Chapter 3: Strategies

Because each roadway corridor has its own characteristics, congestion management efforts must be tailored to meet the needs of a roadway. Transportation professionals must employ a variety of strategies to effectively manage congestion.

Transportation Planning Efforts

RTC is involved in a number of transportation planning efforts intended to address congestion. The following is a list of current transportation planning efforts:

The Metropolitan Transportation Plan[1] for Clark County (MTP) is the most prominent planning document. The plan is designed to be a guide for the effective investment of public funds for regional transportation needs over a twenty-year period. The region uses a wide range of data to develop a regional travel demand forecasting model. The model simulates both current travel demand and also forecasts travel demand twenty years into the future. Using the model, the region can identify where future congestion is most likely to occur.

The Transportation System Management and Operations Plan[2] (TSMO) was adopted in June 2011. TSMO focuses on low-cost, quickly implemented transportation improvements that aim to utilize existing transportation facilities more efficiently. TSMO combines advanced technologies, operational policies and procedures, and existing resources to improve coordination and operation of the multimodal transportation network. TSMO project examples include traffic signal integration, ramp metering, access management, traveler information, smart transit management, and coordinated incident response to make the transportation system work better.

The Columbia River Crossing[3] project is a bridge, transit, and highway improvement project for the purpose of addressing safety, congestion, and mobility problems on I-5 between Washington and Oregon. The CRC Final Environmental Impact Statement was completed and the Record of Decision issued in 2011.

C-TRAN is conducting a Federal Transit Administration Alternatives Analysis (AA) process in the Fourth Plain corridor. The AA process will identify the Locally Preferred Alternative for the Fourth Plain corridor. The purpose is to develop an

[1] *http://www.rtc.wa.gov/programs/mtp/*
[2] *http://www.rtc.wa.gov/reports/#TSMO*
[3] *http://columbiarivercrossing.org/*

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HCT project that will improve trip reliability, reduce travel time, encourage transit use, and create a catalyst for transit-oriented economic development. The Fourth Plain AA process should be completed in 2012.

The C-TRAN 20-year Transit Development Plan[4] was adopted in 2010. This planning process is designed to build upon existing service and develop future operating scenarios for public transit. The plan incorporates the recommendations of the High Capacity Transit System Plan.

The CTR program is intended to improve transportation system efficiency, conserve energy, and improve air quality by decreasing the number of commute trips made by people driving alone. RTC approved a Regional Commute Trip Reduction Plan and endorsed CTR plans for unincorporated Clark County, Vancouver, Camas, and Washougal. The downtown Vancouver Growth and Transportation Efficiency Center[5] (GTEC) was certified in 2007.

The Clark County Freight Mobility Study[6] (RTC, 2010) provides useful information and analysis designed to inform metropolitan transportation planning, local comprehensive planning, and project design. Study efforts included an evaluation of freight traffic movement, identification of freight system deficiencies, identified future infrastructure needs, and identified policy issues to support freight mobility in Clark County.

The Human Services Transportation Plan for Clark, Skamania, and Klickitat Counties[7] summarizes the transportation needs for people who, because of disability, low income, or age, face transportation challenges. It also identifies the transportation activities to respond to these challenges.

The 2011 Safety Management Assessment for Clark County[8] is intended to be an organized approach to transportation safety. Safety for all modes of travel is an important component of the metropolitan transportation planning process. The purpose of the plan is to consider ways to increase the safety of the transportation system.

Identify and Evaluate Transportation Strategies

The information and data contained in System Monitoring chapter is used to identify appropriate congestion management strategies for the region. The identification and selection of strategies for a particular segment or corridor should be tailed to the specific congestion issue. RTC will work collaboratively with member agencies to identify and advance appropriate strategies for managing congestion.

[4] *http://www.c-tran.com/20_Year_Plan_Update2.html*
[5] *http://www.cityofvancouver.us/ced/page/growth-and-transportation-efficiency-center-gtec*
[6] *http://www.rtc.wa.gov/studies/freight/*
[7] *http://www.rtc.wa.gov/programs/hstp/*
[8] *http://www.rtc.wa.gov/reports/#Safety*

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Strategies are detailed in the CMP Toolbox. The intent of the CMP Toolbox is to provide a reference for the development of alternative strategies for consideration in corridor development in relationship to the Metropolitan Transportation Plan.

