

## APPENDIX 9: TRANSPORTATION

### A-9.1 Existing Conditions

#### A-9.1.1 Street and Highway System

##### *Functional Classification*

Public streets are divided into groups having similar characteristics or function based on the length of trips and access to adjacent land parcels. The purpose of this classification system is to provide for the redevelopment of access and circulation, to standardize road designs, and to provide a hierarchy for road funding. The classifications range from local access streets, which directly access abutting properties, to freeways, which only serve vehicular traffic needs.

Principal, minor and collector arterials serve varying degrees of access and circulation needs. The functional classifications are described below.

*Freeway:* An inter-regional divided highway connecting major centers. They are typically a multi-lane, high speed, high capacity roadway intended exclusively for motorized traffic with minimal access controlled by interchanges and road crossings separated by bridges. Interstate 405 and State Route 522 are classified as freeways with limited access.

*Principal Arterial:* A street connecting major community centers and facilities, often constructed with partial limitations on access and minimum direct access to abutting land uses. For example, NE Woodinville-Duvall Road, NE 175th Street, and State Route 202 are classified as principal arterials.

*Minor Arterial:* A street connecting centers and facilities within the community and serving some through traffic while providing high access to adjacent land uses. For example, 156<sup>th</sup> Ave NE, NE 145<sup>th</sup> St, and 124<sup>th</sup> Ave NE are classified as minor arterials.

*Collector:* A street connecting two or more neighborhoods as well as carrying traffic within neighborhoods while serving very little through traffic, but providing high access to adjacent land uses.

*Local Access:* A residential street with generally one lane of traffic in each direction featuring low speeds, high access (frequent access) and low traffic volumes.

##### Major Roadways

Regional travel demand and travel patterns have resulted in a substantial amount of through traffic in Woodinville. Through traffic is defined as vehicle trips with both an origin and a destination outside of Woodinville. The roadways with significant through traffic are State Route 522, State Route 202, and Woodinville-Duvall Road.

State Route 522 has two through travel lanes in each direction and serves as the major route from Seattle to southeast Snohomish County and central Washington via the Stevens Pass highway (State Route 2). State Route 202 through the Sammamish River Valley is primarily a two-lane arterial with a 40 to 50 mph speed limit between State Route 908 in Redmond and State Route 522 in Woodinville. It functions as the only continuous north-south access east of the Sammamish River Between Redmond and Woodinville.

The Woodinville-Duvall Road arterial is four-lane to 156<sup>th</sup> Ave NE and transitions to a two-lane for the remaining section to Duvall, 40 mph roadway connecting Woodinville and State Route 522 with Avondale Road and State Route 203 at Duvall in the Snoqualmie River Valley to the east. This facility is heavily used by commuters who travel through Woodinville to reach State Route 522 and Interstate-405.

Downtown Grid

The City of Woodinville has developed and continues to study the arterial street and pedestrian /bicycle pathway systems in downtown Woodinville. A grid network of new roadways and pedestrian/bicycle paths, or improvements to existing roadways is desired to improve overall circulation, improve safety, provide pedestrian and bicycle connections, and improve operations of the existing park-and-ride. The Downtown Master Plan shall study this and other traffic circulation areas.

Neighborhood Streets

Residential streets for local access are constructed as part of residential subdivisions. As such, facilities for non-motorized travel have been constructed in a piecemeal fashion and may not be consistent from one neighborhood to the next. Also, connections between neighborhoods are often indirect. While through traffic is to be discouraged, connections for pedestrians and bikes are desirable.

**A-9.1.2 Parking**

Within commercial areas, parking is generally provided in off-street parking lots. On-street parking is permitted on some streets.

**A-9.1.3 Traffic Volumes**

A summary of 24-hour traffic volumes and historic growth rates is provided in Table A9-1. As shown, traffic volumes grew at a rate of 7 to 12 percent in the 1980s due to growth and the transition of this area from rural to suburban densities. As available capacity in roadways has diminished, growth in traffic volumes has become more stable, with average growth in traffic of 3 to 3.5 percent. Traffic volume on downtown NE 175th Street has dropped slightly due to the construction of the south bypass (131st Avenue NE - NE 171st Street); the south bypass carried 8,500 vehicles daily in 1994. See Figure A9-1 for the P.M. Peak Hour Traffic Volumes in 1998.

