Technical Report 3

Transportation

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Highway 99 Transportation Assessment

Introduction

From military trail to interstate highway, the transportation of people and goods through this area has shaped the history and the land. Stage coach stops gradually gave way to motor hotels and drive-in hamburger stands. With freeway access and a growing market area to serve, the commercial areas on Highway 99 are likely to continue to evolve to meet changing market demands. A key question is whether these re-vitalized commercial areas will be designed primarily for separate auto-oriented uses or if centers will develop where a mix of uses is available and easily accessible by other means. Shaping a desirable future will require a combination of good design, better connectivity and focused investments in transportation facilities.

Roadway Characteristics

Road Classification

Highways, roads, and streets are classified into groups having similar characteristics for providing mobility and/or access. The functional classification also dictates the design standards of roadways. There are several functional classification schemes. The county's arterial functional classification system and the cross-sections for non-local roadways in the county's jurisdiction are provided in the adopted Arterial Atlas. The following urban classifications are described below.

- **Principal Arterial Parkways** such as the Padden Parkway are the highest classification within the county's functional system. They carry high volumes of traffic through the urban area and between major activity centers of regional impact. Access is normally limited to intersections with other arterials. Direct land access is prohibited.
- **Principal Arterials:** Urban principal arterials (such as NE 78th Street or NE Fourth Plain Road) permit traffic flow through the urban area and between major elements of the urban area. They are of great importance in the regional transportation system as they connect major traffic generators to other major activity centers and carry a high proportion of the total urban area travel on a minimum of roadway mileage.
- **Minor Arterials:** Urban minor arterials (such as Hazel Dell Avenue or NE 99th Street) collect and distribute traffic from principal arterials to streets of lower classifications or allow for traffic to directly access destinations. Access to land use activities is generally permitted.
- **Collectors:** Urban collectors (such as NE 88th Street) provide for land access and traffic circulation within and between residential neighborhoods and commercial and industrial areas. Collectors do not handle long through trips and are not continuous for any great length.
- **Local Streets:** Urban local streets emphasize access to land uses versus mobility and usually do not contain bus routes.

Table 1 shows the Federal Functional Classification inventory of mileage for each classified roadway type in the Highway 99 Sub-Area planning area.

Table 1 | Functional Classification Highway 99 Sub-Area and Clark County Roads

FACILITY TYPE	HWY 99 SUBAREA	URBAN AREA	TOTAL CLARK COUNTY	PERCENT OF TOTAL IN SUBAREA
INTERSTATES	5.1	22.1	31.4	8
EXPRESSWAYS & PRINCIPALS	5.1	99.5	108.7	8
MINOR ARTERIALS	3.1	139.3	164.2	5
URBAN COLLECTORS & RURAL MAJOR COLLECTORS	4.2	148.9	321.9	6
RURAL MINOR COLLECTORS	0.0	0.0	115.6	0
LOCAL ROADS	46.9	985.9	2020.8	73
TOTAL	64.4	1395.7	2,762.5	100

The Highway 99 sub-area has a much higher percentage of interstate and principal arterial road miles than other urban areas in the County and a much lower percentage of minor arterials and collectors. This indicates that traffic moving within and through the area is concentrated on just a few major roads as shown in Figure 1.

Circulation

Circulation to and from the planning area is significantly affected by two interstate highways, the Bonneville Power Administration corridor and the Ross Complex. Interstate-205 runs along the northeast boundary. There are three I-205 crossings which are spaced an average of .55 miles apart: at NE 117th Street, at Salmon Creek Avenue and at NE 134th Street.

