

Washington State Freight Truck Origin and Destination Study: Asotin County



EWITS Research Report Number 21-Asotin
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by

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in cooperation with

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EWITS Research Report: Background and Purpose

This is the twenty-first in a series of Research Reports prepared from the Eastern Washington Intermodal Transportation Study (EWITS). The reports prepared as a part of this study provide information to help shape the multimodal network necessary for the efficient movement of both freight and people into the next century.

EWITS is a six-year study funded jointly by the Federal government and the Washington State Department of Transportation as a part of the Intermodal Surface Transportation Efficiency Act of 1991. Dr. Ken Casavant of Washington State University is Director of the study. A state-level Steering Committee provides overall direction pertaining to the design and implementation of the project. The Steering Committee includes Jerry Lenzi, Chair and Regional Administrator (WSDOT, Eastern Region); Richard Larson, Regional Administrator (WSDOT, South Central Region); Don Senn, Regional Administrator (WSDOT, North Central Region); Charles Howard (WSDOT, Planning Manager), and Eric Berger, Executive Director, County Road Administration Board. Pat Patterson represents the Washington State Transportation Commission on the Steering Committee. An Advisory Committee with representation from a broad range of transportation interest groups also provides guidance to the study. The following are key goals and objectives for the Eastern Washington Intermodal Transportation Study:

- *Facilitate existing regional and state-wide transportation planning efforts.*
- *Forecast future freight and passenger transportation service needs for eastern Washington.*
- *Identify gaps in eastern Washington's current transportation infrastructure.*
- *Pinpoint transportation system improvement options critical to economic competitiveness and mobility within eastern Washington.*

For additional information about the Eastern Washington Intermodal Transportation Study or this report, please contact Ken Casavant at the following address:

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EWITS PREVIOUS REPORTS NOW AVAILABLE

1. Gillis, William R. and Kenneth L. Casavant. "Linking Transportation System Improvements to New Business Development in Eastern Washington." EWITS Research Report Number 1. February 1994.
2. Gillis, William R. and Kenneth L. Casavant. "Lessons from Eastern Washington: State Route Mainstreets, Bypass Routes and Economic Development in Small Towns." EWITS Research Report Number 2. February 1994.
3. Gillis, William-R. and Kenneth L. Casavant. "Washington State Freight Truck Origin and Destination Study: Methods, Procedures, and Data Dictionary." EWITS Research Report Number 3. December 1994.
4. Gillis, William R. and Kenneth L. Casavant. "Major Generators of Traffic on U.S. 395 North of Spokane: Including Freight Trucks and Passenger Vehicles Crossing the International Border." EWITS Research Report Number 4. January 1995.
5. Newkirk, Jonathan, Ken Eriksen, and Kenneth L. Casavant. "Transportation Characteristics of Wheat and Barley Shipments on Haul Roads To and From Elevators in Eastern Washington." EWITS Research Report Number 5. March 1995.
6. Jessup, Eric and Kenneth L. Casavant. "A Quantitative Estimate of Eastern Washington Annual Haul Road Needs for Wheat and Barley Movement." EWITS Research Report Number 6. March 1995.
7. Gillis, William R., Emily Gruss Gillis, and Kenneth L. Casavant. "Transportation Needs of Eastern Washington Fruit, Vegetable and Hay Industries." EWITS Research Report Number 7. March 1995.
8. Casavant, Kenneth L. and William R. Gillis. "Importance of U.S. 395 Corridor For Local and Regional Commerce in South Central Washington." EWITS Research Report Number 8. April 1995.
9. Gillis, William R., Eric L. Jessup, and Kenneth L. Casavant. "Movement of Freight on Washington's Highways: A Statewide Origin and Destination Study." EWITS Report Number 9, November 1995.
10. Chase, Robert A. and Kenneth L. Casavant. "Eastern Washington Transport-Oriented Input Output Study: Technical Report." EWITS Research Report Number 10. March 1996.

