

**Southwest Washington Regional
Transportation Council**

Clark County Freight Mobility Study

Summary Report

**Prepared For:
RTC**

December 2010

Clark County Freight Mobility Study

Summary Report

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MEMORANDUM

TO: Southwest Washington Regional Transportation Council Board of Directors
FROM: Dean Lookingbill, Transportation Director
DATE: November 30, 2010
SUBJECT: **Clark County Freight Mobility Study: Summary Report**

INTRODUCTION

At the December RTC Board meeting, RTC will look to conclude the Clark County Freight Mobility Study with action from the Board to endorse the Study as a first step in addressing freight transportation in this region. As the Board may recall from prior presentations and discussions in late 2009 and earlier in 2010, the Clark County Freight Mobility Study was initiated to provide an understanding of the key elements of freight movement and to explain why freight and goods movement is important to Clark County's economy and employment. The Study was viewed as a first effort to describe and define the regional freight transportation system with significance for supporting industrial lands and jobs in the County. During the course of the Study, much has been learned about freight movement within and through Clark County. Information and data was collected, inventoried and analyzed and a good foundation laid for continuing our consideration of freight transportation as part of the metropolitan transportation planning process required of RTC as part of the local comprehensive planning process and as part of planning efforts of local Port districts.

CLARK COUNTY FREIGHT MOBILITY STUDY: BACKGROUND

The Clark County Freight Mobility Study was initiated in May 2009. RTC was assisted throughout the study by a consultant team led by David Evans and Associates in partnership with BST Associates, Heffron Transportation, and Starboard Alliance. A team of agency stakeholders, comprised of staff from WSDOT, Clark County, the City of Vancouver, the Port of Vancouver, the Port of Camas-Washougal and the Port of Ridgefield, helped develop the Study. Input was also sought from the Regional Transportation Advisory Committee and from a Business Stakeholders Group. Regular updates were provided to the RTC Board during the Study's development.

CLARK COUNTY FREIGHT MOBILITY STUDY SUMMARY REPORT

Attached with this Memo is the Clark County Freight Mobility Study Summary Report. The Summary Report provides an overview of the work conducted for the Study. Work included preparation of a series of task reports to evaluate freight traffic movement, transportation system deficiencies related to freight and point the way to identify future infrastructure needs as well as policy issues to support freight mobility in Clark County.

The Clark County Freight Mobility Study task reports are listed below:

- Global Trade and Transportation Trends

- Current and Expected Economic Conditions and Economic Impact of Freight Delay
- Outreach to Shippers and Documentation of Representative Supply Chains: Interview Summary
- Existing and Future Truck Movements
- Existing and Future Rail Movements
- Vehicle Classification Counts – Best Practices
- Characteristics of Truck Movements
- Summary of Existing Design Guidelines Relating to Truck Mobility
- Basic Principles of Truck Mobility
- Future Actions Items and Priority Freight Projects

FUTURE ACTION ITEMS IDENTIFIED

As the Clark County Freight Mobility Study was developed, through discussions with the RTC Board and with the community at large, several concerns regarding freight transportation were raised. These issues included land use/transportation coordination and livability. In a nutshell, while recognizing the importance of freight transportation to the region, and particularly to regional employment, issues regarding the co-existence of industrial lands, commercial and residential lands reach beyond the scope of this Freight Mobility Study. These issues along with the Freight Corridors of Regional Significance will continue to be addressed as RTC embarks on the 2011 update to the Metropolitan Transportation Plan and as local jurisdictions update their local comprehensive plans. In addition, freight data will continue to be addressed as part of RTC's Transportation System Management and Operations and Congestion Management Processes as well as through local traffic management efforts.

ACTION REQUESTED

The Clark County Freight Mobility Study provides useful information and analysis designed to inform future metropolitan transportation planning, local comprehensive planning and project design. The RTC Board is asked to endorse the Study to mark the conclusion of this Study phase. Freight transportation planning will continue as part of the Metropolitan Transportation Plan update in 2011.

Attachment: Clark County Freight Mobility Study Summary Report

Executive Summary

The Regional Transportation Council (RTC) initiated the Clark County Freight Mobility Study (Study) to provide an understanding of the key elements of freight movement and to explain why freight and goods movement is important to Clark County's economy and employment.

The Study inventories existing freight and goods movement, identifies current deficiencies and future action items to be addressed as part of ongoing regional and local planning processes. The study begins to identify corridor investment needs in order to sustain jobs and economic development for existing and future industrial and employment centers consistent with the adopted Metropolitan Transportation Plan.

Elements of the Clark County Freight Mobility Study report will be incorporated into the next major update to the Metropolitan Transportation Plan (MTP) in 2011 and can be used by local jurisdictions in updates to local comprehensive plans.

