Metropolitan Transportation Plan for Clark County

Updated: December 2002
Amended: December 2003

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

When the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed in 1991, the Act required Metropolitan Planning Organizations (MPOs), such as RTC, to carry out review of several elements of the regional transportation planning program. First, the Act called for review and revision of the federal transportation **Urban Area Boundary** (UAB); a boundary delineating areas that are urban in nature from those that are largely rural in nature. The federal transportation Urban Area Boundary is not to be confused with the Urban Growth Areas being established under the Washington State Growth Management Act (GMA), as described in Chapter 2. The UAB should cover, at a minimum, the area designated by the 1990 Census[1] as "urbanized" by meeting certain population and density criteria. Within Clark County, the Vancouver urban area has a population of over 50,000 and is therefore defined as an urbanized area by the U.S. Census and Camas/Washougal are defined as an urban area or urban place because they have populations of over 5,000 but are not within the main Vancouver urbanized area. Therefore, for federal transportation purposes there is a Vancouver federal transportation Urban Area Boundary and an adjoining Camas/Washougal Urban Area Boundary. (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[2]. 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 was designated as a **Transportation Management Area** (TMA) by the U.S. Secretary of Transportation. Within

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[1] The 2000 Census population numbers will result in changes to the Urban Area Boundary (UAB) described in this MTP chapter. The new Urban Area Boundary will be incorporated into a future update to the MTP once the federal functional classification system has been updated in 2003.

[2] 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 maintenance status for these pollutants. Air quality has implications for regional transportation planning as the region strives to maintain national ambient air quality standards.

TMAs, the MPO has to develop a congestion management system which was adopted by the RTC Board in May 1995 (RTC Board Resolution 05-95-14). The MPO has authority to select, in consultation with the state, projects to receive federal funds (see Chapter 4 for further details).

Figure 3-1: Transportation Boundaries

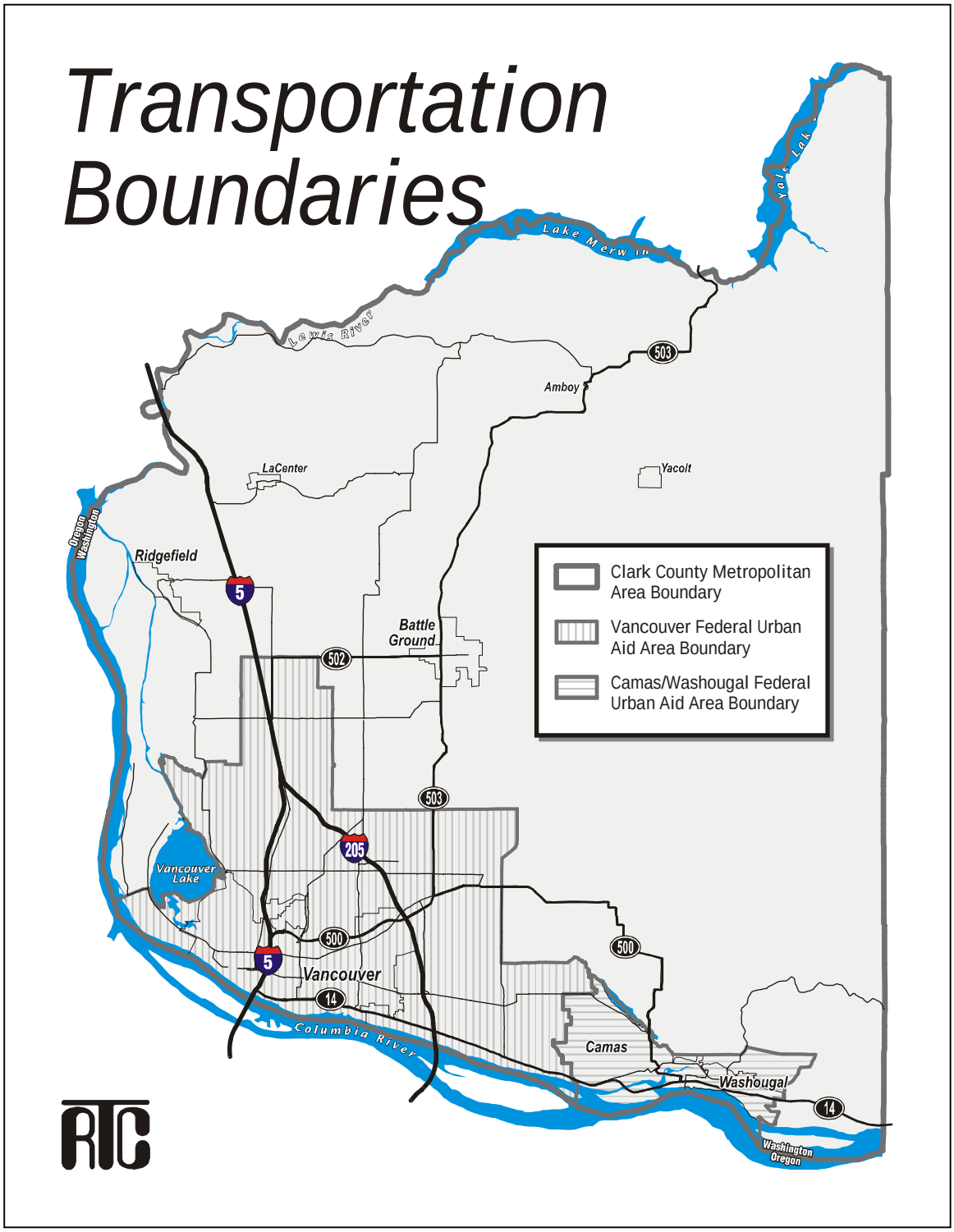
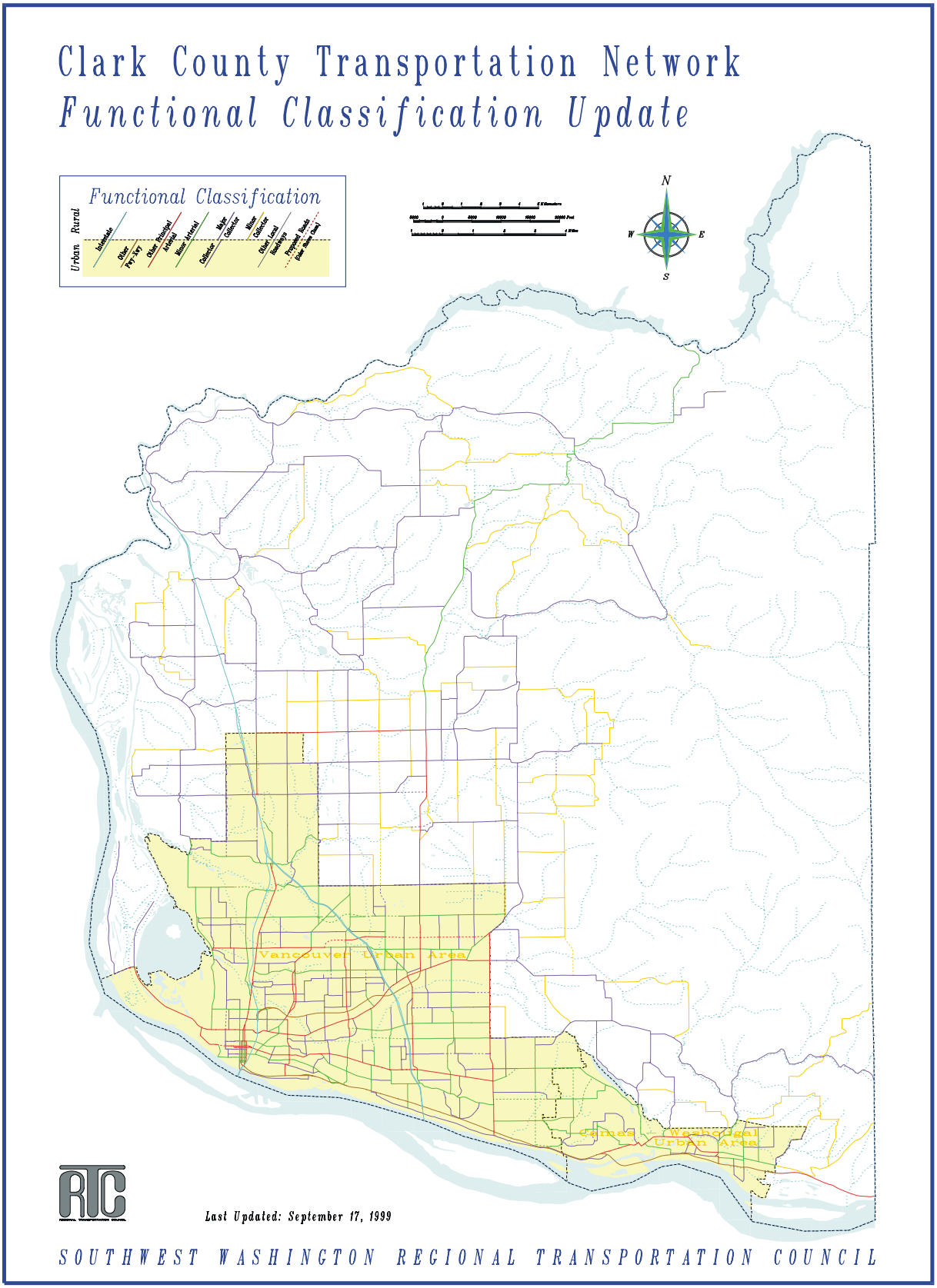


