Metropolitan Transportation Plan for Clark County

Southwest Washington Regional Transportation Council

CHAPTER 3

IDENTIFICATION OF REGIONAL TRANSPORTATION NEEDS

INVENTORY OF THE EXISTING REGIONAL TRANSPORTATION SYSTEM

As an introduction to planning for the future development of a regional transportation system, an inventory of the existing system is provided. Also, a brief description of the context for regional transportation planning, with regard to meeting federal requirements and designation of federal transportation area boundaries is described.

FEDERAL TRANSPORTATION BOUNDARIES

The federal Transportation Act requires that an **Urban Area Boundary** (UAB) is defined to delineate areas that are urban in nature distinct from those that are largely rural in nature. The federal transportation Urban Area Boundary is not to be confused with the Urban Growth Areas established under the Washington State Growth Management Act (GMA), as described in Chapter 2. The federal UAB should cover, at a minimum, the area designated by the decennial U.S. Census as "urbanized" by meeting certain population and density criteria. Following the 2000 Census, the Vancouver urbanized area encompasses Vancouver as well as urbanized areas of unincorporated Clark County, Camas, Washougal and Battle Ground. Also, following the 2000 census, the Hockinson Census Designated Place was defined as an Urban Place as its population was over 5,000. (Refer to Figure 3-1; *Transportation Boundaries*).

ISTEA also called for MPO's to establish a **Metropolitan Area Boundary** which marks the area to be covered by MPO regional transportation planning activities and which, at a minimum, has to include the urban area, the contiguous area expected to be urbanized within the next twenty years, and in air quality attainment areas must include the area enclosed by the **attainment area boundary** which in the Clark County region is the Vancouver Air Quality Maintenance Area[1]. The Metropolitan Area Boundary established for the Clark County region includes the whole of Clark county (refer to Figure 3-1; *Transportation Boundaries*).

With a population of over 200,000 the Portland-Vancouver metropolitan area is designated as a **Transportation Management Area** (TMA) by the U.S. Secretary of Transportation. Within TMAs, the MPO must develop a congestion management system which was first adopted by the RTC Board in May 1995 (RTC Board Resolution 05-95-14) and a report on congestion management within the region has been updated by RTC annually. The MPO has authority to select, in consultation with the state, projects to receive federal funds (see Chapter 4 for further details).

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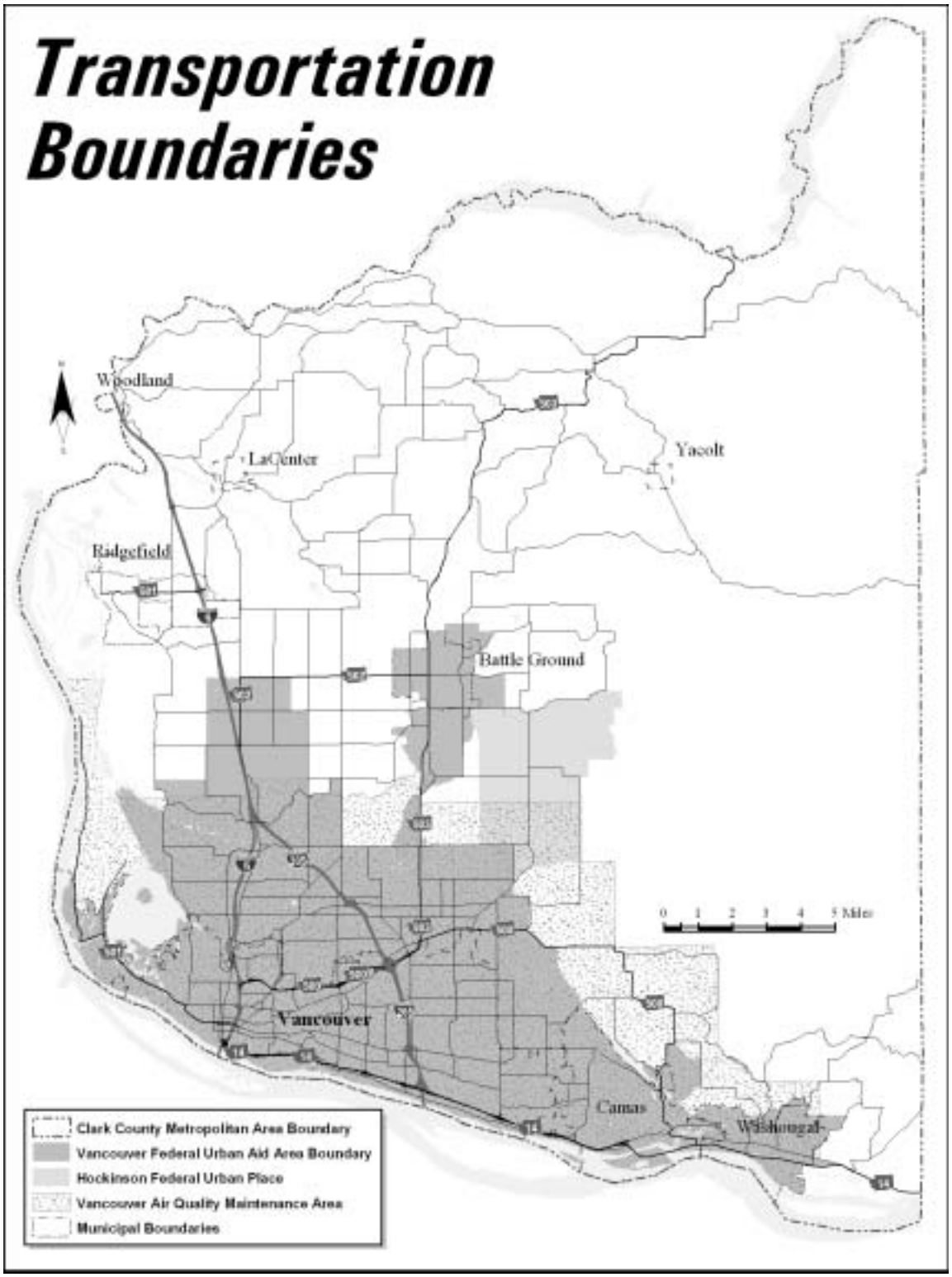
[1] Although classified in the early 1990's by the Environmental Protection Agency (EPA) as a moderate non-attainment area for carbon monoxide and a marginal non-attainment area for ozone, the Vancouver area has since attained unclassifiable/attainment status for the ozone pollutant and maintenance status for carbon monoxide. Air quality has implications for regional transportation planning as the region strives to maintain national ambient air quality standards.

Figure 3-1: Transportation Boundaries



FUNCTIONAL CLASSIFICATION OF THE REGIONAL HIGHWAY SYSTEM

Arterials are categorized into a functional classification system; the classifying of highways, roads and streets into groups having similar characteristics for providing mobility and/or land access. Interstate freeways, classified as divided principal arterials, are designed to provide for the highest degree of mobility of large volumes of long-distance traffic, they are not designed to provide for access to land uses. Collector facilities generally provide equal emphasis upon mobility and land use accessibility. Local facilities emphasize access to land uses.

The Federal Functional Classification system for Clark County usually undergoes a comprehensive update at least once every decade following the results of the decennial census and accompanying changes made to the federally recognized Urbanized Area and to the Urban Area Boundary (UAB) for the region. Details of the process for changing the UAB and federal functional classification system are described on Washington State Depart of Transportation's web site at http://www.wsdot.wa.gov/mapsdata/tdo/functionalclass.htm. Revisions to the functional classification system for the Clark County region were approved by the Federal Highway Administration in December 2003. A comprehensive review of the federal functional classification system for the Clark County region will be made to ensure as close consistency as possible to local classification systems as part of the comprehensive growth management planning process in 2006. Clark County maintains a local classification system as part of its Comprehensive Growth Management Plan. This classification system is reported in the Clark County Arterial Atlas, approved by the Board of County Commissioners, and shows arterial and local street cross-sections anticipated for roads in Clark County within the next twenty years.

As a pre-requisite for review of the federal functional classification system, the Urban Area Boundary must be defined (refer to Figure 3-1; *Transportation Boundaries*). Facilities classified as collector or above in urban areas are eligible for federal funding while in the rural area those facilities classified as major collector and above are eligible. Generally, minor collectors in rural areas are not eligible for federal funding. A description of the urban functional classification categories follows:

PRINCIPAL ARTERIALS

Principal arterials 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 interconnect major traffic generators, such as the central business district and regional shopping centers, to other major activity centers and carry a high proportion of the total urban area travel on a minimum of roadway mileage. They also carry traffic between communities. Frequently principal arterials carry important intra-urban as well as intercity bus routes.

Many principal arterials are fully or partially controlled access facilities emphasizing the through movement of traffic. Within the category are (1) interstates (2) other freeways and expressways and (3) other principal arterials.

Spacing of principal arterials may vary from less than one mile in highly developed central business areas to five miles or more in the sparsely developed urban fringes.

MINOR ARTERIALS

Minor arterials collect and distribute traffic from principal arterials to lesser classified streets, or allow for traffic to directly access their destinations. They serve secondary traffic generators such as community business centers, neighborhood shopping centers, multiple residence areas, and traffic from neighborhood to neighborhood within a community. Access to land use activities is generally permitted. Such facilities are usually spaced under two miles apart and in core areas can be spaced at 1/8 to 1/2 mile apart.

COLLECTORS

Collectors provide for land access and traffic circulation within residential neighborhoods and commercial and industrial areas. They distribute traffic movements from such areas to the arterial system. Collectors do not handle long through trips and are not continuous for any great length.

LOCAL STREETS

Local streets provide direct access to abutting land and access to the higher classification facilities. They offer the lowest level of mobility and usually contain no bus routes. They are not intended to carry through traffic but make up a large percentage of the total street mileage.

Rural roads consist of those facilities that are outside of urban areas. They too are categorized into functional classifications:

RURAL PRINCIPAL ARTERIALS

Rural principal arterials are sub-divided into two sets (1) interstate facilities and (2) other principal arterials. They consist of a connected rural network of continuous routes and provide an integrated network without stub connections.