The study was conducted through a collaborative partnership of stakeholders that included local governments, ports, state transportation departments, economic development agencies, RTC, and system users.

For the project, the RTC and the consultant team prepared the technical memoranda with the following findings:

Freight issues and trends:

- Global Trade and Transportation Trends—Four basic principles underlie all supply chains: the desire of shippers to reduce costs, improve supply chain efficiency, improve time-to-market, and deliver better service to customers. The key issues for truckers are congestion, travel-time reliability, and a need for additional capacity. Key issues for rail are congestion, port access, and mainline capacity limitations. All three ports in Clark County are expanding their portfolios of commercial/industrial lands.
- Current and expected economic conditions and economic impact of freight delay— Most of the freight-related jobs in Clark County are located within five miles of the Columbia River, nearly 30 percent in the urbanized area of Clark County in the vicinity of I-5, I-205, and the Columbia River. The five most freight-intensive industry sectors, which account for half of the freight moving in the Portland-Vancouver area and more than half of the freight moved by truck are petroleum products, minerals, food and beverages, wood products, and grain. The freight generating sectors located in Clark County have a direct impact of 66,057 employees with an income of \$3.2 billion.
- Outreach to shippers and documentation of representative supply chains— Surveys of 25 importers and exporters (shippers), motor carriers, ports, barge operators and railroads revealed that interstate bridges are critical; they are used by 90 percent of shippers and 100 percent of motor carrier, the strengths of the regional freight system are good rail, marine and road access, congestion on interstate bridges and at the Vancouver Wye and Vancouver Yard needs to be alleviated, and decision makers should take a regional, system-wide view of the County's multimodal transportation system.

Existing freight system:

- Existing and future truck movements— The Study collected existing truck volumes and employment data for Clark County and then developed growth rates for medium and heavy trucks that can be applied to industrial development projects in Clark County to provide us with a tool for analyzing potential growth in truck volumes.
- Vehicle classification counts—best practices— Recommends developing a statistically reliable method of estimating vehicle classification percentages on roadways to obtain accurate volumes, preferably using 48-hours vehicle counts, and control locations where counts are taken at different times of the year to determine a seasonal adjustment factor.
- Characteristics of truck movements— The major findings from existing truck data are that an estimated 55 percent of Clark County’s freight is moved by truck--this exceeds the tonnage of freight moved by all other modes combined. Truck volumes throughout Clark County have declined in recent years, peak hour truck volumes typically occur midday (2 to 12 percent trucks), and 67 percent of the 7,000 medium and heavy daily truck trips that use I-5’s on- and off- ramps between SR 14 and SR 500 are to and from the south (2,400 more trips than to and from the north).

Future freight system:

- Existing design guidelines relating to truck mobility— The design guidelines of jurisdictions in Clark County are flexible and provide for the basic needs of truck mobility; however, the design guidelines do not necessarily address the design of facilities for multiple modes of transportation.
- Basic principles of truck mobility— Improving truck mobility through design considerations such as acceleration and stopping distances, gaps in traffic, and turning radii can enhance site design for industrial land and other truck-trip generating facilities, ensure that nearby uses are compatible, and ensure access to the Clark County transportation system.

Based on the findings and recommendations from the analysis of existing and future freight movement, current economic conditions, freight and transportation policies, and discussions with agency and business-freight stakeholder groups and the stakeholder input, the Study team developed strategies to improve freight mobility. These strategies and issues are noted as future action items and will continue to be addressed as RTC embarks on the 2011 update to the Metropolitan Transportation Plan, and as local jurisdictions update their local comprehensive plans. In addition, the freight data needs will continue to be addressed as part of RTC’s Transportation System Management and Operations and Congestion Management Processes as well as through local traffic management efforts.

**Summary of Clark County Freight Mobility Study Strategies
and Future Action Items**

Process	Strategies to Support Freight Transportation
Regional Freight System and Economic Development	Invest in freight mobility to support industrial development goals and job creation
Identify Needs and Projects	Support road improvements that benefit freight mobility Support rail improvements
Design	Develop model design guidelines for complete streets and freight Plan and design for local truck access to Clark County business sectors
Land Use and Transportation Integration	Land use and transportation coordination: protect viability of industrial lands and livability of residents Manage access to industrial areas
Funding	Position projects for funding

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Southwest Washington Regional Transportation Council (RTC)

Clark County Freight Mobility Study

Summary Report, December 2010

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1 Introduction

1.1 Study Purpose, Goals, and Background

The Regional Transportation Council (RTC) initiated the Clark County Freight Mobility Study (Study) to provide an understanding of the key elements of freight movement and to explain why freight and goods movement is important to Clark County's economy and employment.