Figure 3-2: Clark County Federal Functional Classification Map



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.

To meet the requirements of ISTEA, the Federal Functional Classification system for Clark County roads was reviewed in 1993. This review led to a revision of the classification system within some jurisdictions and the result was a county-wide uniform classification system (see Figure 3-2; *Clark County Transportation Network, Functional Classification Update*). The revised functional classification system was approved by the Federal Highway Administration in May 1993. Since the 1993 approval, minor changes have been made to the federal functional classification system. The changes include re-designation of Burton Road, from Andresen Road to NE 162nd Avenue from a collector to minor arterial (MTP, 1996), and re-affirmation of NE 20th Avenue/NE 15th Avenue from Highway 99 to NE 179th Street as a minor arterial. Local jurisdictions periodically review the classification of streets. The City of Vancouver has requested street re-classifications for: Simpson Avenue (Mill Plain to Fourth Plain) from minor arterial to local and NE 97th Avenue (between Mill Plain and NE 18th Street) from collector to minor arterial. Clark County also maintains a Clark County Arterial Atlas, approved by the Board of County Commissioners, that reports on arterial and local street cross-sections anticipated for roads in Clark County.

As a pre-requisite for review of the federal functional classification system, the Urban Area Boundary had to 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. 1993 center line mileage by functional type is listed in Table 3-2. Data in Table 3-2 will be updated with the review of the federal functional classification in 2003.

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 intersection
SR-501	I-5 to Port of Vancouver access
SR-502	I-5 to SR-503 intersection
SR-503	SR-500 intersection to SR-502 intersection

Table 3-2: Federal Functional Classification Mileage 1993

FEDERAL FUNCTIONAL CLASSIFICATION OF CLARK COUNTY ROADS Mileage of Classified and Local Roads					
Facility Type	**Vancouver Urban Area**	**Camas Urban Area**	**Rural Remainder of County**	**Total Clark County**	**% of Total**
Interstates	22.1	0.0	9.2	31.4	1.2%
Expressways & Principals	78.2	11.5	14.2	103.9	4.0%
Minor Arterials	94.5	24.1	19.7	138.3	5.3%
Urban Collectors and Rural Major Collectors	133.2	16.0	204.4	353.5	13.6%
Rural Minor Collectors	0.0	0.0	143.1	143.1	5.5%
Local Roads	625.8	71.3	1,136.3	1,833.4	70.4%
Total	953.8	123.0	1,526.9	2,603.6	100.0%

Source: WSDOT, Clark County

There is a statewide limitation on the percentage of roads that can be functionally classified as Principal Arterial per federal guidelines. As a result, Clark County was unable to classify the facilities listed in Table 3-3 according to their plans for design standards for the facilities. The County intends that the facilities listed in Table 3-3 be developed to the design standards noted in the Clark County Arterial Atlas and should be included in the facilities considered for re-classification when the federal functional classification system is updated in 2003. As the total mileage of local roads increases, then the mileage of principal arterials or minor arterials can be increased.