Objectives of Strategies

Reducing congestion in the region will require accomplishing the following objectives:

- Preservation and maintenance of the existing system
- Improving system performance through operation and management strategies
- Where possible, shifting trips to other modes
- Addition of auto capacity at key bottlenecks

CMP Toolbox

One of the components of RTC's Congestion Management Process is a toolbox of potential congestion reduction and mobility strategies. The intent of this toolbox is to encourage ways to deal with congestion and mobility issues prior to traditional roadway widening projects. To address transportation issues, agencies and jurisdictions should give consideration to the various strategies identified in this section. Usually, multiple strategies are applicable within a corridor, while other strategies are intended to be applied region-wide.

System Preservation and Maintenance

Essential for continued transportation mobility is the preservation and maintenance of the existing roadway, bridge, ports, rail, transit, bicycle, pedestrian, and other systems.

Safety Improvements

It is vital that the region builds and maintains a transportation system that provides a safe and secure means of travel by all modes. Safety improvements are sight dependent.

Transit Improvements

Bus Route Coverage
Provides better transit accessibility to a greater share of the population.

Bus Frequencies and Transit Amenities
Makes transit more attractive to use.

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Park-and-Ride Lot

In conjunction with express bus service, can encourage the use of transit for longer distance commute trips.

High Capacity Transit

Provides a higher transit service to maximize transit usage in dense urban corridors.

Bicycle and Pedestrian Improvements

New Sidewalks and Bicycle Lanes, Separated Pathway, and Trails

Provides better pedestrian and bicycle accessibility to a greater share of the population. Also increases the perception of pedestrian and bicycle safety.

Bicycle Amenities

Bicycle racks, lockers, and other bicycle amenities at transit stations and other trip destinations increases security and provides incentives for using bicycles.

Pedestrian-Oriented Development

Building setback restrictions, streetscape, and other pedestrian oriented development can be codified in zoning ordinances to encourage pedestrian activity.

Bicycle and Pedestrian Safety

Maintaining lighting, signage, striping, traffic control, and other safety improvements can increase bicycle and pedestrian usage.

Transportation Demand Management

Transportation Demand Management: Options such as alternative work hours, telecommuting, ridesharing, and other options can remove, shift, or combine trips to reduce overall demand during peak periods.

Transportation System Management and Operations

Traffic Signal Coordination

This improves traffic flow and minimizes stops on arterial streets.

Incident Management System

Is an effective way to alleviate non-recurring congestion. Primarily applicable on freeways.

Ramp Metering

This allows freeway to maintain flow rates, resulting in improved operations and reducing congestion on freeways.

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Highway Information Systems

These systems provide travelers with real-time information that can be used to make trip and route decisions.

Advanced Traveler Information Systems

This provides data to travelers in advanced by computer or to other devices.

Access Management

Left Turn Restrictions

Turning vehicles can impede traffic flow and are more likely to be involved in collisions.

Consolidation or Relocation of Driveways

In some situations, increasing or improving access to property can improve traffic flow and reduce collisions.

Interchange Modification

Modification of interchanges can reduce weaving and improve traffic flow.

Minimum Intersection/Interchange Spacing

Appropriate spacing of intersection/interchanges can reduce number of conflict points, merge areas, resulting in fewer incidents and better traffic flow.

Collector-Distributor Roads

Collector-distributor roads are used to separate interchange traffic from through traffic at closely spaced interchanges, resulting in fewer incidents and better traffic flow.

Land Use

Mixed-Use Development

This can allow many trips to be made in an area by walking rather than use of a vehicle.

Infill and Densification

This takes advantage of existing infrastructure, rather than requiring new infrastructure to be built.

Transit Oriented Development

Allows improved pedestrian access from transit to housing and businesses.