Clark County's local, regional, and state economy is highly dependent upon the efficient transport of goods to and from markets. Without investments to maintain and improve freight mobility in key highway and rail corridors and at intermodal freight connections (rail-road-water-air) the region's economy and its jobs' sustainability is at risk. The Study identifies the multi-modal freight and goods mobility system and its current and future deficiencies. The study identifies corridor investment needs in order to sustain jobs and economic development for existing and future industrial and employment centers. Specific study goals are to:

- Understand freight and goods distribution, freight origins and destinations, relating to both volume and commodity type. An effective freight system must take into account the various demand elements of freight and goods movement (e.g. pickup and delivery, intermodal connections, and regional consolidation).
- Understand various supply chains in our region.
- Identify where freight distribution bottlenecks occur (on the highway, on the rail network, or at intermodal connecting points).
- Plan ahead for growth in freight and goods movement. Identify where freight-dependent development is targeted to occur and identify transportation infrastructure investments and improvements.

RTC conducted a summary freight study in 1993. Since then, Washington Department of Transportation's (WSDOT) Freight Systems Division has reported on the three components of Washington State's freight system as part of the 2007-2026 Washington Transportation Plan (November 2006):

- Global Gateways - International and national trade which flows through the region via ports and intermodal transportation systems.
- Made in Washington & Oregon - Regional businesses that manufacture goods within a region then use the local freight and surface transportation system to deliver outside the region.
- Delivering Goods To You - The retail and wholesale distribution system which delivers goods locally.

Regional interest in freight and goods movement is ongoing. Within the Portland-Vancouver region, the Portland/Vancouver International and Domestic Trade Capacity Analysis Study (2006) forecast a doubling of trade volume in the region by 2035. Metro (Portland, Oregon) has completed its "Regional Freight Plan, 2035" in June 2010 as part of Metro's 2035 Regional Transportation Plan.

This freight study is supported with federal transportation funding as well as local support from RTC, Clark County, City of Vancouver, the Ports of Vancouver, Camas/Washougal, and Ridgefield. The Clark County Freight Mobility Study was initiated in April 2009 with completion in fall 2010. Study outcomes include a regional consensus on freight and goods mobility policies and investment strategies. The Clark County Freight Mobility Study report is to be incorporated into the next major update to the Metropolitan Transportation Plan (MTP) allowing freight projects to be programmed for funding in the Metropolitan Transportation Improvement Program (MTIP), and can be used by local jurisdictions in updates to local comprehensive plans.

1.2 Participants and Outreach/Business and Stakeholder Collaboration

The study was conducted through a collaborative partnership of stakeholders that included local governments, ports, state transportation departments, economic development agencies, RTC, and system users. The study was guided by a Sponsor Agency Stakeholders Group. A Business Stakeholders Group met during the course of the Study preparation to review reports, to ensure the reports correctly communicate the Clark county freight transportation ‘story’ from the freight business perspective, and to provide anecdotal evidence to further support the Study. Membership of the Business Stakeholders Group was drawn from existing participants in the West Vancouver Freight Alliance, participants in the business survey conducted for the study, and participants recommended by business groups and elected officials. Stakeholder roles in and uses of the Study are:

The RTC will use the study to better integrate freight and goods movement into the regional transportation planning process. Freight policies, strategies, and projects specific to the Clark County region will be incorporated into a future update to the MTP.

Local agencies and ports will be able to highlight the importance of freight movement to current business retention and future jobs growth. They will also be better equipped to make the case for funding for freight transportation projects. Freight study information, projects, strategies, and safety improvements can be incorporated into future Comprehensive Plan updates.

Washington Department of Transportation Freight Division’s collaboration with local partners ensures the region meets the changing requirements for assessing and funding improvements to the statewide freight system.

Freight movers, distributors, shippers, and system users provided input about freight transportation issues, trends, and challenges that can help to assure reliability and sustainability of the region’s freight transportation system.

Preliminary recommendations of the Study were reviewed by the RTC Board in April 2010, the Regional Transportation Advisory Committee in April and May 2010, the freight business community at a meeting of the Vancouver Freight Alliance, port staff at the Three Ports meeting held at the Port of Camas-Washougal on May 10, the Shumway neighborhood meeting on May 6, and the Carter Park neighborhood meeting on May 27, 2010. However, after discussion it is

apparent that some of the issues that emerged will require further discussion and resolve as part of continuing and ongoing transportation planning processes.

1.3 Memoranda Prepared for the Study

For the project, the RTC and consultant team prepared the following memoranda:

Freight issues and trends:

- Global Trade and Transportation Trends
- Current and expected economic conditions and economic impact of freight delay
- Outreach to shippers and documentation of representative supply chains

Existing freight system:

- Existing and future truck movements
- Vehicle classification counts—best practices
- Characteristics of truck movements

Future freight system:

- Summary of existing design guidelines relating to truck mobility
- Basic principles of truck mobility
- Recommended regional actions and Metropolitan Transportation Plan priority freight projects

The memoranda were used to evaluate Clark County's freight transportation system for its current strengths and deficiencies and future system needs, and infrastructure and policy needs to support freight mobility in Clark County. The following sections summarize the purpose, findings, and recommendations of each memorandum.