11. Chase, Robert A. Kenneth L. Casavant. "The Economic Contribution of Transport Industries to Eastern Washington." EWITS Report Number 11. April 1996.
12. Lee, Nancy S. and Kenneth L. Casavant. "Waterborne Commerce on the Columbia-Snake." EWITS Report Number 12. October 1996.
13. Alderson, Lynn C., Kenneth L. Casavant and Eric Jessup. "Transportation Characteristics and Needs of Forest Products Industries Using Eastern Washington Highways: Part I Economic Structure of the Industry." EWITS Research Report Number 13. January 1997.
14. Eriksen, Ken and Kenneth L. Casavant. "Impact of North American Free Trade Agreement (NAFTA) on Washington Highways - Part 1: Commodity and Corridor Projections." EWITS Research Report Number 14. January 1997.
15. Alderson, Lynn C. and Kenneth L. Casavant. "Transportation Characteristics and Needs of Forest Products Industries Using Eastern Washington Highways: Part 2 Movement of Raw Logs." EWITS Research Report Number 15. May 1997.
16. Alderson, Lynn C. and Kenneth L. Casavant. "Transportation Characteristics and Needs of Forest Products Industries Using Eastern Washington Highways: Part 3 Shipment from Mills." EWITS Research Report Number 16. May 1997.
17. Alderson, Lynn C. and Kenneth L. Casavant. "Transportation Characteristics and Needs of Forest Products Industries Using Eastern Washington Highways: Part 4 Commercial Shipments." EWITS Research Report Number 17. February 1997.
18. Jessup, Eric L., John Ellis, and Kenneth L. Casavant. "A GIS Commodity Flow Model for Transportation Policy Analysis: A Case Study of the Impacts of a Snake River Drawdown." EWITS Research Report Number 18. May 1997.
19. Lee, Nancy S. and Kenneth L. Casavant. "A Commodity and Origin-Destination Analysis of Rail Traffic in Washington--1990-1995. EWITS Research Report Number 19. May 1997.
20. Edwards, Richard, Eric L. Jessup, and Kenneth L. Casavant. "Eastern Washington On-Farm and Commercial Grain Storage." EWITS Research Report Number 20. January 1998.

EWITS Previous Working Paper Series Now Available

1. Lee, Nancy and Ken Casavant. "Grain Receipts at Columbia River Grain Terminals." EWITS Working Paper #1, March 1996.
2. Lenzi, Jerry, Eric Jessup, and Ken Casavant. "Prospective Estimates for Road Impacts in Eastern Washington from a Drawdown of the Lower Snake River." EWITS Working Paper #2, March 1996.
3. Ellis, John, Eric Jessup, and Ken Casavant. "Modeling Changes in Grain Transportation Flows in Response to Proposed Snake River Drawdowns: A Case Study for Eastern Washington." EWITS Working Paper #3, March, 1996.
4. Painter, Kate and Ken Casavant. "A Comparison of Canadian Versus All Truck Movements In Washington State With A Special Emphasis On Grain Truck Movements." EWITS Working Paper #4, March 1996.
5. Jessup, Eric L., John Ellis and Kenneth L. Casavant. "Estimating the Value of Rail Car Accessibility for Grain Shipments: A GIS Approach." EWITS Working Paper #5. April 1996.
6. Painter, Kathleen M. and Kenneth L. Casavant. "Truck Movement Characteristics on Selected Truck Routes in Washington State." EWITS Working Paper #6. August 1996.
7. Lee, Nancy S. and Kenneth L. Casavant. "Grain Receipts at Columbia River Grain Terminals, 1980-81 to 1995-96." EWITS Working Paper #7. January 1997.
8. Jessup, Eric L. and Ken Casavant. "Economic Evaluation of Grain Shipment Alternatives: A Case Study of the Coulee City and Palouse River Railroad." EWITS Working Paper #8, March 1997.

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Introduction

A large statewide survey of truck traffic origination, destination, and freight characteristics provided the data for in-depth county level reports of freight truck movement in Washington State. Considerable detail on road usage, truck weight, truck configuration, commodity type, and seasonal traffic variation is available in this survey. We were able to examine a rich set of characteristics for trucks whose freight was either destined for or originating from a particular county. It is important to note the survey does not capture truck movement that did not pass through one of 20 survey sites located on major routes throughout the state (see Table 1A for survey sites). For this reason, considerable intra- and intercounty traffic will not be included for some counties depending on their proximity to a survey site. Again, these truck characteristics reflect only the truck movements as reported at the statewide survey locations.