RURAL MINOR ARTERIALS

In conjunction with the principal arterials, the rural minor arterials form a rural network which link cities and larger towns together with other major traffic generators. The principal arterials and rural minor arterials are spaced at such intervals that all developed areas of the state are within a reasonable distance of an arterial highway. Minor arterials should be expected to provide for relatively high overall travel speeds with minimum interference to through movement.

The other rural road classifications are:

Rural Major Collector Roads (are eligible for federal funding)

Rural Minor Collector Roads (are not eligible for federal funding) and

Rural Local Roads

NATIONAL HIGHWAY SYSTEM (NHS)

ISTEA also required that roads be designated as National Highway System (NHS) facilities. Congress approved the NHS System with passage of the National Highway System Designation Act of 1995 (NHS Act). In Clark County the roads listed in Table 3-1 have been designated as NHS facilities.

Table 3-1: Designated NHS Facilities; Clark County

DESIGNATED NHS FACILITIES - Clark County	
Facility	**Extent**
I-5	Oregon State Line to Clark County line (north)
I-205	Oregon State Line to I-5 Interchange
SR-14	I-5 to Clark County line (east)
SR-500	I-5 to SR-503/Fourth Plain intersection
SR-501	I-5 to Port of Vancouver access
SR-502	I-5 to SR-503 intersection
SR-503	SR-500/Fourth Plain intersection to SR-502 intersection

HIGHWAYS OF STATEWIDE SIGNIFICANCE (HSS)

In 1999 the state legislature adopted Highways of Statewide Significance, fulfilling a requirement of House Bill 1487 passed in 1998. In Clark County highway facilities defined as "of Statewide Significance" are I-5, I-205, SR-14 and part of SR-501 to access the Port of Vancouver.

Figure 3-2: 2023 Regional Transportation System

Designation Of The RTP Regional Transportation System

Consistent with the state's Regional Transportation Planning Program Planning Standards, the designated MTP regional transportation system (see Figure 3-2) includes:

1. All state transportation facilities and services (including highways, state-owned park-and-ride lots etc.).

2. All local freeways, expressways, and principal arterials (the definition of principal arterials can be the same as used for federal classification or be regionally determined).

3. All high-capacity transit systems (any express-oriented transit service operating on an exclusive right-of-way including high occupancy vehicle (HOV) lanes).

4. All other transportation facilities and services, including airports, transit services and facilities, roadways, rail facilities, marine transportation facilities etc. that the RTPO considers necessary to complete the regional plan.

5. Any transportation facility or service that regional need or impact places in the plan, as determined by the RTPO.

It is the designated regional transportation system that is the focus for transportation planning in the MTP.

A detailed description of the designated MTP Regional Transportation System follows:

1. **All state transportation facilities and services** (including state highways, state owned park and ride lots etc.)

In Clark County this category includes Interstate facilities I-5 and I-205.

Clark County has a 20.78 mile section of **I-5**, the major interstate freeway serving the west coast of the U.S.A.. I-5 provides for north-south travel and is used for interstate travel from southern California, through the state of Oregon northward through Washington State to the Canadian border. I-5 crosses the Columbia River from Oregon to Washington over the Interstate Bridge. I-5 has three lanes in each direction from the Interstate Bridge north to the 99th Street off-ramp and the widening of the section from 99th Street north to 134th Street to three lanes in each direction will soon be complete. North of the I-5/I-205 interchange there are three travel lanes in each direction.

A 10.07 mile stretch of **I-205** traverses Clark County until it joins I-5 just north of N.E. 134th Street. I-205 was constructed as an alternative route to I-5, as a by-pass facility through the Portland/Vancouver metropolitan area. I-205 crosses the Columbia River over the Glenn Jackson Bridge that was opened in 1982. The Glenn Jackson Bridge has four travel lanes in each direction. North of the bridge the facility has three lanes in each direction to a point just north of the interchange with SR-500. I-205 continues as a two lane in each direction facility until it joins I-5, just north of 134th Street.

State routes in Clark County include SR-14, SR-500, SR-501, SR-502 and SR-503.

SR-14 provides the main east-west access from the southwest of Washington state to the southeast of the state along the north bank of the Columbia River. The facility extends 21.77 miles through Clark County to the Skamania County line with two lanes in each direction up to milepost 12 and one lane in each direction thereafter.

SR-500 is a 20.37-mile facility entirely within Clark County and allows for east-west cross-county travel. It crosses I-205, provides access to the Orchards area, then traverses rural Clark County until it reaches the Camas urban area. SR-500 intersects with SR-14 in Camas. The facility carries traffic to and from the Clark County regional shopping mall. The segment of SR-500 between I-5 and I-205 was first opened as a limited access facility in 1984.

SR-501 is comprised of two unconnected segments. The south segment extends from the interchange with I-5 westward with three lanes in each direction along the Mill Plain/15th Street couplet to Columbia Street. West of Columbia the facility is two lanes in each direction. This segment of SR-501 carries traffic to and from the Port of Vancouver. The facility reduces to two lanes, one in each direction, and branches into two in the Vancouver Lake lowlands area with both branches terminating in the lowlands. The northern segment of SR-501 extends as a two-lane facility from I-5 westward to the City of Ridgefield where it terminates. Originally it was intended that the two segments be joined to complete a circumferential route around the westside of the Vancouver urban area and to carry traffic to and from the lowlands industrial area. However, the facility was never completed.

SR-502 extends from the I-5/N.E. 179th Street interchange northward to N.E. 219th Street where it turns eastbound toward Battle Ground.

SR-503 extends northward from its intersection with SR-500. It carries traffic between the Vancouver urban area and North County through Battle Ground. SR-503 extends into Cowlitz County.

Table 3-2: State Route Mileage in Clark County

STATE ROUTE MILEAGE IN CLARK COUNTY					
Facility	**Beginning Mile Post**	**Begins at: (Description)**	**Ending Mile Post**	**Ends at: (Description)**	**Route Mileage**
I-5	0	Oregon State Line on Interstate Bridge	20.78	Cowlitz Co. Line	20.78
I-205	0	Oregon State Line on Glenn Jackson Bridge	10.57	Interchange with SR-5	10.57
SR-14	0	Interchange with SR-5, Vancouver	21.77	Skamania Co. Line	21.77
SR-500	0	Interchange with SR-5	20.37	Intersection with SR-14, Camas	20.37
SR-501 S. Section	0	Interchange with SR-5	12.72	Terminus of south segment	12.72
SR-501 Couplet	0.61	Interchange with SR-5	1.16	Franklin Street City of Vancouver	0.55
SR-501 N. Section	16.91	City of Ridgefield	19.88	Interchange with I-5/ N.E. 269th St.	2.97
SR-502	0	Intersection with SR-5, at N.E. 179th St.	7.56	Intersection with SR-503	7.56
SR-503	0	Intersection with SR-500	27.87	Cowlitz Co. line	27.87

2. **All local freeways, expressways, and principal arterials**

Local expressways and principal arterials are also designated as part of the regional transportation system. Principal arterials, such as Mill Plain, Fourth Plain, N.E. 78th Street, Padden Parkway, N.E. 112th Avenue, SE/NE164th/162nd Avenue and segments of St. John's and Andresen are included. Future planned arterials on the regional system, such as an extension of NE 18th Street extension west from NE 102nd Avenue to NE 87th Avenue, are marked on Figure 3-2 by a dashed red line.

3. **All high-capacity transit systems** (any express-oriented transit service operating on an exclusive right-of-way including high occupancy vehicle (HOV) lanes).

The I-5 (from State line to the vicinity of NE 134th Street), I-205 (from state line to vicinity of NE 134th Street) and SR-500 (from I-5 to the Orchards area) corridors are designated as High Capacity Transit (HCT) corridors. See the MTP's Strategic Plan in Appendix B for further information on planning for HCT in the Clark County region.

4. **All other transportation facilities and services considered necessary to complete the regional transportation plan**. These include transit services and facilities, roadways, rail facilities, airports, marine transportation facilities etc.

Clark County Public Transportation Benefit Authority (C-TRAN) provides public transit service in Clark County. All C-TRAN's system and facilities are included as part of the designated regional transportation system.

Early in 2005, C-TRAN convened a Public Transportation Improvement Conference (PTIC) to reconsider the Public Transportation Benefit Area service and taxing boundary. The PTIC designated a new boundary which took effect June 1, 2005. C-TRAN's new boundary has been reduced from county-wide service to an area that includes the City of Vancouver and its urban growth boundary, and the city limits only of Battle Ground, Camas, La Center, Ridgefield, Washougal, and the Town of Yacolt. In September 2005, voters approved an additional 0.2 percent sales tax for C-TRAN, avoiding significant service reductions, preserving existing service, and restoring service to outlying cities.

C-TRAN operates a FIXED ROUTE BUS SYSTEM on urban and suburban routes as well as premium commuter bus service to Portland, Oregon. C-TRAN also provides general purpose dial-a-ride service and Americans with Disabilities Act (ADA)-compliant paratransit service. Figure 3-2 maps C-TRAN's fixed route system. Table 3-3 summarizes the fixed-route bus system. C-TRAN operates 17 local urban routes, 8 premium commuter routes, and 5 innovative transit/dial-a-ride services. Operating hours are generally 5:15 a.m. to 9:15 p.m. on weekdays, 6:45 a.m. to 8:15 p.m. on Saturdays, 8:00 a.m. to 6:00 p.m. on Sundays/Holidays.

Prior to the September 2005 C-TRAN funding vote, there was a proposal to eliminate direct commuter service to downtown Portland. However, the C-TRAN Board of Directors took steps to preserve this commuter service. In May 2005, the C-TRAN Board authorized a fare increase to include a Premium Commuter Fare for express bus service to downtown Portland. Following the September 2005 voter approval of additional sales tax funding for C-TRAN, Premium Commuter service to downtown Portland continues to be provided for trips where ridership can ensure full-cost recovery. There is also a lower cost bi-state commuter service from C-TRAN park and ride lots to MAX light rail stations at Parkrose (I-205 corridor) and the Expo Center (I-5 corridor) in Portland, Oregon.

