application.
- ES 13.2 Encourage placement of buildings, roads, sidewalks and other development to minimize the need for clearing and maximize preservation of existing native vegetation.
- ES 13.3 Ensure the proper care and management

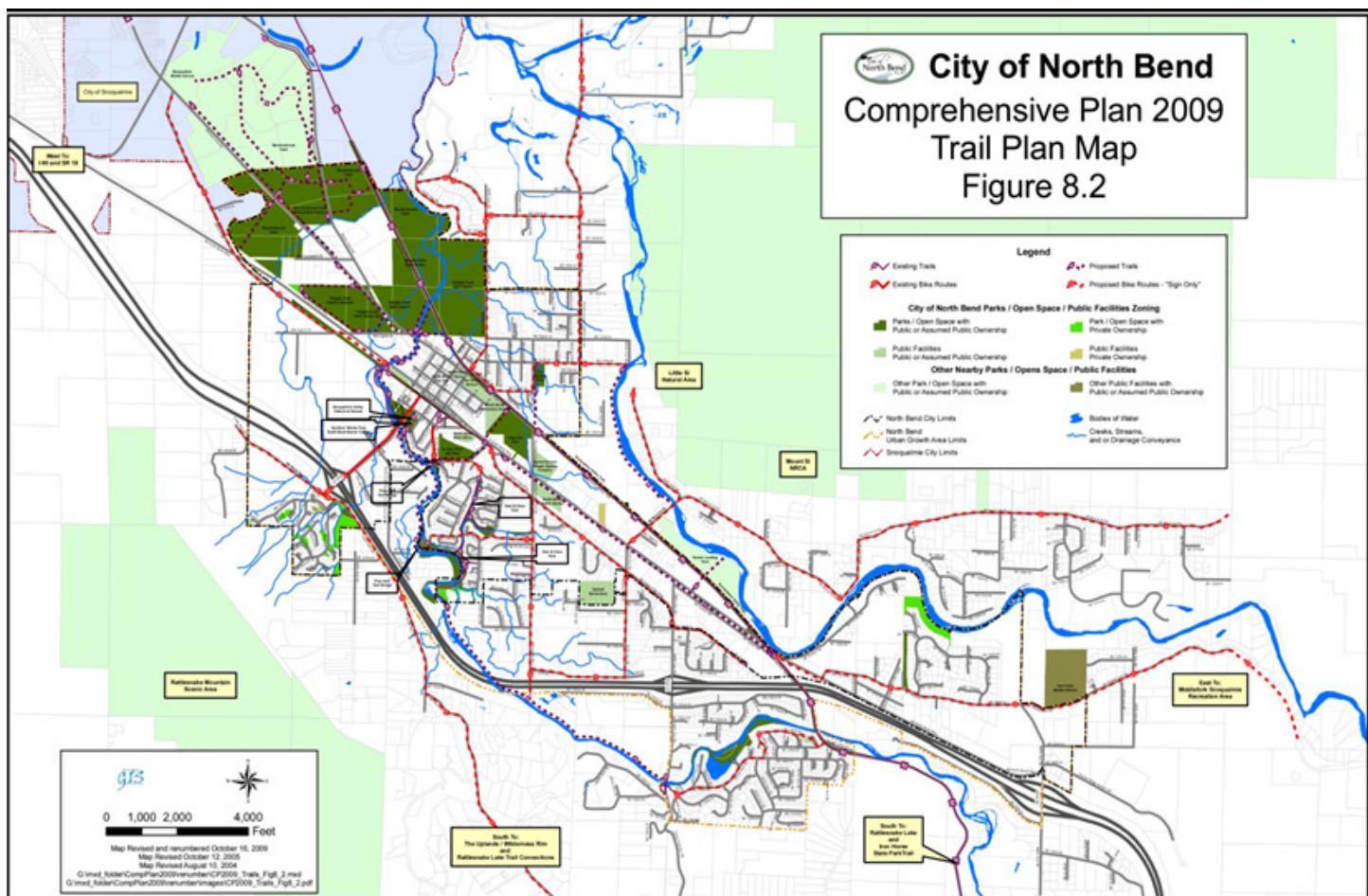
of LID stormwater techniques by the City for public facilities, and by private property owners or homeowners associations responsible for these features on private property.

- ES 13.4 Develop management protocol to ensure that regular "vacuuming" of pervious paving surfaces is performed to keep them from becoming clogged and losing their infiltration capacity over time.
- ES 13.5 Following completion of a residential LID demonstration project consistent with the City's LID Demonstration Project Regulations, evaluate the successes and shortcomings of the development's stormwater management, and consider how the provisions may be applied City-wide.

APPENDICES

APPENDIX A: CITY OF NORTH BEND COMPREHENSIVE PLAN 2009,

TRAIL PLAN MAP



APPENDIX B: ACRONYMS AND GLOSSARY

ACRONYMS

ADA	American with Disabilities Act
ADT	Average Daily Traffic
ARRA	American Reinvestment and Recovery Act
BRAC	Bridge Replacement Advisory Committee
CIP	Capital Improvement Program
CWPP	County-Wide Planning Process
GMA	Growth Management Act
HCM	Highway Capacity Manual
HES	Hazard Elimination Program
HOV	High Occupancy Vehicle
ISTEA	Intermodal Surface Transportation Efficiency Act
ITE	Institute of Transportation Engineers
LOS	Level of Service
MPO	Metropolitan Planning Organization
ROW	Right-of-Way
SOV	Single-Occupant Vehicle
TAZ	Traffic Analysis Zone
TDM	Travel Demand Management
TEA-21	Transportation Efficiency Act for the 21st Century
TIB	Transportation Improvement Board
TIP	Transportation Improvement Program
TSM	Transportation System Management
TRB	Transportation Research Board
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles of Travel
WSDOT	Washington State Department of Transportation

GLOSSARY

Adopt	Method by which the City Council may vote to officially accept a policy, resolution or ordinance.
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Amend

Method by which the City Council may officially alter or change a policy, resolution or ordinance.

American with Disabilities Act (ADA)

Federal civil rights legislation for disabled persons passed in 1990; requires the removal of barriers to mobility by disabled individuals in all public facilities, including public rights-of-way, and calls on public transit systems to make their services more fully accessible as well as to underwrite a parallel network of paratransit service.

Annexation

The act of incorporating an area into the domain of a city, county, or state.

Arterial, Minor

A street which serves as a distributor of traffic from a principal arterial to streets with less intensive use, such as collectors; serves secondary traffic generators such as neighborhood shopping areas and high schools, and serves traffic between neighborhoods. Less intensively used than principal arterials, minor arterials also may have little or no direct access to adjoining properties.

Arterial, Major

A street designed to provide the most efficient movement of traffic between a regional arterial, such as a highway, and major activity areas and points of destination such as shopping districts. Principal arterials also move traffic between communities, utilize traffic lights, and provide little or no direct access to adjoining properties.

Bond

Contract to pay a specified sum of money (the principal or face value) at a specified future date (maturity) plus interest paid at an agreed percentage of the principal.

Bond and Levy Financing

Local governments can raise revenues by selling tax-exempt municipal bonds or by increasing property

taxes through property tax levies. Bonds require a 60 percent voter approval; levies require a simple majority. The City can issue a limited amount of debt without voter approval. Voter approval bonds are retired with property tax revenues.

Calibration

The process of adjusting the parameters of the mathematical travel models so that these models accurately simulate travel patterns observed in the base year.

Capacity

The maximum number of vehicles that can pass over a given section of a lane or roadway during a given time period under prevailing roadway and traffic conditions. The maximum rate of flow that has a reasonable expectation of occurring. In the absence of a time modifier, capacity is an hourly volume. Capacity would not normally be exceeded without changing one or more of the conditions that prevail. In expressing capacity, it is essential to state the prevailing roadway and traffic conditions under which the capacity is applicable.

Capital Improvement Program (CIP)

A plan for future capital expenditures which identifies each capital project, its anticipated starts and completion, and allocates existing funds and known revenue sources over a six-year period.

Census Tracts

A spatial unit of measurement used by the Federal Bureau of Census to collect demographic data.

CIP

See Capital Improvement Program.

Clean Air Act

The federal Clean Air Act identifies automobile sources (vehicles) as primary sources of pollution and calls for stringent new requirements in metropolitan areas and states where attainment of federal air quality standards is or could be a problem. A complementary law exists at the state level in Washington State, entitled the Clean Air Washington Act.

Collector

A street designed to move traffic from local streets and funnel it onto arterials. It may provide access to adjoining properties and is usually wider than local

streets.

Commute

Describes travel or trip taken by those who work outside of their community.

Comprehensive Plan

Mandated by the Growth Management Act (GMA), it is a statutory document which sets forth long-range goals and policies concerning the desirable future and physical development of a community. The City of North Bend's plan is made up of five required elements including land use, housing, utilities, capital facilities and recreation and three supplemental elements including economic development, recreation and sensitive areas.

Concurrency

A GMA requirement that development and the extension of infrastructure occurs at the same time. The GMA requires that transportation facilities needed to maintain the adopted level of service standards for arterials and transit routes are available within six years of development. Concurrency is used to prevent sprawling development in areas that do not have infrastructure in place, and to ease the financial burden on the localities that build it.