Table 1A--Survey Sites and Traffic Direction

Weigh Station	Site Number	Direction of Traffic	Road Designation
Brady West, WA	1	West	SR12
Brady East, WA	2	East	SR12
Cle Elum East, WA	3	East	I90
Cle Elum West, WA	4	West	I90
Deer Park South, WA	6	South	SR395
Douglas POE (BC Border	7	North	I5
Everett North, WA	8	North	I5
Everett South, WA	9	South	I5
Goldendale, WA	10	North/South	SR97
Kelso South, WA	11	South	I5
Othello, WA	12	All Four	SR17
Pasco, WA	13	South	SR395
Peshastin West, WA	15	West	SR2
Plymouth POE, WA	16	North	SR395
East Port Angeles Westbound, WA	17	West	SR101
Sea Tac South, WA	19	South	I5
Sea Tac North, WA	20	North	I5
East Spokane POE, WA	21	West	I90
Tokio East, WA	22	East	I90
Tokio West, WA	23	West	I90
Umatilla POE, WA	24	South	SR395
Vancouver North, WA	25	North	I5
Wallula POE, WA	26	All Four	SR12, SR395, & SR 370
Osoyoos, BC (BC Border	28	North	SR97
Oroville, WA (US Border	29	South	SR97

Information for this report was provided by an extensive study of freight truck movements on major Washington State highways conducted under the Eastern Washington Intermodal Transportation Study (EWITS). This study was the first in the United States to collect statewide freight truck origination and destination data through direct interviews of truck drivers at weigh stations. Over 300 persons conducted these personal interviews of a total of 30,000 truck drivers, providing an extensive database on freight and goods movements in Washington State.

Method of Analysis

Truck traffic characteristics at the county level were analyzed for trucks whose trips either originated or ended in a particular county. Given the survey data, there was no feasible method for analyzing truck traffic that was simply passing through the county. Detailed truck traffic characteristics for each of Washington's 39 counties by season included number of trucks with freight destined for that county per day, their payload weight and commodity type; road usage, including number of trucks per day, freight weight and commodity type; and number of trucks per day, freight weight and commodity type by city of cargo origin and destination. Truck traffic was analyzed on an annual basis for the following characteristics: county road usage, average and total truck tonnage, and number of trucks by commodity; distribution of freight weight by commodity and by road; type of commodity hauled by truck configuration; and truck carriers' home base for truck trips originating or ending in that county. Truck traffic data is likely to be more accurate in terms of relative differences by road, season, etc., than actual magnitude for any one characteristic due to the nature of the survey approach.

Presentation of Results

Detailed truck traffic characteristics are presented for Washington's 39 counties in a set of nine tables for each county. Table 1 presents information by road for truck traffic either originating or ending in that county for each season. Characteristics include total number of trucks, number of trucks with freight, average payload, and total tonnage. In addition, the percentage of loads by commodity on each road is calculated.

Tables 2 and 3 present seasonal truck traffic characteristics by city of cargo origin and city of cargo destination, respectively. For each city, the daily number of trucks, trucks with freight, their average payload weight, and total truck traffic weight are presented. Again, there is a breakdown by commodity type for each city.

Table 4 summarizes truck traffic characteristics for trucks whose trips end in that county by season. Total daily truck traffic, number of trucks with freight, average payload weight, and the total tonnage per day as well as the percentage of truckloads by commodity are presented.

Table 5 analyzes truck traffic originating or ending in that county by commodity. The number of trucks per day as well as the average and total payload by commodity is presented. In addition, truck traffic usage by road is detailed for each commodity.

Table 6 shows distribution of payload weight by commodity for truck traffic originating or ending in that county. Five weight categories in five-ton increments are used. Table 7 presents distribution of payload weight by road for truck traffic originating or ending in that county. Weight characteristics by commodity and by road are easily identified from these two tables.

Table 8 shows truck configuration by commodity for truck traffic originating or ending in that county. The percentage of trucks with freight by configuration is presented for each commodity. Table 9 presents truckers' home base by city and the number of Washington-based carriers for truck traffic originating or ending in the county.

Overall, this county-by-county disaggregation of truck movements shows the powerful impact of particular commodity movements on certain roads and during certain seasons. Farm commodities are hauled from the field to the processor or market on a seasonal basis. Lumber harvest has considerable seasonal variation as well. Construction or closures on major roads used for these purposes will need to be planned accordingly. As different industries grow or shrink, they create specific demands on the transportation infrastructure that may need to be accommodated in future transportation planning.

These results represent a summary of truck traffic origin and destination information at the county level. This information should be useful for state and county planning with respect to traffic sources, either origin or destination, and the characteristics of this traffic. It should also be valuable for planning road maintenance and construction at the county and regional level.