Figure 3-2 maps C-TRAN's fixed route system. Table 3-3 summarizes C-TRAN's fixed route bus system.

Table 3-3: C-TRAN Fixed Route System

Bus Route	Route Name	Weekday Service First Run Begins	Weekday Service Last Run Begins	Weekday Service Frequency (Peak)	Area Served (TC=Transit Center, P&R=Park & Ride)
1	Fruit Valley	6:05 am	8:55 pm	30 min.	7th St. TC to west Vancouver
2	Lincoln/ Felida	5:45 am	8:45 pm	30 min.	7th St. TC to neighborhoods north of downtown Vancouver and Felida to Salmon Creek PR
3	City Center	5:24 am	9:00 pm	15 min.	7th St. TC loop around city center area: courthouse, clinics, schools, and waterfront
4	Fourth Plain	4:55 am	9:43 pm	15 min.	7th St. TC to Vancouver Mall TC via Fourth Plain
6	Hazel Dell	5:40 am	9:00 pm	30 min.	7th St. TC to Salmon Creek P&R on west side of I-5
25	St. Johns	5:45 am	9:07 pm	30 min.	7th St. TC to V.A Hospital, Clark College & Minnehaha area via St. Johns
30	Burton	5:05 am	9:00 pm	30 min.	7th St. TC to Fisher's Landing TC via Burton Rd.
32	Evergreen	5:45 am	9:00 pm	30 min.	7th St. TC to Vancouver Mall TC via Evergreen Blvd./Andresen, interlines with Route. 80
37	Mill Plain	4:58 am.	9:21 pm	15 min.	7th St. TC to Fisher's Landing TC via Mill Plain Blvd.
39	Clark College/ Medical Ctr.	5:43 am	7:50 pm	60 min.	7th St. TC to Clark College and Southwest Washington Medical Center
71	Highway 99	5:20am	9:23pm	15 min.	7th St. TC to Salmon Creek P&R on east of I-5
72	Orchards	5:10 am	9:01 pm	30 min.	Vancouver Mall TC to Orchards area
76	NE 63rd St./ Eastridge	5:30 am	8:51 pm	30 min.	Vancouver Mall TC to Sifton/Five Corners

Bus Route	Route Name	Weekday Service First Run Begins	Weekday Service Last Run Begins	Weekday Service Frequency (Peak)	Area Served (TC=Transit Center, P&R=Park & Ride)
78	78th St.	6:15 am	8:34 pm	60 min.	Vancouver Mall TC to Hazel Dell via 78th St./Andresen Rd.
80	Van Mall TC/ Fisher's Landing TC	5:22 am	8:32 pm	30 min.	Fisher's Landing TC to Vancouver Mall TC, interlines with #32
92	Camas/ Washougal	6:18 am	8:40 pm	30 min.	Fisher's Landing TC to Camas & Washougal
105	I-5 Express	5:45 am	5:59 pm	Peak only	Express from 7th St. TC to downtown Portland
114	Camas/ Washougal Limited	6:30 am	5:15 pm	1 am trip/ 1 pm trip	Express from Camas/ Washougal via SR 14 & 7th St. TC to downtown Portland
134	Salmon Creek Express	5:20 am	6:30 pm	Peak only	Express from Salmon Creek P&R to downtown Portland
157	BPA/Lloyd Center Limited	6:08 am	5:02 pm	3 am trips/ 3 pm trips	Express from Van Mall TC via BPA P&R to Lloyd Center (Portland)
164	Fisher's Landing Express	5:20 am	6:45 pm	Peak only	Express service from Fisher's Landing TC to downtown Portland
165	Parkrose Express	5:50 am	6:20 pm.	All Day	Express from Fisher's Landing TC to Parkrose TC (Portland)
173	Battle Ground Limited	6:35 am	5:35 pm	1 am trip/ 1 pm trip	Express service from Battle Ground P&R to 7th St. TC
177	Evergreen Express	6:00 am	5:15 pm	Peak only	Express from Evergreen P&R via Rose Quarter to downtown Portland
190	Marquam Hill Express	6:00 am	4:45 pm	2 am trips/ 2 pm trips	Express from Vancouver Mall TC via Kmart P&R and BPA P&R to Marquam Hill (Portland)

During regular C-TRAN service hours, a connection is provided between the Vancouver Amtrak Station and the 7th Street Transit Center through a taxi voucher program.

All C-TRAN routes use lift-equipped buses, making them easily accessible to people with disabilities. C-TRAN also provides an Americans with Disabilities Act (ADA)-compliant paratransit service, known as C-VAN. C-TRAN's paratransit service plan is described in the publication 1997 C-TRAN ADA Paratransit Service Plan (January, 1997). C-TRAN attained full compliance with the ADA in January 1997. Table 3-4 provides a summary of paratransit service hours and use between 1994 and 2004.

Table 3-4: C-TRAN; Paratransit Service

C-TRAN PARATRANSIT SERVICE (C-VAN)		
Year	Paratransit Trips	Revenue Hours Per Year
1994	99,036	32,212
1995	115,841	41,803
1996	142,495	48,317
1997	170,816	56,728
1998	186,665	67,769
1999	188,367	65,822
2000	162,130	55,308
2001	175,029	58,695
2002	180,867	61,538
2003	189,143	64,042
2004	178,652	66,254

In 2003, C-TRAN replaced a low ridership route in east county with a general purpose dial-a-ride service called the Connector. Table 3-5 provides a summary of Connector service hours and use. The Connector will continue to operate in Camas.

Table 3-5: C-TRAN Connector Service

C-TRAN CONNECTOR SERVICE (Dial-A-Ride)		
Year	Connector Trips	Revenue Hours Per Year
2003	10,381	2,592
2004	21,436	4,845

Over the next few months, C-TRAN will be implementing a series of other innovative transit services in Battle Ground (replacing route #7), La Center, Ridgefield, and Yacolt. Figure 3-2 shows the areas where these innovative transit services will operate. Details of these services are being developed in conjunction with the communities where the service will operate.

C-TRAN's facilities include transit centers and park and ride lots described in Tables 3-6 and 3-7 below. C-TRAN park and ride facilities provide more than 1,500 parking spaces at five locations. Some are operated under a site use agreement. C-TRAN uses security measures to

make the transit system safer for its users. These security measures include provision of mobile security patrols at the 7th Street Transit Center in downtown Vancouver, Fisher's Landing Transit Center, Vancouver Mall Transit Center, and Salmon Creek Transit Center. The City of Vancouver's Police Department maintains a close working relationship with C-TRAN and responds, as needed, to ensure a safe and secure environment for transit passengers. C-TRAN buses are equipped with emergency alarms and two-way radios. Additionally, C-TRAN's entire fixed route fleet and part of its paratransit fleet are equipped with digital video cameras. Passenger service facilities are located at the 7th Street, Fisher's Landing, and Vancouver Mall Transit Centers. Passenger shelter, bench, and waiting facilities are provided at most of the park and ride lots.

One of C-TRAN's transit centers will move in the near future. C-TRAN's Vancouver Mall Transit Center is over 20 years old and in need of restoration or relocation. Vancouver Mall is a key activity and destination center. However, relocating the transit center to C-TRAN's Administration, Operations and Maintenance (AOM) facility provides a unique opportunity to enhance on-time performance, improve public access to C-TRAN and passenger services, and consolidate operations, which will help to lower C-TRAN's overall operating costs.

C-TRAN has installed and maintains approximately 217 passenger shelters and benches throughout the fixed route system within Clark County. C-TRAN has also begun installing solar-powered shelter flashers and transit stops, which provide passenger activated illumination for safety and to more easily read schedule information, at bus stops along key transit corridors.

All C-TRAN buses are also equipped with bicycle racks that hold two bicycles. C-TRAN provides instruction and assistance to bicyclists who plan to use transit for part of their trip. Bicycle locker facilities are provided at many of C-TRAN's transit centers and park and ride lots.

Table 3-6: C-TRAN Transit Centers (September 2005)

Transit Center	Passenger Services	Security	Public Rest Room	Bicycle Locker/ Rack	Operator Lounge	Admin Offices
Fisher's Landing	Yes	Yes	Yes	Yes	Yes	Yes
7th Street	Yes	Yes	Yes	Yes	Yes	Yes
Vancouver Mall	Yes	Yes	No	Yes	Yes	Yes

Table 3-7: C-TRAN Park & Ride Facilities (September 2005)

Park & Ride	Lot Capacity	Passenger Shelters	Public Rest Rooms	Bicycle Locker/ Rack
Battle Ground	28	Yes	No	Yes
BPA Ross Complex	200+	Yes	No	No
Camas/Washougal	20	No	No	No
Evergreen	271	Yes	No	Yes
Fisher's Landing Transit Center[2]	563	Yes	Yes	Yes
KMART Shopping Center	30[3]	No	No	No
Salmon Creek	495	Yes	No	Yes

Table 3-8 summarizes the bicycle facilities C-TRAN provides at transit centers, park and ride facilities, and the agency's administrative offices.

Table 3-8: CTRAN Bicycle Facilities (September 2005)

Location	Bike Locker[4]	Bike Bank	Bike Rack
7th Street	5	9	N/A
Vancouver Mall	6	6	N/A
Salmon Creek	6	4	1
BPA Ross Complex	N/A	2	N/A
Evergreen	4	8	1
Camas (Burgerville)	2	N/A	N/A
Administrative Offices	2	N/A	1
Annex	2	N/A	1
Fisher's Landing	6	N/A	2

[2] Fisher's Landing Transit Center also has a Park & Ride facility.

[3] Approximate – the use agreement does not specify a number of parking spaces.

[4] Each bike locker has a capacity for two bicycles.

INTER-CITY BUS service from Vancouver to cities throughout the northwest and nation-wide is provided by Greyhound Bus Lines and by Northwestern Trailways.

Clark County has three **PORT DISTRICTS**; the Port of Vancouver, the Port of Camas-Washougal and the Port of Ridgefield.

