

# **Grain Receipts at Columbia River Grain Terminals 1980-1981 to 1999-2000**

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by

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## **EWITS Research Reports: Background and Purpose**

This report is the thirteenth in a series of Working Papers prepared from the Eastern Washington Intermodal Transportation Study (EWITS). Working Papers address current issues related to the mission of EWITS. The papers prepared as a part of this study provide information on the multimodal network necessary for the efficient movement of both freight and people into the next century.

EWITS was 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, Regional Administrator (WSDOT, Eastern Region); Leonard Pittman (WSDOT, South Central Region); Don Senn (WSDOT, North Central Region); Charles Howard (WSDOT, Planning Manager); and Jay Weber (Douglas County Commissioner). Tom Green 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 statewide 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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## **Introduction**

International markets have become the dominant focus of grain production in Washington and the United States. In many years, the international markets account for over 90% of Washington's grain sales. Access to these markets is accomplished by the availability of an efficient and balanced transportation system. Washington's transportation system is fortunate in that all three major modes (truck, barge, and rail) are available. An important contributor to the access to international markets is the efficiency and performance of that multimodal system. Such efficiencies arise because of both the competitive and complementary roles played by the modes in our system. Competition serves to make rates more closely reflect costs of operation while encouraging innovation. Complementary roles allow each mode to perform that function for which it is economically suited, while the overall efficiency of the system serving producers and foreign consumers is enhanced.

This efficient system, irrespective of which mode is used, is dependent on the terminals and export facilities available to move the grain from barge, rail, or truck onto the ocean segment of the transportation overseas. These Northwest ports and the physical facilities within them serve both Washington and national grain movements. Investment in and upgrading of these facilities should reflect the distribution of land side barge, train, or rail arrivals if overall system efficiencies are to be maintained and increased.

It is, therefore, useful to evaluate the volume of grain moving into and through these facilities and to examine in detail the modal split in the arrivals. Trends over time reflect the competitive outcome of the modes as well as changing sources of shipments through Columbia River terminals.

## **Approach and Objectives**

This report is based on unpublished data on volume and arrivals by mode. The data were developed by a comprehensive survey of all exporting firms merchandising grain through those terminal elevators for the crop years 1980-81 to 1999-00. The survey was done in Fall of 2000 by examination of actual firm records by R. C. Grumary and Associates. All exporters were initially sent a letter of inquiry. A follow-up personal contact was made as needed. Individual and aggregate data were reviewed and compared to prior years and respective totals. Verification and correction was requested, where necessary.

The objectives of this working paper are to evaluate volume of wheat and barley moving through the Tidewater elevators, to determine the modal split in the arrivals of these movements, to determine any discernable changes over time and to draw implications on the relationship between volume and modal splits.