Asotin County Results

Asotin County is located in the extreme southeast corner of Washington State. While the only major truck route passing through the county is State Route 12 (SR12), State Route 195 (SR195) was included in the analysis for this county as it ends just inside the county boundary. Truck traffic for freight originating or ending in Asotin County is fairly light, averaging 27 trucks per day on SR12 and 12 trucks per day on SR195 in fall, when traffic is heaviest (Table 1). Traffic is lightest in spring, with an average of 7 trucks per day on SR12 and one per day on SR195. Food products make up the majority of truck traffic for all seasons except in spring, when lumber is the predominant freight.

Trucks destined for Asotin County are headed to Clarkston, with a daily count ranging from 13 trucks per day in winter to none in spring and summer (Table 2). (Due to the small number of trucks in the sample for this county, these numbers will not be as representative of actual truck traffic as they are for counties with more observations.) Lumber or wood products, pulp or paper, and petroleum make up the freight types for trucks in the survey destined for Clarkston.

Truck traffic leaving from Asotin County originates from Clarkston, with a daily count ranging from 33 trucks per day in fall to eight in spring (Table 3). Freight is varied, with food as the predominant freight type. Lumber or wood products are the primary freight in spring, but this may represent a lack of data in the survey rather than the actual freight characteristics.

Total truck traffic heading for or leaving from Asotin County ranges from 38 trucks per day in fall to 8 trucks per day in spring (Table 4). Freight hauled includes food, petroleum, and lumber or wood products, among others. Average payload weights ranged from 13 tons in fall to 25 tons in spring.

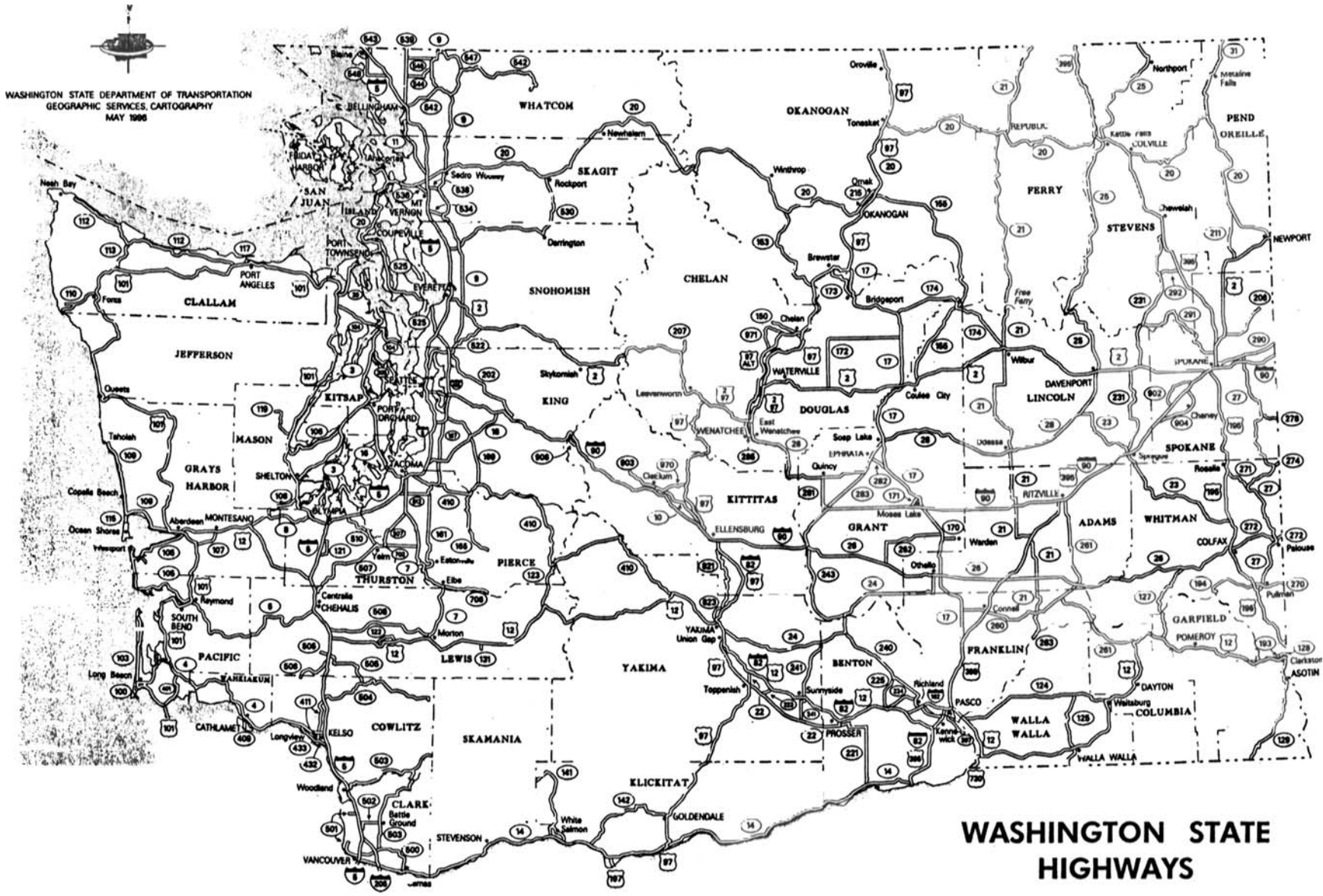
Table 5 shows road usage by type of freight for the major commodities hauled into or out of Asotin County over the entire year. SR195 is used by all trucks hauling lumber or wood and 80% of the trucks hauling food. All trucks in the survey hauling agricultural products use SR12 rather than SR195.