**Table A9-1 Average Weekday Daily Traffic Volumes in the City of Woodinville**

Location	Annual Growth Rate (1995-96)	1995	1996	1997	Annual Growth Rate (1997-98)	1998
State Route 202 (south of Woodinville Dr.)	0.0%	15,000	15,000*	15,000	0.0%	15,000
State Route 522 (Snohomish Co. Line)	2.9%	33,000*	34,000*	35,000*	0.0%	35,000*
State Route 9 (north of 212th Street)	5.0%	19,000	20,000*	21,000	0.0%	21,000

\* indicates actual count.

Source: King County Historical Traffic Count Books and Washington State Department of Transportation Annual Traffic Reports.

**A-9.1.4 Traffic Operations**

The quality of operation of transportation facilities is measured in terms of level of service, where level of service A is considered good and level of service F is considered poor or congested conditions. Level of service can be quantified for street segments or intersections. Data from recent traffic impact studies and visual observations of traffic flow indicate that one or more major movements at the following arterial intersections currently operate at level of

service E or F for one or both of the noon or p.m. peak hours: NE 175th Street/131st Avenue NE; NE 145th Street (State Route 202)/148th Avenue NE; State Route 202/127th Place NE/Woodinville Drive; Woodinville-Snohomish Road/State Route 522 eastbound ramps intersection.

### **A-9.1.5 Accidents**

Hazardous road areas are generally related to poor sight distance, inadequate storage for turning vehicles, poor pavement conditions, and roadside structures such as walls, posts, signs or trees. Sight distance problems include obscuring trees and bushes, hidden driveways or streets, hill crests, and curves. These problems can be commonplace, particularly in some of the older neighborhoods and transitional or developing areas.

Accidents within the City were summarized in the Northshore Plan prepared by King County. The Northshore Plan indicates that between 1987 and 1989, 140th Avenue NE, segments of NE 175th Street and the Woodinville Duvall Road had very high concentrations of accidents. The intersections of NE 175th Street/140th Avenue NE, NE 177th Place/140th Avenue NE and NE 190th Street/140th Avenue NE all experienced more than 30 accidents within this same time frame (1987-1989). Injuries including fatalities are indications of the severity of accidents.

The Washington State Department of Transportation provided accident data on State Route 202. The Washington State Department of Transportation data indicates that in addition to the above intersections State Route 202/NE 175th Street has had 30 accidents in three years. Generally, segments of State Route 202 do not have exceptionally high rates of accidents in comparison to regional levels.

### **A-9.1.6 Non-Motorized Modes**

The role of bicycle and pedestrian travel has received increased attention in recent years as components of a balanced transportation system. Due to the presence of several key trail facilities, Woodinville and the surrounding area has traditionally been an active area for recreational bicycling.

Besides recreation, non-motorized transportation also offers advantages as an alternative to the automobile for certain types of trips and commutes. Whatever the purpose of the trip, however, it remains that non-motorized travel depends upon adequate road right-of-way to provide access to schools, jobs, shopping, parks and other community facilities. The compatibility of the transportation system (and particularly roads) with the needs of bicycling, walking, and other non-motorized travel, determines the safety and access provided by that system.

The region is served by several off-street multipurpose trails. The Burke-Gilman and the Sammamish River Trails are paved facilities, while the Tolt Pipeline Trail is unpaved and primarily serves hikers, equestrians and occasional mountain bicycle use.

The Burke-Gilman and Sammamish River Trails were opened in the late 1970s. Over the years additional segments of the trails Use and Mode Split have been developed so that today they provide a continuous 27-mile long, separated multi-use facility. All data comes from trail user surveys done at five-year intervals by the Cascade Bicycle Club, in cooperation with King County Parks and Recreation and the 2000 Puget Sound Regional Council.