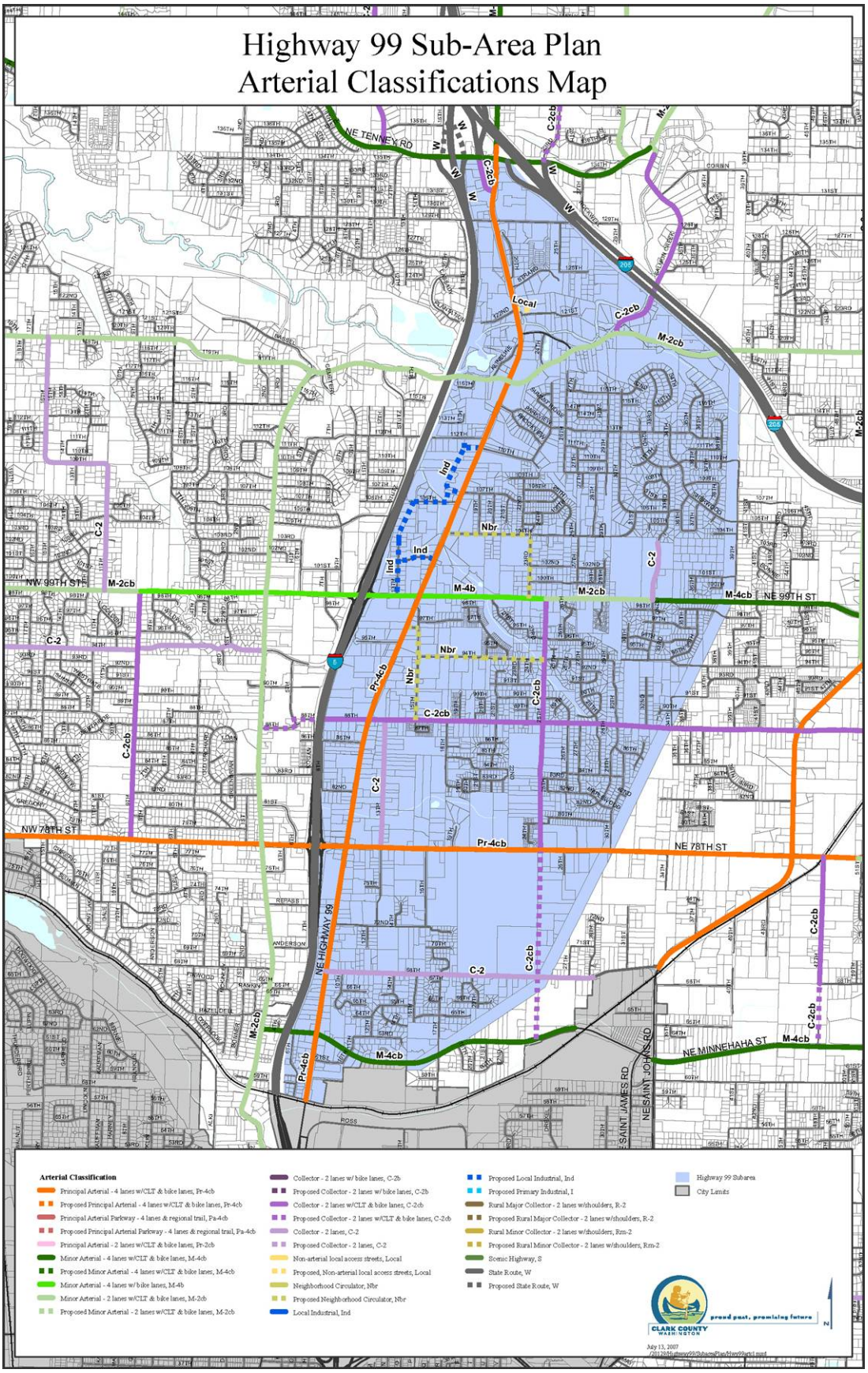
Interstate-5 forms the west boundary of the planning area. There are six I-5 crossings which occur at 63rd, 78th, 99th, 117th, 129th and 134th Streets. The average spacing of crossings is .72 miles and ranges from .26 to 1.02 miles. A planned future crossing at NE 88th St would reduce the longest stretch.

The BPA corridor along the east boundary also hinders circulation somewhat, because encroachment permits are required and the cost of off-site road construction across the power line easement must be borne by adjacent development. Crossings are spaced about .25 miles apart north of 88th St. and about .50 miles apart south of 88th Street.