Weight category by commodity for trucks hauling freight into or out of Asotin County is presented in Table 6. Due to the small number of surveyed trucks for this county, these numbers may not be representative of actual truck traffic. Forty percent of the trucks carrying food are in the 15- to 20-ton weight class, and another 28% have loads weighing over 30 tons. Over 80% of trucks carrying lumber or wood products are in the 5- to 10-ton weight category.

Table 7 shows weight category by roadway for truckloads originating or ending in Asotin County. According to the survey, truck traffic on SR12 is 44% higher than on SR195. Just over one-fifth of the trucks on SR195 carry loads greater than 30 tons, while 14% of the traffic on SR12 fall into this classification. None of the truck traffic on SR195 carried loads of less than five tons, while 18% of the trucks carrying loads on SR12 fell into this category.

The most common truck type for those hauling freight into or out of Asotin County is the tractor and trailer configuration, with 39% of trucks in this classification (Table 8). Another 31% are tractor with two trailers, while 30% are truck and trailers. Just 9% of trucks with freight are straight trucks.

Over the one-year survey period, a total of 88 trucks, loaded and empty, were either heading for or leaving Asotin County (Table 9). Of these trucks, 62% were Washington-based carriers. Tacoma is home base for one-fourth of the surveyed carriers, while Seattle is home base for 16%.



WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
 GEOGRAPHIC SERVICES, CARTOGRAPHY
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WASHINGTON STATE HIGHWAYS

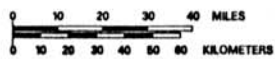


Table 1--Daily Truck Traffic by Road for Each Season, Asotin County

Season/ Road	Total Trucks Per Day (No.)	Loaded Trucks Per Day (No.)	Average Payload (Tons)	Total Tonnage ¹	Commodity	
					Category	Percent
Fall:						
SR 12	27	27	15	391	Agricultural	16
					Food	32
					Print materials	19
					Rubber, plastic	13
SR 195*	12	12	7	84	Lumber, wood	44
					Glass, cement	43
Winter:						
SR 12	17	9	23	210	Food	42
					Pulp, paper	42
					Petroleum	16
SR 195*	17	17	19	321	Food	30
					Lumber, wood	9
					Petroleum	31
					Trans. equipment	30
Spring:						
SR 12	6	6	18	105	Lumber, wood	100
SR 195*	1	1	32	32	Lumber, wood	100
Summer:						
SR 12	16	13	24	315	Food	75
					Other	25
SR 195*	5	5	38	190	Food	100

*SR 195 ends in Clarkston, which lies just inside Asotin County.

¹Total tonnage may differ from the number of trucks per day multiplied by the average payload due to rounding of values for average number of loaded trucks per day and average payload.

Table 2--Daily Truck Traffic by City of Cargo Origin for Each Season, Asotin County

Season/ Town	Total Trucks Per Day (No.)	Loaded Trucks Per Day (No.)	Average Payload (Tons)	Total Tonnage ¹	Commodity	
					Category	Percent
Fall:						
Clarkston	5	5	7	37	Lumber, wood	100
Winter:						
Clarkston	13	9	10	94	Pulp, paper	42
					Petroleum	58

NOTE: There were no trucks with loads originating from Clarkston in the spring and summer surveys.