2 Freight Issues and Trends

2.1 Global Trade and Transportation Trends

Purpose. The Global Trade and Transportation Trends memorandum identifies global trade and transportation trends relevant to Clark County and how they might impact the manner and frequency with which shippers and logistics service providers will utilize the global multimodal transportation system and, specifically, Southwest Washington's multimodal transportation system in the future.

Findings. Usage of various Clark County transportation modes, transportation networks and corridors is influenced by shipper supply chain strategies, which are fluid and have been growing in complexity. Shippers adjust their supply chain strategies as market conditions and global and domestic operating environments change. Four basic principles underlie all supply chains: the desire of shippers to reduce costs, improve supply chain efficiency, improve time-to-market, and deliver better service to customers.

The key issues for truckers are congestion, travel-time reliability, and a need for additional capacity. Key issues for rail are congestion, port access, and mainline capacity limitations. All

three ports in Clark County are expanding their portfolios of commercial/industrial lands. Private developers are also positioning their properties for the economic upturn. Improvements in truck and rail access are required to make these efforts successful, particularly improved freeway access. Barge operators need improvements in the navigation channel and will also benefit from road and highway improvements.

Recommendations. The following lists trade and transportation trends by shipper/logistics service provider type with recommended action strategies.

Trade and Transportation Trends	Action Strategies
Ports and Ocean Carriers	
Exports: Since the Columbia River ports' proportion of cargo in containers is small, the main opportunity will continue to be exporting of dry bulk and break-bulk. China and other countries' demands for resources will increase once the recession eases.	Continue support for port modernization programs to ensure transportation system can accommodate increase exports of dry bulk and break-bulk to China and other countries. The land-side transportation system also must be able to accommodate increased growth in freight.
Short sea shipping: this is the shipping of cargo on inland and coastal waterways instead of via trucks or rail, e.g. use of Columbia River system to barge containers and solid waste and Pacific coast transportation of petroleum from California to the Pacific Northwest.	Ports should continue to pursue opportunities, for example by building small container terminals to handle short sea vessels. Support for navigation channel maintenance and improvement and upstream locks maintenance.
Motor carriers: The economic recession of 2008 and 2009 has had an impact, especially on less than truckload, with less volume and some excess capacity.	Invest in an improved transportation system prior to renewed growth in truck cargo.
Rail: Class I railroads (e.g. BNSF) provide volume discounts for hook and haul unit trains. Vancouver contains the BNSF north-south corridor, connectivity to the Columbia River east-west corridor, a BNSF rail yard, and the Port of Vancouver through which approximately 100 trains operate per day. The area is congested because north-south and east-west traffic cross at-grade and local traffic moves at slow speeds.	The Vancouver Bypass and Port of Vancouver Freight Access Project will help to ease congestion. Improvements to the shortline railroad operation (Chelatchie Prairie railroad) in Clark County also will benefit shippers.
Shipper Strategies	
Modal shifts: 2008 fuel price increases precipitated a shift from truck to rail for international container shipments. Fluctuating fuel prices will see shippers try to take advantage of the least-cost/best value model, as supply chains are dynamic and ever-changing.	Ensure both truck and rail capacity to accommodate either as shifts occur.
Port diversification: Cargo shippers are diversifying ports used to reduce risk of business disruptions, delay and to reduce costs.	Make roadway and rail improvements to take advantage of diversification.

Trade and Transportation Trends	Action Strategies
Decentralization of distribution centers: Shifting of distribution points to be closer to consumer, i.e. from national to regional distribution centers.	Address company distribution center location selection criteria by improving transportation system, developing key freight routes, ensuring proper zoning.
Growth in internet sales	Ensure capacity to accommodate more integrator (e.g. FedEx, UPS) trucks
Near-sourcing: Production returns from China to locations within the U.S., or, more likely, to Mexico and the Caribbean.	Unlikely to affect Clark County.

2.2 Current and Expected Economic Conditions and Economic Impact of Freight Delay

Purpose. The economic background memorandum presents a summary of current and expected economic conditions in Clark County. It draws from numerous reports and data sources to document trends in population, employment, wages, and personal income, and includes summary forecasts of future economic activity in Clark County. The report focuses on the freight generating sectors of Clark County's economy, such as agriculture, mining, forestry/logging, construction, manufacturing, wholesale and retail trade, and transportation/utilities as the biggest users of the freight system. These sectors use the freight and goods system to receive inputs, to ship outputs, and to move interim products.