Congestion

A condition which does not permit movement on a transportation facility at optimal legal speeds. Characterized by unstable traffic flows. Recurrent congestion is caused by excess volume capacity. Nonrecurring congestion is caused by actions such as special events and/or traffic accidents.

Consistency

A measure of whether any feature the Plan or a regulation is incompatible with any other related feature, plan or regulation. The GMA requires that the Plan be both internally and externally consistent.

Countywide Planning Process

As required by the GMA, the King County Council adopted a series of policies which embody a vision of the future of King County and guide the development of North Bend's Comprehensive Plan.

Density

The number of families, persons or dwelling units per unit of land usually expressed as "per acre" which describes the intensity of development.

Dwelling Unit

Describes a building or portion thereof providing complete housekeeping facilities for one family. The term "dwelling" shall not be deemed to include motel, tourist court, rooming house, or tourist home.

Expressway

A divided roadway with full or partial control of access. Interchanges are either grade-separated or controlled by traffic lights. Pedestrian traffic and access from abutting property are restricted. Expressways perform a similar function to freeways in carrying long-distance traffic between major traffic generators. However, rights of way are generally narrower and the degree of access control less strict than for freeways.

External Cordon Survey

A survey of traffic crossing an imaginary cordon line encircling the Study Area; designed to obtain trip data on persons traveling into, out of, or through the Area.

External Traffic Zone

A traffic zone located outside the boundaries of the Study Area. Trips crossing the Study Area boundary are allocated to the appropriate external traffic zone in which they originate or terminate.

Freeways

Freeways are divided roadways with complete access control. Their function is to carry large volumes of long-distance traffic between major centers of traffic generation. Interchanges are grade-separated, and pedestrian traffic and access from abutting properties are prohibited.

Forecasted Traffic Volume

The number of vehicles forecasted to travel on all or part of the street and highway network over a given period of time for a future year.

General Fund

The fund used to account for all financial resources except those required to be accounted for in another fund.

General Obligation Bonds

Bonds for the payment of which the full faith and credit of the issuing government are pledged.

Growth Management

Government programs that control timing, location and character of land use and development.

Growth Management Act (GMA)

State legislation passed in April 1990 which changed land-use planning in the State of Washington to provide for better growth management and transportation planning. The Act requires that local governments in fast growing and densely populated areas develop and adopt comprehensive plans. In 1991 the GMA was amended to further define requirements and to establish a framework for coordination among local governments through countywide and multi-county planning policies (RCW 36.70A).

High Occupancy Vehicle (HOV)

Vehicles having more than one occupant. Examples include carpools, vanpools, buses, and mini-buses. Transportation systems may encourage HOV use by having designated HOV lanes.

Impact Fees

Costs imposed on new development to fund public facility improvements required by new development and ease fiscal burdens on localities.

Intermodal Surface Transportation Efficiency Act (ISTEA)

ISTEA is a federal law, enacted in 1991, that reauthorizes federal statutes on planning and funding for roadways and transit projects. ISTEA made broad changes in the manner that transportation decisions are made. It emphasizes diversity and balance of modes and preservation of existing systems over construction of new facilities, especially roads. It adds a series of social, environmental, and energy factors that must be considered in addition to traditional considerations for transportation planning, programming, and project selection.

Jurisdiction

Includes counties and cities. As appropriate, the term "jurisdiction" also includes federal and state agencies and federally recognized tribes.

Level-of-Service

LOS is a descriptive measure of the quality of transportation service provided the user that incorporates finite measure of quantifiable characteristics such as travel time, travel cost,

number of transfers, etc. Operating characteristics of levels of service for motor vehicles can be found in the latest edition of the Highway Capacity Manual, Transportation Research Board Special Report.

Local Street

A short-distance road primarily for access to abutting residential, industrial or commercial properties.

Major Road

A general term denoting any freeway, expressway, or distributor road.

Mitigation

The act of alleviating, abating, or lessening some problem or affliction.

Mode

The method of travel used, e.g. auto driver, vehicle passenger, public transport passenger, share a ride in a carpool or walking.

Model

A mathematical formula that expresses the actions and interactions of the elements of a system in such a manner that the system may be evaluated under any given set of conditions.

Multimodal

Concerning or involving more than one transportation mode.

Network

A road, rail or other transportation system. A detailed link by link description of the routes covered by a transportation system.

Non-motorized

Generally referring to bicycle, pedestrian and other modes of transportation not involving a motor vehicle.

Park and Ride Lots

Park-and-ride lots refer to facilities which serve as a transfer terminal for automobiles and bikes and which are normally served by public transportation. They can include spaces used by persons transferring to carpools or vanpools whether officially designated for that purpose or not.

Right-of-Way

The land (usually a strip) acquired for or devoted to transportation purposes. For example, highway ROW

and railroad ROW.

State Environmental Policy Act (SEPA)

The state law passed in 1971 requiring state and local agencies to consider environmental impacts in the decision-making process. A determination of environmental significance must be made for all non-exempt projects or actions which require a permit, license or decision from a government agency. Where significant adverse environmental impacts are not found, a Declaration of Non-Significance (DNS) is issued. Major adverse impacts require Environmental Impact Statement (EIS).

Single-Occupant Vehicle (SOV)

A vehicle having only one occupant (usually the vehicle operator!).

Transportation Demand Management (TDM)

TDM includes actions or programs which encourage people to travel at alternative times, or with fewer vehicles to reduce congestion. TDM reduces traffic volumes through methods including: ridesharing, park-and-ride operations, staggered work hours, and transit improvements.

Transportation System Management (TSM)

Actions or construction that control or improve the movement of cars and trucks on the highway system and buses on the transit system. TSM also includes the coordination of the available transportation systems for more efficient operation.

Traffic Assignment

The process of allocating trips onto existing or planned routes available on the highway or public transport network. Assignment may be based on one or more factors known to influence route selection, such as travel time, distance and/or cost.

Traffic Analysis Zone (TAZ)

The basic unit of area for traffic analysis. The region under study is broken up into traffic zones (about 100 in the case of North Bend). All trips to or from a zone are assumed to start or end at one selected point (zone centroid) within that zone. This process greatly reduces the number of possible origin and destination points to a magnitude that can be handled by a computer.

Traffic Calming

Traffic Calming refers to various design features

and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic Calming projects can range from minor modifications of an individual street to comprehensive redesign of a road network. Traffic Calming is becoming increasingly accepted by transportation professional organizations and urban planners.

Traffic Calming Devices

Physical features designed for a specific road and traffic condition. These may include bulb corners, chicane, landscaping, speed bumps, and passive speed control devices.

Traffic Counts

Number of vehicles observed as they pass by a manual count station or recorded as they cross an automatic counting device on a street or highway over a given time period.

Transportation Improvement Program (TIP)

The Transportation Improvement Program is a one- to three- year work plan which identifies projects from the Long Range Plan and the funding necessary to implement them. The TIP is usually revised annually. ISTEA requires that projects only appear in the TIP if funding is already secured for the work--it is not a wish list.

Travel Model

A system of mathematical relationships which can be used to estimate the volume and distribution of travel likely to occur in a given set of circumstances.

Trip Distribution

The geographical distribution of trips; the process by which the total number of trips is converted to individual zone to zone movements.

Trip Distribution Model

A mathematical relationship used to distribute trips between zones on the basis of certain parameters such as spatial separation and relative attractiveness.

Trip Generation

The number of trips produced by or attracted to a zone; the process by which the numbers of such trips are determined.

Trucks

2-axle vehicles with 6 wheels (single unit delivery-trucks), and vehicles with 3- or more axles, including multi-unit vehicles (typically called "semi-trailers" or

"18-wheelers", and "double-bottoms" or "pup trailers and doubles", double trailers that may consist of three or four individual units totaling 7 or more axles).

Urban Growth Areas (UGAs)

Those areas designated by counties pursuant to RCW 36.70A.110 (State of Washington Growth Management Act) to accommodate 20-year growth projections. As generally defined in state law, such areas are those within which urban growth shall be encouraged and outside of which growth can occur only if it is not urban in nature.

Urbanized Area

An area defined by the U.S. Census Bureau according to the specific criteria designed to include the entire densely-settled area around each large city. An urbanized area must have a minimum population of 50,000 persons at a density of 1,000 persons per square mile.

Vehicle Mile of Travel (VMT)

On highways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given highway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.

Zoning

Classification of land in a community into different areas and districts. Zoning is a legislative process that regulates building dimensions, density, design, placement and use within each district.

Zoning Classification

A method of assigning a body of regulations to an area to ensure a type of growth that protects, preserves or enhances the area through the designation of allowed uses, building placement, and lot size.

Zoning Incentive

A planning technique granting additional development capacity in exchange for the developer's provision of a public benefit or amenity.

Zoning Ordinance

A set of land use regulations enacted by the City to create districts within which the type, location, density, bulk, height, and lot coverage of land uses are restricted.