Table 3-3: Examples of Federal and Clark County Road Classification Differences

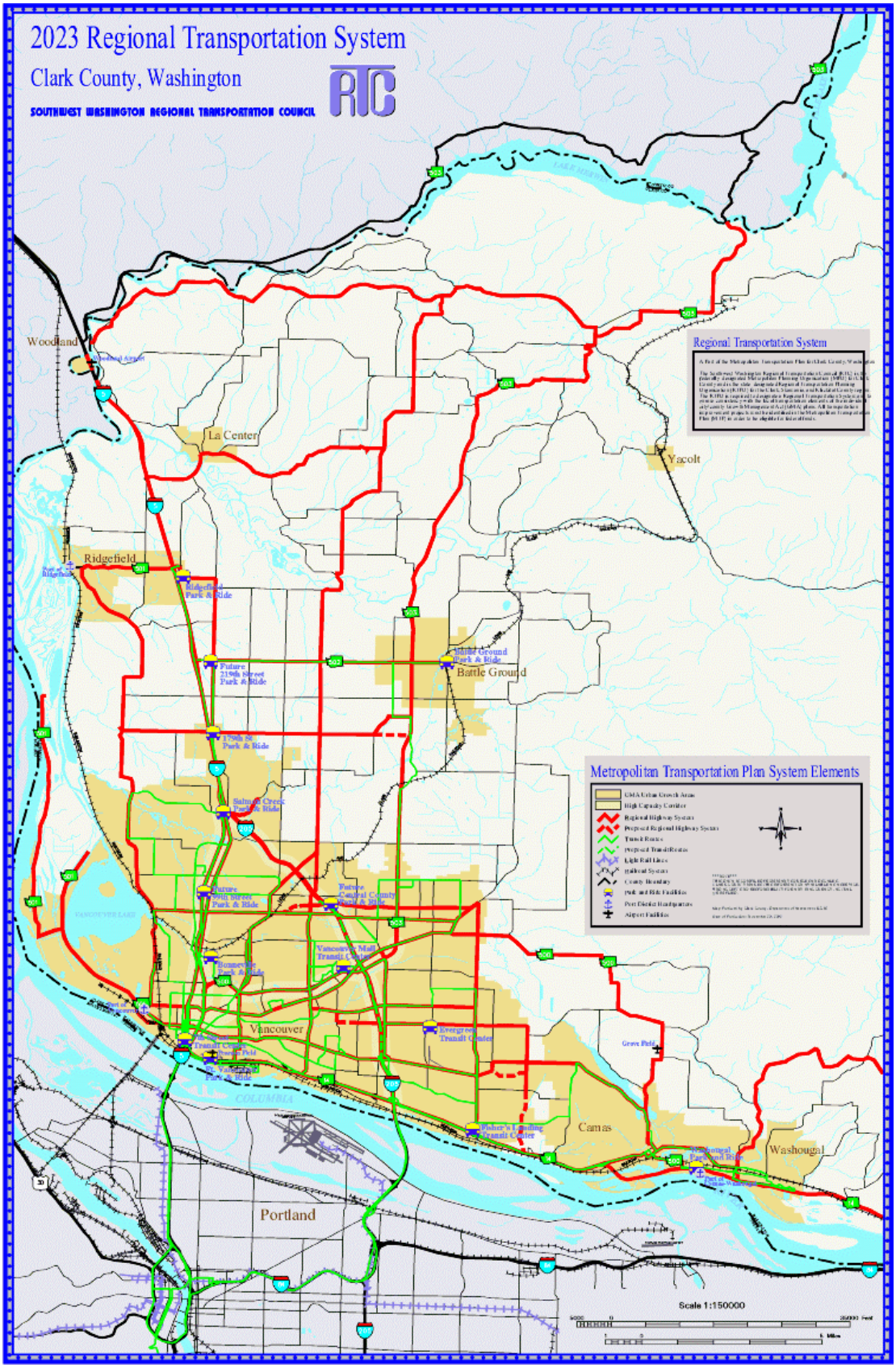
Differences between Federal Functional Class and Clark County Arterial Atlas Designations: Examples			
Facility	**Extent**	**Federal Functional Classification**	**GMA Functional Classification per Clark County Arterial Atlas**
St. John's	NE 78th St to NE 72nd Ave	Minor Arterial	Principal
Andresen/NE 72nd Ave	NE 78th St to NE 119th St	Minor Arterial	Principal
NE 18th St (part proposed, part existing)	Andresen to NE 162nd Ave	Minor Arterial	Principal
SE/NE 192nd Ave (part proposed, part existing)	SR-14 to NE 18th St	Minor Arterial	Principal
Mill Plain (part proposed, part existing)	NE 164th Ave to SE 1st St (180th Ave vicinity)	Minor Arterial	Principal
Mill Plain	180th Ave vicinity to Camas City Limits	Minor Arterial	Principal
179th St	NW 11th to NE 29th Ave	Collector	Principal
Lakeshore/36th Ave	Bliss Rd to NE 78th St	Minor Arterial	Principal
Ward Rd	Fourth Plain to 162nd Ave	Minor Arterial	Principal
Andresen Rd	NE 18th St to Mill Plain	Minor Arterial	Principal

Clark County (1993-1994)

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 3-3: 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 3-3) 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 Highway 99 off-ramp. There are currently two travel lanes in each direction from I-5/Highway 99 to the point at which I-205 joins I-5. North of the I-5/I-205 interchange there are again 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.

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. From the interchange with I-5 the facility has two-lanes in each direction until it reaches Ward Road. The facility then becomes a one-lane in each direction facility and traverses rural Clark County until the Camas urban area is reached. SR-500 meets 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 to the Cowlitz County line. The route has four lanes to SR-502 in Battle Ground at which point it reduces to two lanes.

Table 3-4: 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 N. Section	16.91	City of Ridgefield	19.88	Interchange with I-5/ N.E. 269th St.	19.88 Total north and south sections
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 are marked on Figure 3-3 by a dashed red line. Future planned facilities include the Mill Plain extension, 192nd Avenue (from SR-14 north) and NE 18th Street extension west from NE 102nd Avenue to NE 87th Avenue.

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. The extension of Light Rail Transit (LRT) from Portland to Clark County is a recommendation of the I-5 Transportation Partnership (2002) and is included in the MTP Strategic Plan (see MTP Appendix).

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 is served by the C-TRAN transit system that operates a **FIXED ROUTE BUS SYSTEM** on urban and rural routes in Clark County and express bus service for commuters to Portland, Oregon. C-TRAN also administers Americans with Disabilities Act (ADA)-compliant paratransit service, administers Commute Trip Reduction (CTR) services and provides additional jurisdictional support programs. Figure 3-3 maps C-TRAN's existing fixed route system and potential extension of the system with green dashed lines. Table 3-5 summarizes the existing fixed-route bus system. C-TRAN operates 28 routes with urban, intercity, rural and commuter-oriented lines. Operating hours are generally between 5:30 a.m. and 9:30 p.m. on weekdays, 6:45 a.m. and 8 p.m. on Saturdays and 8 a.m. and 7 p.m. on Sunday. C-TRAN has installed and maintains 220 passenger shelters and benches throughout the fixed route system within Clark County. Data for Tables 3-5 through 3-9 was supplied by C-TRAN.

Table 3-5: C-TRAN Fixed Route System (August 2002)

C-TRAN FIXED SYSTEM - BUS ROUTES (April 2002)							
Bus Route Number	**Route Name**	**Weekday Service First Run Begins**	**Weekday Service Last Run Begins**	**Weekday Service Frequency**	**Saturday Service**	**Sunday/ Holiday Service**	**Area Served** (TC = Transit Center; P&R = Park and Ride)
1	Fruit Valley	6:05 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7th St TC to west side Vancouver
2	Lincoln/Felida	6:15 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7th St TC to residential neighborhoods north of downtown Vancouver and Felida
3	City Center	5:45 a.m.	9:00 p.m.	15 mins.	Yes	Yes	7th St TC to close in east side Vancouver including Vancouver Memorial Hospital and waterfront
4	Fourth Plain	5:10 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7th St TC to Vancouver Mall, via Fourth Plain Blvd.
6	Hazel Dell	5:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7th St. TC to Salmon Creek P& R on west side of I-5
7	Battle Ground	5:45 a.m.	8:45 p.m.	45 mins.	Yes	Yes	Battle Ground to Van Mall TC
25	St John's	5:45 a.m.	8:45 p.m.	30 mins..	Yes	Yes	7th St. TC to Minnehaha area via St. John's and Hazel Dell
30	Burton	5:32 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7th St TC to Fisher's Landing via Burton Rd
32	Evergreen	5:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7th St TC to Van Mall, via Evergreen Blvd
37	Mill Plain	5:18 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7th St TC to Fisher's Landing via Mill Plain Blvd
39	Clark College & SWWMC	7:15 a.m.	8:15 p.m.	60 mins.	Yes	Yes	7th St TC to Clark College and SWWMC
71	Highway 99	5:15 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7th St. TC to Salmon Creek P&R on east side of I-5