The **Port of Vancouver** is situated at the terminus of the Columbia River's deep draft channel and forms a natural gateway to the river-barge ports of eastern Oregon/Washington and northern Idaho. The Port operates international cargo docks and currently offers 13 deep draft vessel berths. In 2004, 502 ships carrying over 4.7 million metric tons of cargo used the Port. The Port handles a wide range of cargoes including general breakbulk, project and direct transfer cargoes, containers, automobiles, forest products, meal products, and dry bulk commodities such as bauxite, ores, sands, and grains. The Port has dockside warehousing for general cargo and bulk storage warehouses. The Port of Vancouver supports the implementation of the Columbia River Channel Improvement Project. Deepening of the Columbia River channel from the existing 40-foot navigation channel to 43 feet would facilitate the deep-draft transportation of goods for years into the future and would help to keep the region competitive.

The Port is located within 2 miles of I-5 and is served by Burlington Northern Santa Fe and Union Pacific Railroad, Canadian National and Canadian Pacific Railroads. The Port of Vancouver has 600 acres of developed industrial and marine property. In 2004, the Port's industrial facilities reached 100% occupancy. The Port has over 1,000 additional acres of land, including an additional 1.5 miles of waterfront access, proposed for future development. Work began in 2004 on the National Environmental Policy Aces (NEPA) process for this additional land's development as part of the Port's Economic Development & Conservation Plan. The Port has recently focused attention on rail access improvement with a Simulation and Access Study of a number of conceptual rail alignments. See the MTP's Strategic Plan in Appendix B for additional detail.

The **Port of Ridgefield** is located about 15 miles north of Vancouver USA. The Port's taxing district extends over 57 square miles and the district is bisected by the I-5 corridor. Port-owned assets include an industrial park developed in the 1990s, located near the I-5/Pioneer Street interchange off N.W. Timm Road. This industrial park is currently the location for 11 business providing nearly 800 jobs. The Port also has a 41-acre industrial site on Lake River, 3 miles from I-5.

The **Port of Camas/Washougal**'s taxing district extends over 95 square miles of land with an industrial park, marina, airport, a park and wildlife refuge. The 430-acre industrial park, located south of SR-14 by Index and 27th to 32nd Streets, has a wide range of industries that provide jobs for over 1,000 employees. The Port has approximately 200 acres of prime property available for development. The marina has moorage to accommodate 356 and a boat launch. The Port district also operates Grove Field Airport (described in a later section).

There are two mainline **RAIL LINES**, both owned by Burlington Northern Santa Fe (BNSF), that run through Clark County. The mainlines carry both freight and passengers. In addition, the Lewis and Clark Railroad is a 33-mile short line railroad owned by Clark County.

The BNSF Seattle/Vancouver line is in excellent condition and has 70 to 80 trains operating in the corridor each day. The BNSF Vancouver/Eastern Washington line is also in excellent condition and handles about 35 trains daily. Union Pacific Railroad operates some freight trains to Tacoma and Seattle on BNSF's lines.

AMTRAK has an agreement with BNSF to operate passenger service on the freight carrier's rail lines. AMTRAK trains serve Vancouver daily. During the 1990's Washington and Oregon began to invest transportation funds to improve local AMTRAK service. In 1993, Amtrak offered a single local daily round-trip connecting Eugene and Seattle with ridership totaling 94,061 trips. By 2003, service had grown to three daily Amtrak Cascades roundtrips operating between Seattle and Portland, with two extending to Eugene. Between 1993 and 2003, ridership increased by 527% from 94,061 annnual riders in 1993 to 589,743 riders in 2003.

The *Coast Starlight*, with service between Seattle and Los Angeles, via Vancouver and Portland, also provides once a day, daily service. The *Empire Builder* also provides one train a day, on a daily basis, between Chicago and Spokane then one part of the train continues to Seattle and the other part continues, via Pasco and Bingen-White Salmon, to Vancouver with service terminating in Portland.

The Pacific Northwest Rail Corridor is one of only five designated high-speed corridors in the nation that pre-qualifies the region for federal high-speed rail funding. In late 1995, the Washington State Department of Transportation (WSDOT) and project partners published *Options for Passenger Rail in the Pacific Northwest Rail Corridor* report. An Environmental Impact Statement on corridor improvements was completed and construction on some rail system improvements began in 1998. Custom-built Talgo trains are now in service on Amtrak's Pacific Northwest Rail Corridor service. Plans are underway to upgrade the Vancouver Amtrak station facility and site as part of the Eugene to Vancouver B.C. passenger rail service improvements. There is also a funded project to improve rail in the vicinity of the Vancouver Yard. The project will add new rail bypass track and provide a grade-separated crossing of the rail lines for vehicles using west 39th Street in Vancouver. The intent of the Vancouver Rail Project is to increase safety, reduce rail congestion, and improve on-time performance of Amtrak's passenger rail service.

Lewis and Clark Railroad is a 33-mile short line railroad owned by Clark County. The line diverges from the main BNSF northern line around NW 78th Street and traverses the County via Rye Yard off St John's Road and Battle Ground to its terminus at Chelatchie Prairie. This short line railroad is also known as the Chelatchie Prairie Railroad or the Clark County Railroad. The operating and maintenance responsibilities for the line are leased out under long-term operating contracts to two different railroad operators. On the line segment from Battle Ground to the south, the Columbia Basin Railroad Company is responsible for freight operations. At present, this line segment serves the only active freight shippers on the railroad. On the line north of Battle Ground, the Battle Ground, Yacolt, and Chelatchie Prairie Railroad Association (which is a volunteer group) is operating a passenger excursion program originating in Yacolt.

Commuter Rail has been considered as an option for travel within the region. The Commuter Rail Feasibility Study (RTC, 1999) considered commuter rail options and reported on future

capacity of the rail corridors in the region. Commuter rail was also considered as part of the I-5 Partnership study in 2001/2.

For **AIR TRANSPORTATION**, Clark County largely relies on the Portland International Airport (PIA) located in Portland, Oregon to the southwest of the I-205 Glenn Jackson Bridge. This is a regional airport with domestic and international passenger and freight service. Passenger airlines currently serving PIA include Air Canada Jazz, Alaska Airlines, America West, American Airlines, Big Sky Airlines, Continental, Delta, Frontier, Hawaiian, Horizon, Jet Blue, Lufthansa, Mexicana, Northwest Airlines, Southwest Airlines, United, and United Express. There are nonstop international flights to Vancouver, Canada; Frankfurt, Germany; Guadalajara, Mexico; and Tokyo, Japan. In addition, air freight carriers that serve Portland currently include Air China Cargo, Airborne, Ameriflight, Bax Global, DHL Worldwide Express, Empire Airlines, Evergreen Airlines, Federal Express, Kitty Hawk Cargo, Korean Air, Menlo Worldwide, United Parcel Service, and Western Air Express. PIA saw rapid growth in passenger numbers and freight in the 1990's and now consistently serves over 1 million passengers per month. In 1998, passenger numbers surpassed 13 million for the first time. In the year ending June 30, 2005, Portland International Airport passengers totaled 13.5 million. In September 2005, the airport served 1,163,365 travelers. 263,189 short tons of cargo was handled by the airport in 2003. The airport is served by Tri-Met's MAX light rail which connects the airport to downtown Portland. C-TRAN buses connect to the Airport's MAX light rail line at the Parkrose Station.

General aviation airfields in Clark County include Pearson Field and Grove Field. **Pearson Field**, located 2 miles south west of Downtown Vancouver off SR-14, is operated by the City of Vancouver and covers 134 acres owned by the U.S. Park Service. The Airpark has one paved runway (3,200 feet by 60 feet) and can accommodate over 170 aircraft. The Airpark is on the Washington State Historical Register. Pearson is designated as a part of the regional transportation system. **Grove Field** is a Basic Utility Stage I Airport operated by the Port of Camas/Washougal. Located in the Fern Prairie area 5 miles north of Camas, Grove Airfield is one of only two publicly owned airfields in the county. Grove Field has a 2,832 foot paved runway illuminated by a low intensity lighting system and also a PAPI system, an above-ground self-fueling station and hangar space for over 60 aircraft. **Evergreen Airfield**, located off Mill Plain in east Vancouver, is to be closed and plans for a mixed use re-development for the site have been submitted to the city of Vancouver.

In addition, there are a number of private airfields located in Clark County that include those described below. Taylor's Green Mountain Airpark is a 23-acre facility, located 9 miles east of downtown Vancouver with one paved runway, six hangars and ten-tie downs. Eight aircraft are based at the Airpark. Goheen Airport, located three miles northwest of Battle Ground, is privately owned. It has one turf runway and provides a base for about 18 planes. 45 acres of Goheen's 60 acre area are zoned for airport use.

The Washington State Department of Transportation's Aeronautics Division and the local pilots' association have proposed that an additional airport should be sited in Clark County because of the vulnerability of existing airfields in the County due to ownership issues and development pressures. Efforts in the 1980's to site such a facility were thwarted when neighborhood residents opposed a proposed airport location in the vicinity of the I-5/Ridgefield Junction.

Federal and state agencies and local jurisdictions have to work together to site such facilities and local jurisdictions must ensure that the land uses surrounding the facility are compatible with aircraft operations and remain that way. Table 3-9, below, provides 1998 compiled by WSDOT which estimates aircraft operations at Clark County airfields.

Table 3-9: Aircraft Operations Estimates

AIRCRAFT OPERATIONS ESTIMATES, 1998 from *Washington State Continuous Airport System Plan* (WSDOT/Aeronautics)								
	Based Aircraft:							
Airport Name All are Private	Single Engine	Multi-Engine	General Aviation Local	General Aviation Itinerant	Air Carrier	Air Taxi	Commuter	Military
Evergreen Field (Vancouver)	240	5	170,000	30,000			0	50
Fly for Fun (Clark County)	9		500	2,500	0	0	0	0
Goheen (Battle Ground)	35		1,350	270	0	0	0	0
Grove Field (Camas)	60	1	5,600	7,000			0	0
Pearson Field (Vancouver)	210	10	23,228	84,201		3,471	0	1,100

Notes:
(1) No regional airlines or major national airlines serve Clark County airports/airfields

Source: FAA 5010 Forms; Airport Management Records; Washington State Aeronautics Division Records

REGIONAL TRANSPORTATION SYSTEM PERFORMANCE

GROWTH IN TRAFFIC VOLUMES

As a result of socio-economic and demographic changes described in Chapter 2 Clark County has seen significant growth in traffic volumes in recent years. The MPO compiles traffic count data from local jurisdictions and publishes the compiled data on RTC's website (see below). Traffic count data is factored to adjust for seasonal, monthly, weekly and daily fluctuations in volumes. Examples of growth in traffic volumes at selected Clark County locations are listed in Table 3-10 below.