APPENDIX C: SIX YEAR TRANSPORTATION IMPROVEMENT PROGRAM

Adopted 6-Year Transportation Improvement Program, 2012-2017

Project Name	Cost		Funding Sources			Local	Total	Year
	Design	Construction	Fed	State	County			
Tanner Trail, Phase 2 and 3 R/W Acquisition	\$4,003,120	\$0	\$9,046	\$1,997,037	\$1,997,037	\$0	\$4,003,120	09-14
North Bend Way Handrail Installation	\$2,000	\$18,000	\$0	\$0	\$0	\$20,000	\$20,000	12
Pickett Ave Reconstruction (6th to 12th)	\$78,646	\$611,454	\$0	\$0	\$0	\$690,100	\$690,100	12-14
Downtown Crosswalk Impr. with in-pavement lighting	\$5,000	\$120,510	\$0	\$0	\$0	\$125,510	\$125,510	12-13
Sidewalk Trip Hazard Elimination	\$9,409	\$69,000	\$0	\$0	\$0	\$78,409	\$78,409	12-13
North Bend Way/Ballarat Signal	\$46,350	\$360,500	\$206,000	\$0	\$0	\$200,850	\$406,850	13-14
Bendigo Traffic Reconfiguration (3rd to NBW)	\$10,825	\$79,403	\$0	\$0	\$0	\$90,228	\$90,228	14
North Bend Way/Park Intersection Improvement	\$148,320	\$1,396,680	\$360,500	\$515,000	\$0	\$669,500	\$1,545,000	13-15
North Bend Way C&G/Landscape (Ballarat to Orchard)	\$32,188	\$235,932	\$0	\$0	\$0	\$268,119	\$268,119	13-15
North Bend Way/NW 8th St Intersection Improvements	\$148,320	\$1,087,680	\$0	\$0	\$0	\$1,236,000	\$1,236,000	16
2nd Street Sidewalk Reconstruction	\$12,978	\$95,172	\$0	\$0	\$0	\$108,150	\$108,150	12
Right Turn Lane, N Bound Bendigo at Park St	\$25,750	\$123,600	\$0	\$0	\$0	\$149,350	\$149,350	13-14
Boalch Avenue Reconstruction	\$75,087	\$550,638	\$0	\$0	\$0	\$625,725	\$625,725	13
Pavement Overlay Program	\$150,000	\$1,650,000	\$0	\$0	\$0	\$1,800,000	\$1,800,000	12-17
Totals	\$4,747,993	\$6,398,569	\$575,546	\$2,512,037	\$1,997,037	\$6,061,941	\$11,146,561	

Notes:

Pickett Ave Reconstruction to be funded by REET
 Federal contributions to NBW/Park Intersection are from Rural Setaside
 Federal contributions to Ballarat signal project are from Rural Setaside
 State contributions to Tanner Trail are from RCO
 County contributions to Tanner Trail are from Conservation Futures
 Additional projects may be added pending update to Transportation Comp Plan

APPENDIX D: TRAFFIC FORECASTING MODEL REPORT

Provided by Eco Resource Management Systems, Robert Shull – Transportation Modeling

The traffic forecasting model for North Bend, WA uses PTV Vision VISUM version 11.52+, by PTV AG, Karlsruhe, Germany with local support from PTV America, Inc., Portland, Oregon. The previous model was imported from the previous TMODEL2 software (© TModel Corporation, Vashon, WA). PTV Vision VISUM is in use worldwide, and is used by a large number of Washington cities and MPOs. A major virtue of PTV Vision VISUM and previously TMODEL2 is its advanced capability for simulation of intersection delays based on type of traffic control and lane geometry. This is an important consideration when modeling a local area traffic network for peak hour conditions. TMODEL Corporation had merged with PTV America, Inc. in 2004 and important features of TMODEL2 were incorporated into PTV Vision VISUM at that time.

Summary Description of Traffic Model

The traffic model for North Bend, WA simulates afternoon peak hour volumes. The model was updated and calibrated to accurately “predict” known traffic counts for the base year 2011. Forecasts of future year traffic

volumes can be developed with this model by entering new data for assumed future road conditions and land use growth.

Land use and road data is coded for 99 internal Traffic Analysis Zones and 9 external zones, 1056 directional links, 499 nodes, and 286 centroid connectors.

The North Bend area is quite self-contained, being situated in the Snoqualmie River valley and surrounded by the Cascade Mountains. The Traffic Model represents the City of North Bend, WA in great detail, and a necessary amount of surrounding areas. The Traffic Model accounts for travel connections beyond this area by means of external zones representing the highway connections via Interstate 90 east and west, State Route 202 to Snoqualmie, and certain other local roads extending into forest areas.

ACCURACY OF TRAFFIC MODEL FOR NORTH BEND, WA
 As further detailed in a later section, the model reproduces existing traffic counts with an R-Squared correlation statistic of 0.89, Root Mean Squared Error (RMSE) statistic of 28% and 92% percent of counts

within limits specified in NCHRP 255. The standards are R-Squared should be 0.88 or above, RMSE should be 35% or below, and 75% of links classified as Principal Arterial and above should be within NCHRP 255 limits. The updated North Bend area model meets and exceeds all of these standard measures.

HOW TRAFFIC FORECASTING MODELS WORK (KEY PRINCIPLES)

This section provides a general introduction to traffic models, to set the stage for later sections which provide specific details about the traffic model developed for North Bend, WA.

Traffic forecasting models, such as VISUM, simulate traffic flows on roadways using mathematical models of human behavior, combined with inventory data about the particular study area at hand and its human population: (a) the physical description of the road network in terms of speed and capacity on each represented road section or link, and the traffic control and channelization characteristics of each intersection; (b) the amount of land use of various types that exists within in each of many small geographic areas, called Traffic Analysis Zones (TAZs); (c) the facilities and services available for alternative modes such as transit and ridesharing.

Human travel behavior characteristics are represented by (a) trip generation rates for each class of land use; (b) mode choice factors for the study area population; (c) mathematical procedures to distribute trips between all TAZs, and (d) mathematical procedures for the routing of trips through the road network (called Traffic Assignment).

Road Network Inventory Data.

At the basic level, each road included in the network is described by its length, free-flow operating speed, and capacity. Many regional-scale traffic models disregard intersection effects entirely. VISUM is ideal for local-area modeling because it adds a rather sophisticated simulation of intersection delay as well, based on the lane configuration and type of control used at each intersection or interchange. As a result, VISUM can model the change in travel demand that results from a local transportation system change as small as adding a traffic signal to an intersection, or adding turn pockets, or favoring or penalizing any given approach.

Land Use Inventory Data.

Traffic models require land use data in more precise local detail than most secondary sources have assembled it. This makes local land use monitoring an important consideration. Regional planning agencies rely on federal census data for population and housing, and state-collected employment information about employers. Such data is usually one to three years old before it is released in final form, and the aggregation level in terms of census tracts or postal zip codes may be too gross for local-area modeling purposes. Converting data from those sources requires additional effort to be accurate at the local level, and a further effort to account for changes to the present year based on development review and building permit activity. For these reasons, many local-area traffic models use instead locally maintained land-use data such as is available from the local North Bend, WA's planning Geographic Information System (GIS), or from the county assessor's inventory of land parcels and structures built on each parcel.

Alternative Modes Data.

To the extent necessary for the local area, traffic models may include options to split calculated trip generation by persons among competing choices of travel modes, such as transit, carpools, vanpools, bicycling, and walking. The form and level of detail for this varies considerably from place to place. Truck and taxi travel may also be explicitly modeled where needed. For this update of the North Bend model, the same procedures were used as previously applied, which means alternative modes were not explicitly modeled. However, it must be understood, that the trip generation rates used and validated for the model (as shown with the statistical analysis) implicitly model the effect of alternative modes.

Human Behavior Factors.

The framework of human behaviors affecting travel decisions was identified in research from the 1950s and 1960s, as documented in technical literature, however, the numeric parameters vary over time and from place to place because people's choices are not universally constant. The traffic model for North Bend, WA is calibrated for local conditions in the following steps:

(a) Trip generation is largely determined by the type of land use. Trip generation factors in a traffic model are similar in the aggregate to the driveway total trip rates reported by the Institute of Traffic Engineers for a wide range of land uses. However, I.T.E. trip generation

rates only describe total vehicle trip generation at a site, without further detail about the reasons for travel, nor does I.T.E. count trips by other modes. Traffic forecasting models account for trip generation in terms of several trip purposes (home-based work-commute trips, home-based non-work trips, non-home-based trips, school trips, truck and taxi trips, and other special-case purposes). Each trip purpose has distinct characteristics for later steps of the modeling process, pertaining to trip length, time-of-day patterns, mode choice and vehicle occupancy. Trip generation rates may be established for 24-hour daily travel, for morning or afternoon peak hours, or peak periods, depending on needs and interests for planning and design.

(b) Trip distribution is the modeling step that allocates the trips generated in each zone to all other zones. The pattern of trip length frequencies differs significantly for each trip purpose. For example, people are willing to travel much longer distances to commute to/from work, than for most other trip purposes. The computational procedure is called the gravity model, since it follows the mathematical form of Newton's Law of Gravity: the amount of human activity (trip generation) in each TAZ proportionately increases the likelihood of trips occurring between any two TAZs, but that likelihood diminishes with increasing travel time between the TAZs. Travel time through the road network is affected by road conditions of speed, capacity, and congestion. Since availability of direct connections also matters in the choices humans make between alternative trip destinations, the VISUM procedure allows use of a weighted average of travel time and travel distance between zones, each for trip distribution and trip assignment. As recommended in current research, the North Bend model now uses an iterative feedback loop with weighted averaging to reach equilibrium convergence between the travel times used for distribution and those computed from trip assignment. The end result of the trip distribution step is a trip table, which gives the number of trips traveling between each zone (TAZ) and each other zone. A trip table may be calculated for a 24-hour day, or a morning or afternoon peak hour, or peak periods, according to how the trip generation rates are established.