Findings. Most of the freight-related jobs in Clark County are located within five miles of the Columbia River. The area near the river has traditionally been home to the county's manufacturing and transportation industries. The largest concentration of freight-related jobs (nearly 30 percent of the total) is located in the urbanized area of Clark County in the vicinity of I-5, I-205, and the Columbia River. There are also pockets north and south of this area that are major centers of freight-related employment.

The five most freight-intensive industry sectors, which account for half of the freight moving in the Portland-Vancouver area and more than half of the freight moved by truck are:

- petroleum products,
- minerals,
- food and beverages,
- wood products, and
- grain.

Other key commodities include logs, aggregates, and mixed freight.

Table 1. Clark County 2007 Freight Tonnage and Value by Mode

Transport Mode	Tons (1,000)	% by Ton	Value (\$1,000s)	% by Value	\$/Ton
Ocean	5,943	18.3%	\$4,660,220	17.6%	\$784
Barge	2,269	7.0%	\$675,383	2.6%	\$298
Rail	5,625	17.3%	\$4,568,740	17.3%	\$812
Truck	17,920	55.2%	\$15,818,286	59.9%	\$883
Air	42	0.1%	\$433,668	1.6%	\$10,249
Pipeline	647	2.0%	\$252,517	1.0%	\$390
Total	32,446	100.0%	\$26,408,813	100.0%	\$814

Source: BST Associates, November 2009

In terms of jobs and economic impact of freight:

- The freight generating sectors located in Clark County have a direct impact of 66,057 employees with an income of \$3.2 billion.
- The total impact (direct, indirect, and induced effects) in Clark County is 130,072 employees with a total income of \$6.1 billion.
- The total impact (direct, indirect, and induced effects) in Washington State is 138,370 employees with a total income of \$6.3 billion.
- Each job in the freight generating sector in Clark County creates 0.97 additional jobs in Clark County and 1.09 additional jobs in Washington State.
- Each dollar in wages and salaries in the freight generating sector in Clark County creates \$0.91 in additional income in Clark County and \$0.99 in additional income in Washington State.
- The indirect impact of freight-generating industries is greater than that of non-freight generating industries, because freight-generators purchase more inputs than non-freight generating industries. On average, freight generating industries in Clark County spend more than 57 percent of their total output on purchases from other firms. In comparison, non freight-generating industries spend less than 37 percent on inputs. Freight-generating industries account for nearly half of all output in Clark County (i.e. 48 percent), but account for 59 percent of industry purchases.

2.3 Outreach to Shippers and Documentation of Representative Supply Chains

Purpose. The Outreach to Shippers and Documentation of Representative Supply Chains memorandum documents the results of surveys of importers and exporters (shippers), motor carriers, ports, barge operators and railroads. The surveys were designed to reach out to document representative supply chains significant to Clark County. The survey included queries regarding the volume of freight flows in, out, and through Clark County by transportation mode; location of manufacturing, processing, distribution centers, and cargo handling facilities; shipping and distribution strategies; the strengths and weaknesses of Clark County's multimodal transportation system; types of service issues stakeholders have with the system and how these

issues impact their operations; and recommendations for how the multimodal transportation system might be improved. Anecdotal information provided by stakeholders about their issues and potential recommendations for multimodal transportation system improvements are included for future use in relating why freight mobility is important to Southwest Washington's economy.

Interviewees represent companies that represent the top Washington state commodity and employment sectors, companies of varying sizes and business models, and key regional logistics service providers. They consisted of ten shippers, eight motor carriers, and seven ports, barge operators, and railroads for a total of 25 stakeholders.

Findings. Findings of the surveys are:

- The type of products surveyed companies move through Clark County range from raw materials and agricultural products to fast-moving consumer goods.
- Most shippers use suppliers in Washington and Oregon and primarily sell to West Coast customers.
- Shippers use multiple transportation modes in supply chains.
- Most surveyed companies have at least one distribution center in Washington or Oregon.
- Five of the stakeholders indicated concern about rising fuel costs.
- About half of the shippers intend to make changes in their supply chain to cut costs, including cutting costs, increasing the portion of cargo that bypasses distribution centers, importing less by increasing manufacturing operations, and consolidating into full truckloads.
- The most heavily-traveled county routes by shippers and motor carriers are I-5, I-205, Mill Plain, Fourth Plain, SR-14, and I-84.
- Interstate bridges are critical; they are used by 90 percent of shippers and 100 percent of motor carriers. Motor carriers try to avoid the peak traffic times.
- The strengths of the regional freight system that the stakeholders identified are the Port of Vancouver, and good rail, marine and road access.

Recommendations.