The Wilnot Gateway, a 3.7-acre city park, provides access between the Woodinville central business district and the Sammamish River Trail. Another proposed project, the Woodinville-Valley trail would provide a 0.7-mile trail bordering State Route 202 at NE 145th Street to connect the Tolt Pipeline Trail and the Sammamish Regional Trail.

### Sidewalks

Similar to many other suburban areas of unincorporated King County, prior to incorporation, residential development in Woodinville occurred with minimal provision for pedestrian facilities, such as sidewalks, separated crossings, and pedestrian-actuated signals. In many cases, there is no access to locations except from a road, causing pedestrians to walk longer distances or to trespass on private property. There are still many areas where sidewalks or pathways do not exist, and where intersections do not have pedestrian-actuated signals.

### Bicycles

The Sammamish River Trail has encouraged citizens to experience bicycling as a means of transportation, recreation, and fitness. As a part of the transportation system, separated trails can provide only limited access; however, under appropriate conditions, trails can serve as an effective transportation corridor. The City of Woodinville is expanding non-motorized transportation facilities. For example, NE 175<sup>th</sup> Street and 156<sup>th</sup> Ave NE provide bicycle lanes.

## **A-9.1.7 Transit**

Most transit service in North King County is provided by King County's Department of Transportation, Metro Transit Division, who operate several transit routes and a park-and-ride lot in Woodinville. Sound Transit also serves Woodinville, Bothell and Kenmore.

The Woodinville park-and-ride lot located on Woodinville Duvall Road provides parking for 500 vehicles and is served by several bus routes

The Burlington Northern Railroad 18th Subdivision Branch Line provides passenger excursions by the Spirit of Washington Dinner Train. This train makes one round trip on weekdays and two round trips on weekends between downtown Renton and Columbia Winery in Woodinville.

## **A-9.1.8 Demand Management**

The Commute Trip Reduction Act requires employers with excess of 100 employees to comply with measures to reduce single occupant vehicle travel. The City of Woodinville has adopted an ordinance to govern and implement the Commute Trip Reduction Act. Several employers meeting the criteria – Stimson Lane, which include the Columbia and Chateau Ste. Michelle Wineries; Mackie Designs; and Molbak's Greenhouse. These and other employers will be preparing and implementing plans consistent with the Commute Trip Reduction Act.

## **A-9.1.9 Goods Movement**

To support economic development in the region it is important to provide transportation infrastructure for efficient movement of freight and goods.

Commercial transportation mobility and access are critical to Woodinville's and the region's economic development. Rail service and truck movement are important for the success of businesses and industries in Woodinville and the region. The Transportation Element policies, and those in the economic development element, support existing businesses and industries, and promote Woodinville as an economically viable community.

### Roadways

State Route 522 and Interstate 405 are limited access roadways providing efficient movement for passenger vehicles as well as goods movement on trucks. In addition, State Route 202 and the Woodinville-Duvall Road are important corridors for trucks. State Route 202, 140th/148th Avenues NE, and the Woodinville Snohomish Road go through industrial areas where truck traffic would be higher than other arterials. Movement of goods and movement of people occur simultaneously on the roadway network. Safety and maintenance are often issues on roads with a high mix of trucks and passenger vehicles.

### Railroad

Burlington Northern Railroad maintains tracks which run from the Black River Junction area of Renton through Kirkland and Woodinville, and also from Woodinville to Issaquah, serving industrial customers in those areas. Trains run approximately three times a week on the track from Renton. The section of track from Woodinville to Kenmore known as the Kenmore Spur was abandoned in 1986 and its right-of-way will be used primarily for completion of the Sammamish River Trail (Northshore Community Plan Draft Environmental Impact Statement, 1991). As stated previously, Burlington Northern tracks also carry passengers.

## **A-9.2 Trends and Projections**

In addition to population increases (see Housing and Land Use Elements), miles of travel per household have increased, as more and more households have more than one wage earner. The rise in both the number and distance of trips combined with the majority of drivers traveling alone has resulted in increased traffic congestion, increased air pollution at peak travel periods, the loss of productive time, and loss of energy resources.