C-TRAN FIXED SYSTEM - BUS ROUTES (April 2002)							
Bus Route Number	**Route Name**	**Weekday Service First Run Begins**	**Weekday Service Last Run Begins**	**Weekday Service Frequency**	**Saturday Service**	**Sunday/ Holiday Service**	**Area Served** (TC = Transit Center; P&R = Park and Ride)
72	Orchards	6:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	Vancouver Mall to Orchards area
76	76th/Sifton	5:30 a.m.	8:00 p.m.	30 mins.	Yes	Yes	Vancouver Mall to Sifton/Five Corners
78	78th Street	6:15 a.m.	8:15 p.m.	60 mins.	Yes	Yes	Vancouver Mall to 78th St and Hazel Dell
80	Van Mall/FLTC	5:30 a.m.	8:45 p.m.	30 mins.	Yes	Yes	Fisher's Landing TC to Van Mall
92	Camas/ Washougal	6:15 a.m.	8:15 p.m.	30 mins.	Yes	Yes	Local Camas/Washougal service to Fisher's Landing TC
93	SE 34th/LaCamas	6:45 a.m.	8:15 p.m.	60 mins.	No	No	Fisher's Landing TC to Camas via high-tech sites
105	Express via I-5	5:21 a.m.	6:29 p.m.	All day	No	No	Express service between 7th St TC and downtown Portland
114	Camas/ Washougal Ltd	6:30 a.m.	5:15 p.m.	1, a.m. trip 1, p.m. trip	No	No	Express from Camas/Washougal via SR-14 to downtown Portland
134	Salmon Creek Express	5:15 a.m.	7:00 p.m.	Peak only	No	No	Express from Salmon Creek P&R to downtown Portland
135	Ridgefield Express	6:30 a.m.	6:05 p.m.	1, a.m. trip 1, p.m. trip	No	No	Express between Ridgefield P&R and Salmon Creek P&R
157	BPA/Lloyd Center Limited	6:05 a.m.	5:12 p.m.	Peak only	No	No	Express service between Van Mall and Lloyd Center
164	Fisher's Landing Express	5:20 a.m.	7:00 p.m.	Peak only	No	No	Express service to downtown Portland from Fisher's Landing TC
165	Parkrose Express	6:15 a.m.	7:15 p.m.	All day	Yes	No	Express from Fisher's Landing TC to Parkrose TC
173	Battle Ground Ltd.	6:35 a.m.	5:22 p.m.	1, a.m. trip 1, p.m. trip	No	No	Express service from Battle Ground to 7th St. TC
177	Evergreen Express	5:20 a.m.	6:40 p.m.	Peak only	No	No	Evergreen TC via Rose Quarter to downtown Portland
190	Marquam Hill Express	6:00 a.m.	4:45 p.m.	Peak only	No	No	Van Mall to Marquam. Hill via BPA P&R

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 of C-TRAN's fixed route system and facilities are included as part of the designated regional transportation system.

All of C-TRAN Clark County local routes use lift-equipped buses making them accessible to people with disabilities. C-TRAN also administers the C-VAN paratransit service. 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 of 1997. All of C-TRAN's buses are also equipped with bicycle racks that will hold two bicycles. C-TRAN runs a training program to prepare bicyclists for use on transit. Table 3-6 provides a summary of

paratransit service hours and use between 1994 and 2001. Paratransit service hours decreased in 2000 with the decrease in fixed-route system service hours following loss of Motor Vehicle Excise Tax (MVET) revenues.

Table 3-6: 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

C-TRAN's facilities include transit centers and park-and-ride lots described in Tables 3-7 and 3-8 below. C-TRAN park and ride facilities provide more than 1,600 parking spaces at eight locations. Some are operated by C-TRAN under a site-use lease agreement. C-TRAN uses security measures to make the transit system safer for its users. These security measures include provision of security patrols at the Seventh Street Transit Center in Downtown Vancouver, Fisher's Landing Transit Center and Vancouver Mall Transit Center. The City of Vancouver's Police Department bike patrol regularly patrols the 7th Street Transit Center. C-TRAN has contracted with the City of Vancouver to ensure that the bike patrol monitors the 7th Street Transit Center. C-TRAN buses are equipped with emergency alarms and two-way radios. Additionally, randomly placed surveillance cameras are located on various buses. Customer service facilities are located at the 7th Street, Fisher's Landing and Vancouver Mall Transit Centers, and public restrooms are located at 7th Street, and Fisher's Landing. Passenger shelter, bench, and waiting facilities are provided at most of the park and ride lots. Bicycle locker or rack facilities are provided at some of the lots (see Table 3-9).

Table 3-7: C-TRAN Transit Centers (August 2002)

C-TRAN TRANSIT CENTERS						
Transit Center	**Customer Service**	**Security**	**Public Restrooms**	**Bicycle Locker/ Rack**	**Operator Lounge**	**Admin Offices**
7th Street	Yes	Yes	Yes	Yes	Yes	Yes
Fisher's Landing	Yes	Yes	Yes	Yes	Yes	Yes
Vancouver Mall	Yes	Yes	No	Yes	Yes	Yes

Table 3-8: C-TRAN; Park and Ride Facilities (August 2002)

C-TRAN PARK AND RIDES				
Park and Ride	**Lot Capacity**	**Passenger Shelters**	**Public Restrooms**	**Bicycle Locker/Rack**
Salmon Creek	436	Yes	No	Yes
Evergreen	279	Yes	Yes	Yes
BPA Ross Complex	200+	Yes	No	No
Fisher's Landing	560	Yes	Yes	Yes
Vancouver Mall	60+	Yes	No	No
Battle Ground	28	Yes	No	Yes
Ridgefield	42	No	No	No
Camas/Washougal	20	No	No	No

Table 3-9 summarizes the bicycle facilities C-TRAN provides at transit centers and park and ride facilities as well as at the agency's administrative offices.

Table 3-9: C-TRAN; Bicycle Facilities (August 2002)

C-TRAN BICYCLE FACILITIES			
Location	**Bike Locker**	**Bike Bank**	**Bike Rack**
7th Street	5	9	N/A
Vancouver Mall	6	8	N/A
Salmon Creek	4	8	1
Evergreen	4	8	1
Camas/Washougal	2	N/A	N/A
Operating Facility	2	N/A	1
Annex	2	N/A	1
Fisher's Landing	4	N/A	2

Greyhound provides **INTER-CITY BUS** service in the I-5 corridor from its bus depot in Downtown Vancouver.

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 currently offering 11 deep draft vessel berths.