Permanent traffic recorders are in place on the I-5 and on the I-205 bridges. RTC compiles the traffic counts provided by Oregon Department of Transportation from these recorders or estimates provided by ODOT. In March 1995 RTC published the *Columbia River Bridge Traffic, 1961 - 1994* report. This data is now updated annually and is available on RTC's web site (http://www.rtc.wa.gov/tc/brdgawd.htm). Figure 3-3 shows the average weekday traffic volumes crossing the Columbia river bridges, 1980 to 2004. In 2004 the estimated average weekday traffic (AWDT) on the I-5 Interstate Bridge was 129,899 and on the I-205 Glenn Jackson Bridge was 145,032. In 2004, the average northbound weekday evening peak hour crossings of the I-5

Interstate Bridge were 5,176 and 7,377 on the I-205 Glenn Jackson Bridge. In the southbound direction, average weekday morning peak hour crossings were 5,412 on the I-5 Interstate Bridge and were 7,545 on the I-205 Glenn Jackson Bridge.

Table 3-10: Traffic Volumes; 1985 to Current Years

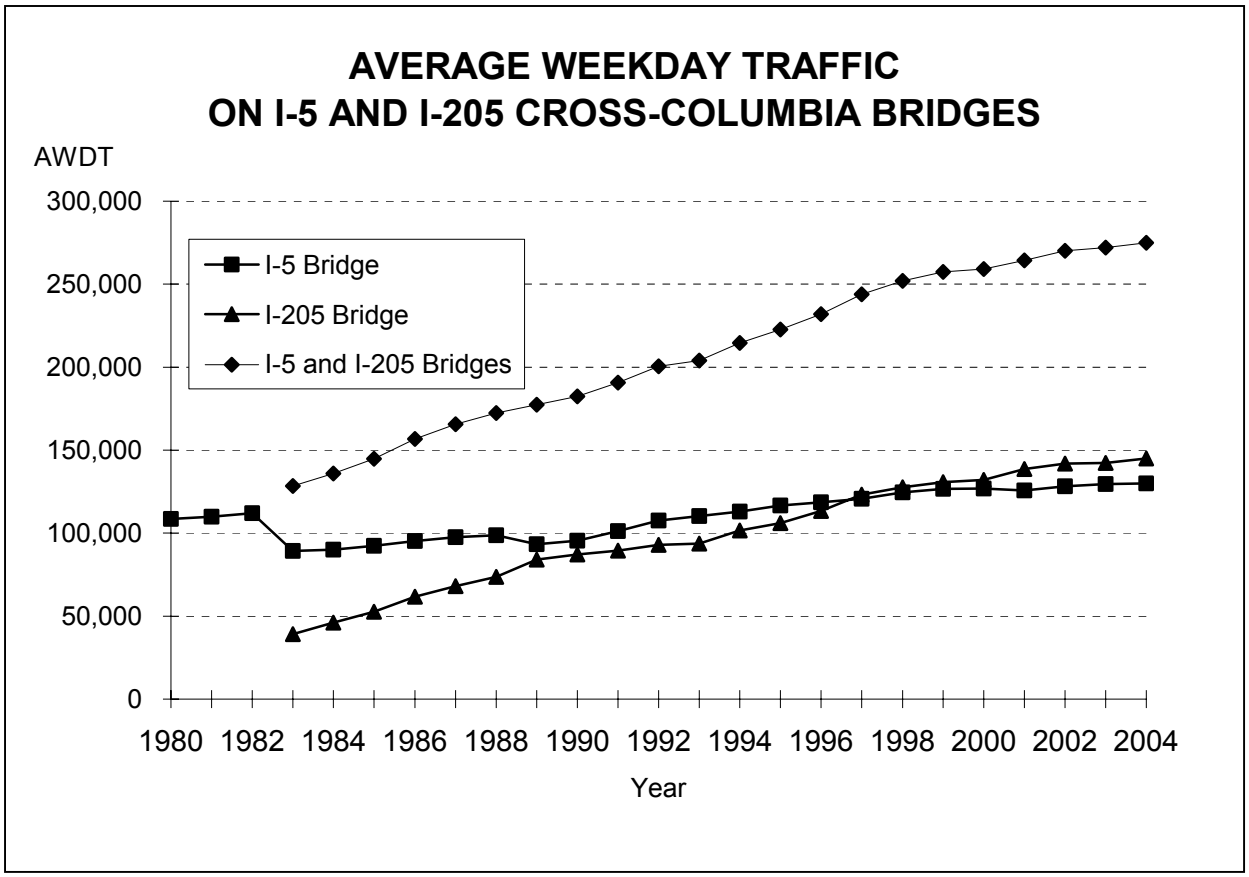
Location	1985 Volumes	Current Volumes	Year of Current Volumes	% Increase	Annual % Increase
I-5 Bridge	92,301	130,000	2004	41%	2.1%
I-5, South of SR-500	54,400	124,879	2001	130%	8.1%
I-5, South of NE 78th St	52,784	98,060	2004	86%	4.5%
I-5, South of Woodland	33,748	63,542	2004	88%	4.6%
I-205 Bridge	52,568	145,032	2004	176%	9.3%
I-205, South of SR-500	40,440	115,025	2004	184%	9.7%
78th St, West of Hwy 99	23,646	29,152	2002	23%	1.4%
164th Ave, South of SE 34th St	7,052	51,414	2002	629%	37.0%
Fourth Plain, West of NE Andresen	16,060	24,719	2003	54%	3.0%
Hwy 99, South of NE 99th St	19,653	21,994	2003	12%	0.7%
Mill Plain, East of NE Andresen	21,021	26,604	2004	27%	1.4%
Mill Plain, East of NE Chkalov	18,220	42,939	2003	136%	7.5%
SR-14, West of SE 164th Ave	22,600	82,794	2004	266%	14.0%
SR-14, West of NW 6th Ave	17,600	31,983	2000	82%	5.4%
SR-500, West of NE Andresen	20,054	51,522	2003	157%	8.7%
SR-500, West of 137th Ave	14,671	29,570	2005	102%	5.1%
SR-503, South of NE 76th St	17,460	34,918	2005	100%	5.0%
SR-503, South of SR-502	7,360	22,506	2005	206%	10.3%

The highest daily traffic ever recorded on the I-5 Interstate Bridge was on Friday July 2, 2004 when 157,301 bridge crossings were made. The highest evening peak hour traffic ever recorded on the I-5 Bridge was on Tuesday May 28, 1996 when 10,838 bridge crossing were made; of these 5,520 were northbound and 5,318 were southbound. For the northbound direction, the highest evening peak hour traffic was recorded on Thursday June 11, 1998 when 5,987 bridge crossings were made. For the southbound direction, the highest morning peak hour traffic was recorded on Wednesday March 31, 2004 when 6,119 bridge crossings were made.

The I-205 Glenn Jackson Bridge's highest daily crossings ever recorded was on Friday July 16, 2004 with 168,491 crossings. The highest evening peak hour traffic recorded on the I-205 Glenn Jackson Bridge was on Friday August 9, 2002 when 13,196 bridge crossings were made. The highest northbound evening peak hour traffic recorded on the Bridge is the 8,426 crossings made

on Wednesday Friday May 24, 1996. For the southbound direction, the highest morning peak hour traffic was recorded on Tuesday October 7, 2003 when 8,247 bridge crossings were made.

Figure 3-3: I-5, I-205 Average Weekday Bridge Crossings



Regional transportation system intersections with the highest traffic volumes, measured in terms of number of vehicles entering intersection are listed in Table 3-11.

Table 3-11: Highest Volume Intersections in Clark County, 2004

CLARK COUNTY HIGHEST VOLUME INTERSECTIONS - 2004				
Rank	**East-West**	**North/South**	**Approx. Volume**	**Count Year**
1	Mill Plain Blvd.	Chkalov Drive	78,000	2003
2	State Route 500	St. John's Road	64,000	2001
3	State Route 500	State Route 503	64,000	2003
4	State Route 500	NE 54th Avenue	59,000	2003
5	Mill Plain Blvd.	136th Avenue	58,000	2003
6	State Route 500	NE 42nd Avenue	58,000	2003
7	SE 34th Street	SE 164th Avenue	58,000	2002
8	Fourth Plain Blvd.	State Route 503	55,000	2003
9	Padden Parkway	State Route 503	54,000	2003
10	Padden Parkway	Andresen Road	49,000	2002
11	NE 78th Street	Highway 99	48,000	2002
12	NE 76th Street	State Route 503	46,000	2003
13	Mill Plain Blvd.	NE 104th/105th Avenue	45,000	2002
14	Padden Parkway	NE 94th Avenue	45,000	2004
15	NE 134th Street	Highway 99	44,000	2001

Notes: Volumes are based on the total number of vehicles entering an intersection on an average weekday, and are approximate due to the variability from year to year.
Freeway ramp intersections with streets were not considered for this listing
Source: RTC's Regional Traffic Count Program.

REGIONAL TRAVEL FORECASTING MODEL: FORECASTING FUTURE TRAVEL DEMAND AND TRANSPORTATION NEEDS

The Regional Travel Forecasting Model for the Clark County region was used to forecast future traffic volumes on the regional transportation system. The regional travel forecast model uses demographic data as a basis for travel forecasts with the basis for the 2030 travel demand forecast model being the underlying forecast 2030 land uses. The travel model process involves trip generation, trip distribution, mode split and trip assignment to the regional transportation system. EMME/2 software is used to assign trips to the regional transportation system as part of the Clark County region's travel forecast model process.