(c) The trip assignment step allocates trips to specific paths through the road network, after the distribution process has determined how many trips travel between any given zone and all other zones. Assignment is now performed with an equilibrium assignment methodology,

including updates of the delay that occurs on each road link and each intersection, based on the amount of traffic assigned. The total travel demand between any two TAZs may end up being allocated to two or more alternative routes. The assignment process does not rigidly prevent a link from receiving more traffic demand than its given capacity. The trip assignment process may shift some demand from a congested route to other available parallel paths that are less congested, but if there are no better options, the demand will remain allocated to the same route even if capacity is exceeded. However, the forecast delay for an overloaded link or node will be extremely high. A forecasted overload thus signifies an unsolved problem with unmet demand for additional capacity, and a need for further analysis of alternative solutions.

Time Periods. The entire modeling process may be carried out for 24-hour total daily trips, or for shorter intervals such as the peak hour of morning or afternoon commuting, or for a peak period of two or three hours. Daily modeling is popular for statewide or regional planning purposes where the issues are more general, but is seldom used in local area planning because the concept of "daily capacity" is very inexact. Local area modeling usually focuses on peak hour conditions when the capacity constraints are most critical and best related to design requirements for improvements.

Mode Choice. The process described above is typical of suburban area traffic models, where almost all travel demand is served by the automobile mode. A fourth modeling step, to allocate a share of total trips to transit and other non-automobile modes, is used in large multimodal regional planning models. The North Bend model uses trip rates that implicitly include mode choice, but only generate automobile trips for distribution and assignment. Mode choice elements can be added to a local-area traffic model, at a level of detail suited to the issues at hand.

Calibration and Validation. The calibration of a new traffic model consists of assembling the model data for existing conditions of the land use and road system, setting the trip generation rates and trip length frequency parameters, and setting other detailed formula assumptions within the model, to best represent local current conditions. Validation consists of comparing the resulting traffic assignment to actual traffic counts, and possibly other available survey data, to show the degree of correlation between the base-year model and base-

year survey information. A well-calibrated model will provide a close correlation to existing counts, when it is populated with existing land use and road information. Calibration errors should be minimal and evenly distributed, to consider a model "validated" and therefore suitable for use in planning and design studies.

Data Integrity. Calibration problems may arise from the formulation of human behavior patterns represented by various formulae in the model, or they may arise from inaccurate input data regarding land uses and the road system. Therefore all assumptions must be checked carefully to resolve the issues. The input land use data may come from several sources which need to be reconciled, and they may require adjustments to fit the model's TAZ framework and calendar year. Failure to account specifically for recently occupied developments is a common cause of "error" when a traffic model's volumes are compared to recent traffic counts. Traffic counts assembled from other sources will usually include inconsistencies between nearby locations, for various reasons. The goal is to represent conditions actually existing at a specific point in time consistent with the land use information. Most available traffic count data is collected for just one or two days at each location, and counts throughout the study area may be collected in different months, seasons, or even years of time. This adds considerable room for random variations, and makes it difficult to precisely match all counts to the single point in time represented by the land use data. The level of detail in the model also affects the level of accuracy to be expected from the model. The number and size of TAZs affects the accuracy of modeled volumes on road links near the connecting points where traffic moves between the TAZ and the road system. For greater local accuracy, more links and intersections must be coded, and TAZs must be smaller and more precisely defined. Regional-scale traffic models have very large TAZs and thus are usually unable to forecast traffic demand on the local road network beneath the level of freeways and major highways.

Post-processing. A well-calibrated model will inevitably still show some residual differences between the modeled base-year traffic volumes and actual base-year traffic counts. In any future-year application, these residual differences should be at least acknowledged. They may also be offset by post-processing adjustments, sometimes called calibration adjustment. For example, if the model under-predicts existing counts by 100 trips, it is likely to

under-predict future conditions in the same or a similar way. A reasonable post-processing adjustment would be to add 100 trips to the modeled future volumes, all else being equal. Post-processing adjustments are, however, also subject to interpretation since future conditions will differ in some ways from existing conditions, which corrupts the assumption about all else being equal. There may or may not be a solid justification to apply the same calibration adjustment as in the base year. This is a difficult area of subjective interpretation, and it is frequently left undone as a result.

Post-processing is most justified in the case of short-term future forecasts where the road system and land use changes are not large, and especially if comparisons to known traffic counts are an important part of the analysis. Post-processing is least necessary for long-range future alternatives analysis where many changes in assumptions are involved and the comparisons are mainly between alternative scenarios and decision choices rather than against existing counts. The need to consider post-processing is generally eliminated if the model is used to identify net changes or differences between any two model runs, rather than to forecast absolute traffic volumes. For use in intersection LOS analyses, the approach of adding and subtracting the calibration deviations was used to adjust for the model differences.

How Traffic Forecasting Models Are Used in Planning and Design Traffic models are more properly described as travel demand forecasting models, since the main output is the volume of travel demand on roads, by individual links and turning movements at intersections. Secondary outputs of traffic models include travel speeds and measures of delay including congestion effects. Traffic models can also identify the particular zone-to-zone travel patterns that use a given road link, or identify the road links which are used by trips to/from any given TAZ, or for a particular trip purpose. When the forecast travel demand is within the limits of capacity on all road links, the tested scenario is viable. A forecast that shows travel demand exceeding capacity, whether in one location or spread throughout an area, indicates a lack of balance between the capacity of the assumed transportation system and the land use assumptions which generated the excess travel demand. The tested scenario's land use and transportation assumptions are not in balance until overloads are corrected by changing the input assumptions. Resolving such issues represents the "art" of

transportation planning, in contrast to the “science” of the traffic model.

There are several ways to interpret a modeled forecast of capacity deficiencies:

(a) There may be a straightforward solution in the form of capacity improvements to the overloaded road facilities;
 (b) The overload may be due to excess demand elsewhere which the assignment model diverted to parallel routes such as the subject location;
 (c) There may be viable alternative assumptions to shift excess demand to other modes, to other times of day, etc., or to accept higher congestion (e.g., reduce level of service standards) which in turn lead to altered understanding of the meaning of “capacity”. If the capacity improvements necessary for balance with travel demand cannot be justified based on any combination of factors including design features, right-of-way availability, construction cost, timing, social impacts, economic impacts, environmental impacts, implementation feasibility and/or political support, then a solution may only be possible if the assumed land uses are changed. Since the traffic model fundamentally forecasts future travel demand based on assumed land uses, it can be fairly described as a land use impact model.

Standard Procedures of the Traffic Model for North Bend, WA

IMPORTANT: The user is assumed to possess and understand the VISUM Manual, and be familiar with traffic modeling in general and have prior training in VISUM practices. This document only accounts for the specifics of this model for North Bend, WA in that context.

This traffic model uses land use data to simulate traffic volumes on the present and future streets in North Bend, WA and immediately adjacent areas. All important roads in those areas are addressed in full detail, and the model also covers surrounding areas at a lesser level of detail. Modeling procedures account for several different trip purposes, provide for transit and park/ride modes, and for trip chaining behavior.

Time Period. The traffic model for North Bend, WA simulates afternoon peak hour volumes.

Base Year Model.

The updated base year model represents the inventory of actual land use and road conditions for the year 2011.

This model was calibrated to accurately “predict” known traffic counts for the base year, as further described in the section on Model Validation.

Size of Model.

The updated 2011 base year model consists of 99 internal TAZs and 9 external stations, 1056 directional links, 499 nodes, and 286 centroid connectors.

Future Year Forecasts.

Alternative versions of the model can be set up to represent alternative assumptions about future land use growth, future road improvements, and future mode choice.

GEOGRAPHIC SCOPE AND ZONE SYSTEM

The Traffic Model represents the City of North Bend, WA in great detail, and surrounding areas as needed to account for the occupied residential land area of the Upper Snoqualmie Valley and tributaries. The adjacent City of Snoqualmie is not included in the model, to simplify data management. Snoqualmie traffic is included in the external zone representing SR 202 at the northwest edge of the model area.

The area represented at full detail includes North Bend, WA and some surrounding areas of high interest. All arterials and collectors are included, as well as many local access roads, and the size of individual zones (TAZs) is small. In more distant areas, there is progressively less detail, with fewer collectors and minor arterials (if any), and the zones are larger (See Figure 13 for reference). At the outer limits of the study region only freeways and selected other principal arterials are included, and the zones are very large. With this style of geographic continuity, the trips to/from/within North Bend, WA are seamlessly integrated with regional travel patterns involving adjacent areas. Travel through North Bend, WA from outside areas is explicitly modeled as trips between remote zones, as an automatic product of the distribution model.