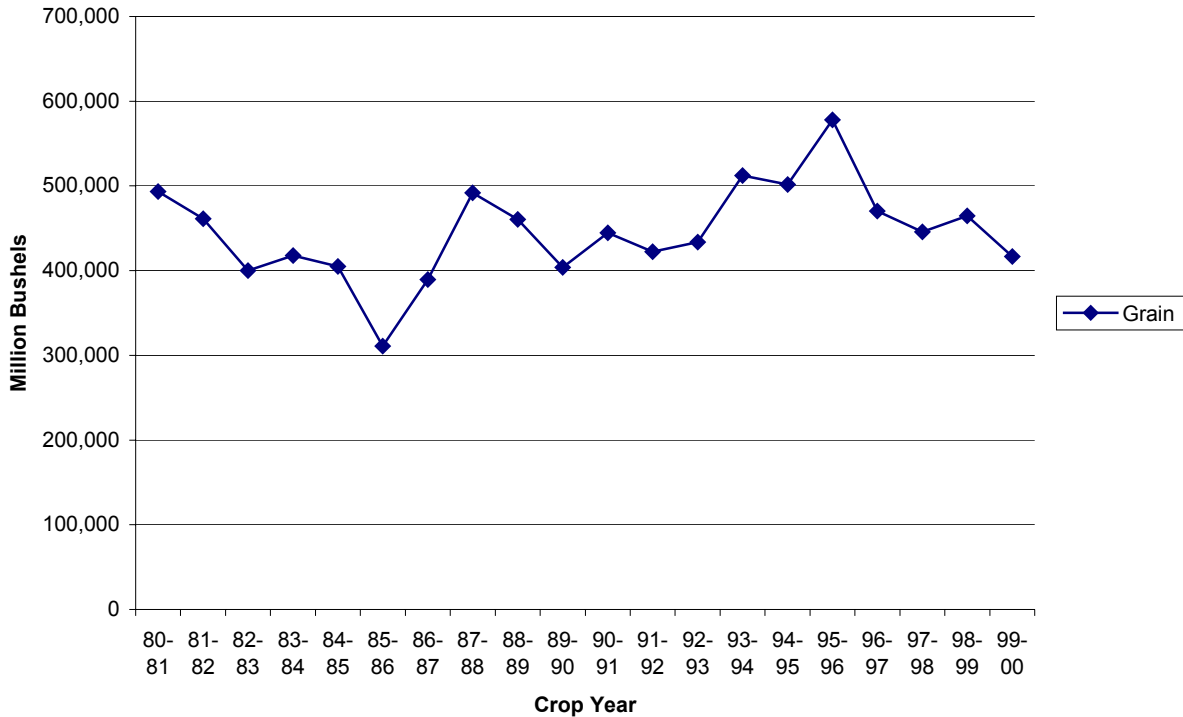
## Volume of Shipments

The total grain receipts from the last 20 years at the Columbia River elevators are shown in Table 1 and Figure 1. The fairly noticeable decrease and then recovery in total volumes of exports is evident, starting from 493 million bushels in 1980-81, decreasing to a low of 311 million bushels in 1985-86 to a record high of nearly 578 million bushels in 1995-96, a 15% increase over the previous year. This was followed by a decrease of 19% to 470 million bushels in 1996-97 and 5% to 446 million bushels in 1997-98. Total receipts increased by 4.2%, to 464 million bushels in 1998-99 and then decreased by 10.34% to 417 million bushels in the 1999-2000 season.

**Table 1--Receipts of Grain Transported by Mode, in Thousand Bushels, 1980-81 to 1999-2000**

<b>Crop Year</b>	<b>Rail</b>	<b>Barge</b>	<b>Truck</b>	<b>Total</b>
80-81	247,686	217,687	28,024	493,397
81-82	227,475	205,089	28,681	461,245
82-83	203,748	170,254	26,054	400,056
83-84	229,029	171,542	17,234	417,985
84-85	215,575	169,235	20,123	404,933
85-86	178,411	116,722	15,819	310,952
86-87	233,612	140,075	15,720	389,407
87-88	274,825	199,855	17,032	491,712
88-89	247,441	198,185	14,707	460,333
89-90	226,714	165,197	11,798	403,709
90-91	254,514	179,528	10,505	444,547
91-92	251,942	162,067	8,406	422,415
92-93	267,143	155,888	10,456	433,487
93-94	317,299	185,589	9,353	512,241
94-95	315,989	176,540	9,282	501,811
95-96	343,136	227,163	7,564	577,863
96-97	258,778	203,353	8,055	470,186
97-98	243,499	196,252	5,995	445,746
98-99	228,684	232,478	3,477	464,639
99-00	242,299	171,475	2,791	416,565

**Figure 1: Total Receipts of Grain at Columbia River Export Terminals, 1980-81 to 1999-2000**



The volume for the 1999-2000 season is the smallest received during the past decade. The general changes in the grain volume over the period from 1981-82 to 1999-2000 are apparent with an average of 397 million over the first six years, 442 million over the next six years, and 479 million for the most recent seven years. Within the last eight years, exports ranged from a low of 434 million bushels to a high of 578 million bushels. During the 1999-2000 crop season 203.8 (48.93%) million bushels of grain were received by Columbia River exporters and 212.7 (51.07%) million bushels were received by Willamette River exporters. The total volumes and share of grain received at the two general locations are shown in Table 2. The sources for these data are strictly confidential.