Along the south edge of the planning area, north/south circulation is affected by the BPA corridor, the Ross Complex and the Chelatchie Prairie railroad. There is no north/south circulation for 1.28 miles between Highway 99 and St. James.

Internal circulation north of Salmon Creek is virtually non-existent due to topography, large lot single-family residences and an unusual land use pattern. Salmon Creek limits internal circulation with crossings spaced at .60 miles at Highway 99 and Salmon Creek Avenue. The current closure of the Klineline Bridge has greatly increased the awareness of how limited circulation is in this area.

Figure 1 | Highway 99 Arterial Atlas Classification Map



South of Salmon Creek, the Sherwood neighborhood and the residential areas between 99th and 117th Streets have reasonably good internal circulation but no access to the arterial collector system to the north, and only fair access to the east, west and south. Intersections along Highway 99 are offset and need to be re-aligned. Better circulation is also needed in the area between I-5 and Highway 99 in order for re-development to be viable.

Between 88th and 99th Streets, there is a partial grid system; however, 94th St is disconnected at 30th to 32nd Avenues. The Maplegate neighborhood has a generally circuitous street system. NE 32nd Avenue is disconnected due to Columbia Land Trust. The development of single family attached housing on lands designated for medium and high residential density also tends to reduce street connectivity in the interest of meeting density targets. Additional pedestrian connections are needed between commercial destinations on Highway 99 and high density residential areas east of 15th Ave.

Between 78th and 88th Streets, the street pattern is reasonably well connected east of 25th Avenue and fragmented west of 25th due to wetlands, the headwaters of Cougar Creek and the lack of infill development which might complete street connections. NE 13th and 25th Avenues are the only north/south through streets. Left turn movements at the intersection of 13th Avenue and 88th Street are likely to be restricted due to proximity to Highway 99. West of Highway 99, the loop formed by 82nd St., 8th Ave and 86th St. provides circulation to support re-development of this area.

There are no continuous connected roads between 68th and 78th Streets either north/south or east/west due in part to the presence of an 80 acre WSU Agricultural Research Station in the center of this area.

Circulation between 63rd and 68th Streets is characterized by numerous cul-de-sacs and only one through street, NE 17th Avenue. South of 63rd Street, there is no circulation between Highway 99 and St. James / St. Johns due to the BPA Ross Complex and the Chelatchie Prairie Railroad right-of-way.

Driveways per mile

Numerous studies have documented the direct relationship between the number of access points and the accident rate for various road types. Accident rates go up as the number of access points increases. Clark County Code does not specifically limit the number of access points, but it does establish minimum spacing standards for full access intersections and driveways based on road class or posted speed.

The minimum spacing for driveways on a posted 40 m.p.h. arterial street is 185 feet, which would allow up to 28 driveways per mile (if staggered at equal spacing on opposite sides of the street). The existing number of driveways along some sections of Highway 99 is much higher than is consistent with the safe and efficient function of a principal arterial street:

- City limits to 78th Street - 65 per mile
- 78th St to 99th Street - 51 per mile
- 99th St to 119th Street - 35 per mile
- 119th to 134th Street - 23 per mile

Traffic conditions

Volumes

Traffic volumes along Highway 99 and on the major streets within the sub-area are projected to increase significantly over the next 20 years, particularly north of NE 99th Street. The volume projections on NE 134th Street west of Highway 99 are projected to be lower as a result of the proposed 139th Street overpass and other Salmon Creek Interchange improvements.