¹Total tonnage may differ from the number of trucks per day multiplied by the average payload due to rounding of values for average number of loaded trucks per day and average payload.

Table 3--Daily Truck Traffic by City of Cargo Destination for Each Season, Asotin County

Season/ Town	Total Trucks Per Day (No.)	Loaded Trucks Per Day (No.)	Average Payload (Tons)	Total Tonnage ¹	Commodity	
					Category	Percent
Fall:						
Clarkston	33	33	14	472	Agricultural	13
					Food	26
					Print materials	15
					Rubber, plastic	11
					Glass, cement	15
Winter:						
Clarkston	21	17	25	416	Food	38
					Lumber, wood	9
					Petroleum	23
					Trans. equipment	30
Spring:						
Clarkston	8	8	25	187	Lumber, wood	100
Summer:						
Clarkston	16	13	24	314	Food	75

¹Total tonnage may differ from the number of trucks per day multiplied by the average payload due to rounding of values for average number of loaded trucks per day and average payload.

Table 4--Truck Traffic for Trips Originating or Ending in Asotin County by Season

Season	Total Trucks Per Day (No.)	Loaded Trucks Per Day (No.)	Average Payload (Tons)	Total Tonnage ¹	Commodity	
					Category	Percent
Fall:	38	38	13	516	Agriculture	11
					Food	22
					Lumber, wood	14
					Print materials	13
					Rubber, plastic	9
					Glass, cement	13
Winter:	33	26	21	534	Food	25
					Lumber, wood	6
					Pulp, paper	15
					Petroleum	35
					Trans. equipment	20
Spring:	8	8	25	187	Lumber, wood	100
Summer:	16	13	24	315	Food	75
					Furniture	25

¹Total tonnage may differ from the number of trucks per day multiplied by the average payload due to rounding of values for average number of loaded trucks per day and average payload.

Table 5--Truck Trips by Commodity for Truck Traffic Originating or Ending in Asotin County

Commodity	Truck Trips	Total Weight		Average Payload	County Roads Used	
	Per Year (%)	Tons	% of Total	(Tons)	Road	% of Trips
Agricultural	3	80	4	20	SR12	100
Food	20	493	23	20	SR12	42
Lumber, wood	6	144	7	21	SR195	80
Petroleum	7	19	1	21	SR195	100
Other	63	1374	65	18	SR12	43
Total	100	2109	100		SR195	57
					SR12	58

Table 6--Weight Category by Commodity for Truck Loads Originating or Ending in Asotin County

Weight Category (tons)	Commodity									
	Agricultural Products		Food		Lumber, Wood		Petroleum		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%
<5	0	0	0	0	0	0	0	0	14	43
5 - <10	0	0	0	0	5	83	0	0	7	22
10 - <15	0	0	0	0	0	0	5	56	5	16
15 - <20	0	0	10	40	0	0	0	0	0	0
20 - <25	4	100	4	16	0	0	0	0	7	21
25 - <30	0	0	4	16	0	0	4	44	0	0
>30	0	0	7	28	1	17	0	0	0	0
Total	4	100	25	100	6	100	9	100	32	100

Table 7--Weight Category by Road for Truck Loads Originating or Ending in Asotin County

Weight Category (tons)	Road			
	SR12		SR195	
	No.	%	No.	%
<5	9	18	0	0
5 - <10	7	14	5	15
10 - <15	0	0	5	15
15 - <20	5	10	10	29
20 - <25	13	27	5	15
25 - <30	8	16	2	6
>=30	7	14	7	21
Total	49	100	34	100

Table 8--Truck Configuration by Type of Commodity Hauled, Asotin County (%)

Commodity	Truck Configuration				Total Loads
	1	2	4	5	
Agricultural products			100		4
Food			77	23	25
Lumber, wood				100	7
Furniture				100	3
Pulp, paper				100	4
Printed materials			100		5
Petroleum products	57			43	9
Rubber, plastic		100			4
Glass, cement	100				5
Transportation equipment				100	5
Misc. manufactured products	100				5
Total	9%	30%	39%	31%	87

Legend: 1 = straight truck, 2 = truck and trailer,
4 = tractor and trailer, 5 = tractor and two trailers

Table 9--Truckers' Home Base for Truck Trips Originating or Ending in Asotin County

Location	Number	Percent
By Town:		
Seattle	14	16
Sumner	7	8
Tacoma	22	25
Portland, OR	9	10
Other	36	41
Total	88	100
Wash. State carriers:	55	62