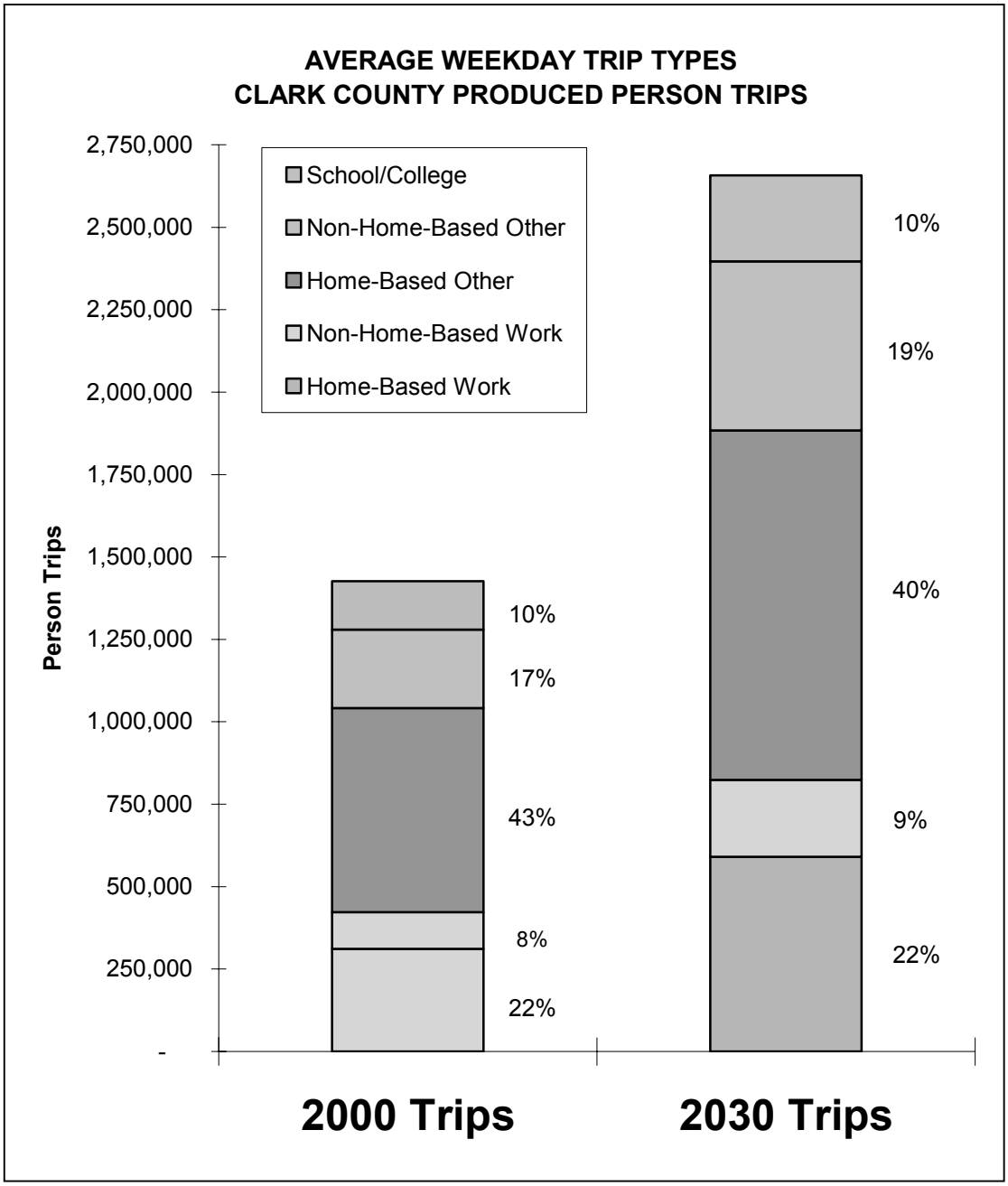
In the modeling process, a base year of 2000 was used and a forecast to the year 2030 was made. As described in Chapter 2, the MTP update must be based on adopted land use plans of local jurisdictions. 2030 land uses are based on the adopted Comprehensive Growth Management Plan for Clark County (Clark County, September 2004) which has a horizon year of 2023, extended seven years to the MTP's 2030 horizon. Prior to adoption of the Comprehensive Growth Management Plans, alternative land use scenarios, and their effect on regional transportation needs, are tested and measured as part of the Growth Management planning process. The 2030 land use allocation to 650 Clark County Transportation Analysis Zones

(TAZ's) was developed by local jurisdictions and RTC's partner agencies using their adopted comprehensive land use plans, as well as current zoning, as the basis for forecasting the future location of population, housing and employment within Clark County. Household and employment data allocated to the TAZs are the input to the regional travel forecast model. After trip generation, trip distribution, mode split and trip assignment onto the assumed regional transportation network, output from the regional travel forecast model is used as a tool to identify specific transportation system needs and future transportation solutions.

Trips can be classified according to place of trip production and purpose of trip. The regional travel forecasting model for Clark County categorizes trips into six groups, they are Home-Based Work, Non-Home-Based Work, Home-Based Other, Non-Home-Based Other, School and College trips. Figure 3-4 show the proportion of trips in each of these categories for average weekday Clark County-produced person trips. In Figure 3-4 College and School trips have been aggregated.

Figure 3-4 shows that in the 2000 base year the largest proportion of trips during a 24-hour period are Home-Based-Other trips (43%). This category can include trips from home to the grocery store, home to childcare, home to leisure activities etc. The second highest category is Home-Based Work trips (22%). Non Home-Based-Other trips make up 17% of the trips. This category can include such trips as shopping mall to restaurant trips. The home-based categories include trips originating at home and going to a destination as well as the return trip to home. School and college trips make up 10% of trips made on a daily basis and Non-Home-Based Work trips, such as delivery trips, made up 8% of daily trips. The proportions for the year 2030 are 40% Home-Based-Other trips, 22% Home-Based-Work trips, 19% Non-Home Based Other trip, 10% school/college trips and 9% Non-Home-Based Work trips. From 2000 to 2030 there is forecast to be a 86% increase in all-day person trips from around 1,427,000 trips per day in 2000 to over 2.6 million in 2030.

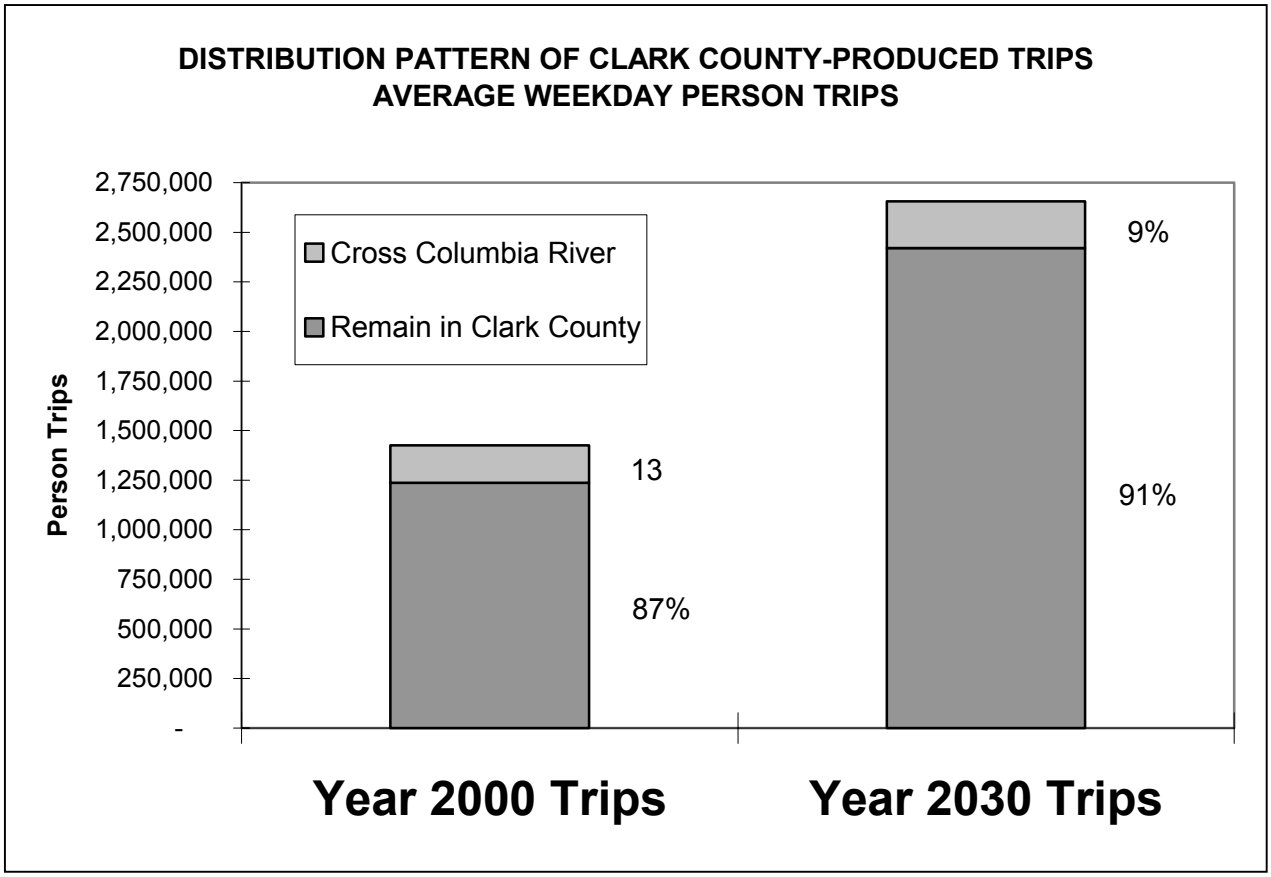
Figure 3-4: Average Weekday Trip Types, Clark County Produced Person Trips



Source: RTC Regional Travel Forecast Model

Trips can also be categorized according to where the trips begin and end. Figure 3-5 shows the proportions of trips that use the Clark County highway system; trips that remain in Clark County (87% of trips in 2000 , 91% in 2030) and trips that cross the Columbia River (13% in 2000, 9% in 2030).