In 2001, over 475 ships carrying over 4.5 million metric tons of cargo used the Port. The Port handles a wide range of cargoes including general breakbulk, project and director 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. 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 of Vancouver also has 600 acres of developed industrial property with around forty tenants. It holds additional property in the Vancouver Lake Lowlands for future development of recreational facilities, business park, industrial sites and expansion of its marine terminal operations. A key focus for the Port of Vancouver in 2002 is the Columbia Gateway property. This 1,094 acre property would provide one of the largest resources of marine and industrial land available within the region. A Draft Environmental Impact Statement (DEIS) is circulating for comment. 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 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, located near the I-5/269th interchange and N.W. Timm Road. The Port's land adjacent to the Ridgefield Junction is zoned for light industrial use and is currently home to 8 businesses employing approximately 380 people. The Port also holds a 41-acre industrial site 3 miles from I-5. The Lake River Industrial Park currently has 7 tenants employing about 80.

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 a total of about 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 main **RAIL LINES** in use in the County which provide freight and passenger service. Burlington Northern Santa Fe (BNSF) owns both main lines. In addition, the Rye branch line provides freight movement for industrial operations along its route.

The BNSF Seattle/Vancouver line is in excellent condition and has 70 to 80 trains operating in the corridor each day. The 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. The Rye Branch is a short segment which diverges from the main northern line around NW 78th Street to Rye yard off St. John's Road. The track is in fair condition; freight trains use it about twice weekly.

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 2000, service had grown to three daily Amtrak Cascades roundtrips operating between Seattle and Portland, with two extending to Eugene. One daily roundtrip serves Seattle and Vancouver, BC and one daily roundtrip serves Seattle and Bellingham. Between 1993 and 2000, ridership has increased five times, with 2000 ridership levels for the Amtrak Cascades service at 525,000 trips. This is a 16% increase compared with 1999 ridership of 449,974 trips. The *Coast Starlight*, with service between Seattle and Los Angeles via Vancouver and Portland, also serves the corridor. The *Empire Builder* travels between Chicago and Spokane with one part of the train continuing on to Seattle and the other part continuing on, 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 in preparation for high speed rail service in the corridor. On February 8, 2002, the Washington State Department of Transportation (WSDOT) issued a Draft Environmental Impact Statement (DEIS) for the Vancouver Rail Project for public review and comment. This proposed project would add new rail bypass tracks and improve or close the west 39th Street at-grade crossing. The intent of the Vancouver Rail Project would be to increase safety, reduce rail congestion, and improve the on-time performance of Amtrak's passenger rail service.

The Lewis & Clark Railway line (LINC) has 30 miles of track from Rye Junction near Vancouver to Chelatchie Prairie. Freight cargo deliveries of plasterboard, plastics, chemicals and machinery can be made to local industries. Formerly known as the Chelatchie Prairie Railroad, a tourist passenger service used to run from Battle Ground to Moulton Falls Park but operations ceased in 1997 due to damage caused by heavy rains. Common carrier operations are conducted between Rye Junction and Battle Ground. Clark County purchased the railroad in 1986 and contracts with a private company for maintenance and operations.

Commuter Rail has been considered as an option for travel within the region. The Commuter Rail Study considered the 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, Continental, Delta, Frontier, Hawaiian, Horizon, Northwest Airlines, Skywest Airlines, Southwest Airlines, Sun Country Airlines, United, and United Express. In addition, air freight carriers that serve Portland include Airborne, Kitty Hawk Cargo, Ameriflight, Bax Global, Cargolux Airlines, DHL Worldwide Express, Emery Worldwide, Empire Airlines, Evergreen

Airlines, Federal Express, Korean Air, 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 1999 passenger numbers totaled 13.7 million. 1999 cargo was 274,971 tons. August 1999 passengers served by PDX exceeded 1.39 million, beating all previous monthly records. The airport is served by Tri-Met's MAX light rail which connects the airport to downtown Portland.

Within Clark County, the following general aviation airfields are in operation: **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 177 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 65. A commercial hangar is currently occupied by an aircraft fabricator. **Evergreen Airport** is located six miles east of Vancouver, off Mill Plain. The airfield is privately owned but is soon to cease operations. Estimates of aircraft operations at the three airfields are provided in Table 3-10.

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 3-10: 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 3-11 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 3-4 shows the average weekday traffic volumes crossing the Columbia river bridges, 1978 to 2001. In May 2002 the estimated average daily traffic (ADT) for the month on the I-5 Interstate Bridge was 125,800 (130,000 estimated average weekday traffic (AWDT)). On the I-205 Glenn Jackson Bridge, the average daily traffic for the month of May 2002 was 135,014 (ADT) and 140,739 average weekday traffic (AWDT). In May 2002, the maximum northbound weekday evening peak hour crossings on the I-5 Interstate Bridge were 5,722 and 7,996 on the I-205 Glenn Jackson Bridge. In the southbound direction, maximum weekday morning peak hour crossings were estimated at 5,700 on the I-5 Interstate Bridge and were 8,058 on the I-205 Glenn Jackson Bridge.

Table 3-11: Traffic Volumes; 1985 to Current Years

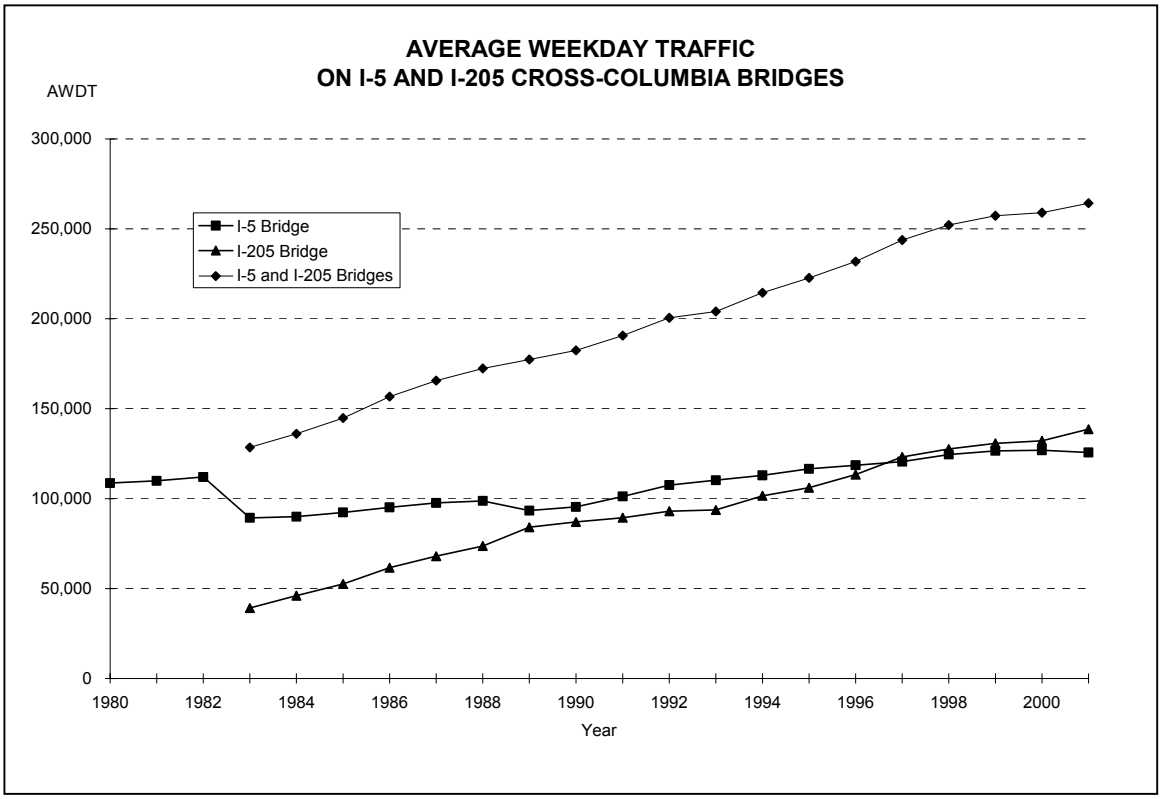
Location	1985 Volumes	Current Volumes	Year of Current Volumes	% Increase	Annual % Increase
I-5 Bridge	92,301	130,000	2002	41%	2.40%
I-5, South of SR-500	54,400	124,879	2001	130%	8.10%
I-5, South of NE 78th St	52,784	96,551	1999	83%	5.92%
I-5, South of Woodland	33,748	58,351	2001	73%	4.56%
I-205 Bridge	52,568	140,739	2002	168%	9.87%
I-205, South of SR-500	40,440	109,308	2001	170%	10.64%
78th St, West of Hwy 99	23,646	28,679	2000	21%	1.42%
164th Ave, South of SE 34th St	7,052	41,809	1999	493%	35.20%
Fourth Plain, West of NE Andresen	16,060	27,943	2000	74%	4.93%
Hwy 99, South of NE 99th St	19,653	19,178	1999	-2%	-0.17%
Mill Plain, East of NE Andresen	21,021	31,454	2001	50%	3.10%
Mill Plain, East of NE Chkalov	18,220	48,002	2000	163%	10.90%
SR-14, West of SE 164th Ave	22,600	70,680	1999	213%	15.20%
SR-14, West of NW 6th Ave	17,600	31,983	2000	82%	5.45%
SR-500, West of NE Andresen	20,054	47,886	1999	139%	9.91%
SR-500, West of 137th Ave	14,671	26,345	2002	80%	4.68%
SR-503, South of NE 76th St	17,460	39,042	2000	124%	8.24%
SR-503, South of SR-502	7,360	19,207	2002	161%	9.47%