**Table 2--Total Volumes and Share Percentages for Grain Received at Columbia and Willamette River Exporters for the Period 1995-2000**

Season	Columbia River Exporters		Willamette River Exporters	
	Volume (Bu.)	%	Volume (Bu.)	%
95-96	240,434,000	41.6	337,434,000	58.4
96-97	213,060,522	45.3	257,125,620	54.6
97-98	206,021,939	46.2	239,724,510	53.8
98-99	217,825,918	46.9	246,813,179	53.1
99-00	203,817,993	48.9	212,750,755	51.1

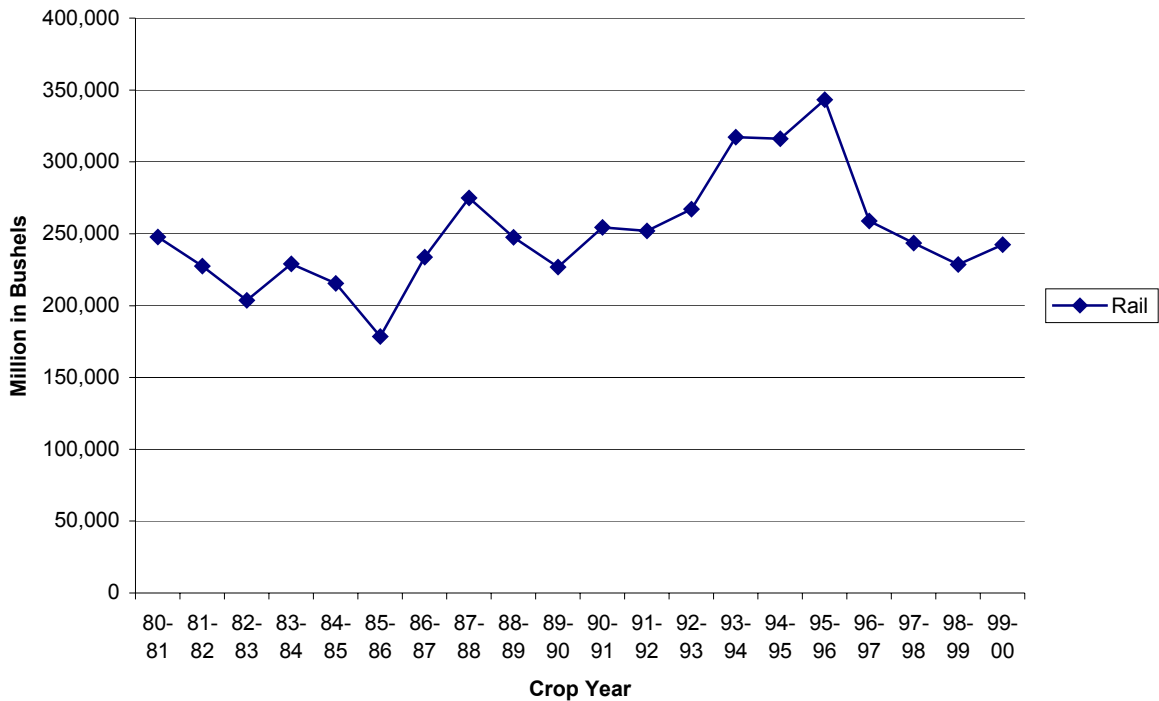
It is apparent from Table 2 that the share of grain delivered to Columbia River exporters has increased during the past five seasons while the share for Willamette River exporters has declined, reflecting activity and capacity of the exporting grain terminals.

The volumes of grain transported by each mode over the period 1980-2000 are shown in Table 1 and Figures 2-5. Rail moved 248 million bushels in 1980-81, increasing to a high of 343 million bushels in 1995-96. The higher share of rail relative to the alternative transport modes is evident in the last half of the study period. An average of 226 million bushels in the first eight years and nearly 281 million bushels in the last eight years were transported by rail, with a 8.6% increase in the 95-96 crop year, followed by a sharp 24% drop in 1996-97 and additional 6% reductions in both the 1997-98 and 1998-99 crop years. The share of rail increased by 6% to 243 million bushels during the 1999-2000 crop year.