Local and regional jurisdictions throughout the area have been cooperating on transportation issues, particularly in the last decade. Nonetheless, transportation facilities have lagged behind demand. The problem is not a local issue confined to the City. Woodinville is adjacent to the crossroads for two major state transportation corridors: State Route 522 which runs east/west from Kenmore through Woodinville, and Interstate 405, the major north/south interstate serving the Eastside sub area and connecting to State Route 2 at Monroe in Snohomish County.

### Future Traffic

The Woodinville Transportation Element was developed to address future vehicular travel demands and needs as well as remedy current travel deficiencies.

One of the tools used to analyze existing and future travel needs was the Woodinville travel model; a computer simulation designed and developed to forecast directional traffic volumes for the weekday afternoon peak hour.

As in most travel modes, the Woodinville model operates by dividing Woodinville into small geographic areas known as subarea analysis zones. From estimated land use in each Subarea Analysis Zone, vehicular trip generation rates for the afternoon peak hour, and the travel time separation between Subarea Analysis Zones, the demand for travel in the afternoon peak can then be forecasted as a set of hourly vehicle volumes from every Subarea Analysis Zone to every other Subarea Analysis Zone. This representation of travel demand, known as a trip table, then is assigned to a computer representation of the existing street system using the shortest time paths (taking into account the effects of congestion) between Subarea Analysis Zones. The model is considered *calibrated* when its predicted hourly volumes match observed traffic counts with a sufficient level of accuracy.

The Woodinville model was adapted from a travel model developed in 1993 for the City of Bothell to represent 1990 and 2010 travel conditions. It was updated in 1999 and calibrated to 1998 counts to represent 1998 and 2020 travel conditions. Travel demand in the Bothell model generally is based on the land use estimates and forecasts provided by the Puget Sound Regional Council. The trip generation rates, choice of travel mode, automobile occupancy rates, and parameters describing the distribution of trip purposes and trip lengths also are consistent with those used by the Puget Sound Regional Council. The main modifications introduced for the 1999 updated Woodinville model were: (1) the incorporation of PSRC year 2020 land use outside the study area; (2) the use of PSRC zonal system and network instead of the Bothell zonal system and network; (3) the adjustments to depict the year 1998 rather

than 1994; (4) the incorporation of more recent land use plans for the City of Woodinville; (5) the use of the most recent short- and long-term transportation improvement plans of Woodinville and neighboring jurisdictions, as well as new road improvements addressed in the Transportation Element and (6) the Woodinville's model is compatible with the regional PSRC model and would allow the city to evaluate transit improvements in the City.

The calibrated model was used to generate 2020 traffic forecasts for several transportation alternatives including testing the CIP projects, looking at major transportation scenarios including extension and realignment of SR 202 across SR 522 and connecting to 120<sup>th</sup> Avenue in Bothell, extending Willows Road north, and evaluating Grid Roads (See Figure A9-2, 2020 Projected Weekday Traffic Volumes). These projects were used on proposed PSRC land use improvements and funded projects as of October 1999.

### **A-9.3 Planning Implications**

#### **A-9.3.1 The Land Use and Transportation Link**

Land use and transportation are fundamentally interrelated. Many of today's transportation problems are the result of a historically inadequate link between land use and transportation objectives. The ability of the transportation system to provide a range of mobility alternatives relies on the manner in which land uses develop at the site, local, and regional levels. The relationships among travel behavior, housing density, population concentrations, and employment density should be used to accomplish Comprehensive Plan goals.

The Growth Management Act requires that the Comprehensive Plan include arterial and transit level-of-service standards to be used as a gauge to judge the performance of the system. The standards identify minimally acceptable travel conditions on arterials and the transit network. They focus on characteristics of the transportation system over which the City has some influence and control.

#### **A-9.3.2 Environmental Stewardship**

Increased trips by motor vehicles, increased travel time, congestion, and longer trips all contribute to deteriorating environmental quality. Policies in other parts of the plan and elsewhere in the transportation element that reduce car use, support transit, and encourage walking and bicycling are key to reducing transportation-related environmental impacts.