EXTERNAL LINKS

Travel to/from the region outside the City of North Bend is accounted for by nine external zones, serving the areas described as follows:

External zones 100 and 101 represent the interstate

corridor, and have predominantly through travel. Zone 100 to/from the Seattle-King County metro area is the major source of work-commute trips to homes in North Bend, and the major source of shopper trips to/from the Factory Outlet Mall. The distance from North Bend to the major population centers of the region is from 15 to 30 miles via this route. Zone 101 represents the recreation area of Snoqualmie Pass and beyond to Eastern Washington and all states east to Boston, MA.

External zone 102 accounts for trips to/from I-90 west via North Bend Way. Travel on this road is essentially a sub-set of the external-internal flow between I-90 West and the City of North Bend. There is also a connection from North Bend Way into the City of Snoqualmie via Meadowbrook Way, just beyond the limits of this model. Meadowbrook Way is predominantly used as access to/from I-90 for the City of Snoqualmie, and traffic counts indicated very little travel between the City of North Bend and Meadowbrook Way. Therefore, the model limits were placed close to the west city limits of North Bend and Meadowbrook Way was not included in the model.

External zone 103 represents the intercity travel between North Bend and Snoqualmie, and a minor amount of other longer-distance travel through Snoqualmie to the region beyond.

External zone 104 (Balch Road) is a low-volume connection to Snoqualmie's eastern residential fringe area, farming areas, and the Mount Si Golf Course.

External zones 105-108 represent primitive forest roads leading to major recreational areas, as follows:

- 105 – 428th Ave SE (to/from primitive forest recreational area north of city)
- 106 – Mt. Si Road (to/from primitive forest recreational area north of city)
- 107 – Middle Fork Road (to/from primitive forest recreational area east of city)
- 108 – Cedar Falls Road (to/from primitive forest recreational area south of city)

These zones were assigned small non-zero trip values for purposes of the traffic model, but there are no counts to validate those estimates. The primary use of these zones is recreational. They do not account for any significant amount of weekday afternoon peak hour traffic on an annual average basis, and could have been omitted. (Peak summer days may be an exception, but no traffic data

exists for that extreme situation.) Existing rural residential uses along these respective forest roads were accounted for by internal zones. These external zones would be most useful as generators of recreational traffic that should be considered if a daily travel model or weekend activity model were to be created. During the calibration process, the estimated numbers of external trips for all external zones were updated to reflect updated count data.

ROAD NETWORK

The road network description accounts for all functionally classified roads and many local roads in North Bend, WA and vicinity, consistent with its very finely detailed TAZ structure. To facilitate coding and checking a geographically correct background map was added to the Point-Of-Interest (POI) layer of the model when it was imported from TMODEL2 to PTV Vision VISUM software.

LINK INVENTORY DATA CODING

The major road link inventory attributes in the updated model are Type, lanes, 1-or-2-way operation, free-flow speed, and link length. From these data elements, directional hourly capacity is automatically determined from Link Type lookup table which is now incorporated directly in the model procedures. The 2011 traffic counts are now also included directly in the network file for model validation comparisons and later post-processing adjustments.

Automatic Link Coding.

To assure that automatic recalculation is always effective and consistent; no links should be coded with "arbitrary" speed or capacity, to achieve better modeling performance. Such problems should be solved instead by improving the model accuracy in other areas. Capacities are automatically computed when the model is run, so any manual adjustments or accidental revisions to capacity are corrected automatically at that time. This is an important consideration in establishing the unbiased credibility of the traffic model. For calibration improvements, attention should be focused instead on other areas of the model if the link is properly characterized in the Type, Number of Lanes, and free flow speed (vo) fields.

Link Type Field. T

The classification scheme for actual or planned roads includes local streets, collectors, arterials, freeways, ramps, and exclusive Bus/HOV lanes. In addition, there

are classification codes to represent zone centroid connectors, and other types of artificial links. Link Type codes are used in several VISUM procedures, to specify the link speed and capacity in a mass network update, to calculate delays in the distribution/assignment process, and can be used in other procedures to determine Level of Service, calculate emissions, etc.

GIS Exchange Codes.

This option was not used but was discussed in the previous implementation of the North Bend WA Traffic Model. PTV Vision VISUM now allows direct importing and exporting of GIS shapefiles as well as transfer of data with databases, excel, and the windows clipboard. There is not a need for GIS exchange codes for the future. For possible use of the model for comparisons with older versions, the TMODEL Class, Area, and Type values were imported for each link and these values are retained with the updated model.

Link 1 or 2 Way Field.

The previous model was coded for 1 or 2 way traffic. In this update using VISUM, directionality is controlled by allowing or not allowing a Transport System (abbreviated as TSys) to use a link. Freeways and Ramps are coded as one-way links for better control and visual representation. The need for turn prohibition codes is reduced somewhat by the use of one-way links.

On rare occasions a two-way arterial street does not have the same attributes in both directions (number of lanes; uphill vs. downhill speed), this difference in attributes can be coded directionally. Unlike TMODEL2, two one-way links may not be used between the same pair of nodes. Caution is advised because this abnormal coding is hard to see on the network screen and could lead to confusion and other coding errors.

Link Lanes.

The field value is the number of moving lanes in one direction. The normal assumption is that each direction has the same number of lanes. If not, this can be coded directionally. The effect of auxiliary lanes is generally not treated in this field. Examples include median left turn lanes, short passing lanes, and turn pockets approaching intersections. Those road features are accounted for by the distinct Type field, since they serve to increase the through capacity of the true through lanes rather than contribute the capacity expected from a normal through lane. They may also be accounted for in the value of Node Capacity and were explicitly coded in node geometry for

LOS analysis locations.

Link Capacity.

This value is automatically generated from the number of lanes, and the capacity/lane specified in the Link Types table within the model .ver file. The steps to compute the capacities are built in to the model run. Table D-1 shows the link Types and Capacities per lane used in the model.

Table D-1: Link Types with Capacity and Speed

Type	Name	Capacity/Lane	Speed
11	Local Access Street-Speed 10	200	10
12	Local Access Street-Speed 15	200	15
13	Local Access Street-Speed 20	400	20
14	Local Access Street-Speed 25	500	25
15	Local Access Street-Speed 30	500	30
16	Local Access Street-Speed 35	800	35
21	Collector Arterial-Speed 15	500	15
22	Collector Arterial-Speed 20	500	20
23	Collector Arterial-Speed 25	500	25
24	Collector Arterial-Speed 30	500	30
25	Collector Arterial-Speed 35	800	35
26	Collector Arterial-Speed 40	800	40
31	Minor Arterial-Speed 20	500	20
32	Minor Arterial-Speed 25	500	25
33	Minor Arterial-Speed 30	800	30
34	Minor Arterial-Speed 35	800	35
35	Minor Arterial-Speed 40	800	40
36	Minor Arterial-Speed 45	800	45
41	Principal Arterial-Speed 25	800	25
42	Principal Arterial-Speed 30	800	30
43	Principal Arterial-Speed 35	800	35
44	Principal Arterial-Speed 40	800	40
45	Principal Arterial-Speed 45	800	45
46	Principal Arterial-Speed 50	800	50
51	Highway-Speed 30	900	30
52	Highway-Speed 35	900	35
53	Highway-Speed 40	900	40
54	Highway-Speed 45	900	45
55	Highway-Speed 50	900	50
56	Highway-Speed 55	900	55
71	On/Off Ramp-Speed 25	1000	25
72	On/Off Ramp-Speed 30	1000	30
73	On/Off Ramp-Speed 35	1000	35
74	On/Off Ramp-Speed 40	1000	40
75	On/Off Ramp-Speed 45	1000	45
76	On/Off Ramp-Speed 50	1000	50
81	Freeway-Speed 50	2000	50
82	Freeway-Speed 55	2000	55
83	Freeway-Speed 60	2000	60
84	Freeway-Speed 65	2000	65
85	Freeway-Speed 70	2000	70
86	Freeway-Speed 75	2000	75

Link Distance (Length).

This link attribute is automatically calculated when a node is moved or inserted, or a new link is added. This model uses the Washington State Plane coordinate system and has the scale integral to the model file. All lengths can be recomputed if desired using standard VISUM procedures.

Link Speed (MPH).

With this update, the link speed is not automatically overwritten from the Link Type value, so specific speeds can be used for links using special speed controls or traffic calming. Different speeds can be entered directionally.

Link Volumes.

These are automatically computed with a model run and cannot be edited by the user.

Link Travel Times.

These are automatically computed with a model run and cannot be edited by the user.

Count_2011.

Traffic counts from 2011 are coded using User Defined Attributes (UDA). Where multiple counts were available these were entered in the field of Count_2_2011. Count location identification information is coded in Count_2011_ID and Count_2_2011_ID.

Model_2011.

Model volumes for the calibrated and validated 2011 model run were saved in this field. These are used for post-processing volumes for further analysis.

Link-based delay is calculated during assignment from the assigned directional volumes on the link, the directional link capacity, according to the link delay formula for the link type. The delay formula is incorporated in the model run parameters file for each of the link types, similar to the previous TMODEL2 implementation. This delay is different for each direction on the link, to the extent that the directional volumes and possibly capacities are different. It is meant to account for running delays on links that arise due to volume, without consideration of intersection control delays.