Table 2 | Current & Projected Volumes

ROAD SEGMENT	2006 DAILY TRIPS	2000 PM	2030 PM
Highway 99			
Ross Road to NE 63rd Street	19,500	1,570	2,330
NE 63rd Street to NE 78th Street	19,800	2,400	2,310
NE 78th Street to NE 88th Street	19,500	1,750	1,900
NE 88th Street to NE 99th Street	17,400	1,480	1,715
NE 99th Street to NE 117th Street	16,200	1,235	2,020
NE 117th Street to NE 134th Street	21,900	1,560	2,140
NE 63rd Street			
NE 63rd Street – East of Highway 99	13,500	1,280	1,680
NE 63rd Street – West of Highway 99	8,400	820	950
NE 78th Street			
NE 78th Street – East of Highway 99	25,200	1,580	2,690
NE 78th Street – West of Highway 99	33,100	2,340	3,850
NE 78th Street at NE 25th Avenue	22,000	1,580	2690
NE 99th Street			
NE 99th Street – East of Highway 99	13,750	1,320	1,540
NE 99th Street – West of Highway 99	25,100	1,365	2,240
NE 99th Street at NE 50th Avenue	8,950	1,320	1,540
NE 117th Street			
NE 117th Street – East of Highway 99	5,700	720	1,660
NE 117th Street – West of Highway 99	6,300	520	950
NE 134th Street			
NE 134th Street – East of Highway 99	25,800	750	1,120
NE 134th Street – West of Highway 99	31,500	2,570	1,550

Concurrency corridors

Under the Growth Management Act, local jurisdictions adopt and enforce ordinances that prohibit development approval if the development causes the level-of-service on certain transportation facilities or concurrency corridors to decline below the adopted standards unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with the development. Eight of the adopted concurrency corridors are partially or completely within the planning study area. The Board of County Commissioners has adopted minimum travel speeds for each of the concurrency corridors. Actual travel speeds are significantly higher than the adopted minimum standards on most of the corridors. The Salmon Creek Avenue corridor is below the minimum travel speed

standard, but additional capacity is reasonably funded within the next six years. The NE 99th Street corridor is within ½ mph of the minimum travel speed standard which may need to be reduced if the Highway 99 project from NE 99th St to 117th Street is not funded soon.

Table 3 | Highway 99 Concurrency Corridor Travel Speed

Corridor	Minimum Travel Speed	Actual Travel Speed
Highway 99 **(**NE 63rd Street to NE 99th Street)	13 MPH	19.1 MPH
Highway 99 (NE 99th Street to NE 134th Street)	13 MPH	21.6 MPH
Salmon Creek Avenue (Interstate-5 to NE 50th Avenue)	**13 MPH**	**12.9 MPH**
NE 119th Street (Highway 99 to NE 72nd Avenue)	17 MPH	28.4 MPH
NE 99th Street (Interstate-5 to St. Johns Road)	**22 MPH**	**22.5 MPH**
NE 88th Street (Highway 99 to Andresen Road)	17 MPH	23.0 MPH
NE 78th Street (Interstate-5 to Andresen Road)	17 MPH	23.8 MPH
NE 63rd Street (Hazel Dell Avenue to Andresen Road0	22 MPH	23.6 MPH

Congestion monitoring data

Two of the top ten highest volume intersections in the County are within the Highway 99 sub-area. Traffic counts on Highway 99 @ NE 78th St and Highway 99 / NE 20th Ave @ NE 134th Street show that each intersection carries about 51,000 entering vehicles on an average weekday.

Intersection delay

Average PM peak hour delays per vehicle are between 60 and 90 seconds at the intersections of Highway 99 with NE 78th Street, NE 117th Street and NE 134th Street. Average delay per vehicle is greater than 90 seconds at the intersection of Highway 99 and NE 99th Street.

Current traffic volumes do not exceed 70% of the corridor capacity for any of the sub-area corridors in the Congestion Management Network. Corridor travel speed during the AM peak hour is typically between 26 and 35 mph; travel speed declines to between 10 and 25 mph during the PM peak hour for all Congestion Management corridors except for the NE 99th St corridor.

Accident rates

Clark County of Public Works annually updates an analysis of roadway conditions for approximately 350 road segments. Four road segments in the planning area ranked within the top 50 for vehicle accident rates. Accident rates are expressed in number of accidents per million vehicle miles traveled (MVM).