The highest daily traffic ever recorded on the I-5 Interstate Bridge was on Friday June 18, 1999 when 149,847 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 May 10, 1995 when 6,069 bridge crossings were made.

The I-205 Glenn Jackson Bridge's highest daily crossings ever recorded was on Friday June 14, 2002 with 167,184 crossings. The highest evening peak hour traffic recorded on the I-205 Glenn Jackson Bridge was on Friday May 24, 1996 (Memorial Day weekend) when 12,800 bridge crossings were made. Of these bridge crossings, 8,426 were northbound and 4,374 were southbound. 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 Monday April 8, 2002 when 8,200 bridge crossings were made.

Figure 3-4: 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 3-12.

Table 3-12: Highest Volume Intersections in Clark County, 2001

CLARK COUNTY HIGHEST VOLUME INTERSECTIONS - 2001				
Rank	**East-West**	**North/South**	**Approx. Volume**	**Count Year**
1	State Route 500	Gher Rd/NE 112th Avenue	85,000	2001
2	State Route 500	Thurston Way	82,000	1999
3	Mill Plain Blvd.	Chkalov Drive	80,000	2000
4	State Route 500	State Route 503	66,000	2001
5	State Route 500	St. John's Road	64,000	2001
6	State Route 500	NE 54th Avenue	58,000	1999
7	State Route 500	NE 42nd Avenue	56,000	1999
8	Fourth Plain Blvd.	Andresen Road	55,000	2000
9	NE 76th Street	State Route 503	54,000	2000
10	Mill Plain Blvd.	NE 123rd/124th Avenue	52,000	1998
11	NE 78th Street	Highway 99	50,000	2001
12	Mill Plain Blvd.	136th Avenue	50,000	1999
13	SE 34th Street	SE 164th Avenue	47,000	1999
14	Mill Plain Blvd.	Andresen Road	47,000	2001
15	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

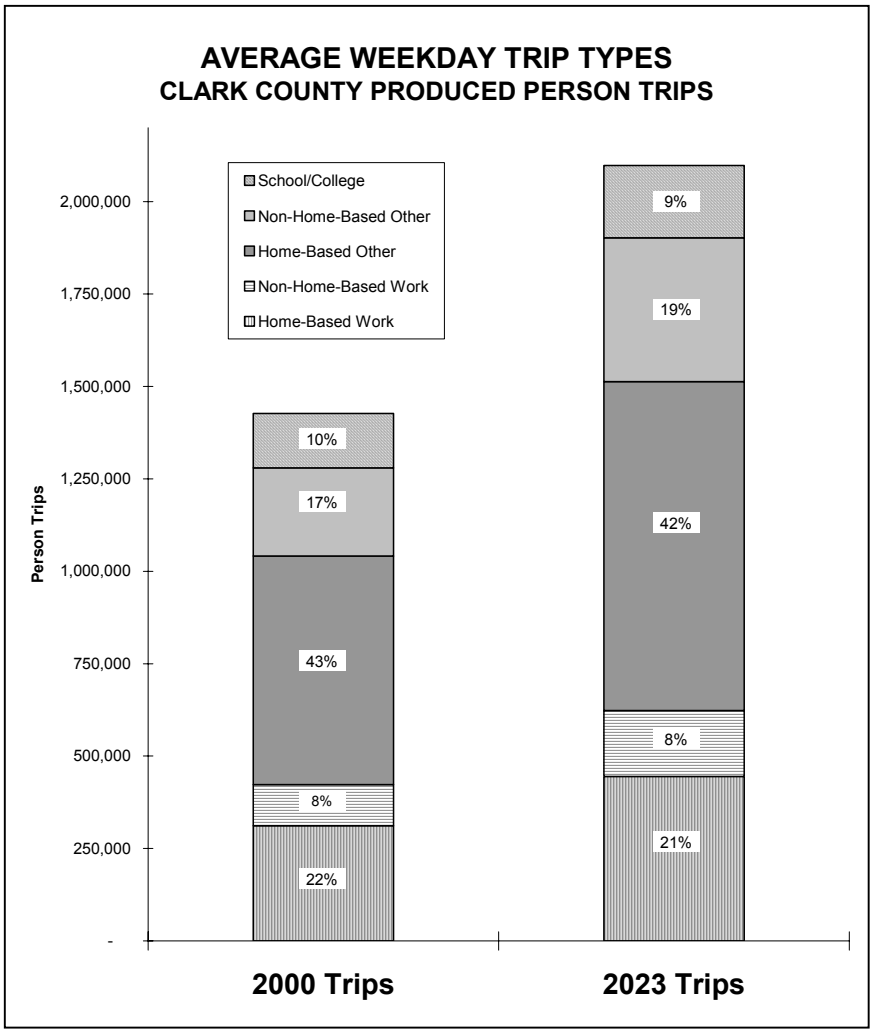
The Regional Travel Forecasting Model for the Clark County region was used to forecast future traffic volumes on the regional transportation system. EMME/2 software is used for the Clark County region's travel forecasting model. In the modeling process, a base year of 2000 was used and a forecast to the year 2023 was made. Growth allocations for future population, housing and employment (as described in Chapter 2) and existing local comprehensive land use plans and zoning were used as a basis for forecasting future population and employment distributions within Clark County. The regional model uses demographic data as a basis for travel forecasts and the data is run through trip generation, trip distribution, mode split and trip assignment processes. Alternative land use scenarios were tested, and their effect on regional transportation needs measured, as a part of the Growth Management planning process. This regional travel forecasting model for the MTP is based on GMA plans.