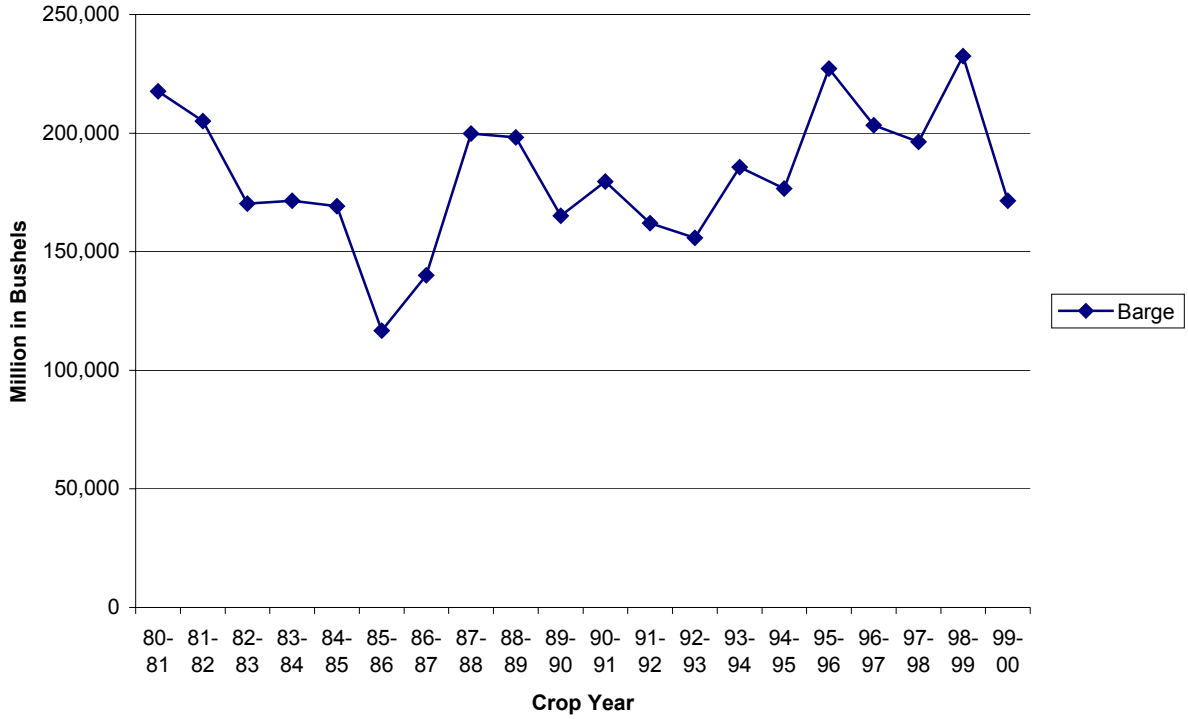
Barge shipments reflect a general increase in volume since the 85-86 and 86-87 years. The number of bushels barged decreased from 218 million bushels in 1980-81 to 117 million bushels in 1985-86. Barge transport increased by 99% during the past 13 seasons and peaked at a record 232 million bushels during the 1998-99 season. In contrast to this trend, barge shipments were reduced by 26% to 171 million bushels during the period 1999-2000.

Receipts by truck showed a pronounced and steady decline over the 20-year study period, decreasing from 28 million in 1980-81 to a low of 2.8 million bushels in 1999-00. Truck shipments showed a decrease in total volume of 18% even during the record crop year of 1995-96. The relative shipments by mode, depicted in Figure 5, reflect the trends in volume identified above.