Node-based delay is calculated during assignment from the assigned volumes through the node at the destination end of each directional link, that node's capacity and

other delay features from the node impedance settings in the model run parameters file. These are automatically computed during the model run. Node delay is referred back to each approach leg so that total travel times through the network are accounted for correctly. The amount of node-based delay is often quite different for the two directions of a link because the nodes at opposite ends of the link are quite different.

NODE INVENTORY DATA CODING

In VISUM, like the previous implementation in TMODEL2, and unlike most other traffic modeling software, nodes are coded with data to precisely specify the delay characteristics of each node. This gives considerable power to simulate urban intersection behavior, and especially to model the different capacity, delay, and priority provided by signals, stop signs, roundabouts, interchanges, etc. In a local-area street network, the majority of delay is generated at intersections, rather than on links, so node coding is a powerful tool to improve assignment accuracy.

Automatic Node Coding.

Due to the simplicity of the North Bend network, this feature was not utilized. Instead, all nodes of each given type were assigned a uniform capacity. The node coding values for all categories of intersection control and intersection channelization options are given in Table D-2.

Node Type (Intersection Control Type).

The node type field defines the intersection control type for delay purposes and is matched to the node volume/delay functions used during the model run. Node types include all "real" intersection and interchange control options, and also "dummy" node categories representing non-intersections that are junctions of two or more links. These include "shape nodes" used to visually shape a curved road section using straight-line segments, and zone centroids which are preferably not also road intersections.

Intersection Control.

This selection is not used for model run computations or delays. However, the specifications here will determine which analysis method is used for LOS computations. This field value only needs to be set for those locations that also have the Analysis_Intersection box checked, which specifies the locations to be analyzed. Analysis intersections must have detailed geometry and

signalization coded for proper LOS analysis.

Node Capacity.

This major attribute of every node is based on the Type field and this is automatically updated during the model run using the values in Table D-2. An additional amount of 500 per lane capacity is added for intersections with more than 4 entering lanes as per the previous TMODEL2 model.

TMODEL Special.

This check box for approach links that have partial stop control must be checked to properly assign delay. To the legs that are stopped. When testing the conversion of a partial way stop controlled intersection to a roundabout or signal, confirm that none of the links approaching the intersection have this box checked. When this box is checked, VISUM allocates the calculated delay for the node to each such link, and assigns no delay to any other links entering that node. If the approach delay is to be allocated evenly to all approaches to an intersection, then TMODEL Special approach link boxes should be specified.

Count_ID.

The name of the count location is identified when there are turn movement counts at this intersection.

Table D-2: Node Coding Values City of North Bend Traffic Model Node Coding Table		
Type	Description	Capacity
0	Uncontrolled, Shape, Connector	32000
1	Two-Way Stop	1600
2	All-Way Stop	2000
3	Traffic Signal	3000
4	Roundabout	3600
5	Ramp - Merge	Outbound Link Capacity
6	Ramp - Diverge	32000

TURNS

Delay at intersections is further modeled in VISUM equations for specific turns at specific intersections; e.g., left turns. This is now incorporated directly in the model run file and a 6 second delay is added for all left turns. This

represents the additional impedance that drivers perceive to make a left turn.

Count_2011.

The volume of the turn count data for 2011 was entered in this field. This does not need revision for forecast runs.

Model_2011.

The turn volume from the calibrated 2011 model was placed in this field for use in post-processing adjustments.

Adjustment.

The amount of the adjustment for post-processing was automatically placed in this field and is automatically applied when conducting LOS analysis.

The case of absolute turn prohibition is coded by not allowing a Transport System (TSys) of Car to use the prohibited turn. If testing revisions where either placing or removing prohibitions, make sure and check that these are properly set.

CALCULATION OF DELAYS DURING ASSIGNMENT PROCESS

In the traffic assignment process, link, node, and turn delays are calculated based on the traffic volumes served and the coded capacity values. The calculation depends on the classification of the link, node, and turn, as well as the capacity. Delay on freeways thus accumulates by a formula that is different from the delay on arterials, or on local streets. Similarly, node delay is developed differently for signalized intersections than for stop controlled intersections.

A specific delay formula is defined for each type of link or node in the integral model run parameters. In the previous North Bend WA Traffic Model, only the node delays were defined with links using the default BPR volume-delay function. This is updated to use more realistic delay equations for both links and nodes with this 2011 update. During the assignment process, each link's and node's delay is calculated between iterations based on the ratio of demand volume to capacity. Each node's delay is calculated from the sum of entering volumes divided by capacity, and added to those approach legs which are specified to receive delay. No delay is added to the through (non-stopped) approach legs at partial stop

controlled intersections. In cases of equal priority (all-way stop, roundabouts, and signals), all approaches receive the same delay per vehicle. The resulting total travel time is updated for each iteration of the assignment. After the final assignment is completed, the resulting travel time is recorded for both the link and individual turns for each node. This can be converted to congested speed and/or to vehicle-hours of travel for reports, as desired.

TRIP GENERATION PROCEDURE BASED ON LAND USE DATA

To accurately simulate travel in the afternoon peak hour at residential locations, at employment sites, and at retail and service centers, the model accounts for each travel purpose that has different proportions of travel by trip direction and different patterns of trip length. These trip purposes include commuting between work and home, non-work travel between homes and other places, non-home-based travel including business travel, trucks and taxis, and personal travel between various locations excluding the home.

To improve the local accuracy of traffic simulations, the North Bend WA Traffic Model includes specialized trip purposes to also address trip chaining (a home-bound commuter's shopping or other intermediate stops between work and home). Trip generation for North Bend, WA Traffic Model followed the TMODEL2 "Type 2" method of trip generation in terms of data format and computations. This process was imported into VISUM and updated to use the integral trip generation procedure. Land use data for all zones is now saved directly in VISUM as data attributes for each TAZ. This allows for easy entry/edit and checking as well as graphical display. Trip generation rates are described for the afternoon peak hour in the model run procedures. There is no longer a need to use an external Excel workbook with the resultant complexity of use to import and export data. Land use categories and trip generation rates are the same as those used and previously calibrated.

1. Land Use files.

Land Use categories used in North Bend, WA Traffic Model are as follows:

- (a) Single-family dwellings (includes duplexes and conceivably condominiums, if large with multiple bedrooms and multiple parking stalls)
- (b) Multi-family dwellings (apartments and most

condominiums)

- (c) General retail buildings (1,000 square feet gross floor area)
- (d) General office buildings (1,000 square feet gross floor area)
- (e) Industrial buildings (1,000 square feet gross floor area)
- (f) Warehouse buildings (1,000 square feet gross floor area – industrial type activity but very low trip generation)
- (g) Hotel and Motel buildings (1,000 square feet gross floor area)
- (h) Medical-dental offices and hospitals (1,000 square feet gross floor area)
- (i) Congregate Care facilities (1,000 square feet gross floor area – nursing homes, assisted living, etc. with full-time caretaker staff and limited off-site travel by residents)
- (j) Park/ride lots (parking spaces)
- (k) "Active" undeveloped land area (parks, playgrounds, utility storage areas – equivalent peak hour trips manually estimated for each such location)
- (l) Special Land Uses (1,000 square feet – as inventoried from GIS source but not used in trip generation)
- (m) Parking (1,000 square feet – as inventoried from GIS source but not used in trip generation)
- (n) Vacant (1,000 square feet - as inventoried from GIS source but not used in trip generation)
- (o) Open Space (1,000 square feet - as inventoried from GIS source but not used in trip generation)

The 2011 base year land use files were developed by first interpolating the previous data to estimate year 2011. These data elements were then checked and revised by the City of North Bend to update to current conditions and to also update the forecast values. Because the checking process involved some aggregation of categories, these were then disaggregated after the adjustment process to obtain the appropriate number of units for each TAZ.

Note that the inventory includes some categories not used for trip generation per se, but possibly useful to help allocate future growth assumptions from a citywide estimate to a subarea and zone level. These include the categories for "Special", "Vacant", and "Open Space", which may indicate future development potential. These were not updated nor revised during this model update process as they were not used for trip generation and did not affect model operation.

2. Maintain Zone Attribute Data.

The average trip generation rates are sometimes modified

according to zone-specific details, to account for unusual or non-average trip generation conditions at specific zones. The traffic modeler can use these zone attributes to account for traffic factors not addressed by the average trip generation rates in the model, and land use details not represented by the land use source data. The Zone Attribute page of the previous LUTG workbook held these factors and they were used in the trip generation spreadsheet. These factors were imported into the VISUM model as Zone (TAZ) attributes and used within the expanded trip generation process to replicate the earlier manual process. This is now automatic during the model run. The North Bend model adjustments included in the zone attributes include the following:

- a. the Nintendo Factory is a large employer, but the shift schedule causes nearly all worker trip generation to occur before the afternoon peak hour, so trip generation is reduced to near zero by the non-residential trip generation intensity factor.
- b. Some land use data from areas outside the City of North Bend was of uncertain accuracy. Where the rural residential environment supported a below-average trip rate the residential trip intensity factors were adjusted to .8 or .9 to best fit the available count data. For two zones the factor was raised to 1.1. This may also indicate inaccurate dwelling counts but there is no independent data to check.
- c. Retail trip generation was adjusted to fit local conditions and specific retail activity characteristics. Many downtown North Bend zones have considerable walk-in business, and do not generate vehicular trips at the level predicted by standard suburban trip rates such as provided by ITE. Each newly developed suburban-type retail zone was assigned an intensity factor of 1.0, but older established zones were given a factor of 0.4 because they were either walk-oriented or dominated by antiquated and uncompetitive businesses that do generate the level of vehicular activity suggested by the square footage in the GIS parcel inventory. These factors could be refined somewhat if more traffic count data were collected, but the value of the effort would be minimal in an overall sense.
- d. The portion of a zone's retail activity that was freeway oriented, such as the Factory Mall zone, was given factors of to reflect the association of their trip generation with the freeway external zones, rather than distribute that trip generation within the city.