More and longer trips by motor vehicles, longer travel times, and congestion are major contributors to local and regional air quality problems, contamination of storm water runoff, noise pollution, energy consumption, and global climate change. Increased congestion has also affected residential neighborhoods as drivers leave the arterial systems for less congested residential streets. The automobile-dominated transportation system makes individual mobility and traveling long distances inexpensive and convenient, and so makes suburban sprawl possible. Changes to the transportation system should improve local, regional, global environmental quality, protect the quality of life in residential areas, and reduce the use of energy and the consumption of undeveloped land.

#### **A-9.3.3 Moving People and Goods**

##### Automobiles

To slow the trend of increasing car use, the City must provide alternatives and must change the way people think about and act upon travel choices. Transportation alternatives to the car need to respond to people's needs for mobility, privacy, comfort, safety, and convenience. The City recognizes that transportation needs and travel choices will change over time as alternatives to car travel become more viable.

Air quality and efficient use of infrastructure are two issues that have driven the need to provide alternatives to the single occupant vehicle. Bikeways can be provided as separate recreation facilities or as transportation routes on major roadways. There must be an effective proportion of high-occupancy vehicle treatments versus purely general-purpose lanes on freeways and some principal arterials. Safety and comfort are two criteria that should be used when developing strategies to move people from single occupant vehicles to other, more efficient, modes.

Travel demand management strategies, such as the availability and cost of parking or employer bus pass subsidies, play an integral role in travel behavior decisions. It is not known to what extent people's travel choices can be changed by managing travel demand, rather than adding new transportation facilities or expanding existing ones.

#### Transit

Providing convenient and accessible transit service can help to slow the increase in the use of single-occupant automobiles, slow the increase in environmental degradation associated with their use, and increase mobility without building new streets and highways. Street rights-of-way are limited; and as streets get more congested, transit with priority treatment can help people move around the city and the region. The transit system will need to change to respond to people's behavior and travel needs. Major investment may be needed to provide more innovative transit service, while some actions can be taken which is low cost. Land use changes and capital facilities can strengthen the transit system, increase ridership, and provide greater mobility choices for citizens, employees and visitors.

The key to reducing reliance on single-occupant vehicles is the provision of viable options to using automobiles, such as improved transit service. More neighborhood-to-neighborhood transit service needs to be considered.

#### Bicycles and Pedestrians

With supportive land use and transportation policies, walking and bicycling can be practical alternatives to driving (especially for short trips), contribute greatly to the quality and vitality of the street scene, and help achieve environmental goals. Pedestrian and bike improvements to intersections, sidewalks, and other facilities can improve access and safety, and are particularly important for children, senior citizens, and people with disabilities.

Developing safe, attractive, and efficient bicycle and pedestrian circulation environments is one of the most critical elements in supporting the use of public transit as an alternative to the automobile.

#### **A-9.3.4 Parking Management**

Adequate parking should be protected while parking policies should be changed to encourage alternative modes of transportation.

#### **A-9.3.5 Goods Movement**

Measures should be taken to ensure the efficient movement of goods and information, given the importance of goods movement to the city's economic vitality.

#### **A-9.3.6 Level-of-Service**

Level of Service standards should be implemented that do not also encourage expansion of

single-occupant automobile use, or expenditures toward such use, while at the same time achieving the city's other economic and environmental goals, as well as regional Level of Service consistency.

#### **A-9.3.7 Concurrency**

If Level of Service on arterials and transit routes declines below the standards adopted by the city, the Growth Management Act requires that measures to accommodate the development be implemented within six years, or the development must be prohibited. A balance should be sought between a desire to accommodate growth and the influence of traffic congestion in changing travel behavior.

#### **A-9.3.8 Transportation Financing**

The city will need to prioritize its investments for maintenance, growth, and alternatives to automobile travel i.e., bicycles, pedestrians, goods movement, and transit.

### **A-9.4 Countywide Planning Policies for Transportation**

Table 2-1 in Chapter 2 presents a comparison of King and Snohomish counties' transportation policies with the City of Woodinville's.