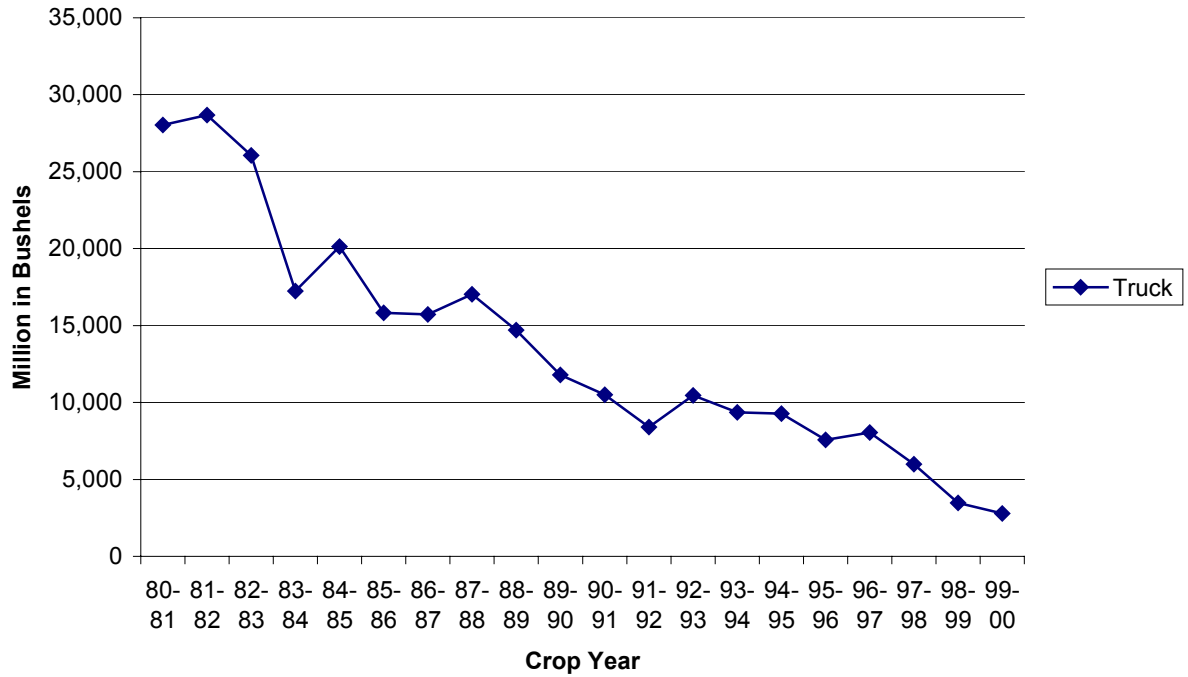
**Figure 2: Receipts of Grain by Rail at Columbia River Export Terminals, 1980-81 to 1999-2000**



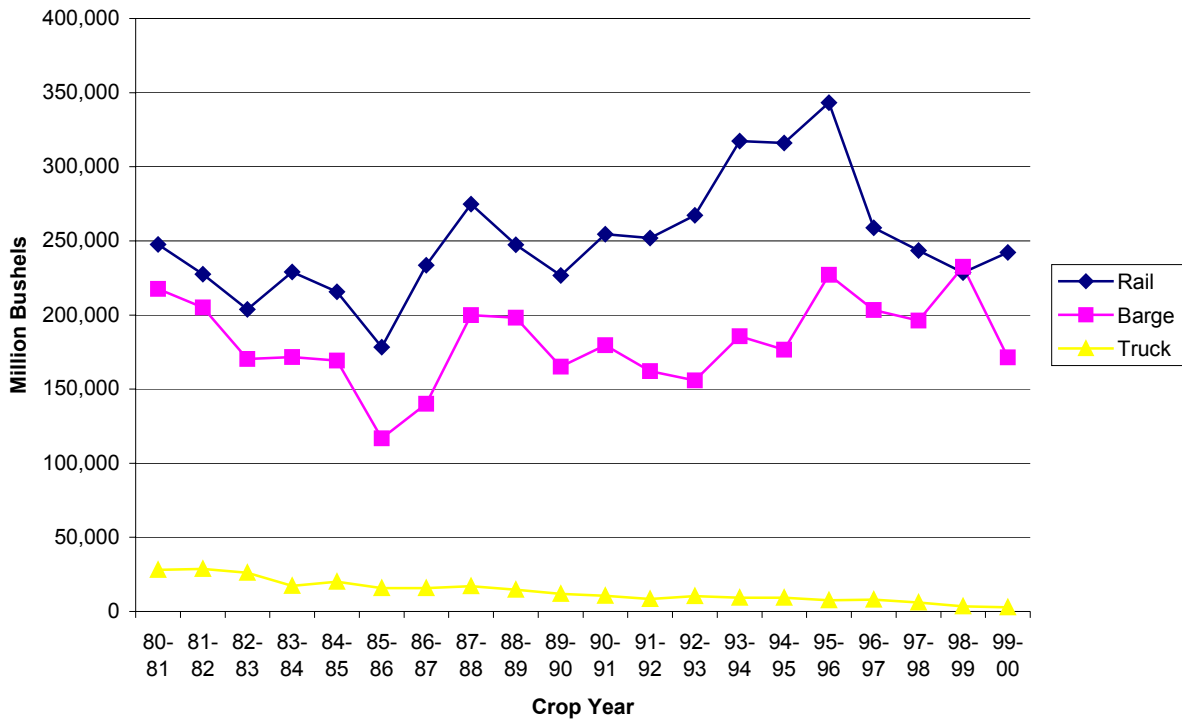
**Figure 3: Receipts of Grain by Barge at Columbia River Export Terminals, 1980-81 to 1999-2000**