Table 4 | Highway 99 Sub-Area Plan Accident Rates (MVM)

Rank	Road Segment	Accident Rate
14	NE 134th Street (Highway 99 to I-5 SB on ramp)	7.61
32	Highway 99 (NE 88th Street to NE 99th Street)	4.76
40	Highway 99 (NE 99th Street to NE 117th Street)	4.47
48	Highway 99 (NE 68th Street to NE 78th Street)	4.10

Freight

Rail

Although the Lewis & Clark Railroad crosses Highway 99 at the southern edge of the sub-area, there is no rail service available within the sub-area and no industrial land that benefit from rail service.

Truck

The Highway 99 corridor is an important route for truck freight. Truck volumes average 7% of the total traffic volumes on the corridor and are as much as 9% on some segments. Highway 99 also serves as an emergency by-pass route for Interstate 5 traffic when there is an accident or road closure. Trucks comprise 12% of the total volumes on I-5. The railroad bridge serves as a significant barrier to truck traffic on the Highway 99 corridor. The clearance height is 13' 4" which is a restriction for some truck types. There are also no sidewalks, shoulders or bike lanes under the bridge or north to NE 63rd Street. Replacement of the railroad bridge, lowering the roadway, and adding sidewalks and bike lanes should become a high priority project in that it would provide substantial multimodal benefits. The bridge replacement also provides an opportunity to create a gateway feature that could celebrate and enhance the identity of the area.

Transit

Public transportation, **public transit** or **mass transit** all refer to transport systems in which the passengers do not travel in their own vehicles. While the above terms are generally taken to include rail and bus services, wider definitions might include scheduled airline services, ferries, taxicab services etc. — any system that transports members of the general public.

Bus Transit

Bus transit is the most common form of mass transit service in the United States. Buses typically operate on fixed routes and schedules over existing roadways. Buses must be in compliance with mass transit safety and accessibility rules including federal Americans' with Disabilities Act (ADA) provisions.

Clark County Public Transit Benefit Area Authority (C-TRAN) is a locally funded public transit system that has been providing mobility options in Clark County for 25 years. They currently provide fixed route service on 25 bus routes, including 7 express routes to Portland, 3 limited routes connecting to the Delta Park/Vanport MAX station and a limited

route between Fisher's Landing and the Parkrose MAX station. A demand response bus service called The Connector provides people in the cities of Camas, La Center, and Ridgefield with fully accessible dial-a-ride with connections to regular stop service. Other services include: a curb-to-curb service for people who cannot access regular bus service (C-VAN), and a Bike & Bus Program.

C-TRAN bus transit service provides multimodal connections to the TriMet bus system in Oregon, the MAX Light Rail system, the Vancouver AMTRAK station (two routes serve within a few blocks of the station), and to Portland International Airport via MAX.

Figure 2 | C-TRAN System Plan

C-TRAN transit routes serving the planning area originate at the NE 99th Street Transit Center at Stockford Village. The new NE 99th Street Transit Center is a major hub that provides connections to seven transit routes, two commuter routes, C-VAN and the Connector. Local bus routes #9, 25, 37, and 78 operate seven days a week and holidays. Peak hour transit service on Highway 99 operates approximately every 15 minutes on weekdays, every 15 to 30 minutes on Saturdays, and every 30 minutes Sundays. Commuter connections into Portland originate at the NE 99th Street Transit Center and the Salmon Creek Park and Ride.

Transit Services:
C-TRAN operates several local routes that provide transit service within the study area including route #25: Fruit Valley/St. Johns, #37: Mill Plain/Highway 99, and #78: 78th Street.

#25 Fruit Valley/St. Johns (previously route #25 St. Johns) originates at 99th Street Transit Center and provides access to the V.A. Hospital campus and Clark County Health Facility, Clark College, downtown Vancouver and Fruit Valley via 99th and 88th Streets to St. James and St. Johns to Ft. Vancouver Way. It served 219,000 riders in 2007 with 30-minute service from 6:00 a.m. to 9:00 p.m. week days and scaled back service on Saturdays and Sundays.