- Improve the weaknesses of the regional freight system identified by the stakeholders: Congestion on interstate bridges, river navigational challenges, and rail congestion at Vancouver Wye and Vancouver Yard.
- The stakeholders urge decision makers to take a regional, system-wide view of the County's multimodal transportation system.

3 Existing Freight System

3.1 Existing and Future Truck Movements

Purpose. The Existing and Future Truck Movements memorandum developed truck trip growth rates that could be applied to industrial development projects in Clark County.

Findings. Standard software used in operational analysis typically includes a default value of two percent for trucks. For arterials and highways serving industrial areas, the proportion of trucks may be much higher. The proportion of medium and heavy trucks can affect intersection capacity analysis and roadway capacity analysis, particularly roadways with uphill or grades. Therefore industrial development projects should adjust the proportion of trucks in the forecast traffic volumes to reflect the expected growth in truck traffic.

The memorandum takes actual truck volumes and employment data for Clark County and determines a correlation between truck trips and industrial employment. This data and correlation is then used as the basis for a methodology to determine growth factors to help forecast future truck volumes in various areas of Clark County. The methodology is based on the relationship between land-side freight movement and the industries that generate freight movement. The methodology uses employment data and the employment forecast consistent with Clark County's Comprehensive Growth Management Plan (September 2007) as well as RTC's 650 Transportation Analysis Zone (TAZ) system aggregated to form 37 Truck Traffic Analysis Zones (TTAZs).

Recommendations. The analysis recommends the growth rates for medium and heavy trucks in Table 2 be applied to industrial development projects in Clark County.

Table 2. Truck Trip Growth Rate by Travel Shed

Truck Travel Sheds and Description	Medium and Heavy Truck Trip Growth Rate
Downtown Vancouver, west of I-5	5.2%
East of I-5 between I-5, I-205 and the Columbia River	0.9%
East of I-205, west of Camas	2.2%
Camas/Washougal	4.1%
North of Camas/Washougal	1.1%
North and east of I-205 and I-5, west of Battle Ground	4.3%
Ridgefield	7.9%
La Center and rural area east of I-5	2.6%
Battle Ground	0.8%
North of Battle Ground	1.4%
OVERALL	3.2%

3.2 Vehicle Classification Counts – Best Practices

Purpose. Obtaining accurate truck counts is critical for making good decisions about transportation system priorities, needs, and impacts for the movement of freight. Knowing the number and mix of trucks on a given roadway improves the understanding of truck movements in the freight system, how trucks affect traffic operations, and what design standards should be applied.

Findings. Table 3 lists different methods that can be used to gather truck data, each with various levels of accuracy depending on the circumstance in which they are used.

Table 3. Types of Counting Methods

Type	Advantages	Disadvantages
Machine (Tube) Classification Counts-- using pneumatic tubes laid across each lane of a street and a counting machine that detects the number of axles that cross the tubes	Most common and least expensive method for classifying vehicles. Best method to classify into FHWA 13 vehicle types. Captures 24-hour data. Good accuracy on single-lane arterials and highways where speeds are greater than 10 mph.	Accuracy declines on multi-lane arterials and highway unless lanes can be isolated. Accuracy declines when speeds drop below 10 mph. Cannot distinguish between different types of trucks with the same axle configuration. Some long wheel-base passenger vehicles may be classified as trucks.
Induction Loop Classification Counts-- have imbedded induction loops into the pavement	Can be used to determine fluctuations in hourly, daily, and seasonal truck volumes. High level of accuracy when speeds are above 10 mph. Good method to classify into the FHWA 13 vehicle types.	Expensive up front capital cost to install loops. Accuracy declines when speeds are below 10 mph. Cannot distinguish between different types of trucks with the same axle configuration. Some long wheel-base passenger vehicles may be classified as trucks.
Camera Classification Counts-- record long periods of vehicle data that are then manually viewed to determine the number of vehicles by type	Most accurate, even at low speeds. Can distinguish between different types of trucks that have the same axle configuration (for example a container truck versus a standard box truck). Can capture vehicle classifications for intersection turning movements.	Moderately expensive. Usually limited to daylight hours. Difficult to classify axle configurations per the FHWA classification system.

Type	Advantages	Disadvantages
Manual Classification Counts	High level of accuracy when classifying for three to five types of trucks. Not affected by congested conditions (although more personnel may be needed). Can distinguish between different types of trucks that have the same axle configuration (for example a container truck versus a standard box truck). Can capture vehicle classifications for intersection turning movements.	Moderately expensive. Usually limited to short periods of time during daylight hours. Difficult to observe axles and classify into the FHWA system.
Radar Counts-- that detects vehicle length	Relatively easy to perform. Can classify trucks by length. Can detect by lane on multiple lane facilities.	Cannot classify by axle. Cannot distinguish between different types of trucks with the same length. Accuracy is unknown.