Parking Enforcement

Enforcement of existing regulations can improve traffic flow in urban areas.

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Location Specific Parking Ordinances

Parking requirements can be adjusted for factors such as availability of transit, mix of land use, and pedestrian oriented development that reduces the need for on-site parking.

Carpool/Vanpool Parking

Preferential, reduced, or free parking for carpool/vanpool can provide an incentive and reduce parking demand.

Roadway Improvements

Geometric Design Improvements

Addition of turn lanes at intersections, roundabouts, improved sight distance, auxiliary lanes, and other geometric improvements can reduce congestion by removing bottlenecks.

Upgrade Roads to Urban Standards

Upgrading from rural roads to urban standards with improved geometry, bicycle lanes, sidewalks, and transit amenities can improve traffic flow for all modes.

Grade Separation

Upgrade high volume intersection to an interchange or grade separated facility can significantly reduce traffic delay and reduce congestion.

Managed Lane

Adding a managed lane such as transit-only, High Occupancy Lane (HOV), or other managed lane can provide an incentive to shift away from a single occupant vehicle.

Road Widening to Add Travel Lanes

Can increase capacity and remove congestion.

Strategy Implementation

RTC's Congestion Management Process provides a tool for monitoring the region's traffic congestion. The CMP provides information to help guide the investment of transportation funding toward improving congestion. Information developed through the Congestion Management Process will be applied through the RTC regional transportation planning process.

In coordination with WSDOT, C-TRAN, and local agencies, RTC utilizes the Congestion Management Process to identify needs. This effort is supported by regional studies, local capital facility plans, regional transportation model, and other planning efforts which all feed into the development of the Metropolitan Transportation Plan (MTP). Needs are developed based on a planning level analysis that considers how various strategies can address congestion prior to adding capacity. Identified congestion needs are then incorporated into Metropolitan

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Transportation Plan recommendations. Project sponsors then need to give consideration to the various strategies from the CMP Toolbox as projects move forward to implementation.

Local project priorities are then submitted to RTC and prioritized through the regional Metropolitan Transportation Improvement Program[9] (MTIP) which selects priority projects for implementation. For purpose of selecting projects to fund through the MTIP process, additional points are awarded to a project that:

- Located on the CMP Network
- Addresses Congestion
- Incorporates Alternative Modes
- Incorporates Transportation System Management Alternatives

The Metropolitan Transportation Improvement Program and Annual List of Obligation will allow the region to track the implementation of congestion management strategies.

Monitor Strategy Effectiveness

This report contains data that allows for the continuing development and updating of information to track the performance of the regional transportation system and implemented strategies.

In assessing the degree to which the CMP strategies address congestion issues, projects are tracked through the project implementation process and results are reported back to regional technical committees.

As part of the project implementation process, all regionally selected projects are required to complete a before and after analysis that identifies project goals and outcomes. This information is reported back to the Regional Transportation Advisory Committee. The region also tracks effectiveness through a 10 year corridor analysis.

2002-2012 Trends

Between 2002 and 2012 the region experienced a substantial increase in overall traffic volumes. The overall increase in traffic volumes relates to growth in the regional population. This growth along with improvements to the transportation system is reflected in the following 10 year analysis of vehicle volumes, capacity, and travel speed.

[9] *http://www.rtc.wa.gov/programs/tip/*

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Corridor Capacity

Through the ten-year period, both the AM and PM peak periods had increased congestion along congestion management corridors. However, congestion decreased along corridors where capacity has been added to the system. The change in corridor capacity (volume-to-capacity ratio) has been especially reflective of location with road, intersection, and interchange improvements. In the past few years, capacity has been improved with transportation improvements along many of the congestion management corridors. Some of the major improvements include:

I-5/Highway 99/Main Street Corridor

- I-5/Pioneer Street Interchange Improvements
- I-5/SR-502 Interchange
- I-5, 99th St. to 134th St. Widening
- I-5/78th Street Interchange Reconstruct
- I-5/Main Street Interchange Reconstruct
- I-5/63rd Street Overcrossing
- Highway 99/20th Avenue Realignment
- Highway 99 Klineline Bridge