Figure 3-5: Distribution Patterns of Clark County Produced Person Trips, Average Weekday



Source: RTC Regional Travel Forecast Model

Needs analysis was then carried out to determine what impact this forecast growth in travel demand might have on the transportation system. In carrying out analysis of existing and future transportation needs the regional travel forecasting model was used to run three scenarios:

Base-Year 2000 traffic volumes on 2000 highway network

Committed System (Year 2030) Forecast 2030 traffic volumes on "committed" highway network.

The "committed" network has improvement projects for which funds are already committed in the Metropolitan Transportation Improvement Program (MTIP).

MTP (Year 2030) Forecast 2030 traffic volumes on 2030 highway network with *MTP* improvements listed in Appendix A.

MTP improvements are projects for which funds are already programmed and committed in the *2006-2008 Metropolitan Transportation Improvement Program* together with projects for which there is an identified regional need, strong regional commitment, and a reasonable expectation that funds will be available within the twenty-year horizon to construct them.

Tables 3-12, 3-13, 3-14 and 3-15 present system-wide benchmark results from testing the scenarios described above. Each table presents data by functional classification.

Table 3-12: P.M. Peak Hour Speed

AVERAGE PEAK HOUR SPEED ON CLARK COUNTY HIGHWAYS (Results from Regional Travel Forecasting Model, using EMME/2 software)			
	Speed in Miles per Hour		
Facility Type/Region	**Base-Year 2000**	**Committed System (2030 demand on Committed System)**	**2030 MTP**
Interstates (excluding Ramps)	48	31	37
Interstates (including Ramps)	45	31	36
Expressways & Principals	36	31	35
Minor Arterials	31	27	29
Major & Minor Collectors	34	29	32
Other Roads	27	25	28
Total Clark County System	37	30	33

Table 3-13: Peak Hour Vehicle Miles Traveled

VEHICLE MILES TRAVELED ON CLARK COUNTY HIGHWAYS IN P.M. PEAK HOUR (Results from Regional Travel Forecasting Model, using EMME/2 software)			
	Miles of Travel		
Facility Type/Region	**Base-Year 2000**	**Committed System (2030 demand on Committed System)**	**2030 MTP**
Interstates (excluding Ramps)	191,750	315,139	319,166
Interstates (including Ramps)	214,065	337,843	359,798
Expressways & Principals	195,661	309,544	311,631
Minor Arterials	85,773	175,392	163,365
Major & Minor Collectors	106,360	265,174	248,690
Other Roads	12,918	28,761	24,206
Total Clark County System	614,777	1,116,713	1,107,690

Source: Tables 3-12 through 3-15: RTC Regional Travel Forecast Model

Table 3-14: Peak Hour Lane Miles of Congestion

LANE MILES OF CONGESTION IN P.M. PEAK HOUR (Results from Regional Travel Forecasting Model, using EMME/2 software)			
	Lane Miles of Congestion		
Facility Type/Region	**Base-Year 2000**	**Committed System** (2030 demand on Committed System)	**2030 MTP**
Interstates (excluding Ramps)	7.02	88.57	55.65
Interstates (including Ramps)	10.72	100.38	62.79
Expressways & Principals	21.12	151.73	110.56
Minor Arterials	9.45	48.93	59.04
Major & Minor Collectors	3.53	59.42	46.88
Other Roads	0.66	4.33	2.47
Total Clark County System	45.48	364.78	281.74

Table 3-14 (above) presents data on congestion on the Clark County highway system. This measure represents the number of lane miles that operate under congested conditions (at volume to capacity ratio of 0.9 or above; equivalent to level of service E or F) during the full p.m. peak hour. The table's data indicates the relative growth in congestion forecast to occur in the future as travel demand increases.

Table 3-15: Peak Hour Vehicle Hours of Delay

P.M. PEAK HOUR VEHICLE HOURS OF DELAY - CLARK COUNTY HIGHWAYS (Results from Regional Travel Forecasting Model, using EMME/2 software)			
	Hours of Vehicle Delay		
Facility Type/Region	**Base-Year 2000**	**Committed System** (2030 demand on Committed System)	**2030 MTP**
Interstates (excluding Ramps)	484.0	4,047.2	2,609.2
Interstates (including Ramps)	559.4	4,274.4	2,751.6
Expressways & Principals	289.3	1,811.6	858.4
Minor Arterials	109.7	782.6	453.6
Major & Minor Collectors	46.5	1,331.7	644.9
Other Roads	29.5	165.2	68.9
Total Clark County System	1,034.4	8,365.5	4,777.5

Table 3-15 presents vehicle hours of delay. Using the time taken to travel a highway segment at level of service C as a base condition, any road segment operating at LOS D, E or F is measured against the level of service C base condition. The time difference is calculated, aggregated for the entire highway system. The result is Vehicle Hours of Delay. The data is of use in analyzing the relative increase in delay forecast to occur with growth in travel demand in the future.

The preceding system-wide data represents measures of assessing highway system performance, but perhaps more meaningful is an analysis of performance and needs within corridors or on individual system links and at intersecting points. A planning level of analysis, using capacity analysis and level of service standards criteria, was carried out resulting in a first-cut analysis of existing and forecast future deficiencies of the regional transportation system.

LEVELS OF SERVICE

Level of service standards represent the minimum performance level desired for transportation facilities and services within the region. They are used as a gauge for evaluating the quality of service of the transportation system and can be described by travel times, travel speed, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The Washington State Growth Management Act states that these standards should be established locally and standards should be regionally coordinated. The standards are used to identify deficient facilities and services in the transportation plan, and are also to be used by local governments to judge whether transportation funding is adequate to support proposed land use developments.

Levels of service are defined as "qualitative measures describing operational conditions within a traffic stream and their perception by motorists and/or passengers". A level of service definition generally describes these conditions in terms of such factors as speed and travel time, volume conditions, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. These levels of service are designated A through F, from best to worst. Level of service E describes conditions approaching and at capacity (that is, critical density).

For uninterrupted flow conditions (such as freeways and long sections of roadways between stop signs or signalized intersections), the following definitions[5] apply:

- Level of Service A describes free flow conditions, with low volumes and high speeds. Freedom to select desired speeds and to maneuver with the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

- Level of Service B is in the range of stable flow but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver with the traffic stream from LOS A.

- Level of Service C is still in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and

[5] ..From *Highway Capacity Manual*, Transportation Research Board, 1985

maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

- Level of Service D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

- Level of Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

- Level of Service F describes forced or breakdown flow. These conditions usually result from queues of vehicles backing up from a restriction downstream. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. It marks the point where arrival flow exceeds discharge flow.

These definitions are general and conceptual in nature, and they apply primarily to uninterrupted flow. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them.

Table 3-16 below quantifies Level of Service as defined by the Highway Capacity Manual: Special Report 209, Third Edition (Transportation Research Board, 1998). The agreage travel speeds are shown with their corresponding level of service designation.

Table 3-16: Level of Service Definitions (HCM)

Level of Service Definitions (Highway Capacity Manual)						
LOS Class	**A**	**B**	**C**	**D**	**E**	**F**
Type I Urban Arterials Roadway Segment: Average Travel Speed (mph)	≥ 42	≥ 34	≥ 27	≥ 21	≥ 16	< 16
Type II Urban Arterials Roadway Segment: Average Travel Speed (mph)	≥ 35	≥ 28	≥ 22	≥ 17	≥ 13	< 13
Signalized Intersections Control Delay per Vehicle (seconds)	≤ 10	>10 & ≤ 20	>20 & ≤ 35	>35 & ≤ 55	>55 & ≤ 80	> 80
Unsignalized Intersections Delay per Vehicle (seconds)	≤ 10	>10 & ≤ 15	>15 & ≤ 25	>25 & ≤ 35	>35 & ≤ 50	> 50

LEVEL OF SERVICE STANDARDS ON HIGHWAYS OF STATEWIDE SIGNIFICANCE AND HIGHWAYS OF REGIONAL SIGNIFICANCE

Congestion and Levels of Service continue to be issues of significance for Clark County as the region continues to experience rapid growth. In 1998 the Washington State Legislature passed House Bill 1487, otherwise known as the Level of Service (LOS) Bill. The Bill set new requirements relating to transportation and growth management planning. The LOS Bill aimed at clarifying how state-owned transportation facilities should be planned for and included in city and county comprehensive plans required under the Growth Management Act. The intent of the legislation was to enhance the coordination of planning efforts and plan consistency at the local, regional and state levels. The LOS Bill amended several laws including the Growth Management Act (RCW 36.70A), Priority Programming for Highways (RCW 47.05), Statewide Transportation Planning (RCW 47.06) and Regional Transportation Planning Organizations (RCW 47.80). The combined amendments to these RCWs were provided to enhance the identification of, and coordinate planning for major transportation facilities identified as "transportation facilities and services of statewide significance". The key requirements to the bill are listed below

- Designation of Highways of Statewide Significance (HSS) completed in 1999 and most recently updated in 2004. The State must give higher priority to correcting identified deficiencies on transportation facilities of statewide significance. In the Clark County region the HSS system is I-5, I-205, SR-14 and SR-501 between I-5 and the Port of Vancouver.
- State-owned facilities, including Highways of Statewide Significance, to be included in local plans.
- Level of Service for Highways of Statewide Significance is set by the State in consultation with other jurisdictions.
- Level of Service for regional state highway facilities (not part of the HSS) to be set through a Regional Transportation Planning Organization (RTPO) coordinated process with state, regional and local input.
- Highways of Statewide Significance (HSS) are not part of local concurrency requirements.
- The LOS Bill does not address concurrency requirements for regional state highway facilities.

For the HSS system the Bill requires that the transportation element of the comprehensive plan address the land use impact on the state highway facilities. The State, in consultation, will set the LOS for the HSS system and they are exempt from local concurrency analysis. In Clark County, WSDOT has established a LOS ‘C’ for rural HSS facilities and ‘D’ for urban HSS facilities.

Non-HSS state highways, otherwise known as Highways of Regional Significance, in Clark County include SR-500, non-HSS segments of SR-501, SR-502, and SR-503 must also be addressed in the comprehensive plan, and have LOS set in coordination with the RTPO. The law is silent in terms of including or exempting them from local concurrency rules. In December

2001, the RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities and LOS 'C' or better on rural non-HSS facilities.