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 3-5 show the proportion of trips in each of these categories for average

weekday Clark County-produced person trips. In Figure 3-5 College and School trips have been aggregated.

Figure 3-5 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. The proportions for the year 2023 are 42% Home-Based-Other trips, 21% Home-Based-Work trips and 19% Non-Home Based Other. From 2000 to 2023 there is forecast to be a 47% increase in all-day person trips from around 1,427,000 trips per day in 2000 to over 2 million in 2023.

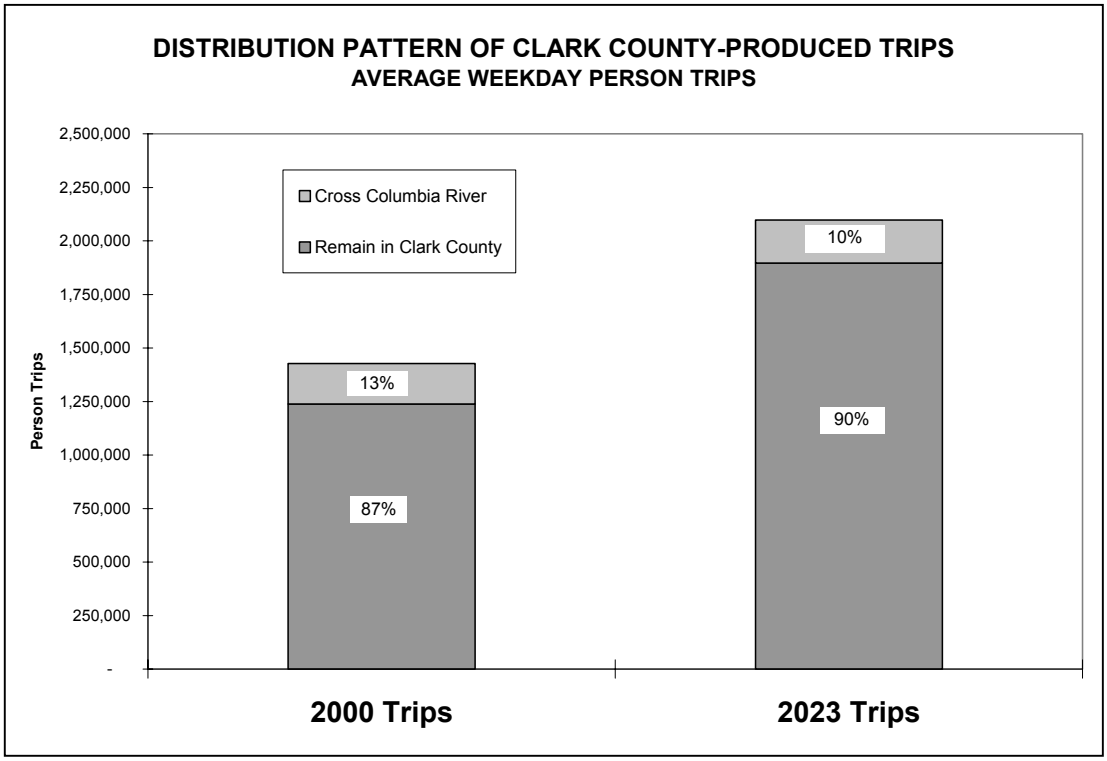
Figure 3-5: Average Weekday Trip Types, Clark County Produced Person Trips



Source: RTC Regional Travel Forecast Model

Trips can also be categorized according to where the trips begin and end. Figure 3-6 shows proportions of trips that use the Clark County highway system in terms of those trips that remain in Clark County (86.7% of trips in 2000 to 90.4% in 2023) and those trips that cross the Columbia River (13.3% in 2000 to 9.6% in 2023).

Figure 3-6: 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

No-Build Forecast 2023 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 2023) Forecast 2023 traffic volumes on 2023 highway network with *MTP* improvements listed in Appendix A.

MTP improvements are projects for which funds are already programmed and committed in the *2002-2004 Metropolitan Transportation Improvement Program* as well as 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 3-13, 3-14, 3-15 and 3-16 present system-wide benchmark results from testing the scenarios described above. Each table presents data by functional classification.

Table 3-13: 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**	**No-Build (2023 demand on Committed System)**	**2023 MTP**
Interstates (excluding Ramps)	48	38	42
Interstates (including Ramps)	45	36	40
Expressways & Principals	36	32	36
Minor Arterials	31	28	30
Major & Minor Collectors	34	32	33
Other Roads	27	28	28
Total Clark County System	37	33	35

Table 3-14: 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**	**No-Build (2023 demand on Committed System)**	**2023 MTP**
Interstates (excluding Ramps)	191,750	281,889	296,977
Interstates (including Ramps)	214,065	309,731	333,269
Expressways & Principals	195,661	285,544	268,391
Minor Arterials	85,773	141,390	136,151
Major & Minor Collectors	106,360	208,150	197,565
Other Roads	12,918	22,062	20,413
Total Clark County System	614,777	966,877	955,789

Source: Tables 3-13 through 3-16: RTC Regional Travel Forecast Model

Table 3-15: 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**	**No-Build (2023 demand on Committed System)**	**2023 MTP**
Interstates (excluding Ramps)	7.02	38.33	31.12
Interstates (including Ramps)	10.72	43.86	35.07
Expressways & Principals	21.12	86.35	34.18
Minor Arterials	9.45	38.46	20.05
Major & Minor Collectors	3.53	40.29	22.40
Other Roads	0.66	2.09	2.31
Total Clark County System	45.48	211.04	114.01

Table 3-15 (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 is of most use when used to assess the relative growth in congestion that is expected to occur in the future, given the forecast increase in travel demand.

Table 3-16: 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**	**No-Build (2023 demand on Committed System)**	**2023 MTP**
Interstates (excluding Ramps)	484.0	2,056.2	1,400.1
Interstates (including Ramps)	559.4	2,291.3	1,476.7
Expressways & Principals	289.3	1,222.9	440.2
Minor Arterials	109.7	454.3	208.5
Major & Minor Collectors	46.5	451.7	362.9
Other Roads	29.5	48.2	48.4
Total Clark County System	1,034.4	4,468.4	2,536.8

Table 3-16 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 and the result is Vehicle Hours of Delay. The data is of use in analyzing the relative increase in delay expected to occur, given the forecast growth in travel demand.

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[3] 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.

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

- 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 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.

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. 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' of 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.