Recommendations:

- Estimating truck volumes and classifications based on an applied percent to total traffic volume can result in an inaccurate view of actual volumes. A statistically reliable method of estimating vehicle classification percentages on roadways may sometimes need to be developed.
- Jurisdictions should use FHWA's guidelines for prioritizing locations to collect full counts and developing accurate estimation methodology.
- Short duration counts must cover at least a 24-hour period, but 48-hour counts are preferred because the highest volume time periods for general-purpose traffic will not be the same for trucks.
- Control locations where counts are taken at different times of the year can be used to determine a seasonal adjustment factor (agricultural commodities).

3.3 Characteristics of Truck Movements

Purpose. The Characteristics of Truck Movements memorandum documents existing truck movements throughout Clark County, defines the relationship between truck movements and land uses, and presents the relationship between the global supply chain and Clark County's freight system. The memorandum includes description of truck classifications according to size, sources of truck traffic volumes, and presentation of truck volumes by year, month, weekday, and time of day, including peak hours, for major highways in Clark County.

Findings. The existing truck data revealed several trends that can be used to describe Clark County's existing freight system. These are:

- An estimated 55 percent of Clark County's freight is moved by truck. This exceeds the tonnage of freight moved by all other modes combined.

- There is a strong correlation between industrial employment sectors and truck trip generation. Most of the freight-related jobs in Clark County are located within five miles of the Columbia River. The largest concentration of freight-related jobs (nearly 30 percent of the total) is located in the urbanized area of Clark County between I-5, I-205, and the Columbia River. There are also pockets north and east that are major centers of freight-related employment.
- Truck volumes throughout Clark County have declined in recent years. On I-5 in downtown Vancouver, the medium and heavy truck volumes fell by 6 percent from 2007 to 2008 and then by 15 percent from 2008 to 2009 (January through April data).
- On SR 14 in Camas, the decline in truck volumes first occurred from 2006 to 2007, decreasing by 10 percent. Truck volume fell another 11 percent from 2007 to 2008, and fell another 32 percent from 2008 to 2009 (January through April data).
- Truck volumes are relatively constant from February through October. Volumes are lowest from November through January. For this reason, future truck counts in winter months should be avoided.
- Truck volumes are highest on Tuesday, Wednesday, and Thursday. Lower volumes occur on Monday and Friday and over the weekend.
- The peak hour truck volumes typically occur midday (12:00 to 1:00 P.M.) Lower volumes occur during the commuter peak periods (from 7:00 to 9:00 A.M. and from 4:00 to 6:00 P.M.) because travel times are slower at those times. On I-5 across the Columbia River Bridge, 42 percent of the daily truck trips occurred between 9:00 A.M. and 3:00 P.M.
- The percentage of trucks varies depending on the location, the prevailing land uses in the area and the type of roadway (highway or arterial). The percentage of trucks in the traffic stream is often higher than expected. At ten locations on state highways and arterials in Clark County, the percentages of trucks are:
 - AM peak hour of all traffic is 3 percent to 5 percent trucks
 - Midday peak hour of truck traffic is 2 percent to 12 percent trucks, and
 - PM peak hour of all traffic is 2 percent to 15 percent trucks.
- There are about 7,000 medium and heavy daily truck trips that use all of I-5's on and off all the ramps between SR 14 and SR 500. Of these trips, 67 percent are to and from the south which is about 2,400 more trips to and from the south, than to and from the north.

Recommendations. Recommendations included continuation of truck traffic counting and tracking of employment types over time. Also recommended is continuing to address freight transportation issues as part of ongoing planning processes. These include update to the Metropolitan Transportation Plan in 2011, local comprehensive plan updates, continuation of freight data collection and analysis through RTC programs such as the Transportation System Management and Operations and Congestion Management Process and through planning efforts of local Port districts.

4 Future Freight System

4.1 Existing Design Guidelines Relating to Truck Mobility

Purpose. The Summary of Existing Design Guidelines Relating to Truck Mobility memorandum summarizes the transportation policies, functional classifications, and design guidelines in the comprehensive plans, transportation plans, and municipal codes of Clark County, City of Vancouver, City of Battle Ground, City of Camas, The City of La Center, City of Ridgefield, and the City of Washougal.

Findings. Most jurisdictions identify truck routes by functional classification. While the jurisdictions in Clark County do address trucks in their policies and standards, most of the routes and design guidelines are not focused on truck mobility. Information about the Washington State Department of Transportation (WSDOT) Freight and Goods Transportation System (FGTS) is also provided.

Many arterials in Clark County serve important freight mobility needs and at the same time carry all modes of transportation – commuters in passenger vehicles, small commercial vehicles, buses, bicycles, and pedestrians. The design guidelines of jurisdictions in Clark County are flexible and provide for the basic needs of truck mobility; however, the design guidelines do not address the design of facilities with multiple modes of transportation.