**Figure 4: Receipts of Grain by Truck at Columbia River Export Terminals, 1980-81 to 1999-2000**



**Figure 5: Receipts of Grain by Rail, Barge and Truck at Columbia River Export Terminals, 1980-81 to 1999-2000**



### Grain Receipts by Modal Split

The arrival pattern, by mode, of grain receipts is indicated in Table 3 and Figures 6-9. The general dominance of rail since 1988-89 is quite evident, increasing from a low of 54% to a record high of 63% in the 1994-95 crop year. However, there was a slight decrease in rail share over the 1996-99 crop years, falling to 49.2 % in 1998-99 (Figure 6). Rail reversed this trend during the past season by delivering 58.2% of the shipments.

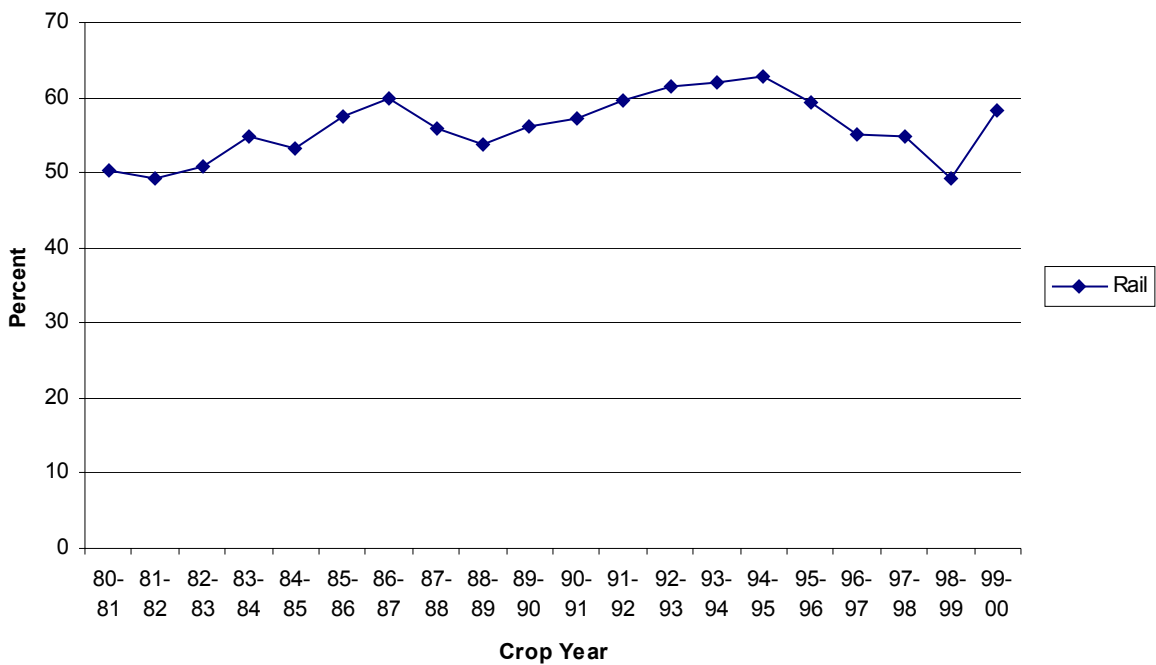
Barge receipts have experienced a fairly steady increase in modal share, with a more pronounced resurgence during the 1996-99 seasons (Figure 7). Barge share had decreased from 44% in 1980-81 to a record low of 35% in 1994-95. However, in 1995-96 crop years 39% of grain delivered was shipped by barge, an increase of 28% in volume over the previous year. In the following seasons, the barge share increased to 43.2%, 44% and 50% of total receipts respectively. Barge shipments were reduced to 41.1% of the total delivered grain during the 1999-2000 crop year.