I-205/112th Avenue Corridor

- NE 18th Street, 112th Avenue Intersection
- I-205 Off ramp to 112th Avenue

162nd/164 Avenue Corridor

- 164th Avenue, SE 1st to SR-14: Reconstruct five intersections
- 162nd Avenue, NE 39th St. to Ward Road (Widen to 5 lanes)
- 192nd Avenue (Relieves 162nd Avenue)

SR-500/Fourth Plain Corridor

- SR-500/Saint Johns Interchange
- SR-500/Thurston Interchange
- SR-500/112th Avenue Interchange
- SR-500/I-205 Extend Westbound Auxiliary Lane
- Fourth Plain, Ward Road to 162nd Avenue

Mill Plain Corridor

- Mill Plain/NE 136th Avenue Intersection

Saint Johns Corridor

- Saint Johns, NE 50th Avenue to 72nd Avenue

Andresen Road Corridor

- 72nd Avenue, north of 88th Street to Saint Johns

NE 136/137/138th Avenue Corridor

- NE 138th Avenue, 18th Street to 28th Street

Padden Parkway Corridor

- Padden Parkway

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Vehicle Volumes

Several corridors have shown a significant increase in peak hour vehicle volumes since 2002. Some are due to regional growth, while others can be attributed to improvements to the transportation system. For example, in years 2002-2003 the 192nd Avenue corridor was added as a new facility creating a significant shift in vehicles from the 162nd Avenue corridor. Corridors that experienced a volume increase of over 500 vehicles in the AM and PM peak hour, between 2002 and 2012 include:

- I-5, Main Street to I-205 (PM)
- I-205, SR-500 to 134th Street (AM)
- SR-14, 164th Avenue to Skamania Co. Line (AM and PM)
- Mill Plain, Fourth Plain to I-5 (PM)
- 192nd Avenue, SR-14 to SE 1st Street (AM and PM)

The only corridor to show a significant decrease in peak hour vehicle volumes is 162nd/164th Avenue corridor which experienced a decrease of over 500 vehicles in both the AM and PM peak hour as 192nd Avenue was added to the network and began to serve the same travel shed.

Due to peak hour congestion, the I-5, I-205, and Main Street corridors often experience decrease in volumes of greater than 500 vehicles. In the I-5 corridor, vehicles will often shift from I-5 to Main Street to avoid the AM southbound backup near the I-5 Interstate Bridge. In the I-205 corridor, vehicle throughput can decreased in the PM peak hour due to congestion at the interchanges on both sides of the Glenn Jackson Bridge.

Speed

In general, a trend between 2002 and 2012 congestion monitoring reports includes decreased speeds along congestion management corridors, with the exception of where the system has been improved. Corridors that had a significant (5 mph or more) decrease in peak period speed includes the following:

Corridor	Peak Period	2002 Speed	2012 Speed	Difference
I-5, State Line to Main St.	AM	54 mph	34 mph	-20 mph
Main Street, Mill Plain to I-5	AM	35 mph	21 mph	-14 mph
SR-14, I-205 to 164th Av.	PM	48 mph	37 mph	-11 mph
Fourth Plain, I-5 to Mill Plain	PM	31 mph	21 mph	-10 mph

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SR-503, Fourth Plain to 119th St.	AM	31 mph	22 mph	-9 mph
Fourth Plain, I-5 to Mill Plain	AM	34 mph	26 mph	-8 mph
112th Av., Mill Plain to SR-500	PM	23 mph	15 mph	-7 mph
I-205, State Line to SR-500	AM	62 mph	55 mph	-7 mph
Hwy. 99, Main St. to 134th St.	PM	27 mph	21 mph	-6 mph
Padden Pkwy, Andresen to Ward	AM	39 mph	34 mph	-5 mph

The following corridors had significant increase in speed associated with transportation improvements, between 2002 and 2012:

- SR-500, Andresen to SR-503
- 162nd Av, Mill Plain to Ward
- 164th Av, SR-14 to Mill Plain

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