#37 Mill Plain/Highway 99 (previously route #71 Highway 99) Originates at 134th Street Park and Ride and provides access the entire length of Highway 99 and Main Street to downtown Vancouver and then traveling to Fisher's Landing Transit Center via Mill Plain Blvd. and 164th Street. This is one of three C-TRAN trunk routes carrying 327,600 riders in 2007 with 15-minute service from 5:30 a.m. to 12:00 midnight with slightly scaled back service on weekends.

#78 78th Street travels from 99th Street Transit Center to Vancouver Mall Transit Center via Highway 99, 78th Street, Andresen and Van Mall Drive. This route carried 48,400 passengers in 2007 with hourly service from 5:00 a.m. to 9:30 p.m. and reduced service on weekends.

Transit Facilities

There are three C-TRAN transit facilities adjacent to the Highway 99 Study Area:

Salmon Creek Park and Ride: Located at 134th Street and I-5 and served by route #37 Mill Plain/Highway 99 (previously #71) with connections to Legacy Hospital/WSU-Vancouver, Felida/Salmon Creek, Ridgefield/La Center and Cowlitz County. Routes #134 Salmon Creek Express and 105 I-5 Express originate at Salmon Creek Park and Ride and provide trips to downtown Portland. This park and ride will be relocated to 139th Street and 10th Avenue as part of the I-5/I-205 interchange project (also known as the Salmon Creek Interchange Project) anticipated for 2012.

99th Street Transit Center at Stockford Village: Located at 99th Street and 7th Avenue and immediately west of the I-5 interchange, virtually all C-TRAN local routes on the westside serve the new transit center and park and ride facility including routes #37 Mill Plain/Highway 99, #25 Fruit Valley/St. Johns, and #78 78th Street. Connections to buses serving Felida/Salmon Creek, Hazel Dell, Lincoln and other north Vancouver neighborhoods are available at 99th Street Transit Center. The #199 99th Street Express serves downtown Portland with peak period premium commuter service.

BPA Park and Ride: Located on the BPA campus on Ross Street east of Highway 99 is served during peak periods by route #190 Marquam Hill Express that serves Marquam Hill medical facilities.

Planned service & facility improvements

Pending completion of both HCT studies and C-TRAN's 20-year Transit Development Plan there are no significant changes to service and facilities anticipated.

Vanpool/Carpool

Vanpools provide transportation to small groups of individuals traveling between common origins and destinations under a ride sharing arrangement. The vehicles are usually 10-15 passenger vans including the driver. Vanpools must also operate in compliance with mass transit rules including Americans' with Disabilities Act (ADA) provisions, be available to the public, must be advertised and the service must be operated by a public entity or a public entity must own, purchase or lease the vehicle(s). C-TRAN will begin providing vanpool opportunities in 2008 to Clark County residents and employees. C-TRAN's Vanpool Program will work closely with the Commute Trip Reduction Program and rideshare matching services.

High Capacity Transit

Clark County has seen significant economic and population growth over the past 25 years. However, growth has outpaced transportation investment, which has resulted in large increases in traffic congestion and travel delays. Regional public transit is part of a long-term solution. Two separate studies are underway that may affect the Highway 99 planning area; the Columbia River Crossing Project and the High Capacity Transit Corridor System Study.

The Columbia River Crossing project is a bridge, transit and highway improvement project for Interstate 5 between Vancouver and Portland. It is co-sponsored by the Oregon Department of Transportation and the Washington State Department of Transportation and is working to address the congestion, mobility and safety problems on I-5 between State Route 500 in Vancouver and Columbia Boulevard in Portland.

The High Capacity Transit Corridor System Study will provide a framework for long-term investments in the region's transit system. Modes recommended for further analysis include: Bus rapid transit (BRT), BRT lite, commuter rail, light rail transit (LRT), street car, and trolley. I-5/Highway 99 and SR-500/Fourth Plain Boulevard are the two most likely corridors for the future extension of a high capacity transit system.