Receipts by truck fell below 1% during the 1998-99 season. In the period 1980-86 the share of grain transported by truck ranged between 4 to 5 percent. However, the volume transported by this mode has continued to decline since 1985-86. As evidenced in Figure 9, the modal strength of rail during the past two decades is apparent. However, in the 1998-99 season, the volume transported by barge had grown to the point where it was greater than rail volume reflecting a modal split of 49.2% rail, 50% barge and 0.8% truck. During the 1999-2000 crop year rail has dominated receipts thus reducing the shares of barge and trucking. Total grain deliveries for the past season were split 58.2% rail, 41.1% barge and 0.7% truck.

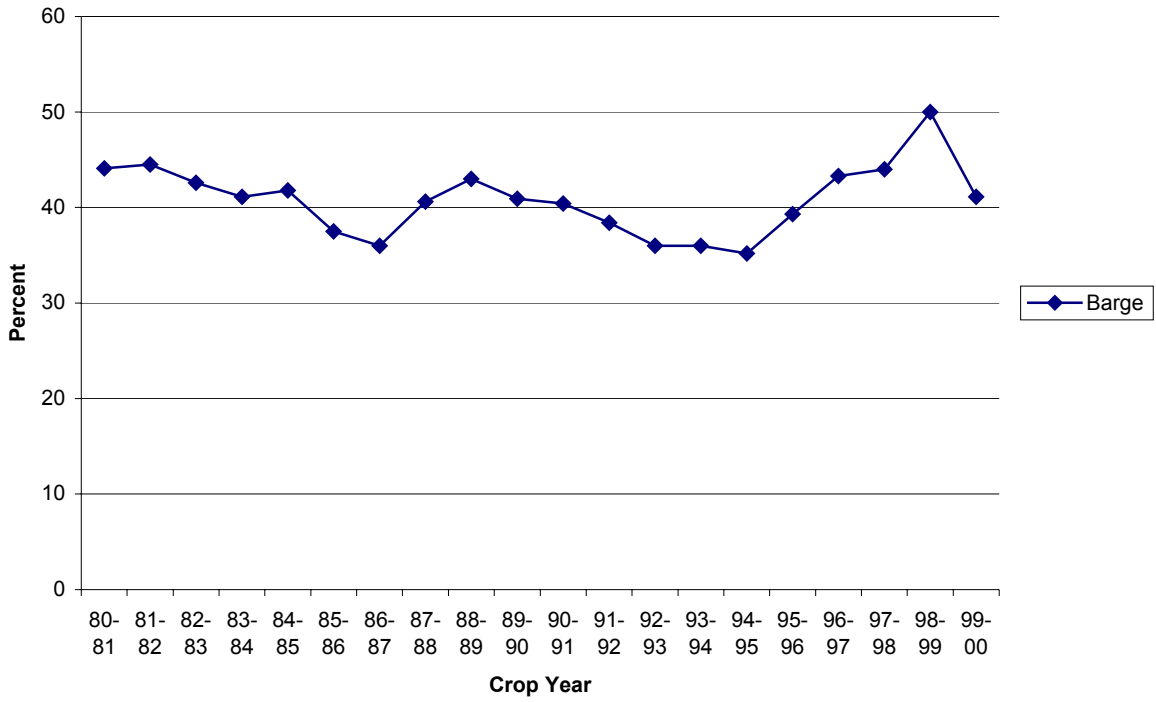
**Table 3--Percent of Grain Transported by Mode, 1980-81 to 1999-2000**