Recommendation. Local jurisdictions in Clark County should work toward addressing the design of facilities with multiple modes of transportation when updating their design guidelines.

4.2 Basic Principles of Truck Mobility

Purpose. The Basic Principles of Truck Mobility memorandum documents the basic operating and design principles for truck mobility. The application of these principles can result in improved roadway design for truck mobility.

Findings. Trucks moving freight rely on capacity and uncongested conditions to reduce travel time, improve reliability, minimize collisions, and reduce cost. Increasing the number of lanes on a roadway may not be feasible given the competition for major project funding, and other project design constraints. Trucks are bigger and heavier than passenger vehicles, and therefore, are slower to accelerate, require longer stopping distances, require a longer gap in traffic to enter a roadway or merge onto a freeway, and have larger turning radii.

Trucks are more adversely impacted by uphill grades. An uphill grade on a ramp or a short ramp affects the speed that a truck can reach before the merge point with the freeway mainline. Design solutions to increase the truck speed at the merge point include: lengthening freeway ramps to provide a longer acceleration distance; flattening the grade; enlarging the radius of loop ramps; changing the ramp configuration; and/or allowing trucks to bypass a ramp meter.

Mobility on arterials and local access streets is affected by the street width and the turning radius at intersections. Where the turn radii are tight, drivers often swing wide, encroaching into the adjacent lane, so that the truck does not ride up on to a sidewalk or encroach onto a shoulder

area. This is of particular concern on two lane streets where the truck must encroach into the oncoming traffic lane. On arterial streets with higher volumes of truck traffic, such turning movements can seriously disrupt the flow of traffic and can create safety concerns.

Recommendations. These factors need to be considered when designing roads to accommodate freight movement and are particularly important considerations relating to the capacity of significant freight transportation routes. Over-designing for trucks can result in impacts to other modes, natural resources, and result in excessive cost. Improving truck mobility through design can enhance site design for industrial land and other truck-trip generating facilities, ensure that nearby uses are compatible, and their access to the Clark County transportation system.

5 Recommended Regional Actions and MTP Freight Projects

Based on the findings and recommendations from the analysis of existing and future freight movement, current economic conditions, freight and transportation policies, and discussions with agency and business-freight stakeholder groups and the stakeholder input, the Study team developed strategies as a starting point for discussion. The recommended strategies to improve freight mobility are of regional significance and intended to support a freight element in the 2011 update to the RTC's Metropolitan Transportation Plan.

**Summary of Clark County Freight Mobility Study Strategies
and Future Action Items**

Process	Strategies to Support Freight Transportation
Regional Freight System and Economic Development	Invest in freight mobility to support industrial development goals and job creation
Identify Needs and Projects	Support road improvements that benefit freight mobility
	Support rail improvements
Design	Develop model design guidelines for complete streets and freight
	Plan and design for local truck access to Clark County business sectors
Land Use and Transportation Integration	Land use and transportation coordination: protect viability of industrial lands and livability of residents
	Manage access to industrial areas
Funding	Position projects for funding

6 Glossary and Acronyms

FGTS. Freight and Goods Transportation System (WSDOT)

Heavy trucks have four or more axles and a “tractor-trailer” configuration. They have slower acceleration speeds, longer stopping distances, different sight lines, and a large turning radius. Their operating characteristics consume approximately double the freeway capacity as compared to a passenger car.

I-5. Interstate 5

Light trucks are a single unit, have two axles and up to six tires. This size truck performs light commercial activity. On highways and arterials, the operating characteristics of light trucks may be similar to a passenger car.

Medium sized trucks have three or four axles, but are a single unit. Today, single unit trucks with three or four axles are fire trucks, dump trucks, and large recreational vehicles. The medium trucks carry heavier loads, require a wider turning radius, and use more capacity on highways and arterials than a passenger car.

MTIP. Metropolitan Transportation Improvement Program

MTP. Metropolitan Transportation Plan

NHS. National Highway System

Oversized loads. Loads that require a permit because they exceed the maximum thresholds for length, height, or weight. The permits are required to make sure that infrastructure along the desired travel route can accommodate the load or dimension.

RTC. Southwest Washington Regional Transportation Council

Short sea shipping is the shipping of cargo on inland and coastal waterways instead of via trucks or rail.

SR. State Route

Study. Clark County Freight Mobility Study

TAZ. Transportation Analysis Zone

TTAZ. Truck Traffic Analysis Zone

Vehicle classifications. For the purpose of transportation planning or traffic operations analysis, the 13 Federal Highway Administration (FHWA) vehicle classifications are often grouped into three primary categories: light (small), medium, and heavy (large).

WSDOT. Washington Department of Transportation