Bus Rapid Transit – Bus rapid transit can include a range of bus improvements from providing bus priority at traffic signals (BRT Lite) or exclusive bus lanes on an arterial such as Highway 99 to providing a completely separate roadway for buses.

Streetcar/Trolley – Streetcars typically operate as single cars on tracks embedded in roadways. Auto traffic usually shares a lane with the streetcar and the operation is subject to vehicle congestion.

Light Rail - Light rail is an electric railway with a lighter passenger volume compared to heavy rail. Passenger cars operating singly (or in short, two-car trains) on fixed rails in shared or exclusive right-of-way, low or high platform loading characterize light rail service. The vehicle's power is drawn from an overhead electric wire.

Commuter Rail - Local (short-distance) travel operating between a central city and adjacent suburbs. Service is provided on regular schedules, moving commuters within urbanized areas or between urbanized areas and outlying areas. The potential for future commuter rail service to Battle Ground on the Chelatchie Prairie Railroad right-of-way is being explored as part of the HCT Study.

Heavy Rail - Heavy rail service is characterized by high-speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed electric rails in

separate rights-of-way from which all other traffic is excluded. There are no viable heavy rail corridors in Clark County.

Pedestrian System

Pedestrian accessibility plays a crucial role in the Highway 99 sub-area plan. Everyone benefits from walking where benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community. But walking alone is not enough, the community needs walking paths that are safe, easy, and connect to major destinations. To insure that the availability of sidewalks is adequately addressed, a Sidewalk Inventory Assessment was completed and recommendations provided to remedy any deficiencies. (For more detailed information refer to Technical Report 4: Sidewalk System Inventory and Technical Report 9 Health Impact Assessment).

Bicycle System

Bicycle linkages to regional facilities and connects to major destinations was another factor reviewed in the Highway 99 sub-area plan. To insure that the availability of sidewalks is adequately addressed, a Bicycle Lane Inventory Assessment was completed and recommendations provided to remedy any deficiencies. (For more detailed information refer to Technical Report 5: Bicycle Lane Assessment and Technical Report 9 Health Impact Assessment).

Key Findings

Many of the key investments in roadways have already been identified as future projects in the County's Transportation Capital Facilities Plan.

Table 5 | Highway 99 Sub-Area Road & Bridge Projects
6-Year Transportation Improvement Program

	Location	Project	Programmed
1	Klineline Bridge	Replacement	February 2008 Out to bid
2	Ne 88th Street	Highway 99 to St. Johns	2011-2012 Planned construction
3	NE 134th Street	Signal Optimization	2008-2009 Completion
4	Highway 99	NE 99th Street to NE 119th Street	2011-2013 PE/ROW
5	NE 119th Street	Salmon Creek Ave. to NE 72nd Avenue	2011-2012 PE/ROW
6	Salmon Creek Interchange	Phase 1	2010-2012 Planned Construction

Source: Transportation Improvement Program, 2008-2013

Table 6 | Additional Highway 99 Sub-Area Road & Bridge Projects 20-Year Capital Facilities Program

	Location	Project	Programmed
1	Highway 99	Railroad Bridge to NE 63rd Street	
2	Highway 99	NE 119th Street to NE 129th Street	
3	NE 88th Street	Hazel Dell Avenue to Highway 99	
4	Salmon Creek Interchange	Phase 2	

Source: Clark County Public Works

Table 7 | Additional Highway 99 Sub-Area Road Projects to Add to the 20-Year Capital Facilities Program

	Location	Project	Programmed
1	Highway 99	NE 63rd Street to NE 78th Street	
2	Highway 99	NE 78th Street to NE 99th Street	
3	NE 78th Street	I-5 to NE 31st Avenue	
4	Highway 99	NE 129th Street - Gateway	
5	Highway 99	Railroad Bridge - Gateway	
6	NE 99th Street	I-5 - Gateway	
7	NE 78th Street	I-5 - Gateway	