Urban areas and urban facilities are defined by the GMA urban growth boundaries. Rural areas and rural facilities are outside of the GMA urban growth boundaries. Although local agencies may establish their own methodology for analyzing LOS, these LOS standards must be consistent with the Highway Capacity Manual LOS criteria.

Local agencies should incorporate the LOS standards established for both the Highways of Statewide Significance and regional state highway facilities (or non-HSS) into the transportation elements of their Comprehensive Growth Management Plans. Once local Growth Management Plans are updated, RTC must certify that the local transportation elements are consistent with the Metropolitan Transportation Plan, include LOS standards for the HSS and non-HSS segments and describe the impacts of land uses on the state highway system.

CLARK COUNTY/VANCOUVER LOS STANDARDS

Capacity analysis is an estimate of the maximum amount of traffic that can be accommodated by a facility while maintaining prescribed operational qualities. The definition of operational criteria is through levels of service, as described above, or by other operational criteria. The Growth Management Act requires local jurisdictions to set levels of service standards for transportation facilities. This ties in with the GMA concurrency requirement that transportation and other infrastructure is available concurrent with development. Levels of Service (LOS) standards are to be regionally coordinated and were coordinated within the region during the GMA planning process in 1994.

Vancouver adopted a corridor-based concurrency ordinance in March 1998. In 1999, the City of Vancouver amended the existing Level of Service (LOS) standards contained in the Mobility Management element of the Comprehensive Plan. Levels of service standards to meet Vancouver's concurrency test requirements include: 1) corridor travel times (maximum allowable travel time between two designated points along a corridor); 2) an Average Signalized Intersection Performance Standard (a quantitative standard of the performance of all signalized intersections within an identified transportation corridor or Transportation Management Zone (TMZ); and 3) Mobility Index (the maximum number or percentage of signalized intersections which may have an operating level below the Average Signalized Intersection Performance Standard. The City of Vancouver's concurrency corridors are listed below (Table 3-17):

Table 3-17: City of Vancouver Concurrency Measurement Corridors

Andresen Rd
- Mill Plain to SR-500
- SR-500 to 78th St.

Burton Rd
- Andresen Rd. to 112th Ave

NE 28th St
- 112th Ave to 138th Ave
- 138th Ave to 162nd Ave

Mill Plain Blvd
- I-5 to Andresen Rd.
- Andresen Rd. to I-205
- I-205 to 136th Ave
- 136th Ave to 164th Ave

164th Ave
- SE 1st St to SR-14

162nd Ave.
- SE 1st St. to Fourth Plain Blvd.

192nd Ave.
- SR-14 to 18th St.

Fourth Plain Blvd.
- Port of Vancouver to I-5
- I-5 to Stapleton
- Stapleton to I-205

St John's Blvd.
- Fourth Plain Blvd to 78th St.

NE 18th St.
- 112th Ave to 138th Ave
- 138th Ave to 162nd Ave

NE 112th Ave
- Mill Plain Blvd to 28th St
- 28th St to 51st St

NE 136th Ave
- Mill Plain Blvd to 28th St.

NE 138th Ave
- NE 28th St. to Andresen

Further information on the City's Concurrency program can be found at the web site address, http://www.ci.vancouver.wa.us.

On October 10, 2000, the Board of Clark County Commissioners adopted a new Transportation Concurrency Ordinance and related levels of service. For details of the October 2000 Clark County Concurrency ordinance and travel speed standards refer to County website at http://www.clark.wa.gov/Public-Works/transportation/concurrency.html and Clark County Code Section 40.350.020. The County's Level of Service standards rely on meeting minimum travel speeds in each of the transportation corridors designated by the County as outlined in Clark County Code Section 40.350.020. The corridor travel speeds are periodically reviewed and updated with the latest update in September 2004. Minimum corridor travel speed range between 13 miles per hour and 27 miles per hour, depending on the corridor. Facilities also have to meet thresholds for travel delay at signalized intersections within the designated corridors. Individual movements at each signalized intersection of regional significance shall not exceed an average of two cycle lengths or two hundred and forty seconds of delay, whichever is less. Outside of designated transportation corridors, all signalized intersections of regional significance shall achieve LOS D or better except for the intersections of SR-500/Falk Road and SR-500/NE 54th Avenue which shall achieve LOS E or better. All unsignalized intersections of regional significance in unincorporated County shall achieve LOS E standards or better (if

warrants are not met) and LOS D or better if warrants are met. There are some exemptions that can apply to concurrency requirements.

Table 3-18: Clark County Concurrency Measurement Corridors

Clark County Concurrency Measurement Corridors: Corridors and Corridor Limits Description

North-South Roadways

Lakeshore Avenue
Bliss Rd to NE 78th St

Hazel Dell Avenue
Highway 99 to NE 63rd St.

Highway 99 & NE 20th Avenue
North: NE 20th Avenue (), NE 179th St. to S of NE 134th St.
Central: N of NE 134th St. to NE 99th St.
South: NE 99th St. to NE 63rd St.

St. Johns Road
NE 119th St. to NE 68th St.

NE 72nd Avenue
SR-502 to NE 119th St.

Andresen Road
NE 119th St. to NE 58th St.

Gher/Covington Road
Padden to SR-500

SR-503
North: SR-502 to NE 119th St.
South: NE 119th St. to Fourth Plain

Ward Road
Davis Rd. to SR-500

NE 162nd Avenue
Ward Rd. to NE 39th St.

NE 182nd Avenue
Risto Rd. to Davis Rd.

East-West Roadways

SR-502
SR-503 to NE 179th St.

179th Street
West: NW 41st Ave. to I-5
West Central: I-5 to NE 72nd Ave.

139th St. & Salmon Creek Ave.
139th Street (West), Seward Rd. to I-5
Salmon Creek Ave. (W. Central), I-5 to NE 50th Ave.

119th Street
West: Lakeshore to Hazel Dell
West Central: Hwy 99 to NE 72nd Ave.
East Central: NE 72nd Ave. to SR-503

99th Street
West: Lakeshore to I-5
West Central: I-5 to St. John's Rd.
East: SR-503 to NE 172nd Ave.

Padden Parkway (East Central)
I-205 to SR-503

78th/76th Street
West: Lakeshore to I-5
West Central: I-5 to Andresen
East Central: Andresen to SR-503
East: SR-503 to Ward Rd.

Fourth Plain Boulevard
East Central: I-205 to SR-503
East: SR-503 to 162nd Ave.

63rd Street
West Central: Hazel Dell to Andresen
East Central: Andresen to NE 107th Ave.

TRANSIT LOS INDICATORS

In 1994, as part of the GMA planning process, C-TRAN also identified LOS indicators to assess the operational quality of the transit system. This matrix has been updated and is presented in Table 3-19. It can be used as a guide to assess where transit service would be feasible in areas within C-TRAN's service boundary.

Table 3-19: C-TRAN Level of Service Indicators (Summer 2005)

C-TRAN LOS INDICATORS (Summer 2005)								
	PERFORMANCE INDICATORS						PLANNING INDICATORS	
Service Category	Passengers/ Revenue Hour	Load Factor	Peak/ Non-peak Headways	Bus Stop Spacing	Accessibility (within service boundary)	Span of Service	Density	Supporting Factors
Premium Commuter	TBD	1.0	10-15/NA	NA (or P&R sites)	Within 5 miles of 80% of pop+emp	M-F, peak	High density employment district as destination	Full cost recovery, parking mgmt, sufficient P&R spaces/transit connections
Commuter Shuttle	TBD	1.0	15/TBD	NA (or P&R sites)	Within 5 miles of 80% of pop+emp	M-F, mainly peak	High density employment district as destination	Parking mgmt, sufficient P&R spaces/transit connections
Urban Corridor	TBD	1.5	15/30	1/8 mile	Within 1/4 mile of 75% of pop+emp	M-F, 15 hours	8 or more residential units per acre, employment / comercial uses	Land use/zoning compatibility, pedestrian/ bike facilities, trip generators/destinations along corridor
Urban/ Suburban Residential	TBD	TBD	30/60	1/4 mile	Within 1/4 mile of 75% of pop+emp	M-F, 15 hours	4-8 residential units per acre, mix of uses along routes	Land use/zoning compatibility, pedestrian/ bike facilities, connection to major activity centers
Rural	TBD	TBD	60/120	TBD	Within 5 miles of 75% of pop+emp	M-F, TBD	2-4 residential units per acre	Pedestrian/bike facilities, citizen requests for service
Subscription	TBD	TBD	As needed	Desig-nated sites	NA	M-F, peak	NA	Specialized employer needs
Paratransit	TBD	TBD	NA	NA	Within 3/4 mile of fixed routes	M-F, 15 hours	NA	Passengers who cannot access fixed route, caregivers/providers who learn how to work effectively with C-TRAN

During 2006, service standards will be presented to C-TRAN's Board of Directors for adoption. The new standards will be incorporated in the next MTP update.

HIGHWAY SYSTEM CAPACITY ANALYSIS

EMME/2 software is used to analyze highway capacity needs for the Clark County region. Appendix A lists projects identified in the *MTP* as needed to meet future forecast capacity deficiencies determined by assigning forecast 2030 trips to an assumed transportation network.

The list contained in Appendix A notes projects which are incorporated into the 2030 regional travel forecasting model and are consequently considered as part of the air quality conformity analysis.

TRANSPORTATION SYSTEM ANALYSIS

Highway capacity is not the only consideration in analysis of the regional transportation system. Consecutive federal Transportation Acts, The Intermodal Surface Transportation Efficiency Act (1991), and Transportation Equity Act for the 21st Century (TEA-21) and SAFETEA-LU (2005), emphasize the need to develop alternative modes and increase capacity of the existing highway system through more efficient use by, for example, ridesharing, system management and transit use. Other alternatives have to be considered before capacity expansion. Such strategies are described in more detail in Chapter 5, System Improvement and Strategy Plan. In addition, Chapter 5 also addresses the need for maintenance and preservation of the existing regional transportation system, safety of the transportation system, development of non-motorized modes and high capacity transportation systems.