Two additional attributes are used in the distribution and

assignment procedures. These were refined during the update of the model calibration with values that provided a better match for the traffic count data. They are:

- a. Terminal Time gives the amount of time at the start and end of any trip to add to network travel time to account for the traveler's walk access time between a building and the vehicle. This is set uniformly at 50, representing 0.50 minutes, since all zones are small and the parking areas are immediately adjacent to homes and non-residential buildings in most cases.
- b. Intrazonal Time was uniformly set to 9999 (representing 99.99 minutes) to assure that the gravity model does not assign any trips to start and end within the same zone. All zones are very small and intrazonal travel by vehicles is very small. This was revised to use 50% of the minimum time to the next two closest zones. This allows for some intrazonal trips for those situations with mixed use which reduces vehicle traffic on the roadway. Future year land use data and growth assumptions may or may not require that any zone attributes be changed. Changes should be made only for specific and documentable reasons.

3. Calculate trip ends (origins and destinations) at each TAZ.

The model run procedures, both for the base year and the forecast year contain procedures to compute the adjusted land use values and generate the trip ends for each TAZ. There is no manual intervention required. Trip generation for each trip purpose for each TAZ is calculated by direction, in terms of trip origins (leaving the TAZ) and trip destinations (entering the TAZ).

Note - Regional travel models commonly calculate trip generation in terms of productions and attractions at the daily aggregate level in a non-directional manner, and do not convert trips from that artificial schema to the more realistic origin/destination format until the final modeling step of traffic assignment. That complex procedure has been avoided in this model. Since peak hour travel has a highly directional character (as compared to daily travel that is generally balanced in both directions) it is more straightforward to use the form of origins and destinations directly at the trip generation stage. The trip generation rates have been correspondingly converted from productions and attractions to origins and destinations.

The traditional three major trip purposes represented in

most regional traffic models are:

Home-based-work,
Home-based-other, and
Non-home-based.

The North Bend, WA Traffic Model further subdivides trip generation into a total of six directional “trip purposes” to more accurately describe peak hour travel. The additional trip purposes are used to subdivide trips by direction of travel, and to explicitly model “chained trips” involving more than one stop. The trip purposes used in this model are the following, all of which are directional in nature for better accuracy and control in the assignment process:

1. From Work to Home (no stops)
2. From Work to Other (first part of “chained” trips en route home; for shopping, etc.)
3. From Other to Home (concluding part of “chained” trips en route home)
4. From Home to Other (predominantly to retail shopping, and other local destinations)
5. From Other to Home (return part of local home-to-other trips)
6. Non-Home-Based (trips between two TAZ’s which do not include the driver’s residence. This accounts for several types of trips including second- or third- legs of a multi-stop tour of “chained” trips, commercial travel of all types, and truck travel.)

The Table D-3 lists the trip generation rates for this model’s trip purposes, by land use type. The calibrated trip rates, when applied to the base year land use data, produce a balanced trip generation file in which the trip origins equal the trip destinations for each purpose, within a very small margin. The retail trip generation rate includes a significant size adjustment factor to account for scale effects. This factor is different for each zone, according to the amount of retail land use in that zone. The adjustments are applied before trips are generated.

Table D-3: Traffic Model Initial Trip Generation Rates

	A-WH		B-WK-DVT		C-DVT-HM		D-HM-OTH		E-OTH-HM		F-NHB	
Variable	Origins	Dests	Origins	Dests	Origins	Dests	Origins	Dests	Origins	Dests	Origins	Dests
SFDU	0.02000	0.29000	0.00000	0.00000	0.00000	0.07000	0.25000	0.05000	0.06000	0.25000	0.02000	0.01000
MFDU	0.00000	0.22000	0.00000	0.00000	0.00000	0.05000	0.14000	0.04000	0.04000	0.15000	0.01000	0.01000
Retail	0.05000	0.00000	0.00000	0.40000	0.40000	0.00000	0.00000	0.78000	0.77000	0.00000	0.71000	0.68000
Office	0.85000	0.00000	0.22000	0.00000	0.00000	0.00000	0.00000	0.11000	0.09000	0.00000	0.07000	0.13000
Industrial	0.49000	0.00000	0.12000	0.00000	0.00000	0.00000	0.00000	0.02000	0.02000	0.00000	0.04000	0.04000
Warehouse	0.02000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02000	0.02000	0.00000	0.01000	0.01000
Hotel	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.30000	0.30000	0.00000	0.30000	0.30000
Med_Dental	0.96000	0.00000	0.00000	0.41000	0.35000	0.00000	0.00000	0.91000	1.01000	0.00000	0.35000	0.41000
Congregate Care	0.07000	0.03000	0.00000	0.05000	0.05000	0.00000	0.00000	0.05000	0.05000	0.00000	0.00000	0.00000
Park & Ride	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.06000	0.00000	0.00000	0.10000	0.04000
X-I Origins	0.41515	0.00000	0.10217	0.00000	0.02728	0.00000	0.21224	0.00000	0.14525	0.00000	0.09791	0.00000
I-X Destinations	0.00000	0.13797	0.00000	0.02341	0.00000	0.03330	0.00000	0.33178	0.00000	0.11894	0.00000	0.35460

The previous model required a number of steps for to be conducted manually within the spreadsheet, such as balancing the trip origins and destinations. This is now automatically conducted in the model run procedures. However, the discussion is still included here for reference. When initially calibrated, the trip generation rates and the base-year land

use are matched, so that total trip origins equal total trip destinations for each trip purpose. However, for future land use scenarios, the assumed future changes in land use within the local area and throughout the region usually do not constitute as precise a balance of homes and jobs as is true for the actual base-year conditions. As a result, the totals of computed future trip origins and trip destinations for each trip purpose will be unbalanced to some degree. The model procedures will balance these to the average of the total origins and destinations for all trips within each of the trip purposes.

ALTERNATIVE MODES

Travel by means other than cars and trucks is presently near-negligible throughout the modeled area centered on North Bend, WA., but the model can be revised for the future if these conditions change or it is desired to test large changes in use of alternative modes. This can be tested by either modifying trip generation rates, adding a factor, or adding a complete mode choice model into the model run parameters.

Park and Ride Lots

In addition to direct auto trip reductions attributable to local transit service, North Bend, WA Traffic Model also can simulate explicitly the automobile trips to/from park/ride lots in the study area. There are not existing park/ride lots of any size in North Bend today, but the land use file format contains a field to account for any such future lot. If park/ride spaces are coded into a TAZ for the future, the model will calculate the trips generated at the park/ride lot. The trip generation model calculates trip ends to and from each park/ride lot using a standard average driveway trip rate for park/ride lots in the region, as provided by Metro, the county transit operator. The regional average driveway trip rate is subdivided in this model into trip purposes to separately account for trips by direction between park/ride lots and homes, and between park/ride lots and nearby retail/commercial locations. This level of sophistication is needed to explain the fact that about 20% of activity at the park/ride lot in the afternoon peak hour is inbound not outbound, and that it takes approximately two hours of the afternoon peak period to fully discharge the park/ride lot's volume of parked cars.

The model assumes that each park/ride space that exists will be used with no substantial vacancies (but a vacancy factor could be established if needed as a unique Zone Attribute or as a reduced number of spaces). It is

important therefore to accurately identify the timing and certainty of each potential future park/ride site. Park/ride lots tend to increase traffic volumes within the local area, but reduce them regionally. Lots located along state highways at the edges of the modeled local area do not actually reduce trips from the local area itself. Rather, they remove travel from roads further away from the local area. To reduce traffic impacts on a suburban area's major commuter arterial routes by such means, it is necessary to place significant park/ride facilities near the center of the local area, and to combine them with high quality transit service to/from the external employment areas.

TRIP DISTRIBUTION PROCEDURE

The output of the trip generation model is a table of trip generation for each TAZ, for each trip purpose. Each actual trip has two ends, which are both accounted for in trip generation. Trip origins leave a TAZ, while trip destinations arrive at a TAZ. The directionality of each trip purpose is important to the accurate modeling of peak hour traffic.

Example: A residential TAZ has many work-commute trip destinations in the afternoon, and few work-commuter trip origins (e.g., afternoon/evening-shift workers going to work). An employment location has many work commute trip origins in the afternoon peak hour, and few commute trip destinations. For shopping trips and most other trip purposes, the origins and destinations are roughly in balance at each TAZ, both residential and commercial.