As local agencies continue with the GMA comprehensive land use plan process, they will need to incorporate both the Highways of Statewide Significance and regional state highway facilities (or non-HSS) LOS standards in the transportation elements. Once Growth Management Plans are updated, RTC will need to certify these transportation elements are consistent with the Metropolitan Transportation Plan, include these LOS standards and describe impacts of land use 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 concurrently with development. Levels of Service (LOS) standards are to be regionally coordinated. LOS standards were coordinated within the region during the GMA planning process. Clark County's initial 1994 LOS standards are outlined in Table 3-17. These have now been updated and/or repealed by actions of the Board of Clark County Commissioners and City of Vancouver as described below.

Table 3-17: Clark County Level of Service Standards (Established in GMA Plan, 1994)

CLARK COUNTY LEVEL OF SERVICE (LOS) STANDARDS (1994)	
LOS B	Rural arterials not identified as LOS C or below
LOS C	Rural connectors that link urban areas to the inter-urban routes Arterials within La Center and Yacolt that are not rural connectors of inter-urban routes All Vancouver urban area roadways not defined as LOS D and were at LOS C or above under 1994 conditions High Occupancy Vehicle (HOV) lanes[1]
LOS D	Battle Ground, Camas, Ridgefield, and Washougal urban areas Vancouver Urban Area: • WSU and Vancouver Mall activity centers • Community subcenters • Arterials connecting community centers and subcenters • Arterials leading out of Vancouver Central Business District (CBD); and, • All other roadways maintain LOS D or maintain existing LOS, if at LOS D or below under 1994 conditions Rural interurban routes (predominantly state highways)
Mitigated LOS D	Major multimodal transportation corridors, LOS D consistent with WSDOT service objective H-23(b), and minimum LOS E[2] Community centers within Vancouver urban area, with existing LOS E, provided TSM or other congestion mitigation measures are in place
LOS E	Downtown Vancouver Activity Center Unsignalized arterial approaches that do not meet signal warrants or a signal is not desired per an approved access management plan for the specific corridor
Mitigated LOS E	Columbia River bridges at or below LOS E are allowed a LOS threshold of E with a 15 percent increase in V/C ratio over existing conditions (i.e. a volume/capacity ratio range of 1.05 to 1.15 vs 0.90 to 1.00).

Sources: 20 Year Comprehensive Growth Management Plan for Clark County; Clark County, (1994)
Growth Management Plan for Clark County, Transportation Element; Clark County, (1994)

1 For future High Occupancy Vehicle (HOV) lanes

2 "Mitigate congestion on urban highways in cooperation with local and regional jurisdictions when the peak period LOS falls below Level of Service D".
Source: Washington Transportation Commission, System Plan Service Objectives, H-23(b), approved January 26, 1993

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 3-18):

Table 3-18: City of Vancouver Concurrency Measurement Corridors

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

Burton Rd
- 18th St 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.

Fourth Plain Blvd.
- Port of Vancouver to I-5
- I-5 to Andresen Rd.
- Andresen Rd. to I-205
- I-205 to 117th Ave.
- 117th Ave. to 162nd Ave

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

St James' Blvd.
- Fourth Plain Blvd to 78th St

SR-14
- I-5 to I-205
- I-205 to 164th Ave

SR-500
- I-5 to Andresen Rd.
- Andresen Rd. to Fourth Plain Blvd.

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

NE 112th Ave
- Mill Pain Blvd to 28th St
- 28th St to SR-500

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

City Center Zone (Downtown)

Remaining Arterials

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

On October 10, 2000, the Board of Clark County Commissioners also adopted a new Transportation Concurrency Ordinance and related levels of service. The County's Level of Service standards rely on meeting minimum travel speeds in each of the transportation corridors designated by the County (see Table 3-19) and/or meeting thresholds for travel delay at signalized intersections within the designated corridors. 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 the unincorporated County shall achieve LOS E standards or better (if warrants are not met) and LOS D or better if warrants are met. For full details of the October 2000 Clark County Concurrency ordinance and travel speed standards refer to the Clark County website at http://www.co.clark.wa.us/site/concurr/index.htm.

Table 3-19: 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
NE 20th Avenue (North), 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, Andrsen 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. The matrix outlined in Table 3-20 can be used by local jurisdictions and C-TRAN to assess whether transit system expansion would be feasible in a given area.

Table 3-20: C-TRAN Level of Service Indicators (1994)

C-TRAN LOS INDICATORS (1994)									
	PLANNING INDICATORS							SUPPORTING FACTORS	
Service Classes	**Persons per Sq. Mile (Pop+Emp)**	**Peak/ Non-Peak Headways**	**Bus Stop Spacing**	**Accessibility**[4]	**Load Factor**	**Travel Time Ratio (transit/ auto)**	**Service Span (hours/day, days/week)**	**Expected Market Characteristics**	**Other Supporting Characteristics**
Commuter: Inter-state	20,000-25,000	15/NA	major P&R lots	within 5 miles of 80% of pop+emp	1.0	1.75	M-F Peak	Portland employees who live in Washington	Parking mgmt.; HOV priority treatments; P&R spaces
Commuter: Intra-state	20,000-25,000	15/NA	major P&R lots	within 3 miles of 80% of pop+emp	1.0	1.75	M-F Peak	CBD & urban grow[th] centers; employees living in Washington suburbs	Parking mgmt.; HOV priority treatments; large # of P&R spaces
Urban Corridor Service	18,000-20,000	15/30	1/8 mile	within 1/4 mile of 75% of rural pop+emp	1.5	2.0	7 days 12-16 hrs/day	Income, special generators, age, high density residential development	Land use zoning compatibility; parking mgmt.
Urban Residential Connector Service	12,000-18,000	30/60	1/4 mile	within 1/4 mile of 80% of pop+emp	1.5	2.0	5 days 12-16 hrs/day limited weekend. & evening service	Residential development connecting to major activity centers	Parking mgmt.; zoning; land use compatibility
Rural	Policy coverage	60/120	designated pick-up locations	within 5 miles of 75% of rural pop+emp	1.0	2.0-3.0	M-F 10-12 hrs/day ltd. weekend service	Community centers, city halls, post offices	Citizen requests for service
Subscription Bus	30	as needed	NA	NA	1.0	1.15	M-F Peak	Specialized employer needs	Commute trip reduction; parking mgmt.
Vanpool	8-15	as needed	NA	NA	1.0	1.15	M-F Peak	Specialized employer needs	Commute trip reduction; parking mgmt.
C-VAN (disabled)	Policy	as needed	NA	NA	1.0	NA	7 days, 12-16 hrs/day	Elderly & handicapped	NA

[4] Accessibility is defined as the percent of households and jobs within walking distance of a transit stop, transit center, or park and ride lot.

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 existing and future forecast capacity deficiencies determined by assigning forecast 2023 trips onto the existing highway system as described earlier in this chapter. The list contained in Appendix A notes projects which are incorporated into the 2023 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. The Intermodal Surface Transportation Efficiency Act (1991) and Transportation Equity Act for the 21st Century (TEA-21) emphasize the need to develop alternative modes and increase capacity of the existing highway system through more efficient use by means of ridesharing, system management and transit use. Capacity expansion is to be resorted to after other alternatives have been considered. 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.