The trip distribution model combines the trip generation information at all TAZs with mathematical formulae describing the length of all trips in the form of a probability distribution. Trips for each trip purpose will range from very long to very short, according to a calibrated probability curve which varies by trip purpose. Work-commute trips are much longer on average than other trip types. The trip length probability curves in North Bend, WA Traffic Model were taken from previously calibrated traffic models in other locations, and work well in this situation also. During the model import and update process, these were adjusted slightly to calibrate the model with the slightly different methodology and algorithms available in VISUM versus TMODEL2. Trip "length" in the trip distribution model can be measured as a weighted average of (predominantly) travel time and (modestly) travel distance between each pair of TAZ's. This composite measure is called the interzonal

impedance. The coded road network is used to develop the matrix of interzonal times and distances, and combine those values into measures of time, distance, or weighted impedance between each pair of zones.

Congestion obviously affects travel times, and the existence or absence of major new road facilities can also affect these calculations. Therefore, the road network used to develop the trip distribution should be the same, or nearly the same, as the network to which trips are assigned in the last step of the model. To assure that this is so, North Bend, WA Traffic Model now uses an iterative feedback loop with weighted averaging based upon current research for model convergence. What this means is, for the first step, trips are distributed based upon free flow travel times, then for each iteration, the travel times are updated using a weighted average of the times from the previous iteration and the current iteration to adjust the trip distribution. After each update of the trip distribution, the trips are assigned to the network and the travel times are updated. This iterative process continues for ten (10) iterations or until the link volumes no longer are changing. This assures that the trip distribution reflects the congestion in the network. The gravity model coefficient values used for the TMODEL Gravity Model formulation in VISUM are shown below in table D-4.

Table D-4: Gravity Model Coefficients			
Purpose	a	b	c
A-WH	-0.5	2.0	25
B-WK-DVT	-0.5	2.0	25
C-DVT-HM	-0.5	2.8	25
D-HM-OTH	-0.5	2.8	25
E-OTH-HM	-0.5	2.8	25
F-NHB	-0.5	2.9	25

The result of the trip distribution step is a trip table for each trip purpose, and these are combined a total trip table combining all trip purposes, for the afternoon peak hour. These trip tables can be examined and interpreted to help understand the movements that make up the travel patterns on the road system, and to devise effective future improvements, including multi-modal strategies. For example, analysis of the work-commute trip table can identify major clusters of commuters who might be attracted to an express bus service between North Bend, WA neighborhoods and employment centers elsewhere.

TRIP ASSIGNMENT PROCEDURE

The trip assignment procedure is updated to use the equilibrium assignment algorithm. This procedure minimizes travel time between all zone pairs, so it assumes that no traveler can change the path of their trip without increasing travel time for all travelers. This, of course, assumes that travelers have ideal knowledge of travel conditions throughout the network and will act logically on this knowledge to help optimize the system for themselves and all other travelers. In actuality, neither of the assumptions is true. However, this methodology gives us logical, rational, repeatable results. These results can then be used to test different alternatives. We have already discussed calibration and post-processing adjustments that may account for differences. However, we must first have a systematic repeatable approach that can be applied for the forecasts.

The trip tables produced by the trip distribution model are provided to the trip assignment model, for assignment to the road system. During each assignment iteration travel times are recomputed using the assigned traffic volumes, network input values for speed, capacity, and length, along with the volume delay functions to reflect congested travel times. As discussed in the section for trip distribution, the distribution and assignment use an iterative procedure to achieve an equilibrium state, both within the trip distribution and within the traffic assignment.

The final assignment uses Multi-Point Assignment, which is another TMODEL2 innovation that is used in VISUM now

as well. This forces trips to use multiple TAZ centroid connectors to better reflect the arrangement of driveways, parking lots, and other access points within the TAZ. This has been proven to better reflect reality and to provide a better, more realistic, traffic assignment. The final equilibrium assignment is run to a converged relative gap statistic of 10-5. If final assignments are not run to this low of a relative gap, the comparison of alternatives can lead to incorrect conclusions because the amount of random variation can exceed the amount of difference between alternatives. Insuring that the assignment is converged along with the convergence of the trip distribution assures that the model is responsive to the changes in the network.

MODEL VALIDATION

No traffic model is ever totally accurate, due to the practical limitations of input data (incomplete or inaccurate counts, land use, road network data, etc.) as well as the complexity and diversity of human travel decisions. Calibration of a traffic model consists of adjusting internal formulae and parameters to achieve a good representation of actual base year traffic from the inputs of base year land use and road data. Validation is the process of comparing traffic model outputs to traffic counts and other data, to verify reasonable operation according to available standards of reference.

This traffic model has been compared to three commonly accepted statistical standards suggested by the Federal Highway Administration, in Model Validation and Reasonableness Checking Manual (1997). These standards are advisory rather than mandatory, but are well-regarded by most transportation modelers.

R-Squared (R₂).

This correlation statistic describes the "goodness of fit", or the overall degree to which the model volumes correspond to observed count data. Perfection would be 1.00 or 100% correlation of model volumes to counts. Values above 0.88 are desired. The updated North Bend model has a value of 0.89.

Slope of regression line.

Although not specified in documentation, the R₂ statistic can be within standards and the model will still not be representative of the count data and travel patterns unless the regression line has a slope of close to 1.0. There is not a standard for this value, but the updated North Bend model has a slope of 0.99.

Root-mean-square error (%RMSE).

This describes the average model error in relation to the average counted volume and represents the spread from the regression line. Values under 35% are desired. The updated North Bend model has a value of 28%.

Allowable errors.

A federal research study (National Academy of Sciences - Transportation Research Board, National Cooperative Highway Research Project #255, Highway Traffic Data for Urbanized Area Project Planning and Design, 1982). provides a well-known formula for allowable differences between model volumes and counts. The formula permits higher percentage errors on low-volume roads and lower percentage errors on high-volume roads. Obviously, the consequences of forecasting error will be greater on major roads. A high percentage of links with modeled volumes within this allowable range is obviously desirable, but no absolute standard is provided. It is recommended that 75% of links classified as Principal Arterial and above are within these limits. The updated North Bend model has 92% of ALL counted links within these limits.

These statistics show that the updated North Bend, WA Traffic Model is calibrated to an acceptable level to be used for forecasts.

MODEL RUN PROCEDURES

The PTV Vision VISUM version (.ver) files are supplied to the City for future use. All filter and other files are included with these files. There are three model run parameter (.par) files to be used for running the model.

North Bend Model Run 06082011.par – This file should be loaded for re-running base year calibration or validation if the network or land use is changed.

North Bend Forecast Run 10072011.par – This file should be loaded for running additional forecast alternatives if the network or land use is changed.

North Bend Intersection LOS 06082011.par – This file is loaded and used to run intersection LOS after one of the two procedures have been run. This will result in an excel spreadsheet being created that contains details on each intersection analyzed and a summary sheet showing the average and worst turn LOS.

APPENDIX E: PREVIOUS PLANS AND STUDIES

WSDOT Truck Parking Study – The study analyzed the adequacy of truck parking along WA State's primary freight corridors including I-90, focusing on public rest areas, commercial truck stops, weigh stations and other unofficial areas (like chain-up areas). Findings relevant to North Bend included:

- The parking capacity in the west segment of I-90 between Seattle and Vantage is less than the demand, resulting in 39 to 90 illegally parked trucks on an average night.
- The Seattle East Auto/Truck Plaza in North Bend is regularly at capacity (about 94%) on an average night.
- The assumed growth in truck parking demand along the I-90 corridor is 4% per year.
- The resulting projected 2030 nighttime truck parking demand for the Seattle East Auto/Truck Plaza is 443 spaces compared to the existing supply of 175 (253% greater).
- Recommended ways to increase truck parking included constructing new public rest areas and limited feature lots for trucks, legalized use of weigh stations, public-private partnerships at commercial truck stops including financial aid and shared-use agreements, efforts to separate truck and recreational parking areas, a communications program on corridor parking conditions, and more rigorous and uniform enforcement of existing truck parking laws.

Middle Fork Business Park - Documentation was provided for a series of SEPA environmental determinations for the phased development of the Genie Properties located at SE 144th St / 468th Ave SE, including a 167,000 s.f. industrial warehouse and office building in October 2000, a 2nd phase 134,200 s.f. warehouse and 33,600 s.f. office in November 2002, and a 150,000 s.f. manufacturing/warehouse and 40,000 s.f. cross dock facility in July 2008. In addition to frontage improvements and mitigation fees, the applicant contributed a pro-rata share of \$32,000 toward the cost of signalizing the intersection of 468th Avenue SE / I-90 eastbound on-off ramps to mitigate projected LOS F operating conditions. (The

share represented 12.8% of an estimated \$250,000 cost to signalize the intersection.)

Middle Fork Road Re-Paving Project – A contact call to King County's project manager was returned by Michael Traffalis of the Federal Highway Administration. He explained that the 9.7 mile re-paving project is a forest service project as it provides access to federal lands including the Mt. Baker Campground, forest service lands, and various mining claims. No logging is anticipated in the travelshed. King County has jurisdiction and maintenance responsibility. Traffic forecasts prepared in 2004 were provided. An annual growth rate of 1.5% was assumed, resulting in a 2011 ADT of 286 at MP 2.88 (nearest North Bend), increasing to 380 ADT in 2030.