Crop Year	Rail	Barge	Truck
80-81	50.2	44.1	5.7
81-82	49.3	44.5	6.2
82-83	50.9	42.6	6.5
83-84	54.9	41.1	4.0
84-85	53.2	41.8	5.0
85-86	57.4	37.5	5.1
86-87	60.0	36.0	4.0
87-88	55.9	40.6	3.5
88-89	53.8	43.0	3.2
89-90	56.2	40.9	2.9
90-91	57.2	40.4	2.4
91-92	59.6	38.4	2.0
92-93	61.6	36.0	2.4
93-94	61.9	36.0	2.4
94-95	62.9	35.2	1.9
95-96	59.4	39.3	1.3
96-97	55.0	43.3	1.7
97-98	54.7	44.0	1.3
98-99	49.2	50.0	0.8
99-00	58.2	41.1	0.7

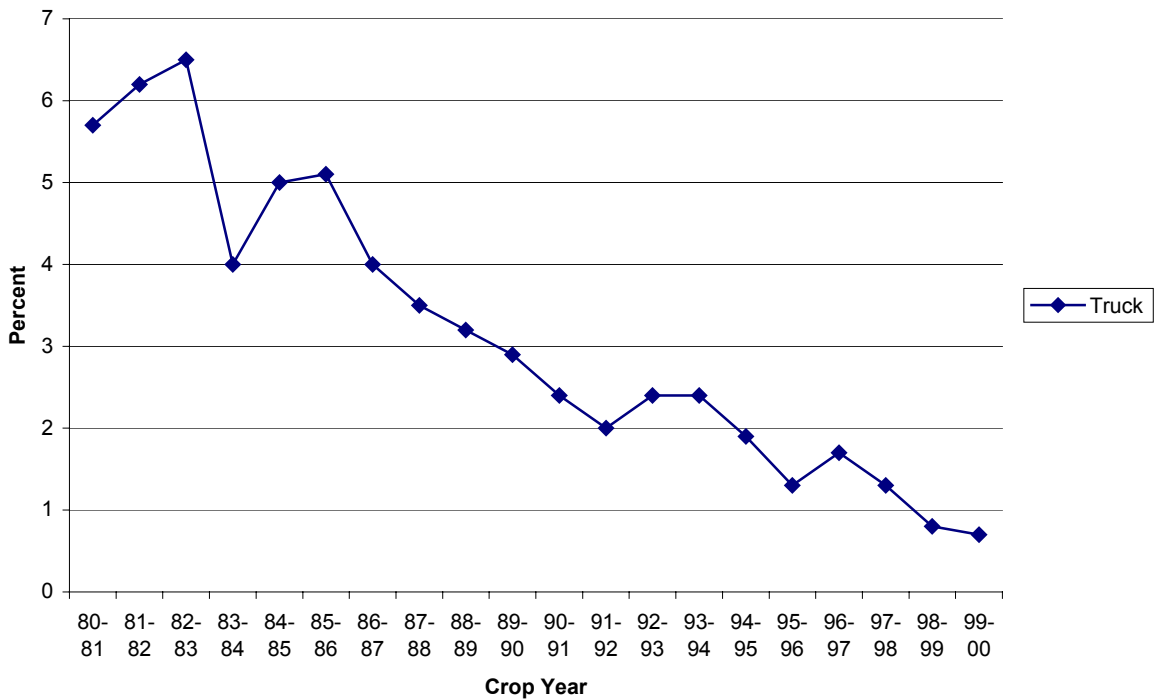
**Figure 6: Percent of Grain by Rail to Columbia River Export Terminals, 1980-81 to 1999-2000**



**Figure 7: Percent of Grain by Barge at Columbia River Terminals, 1980-81 to 1999-2000**

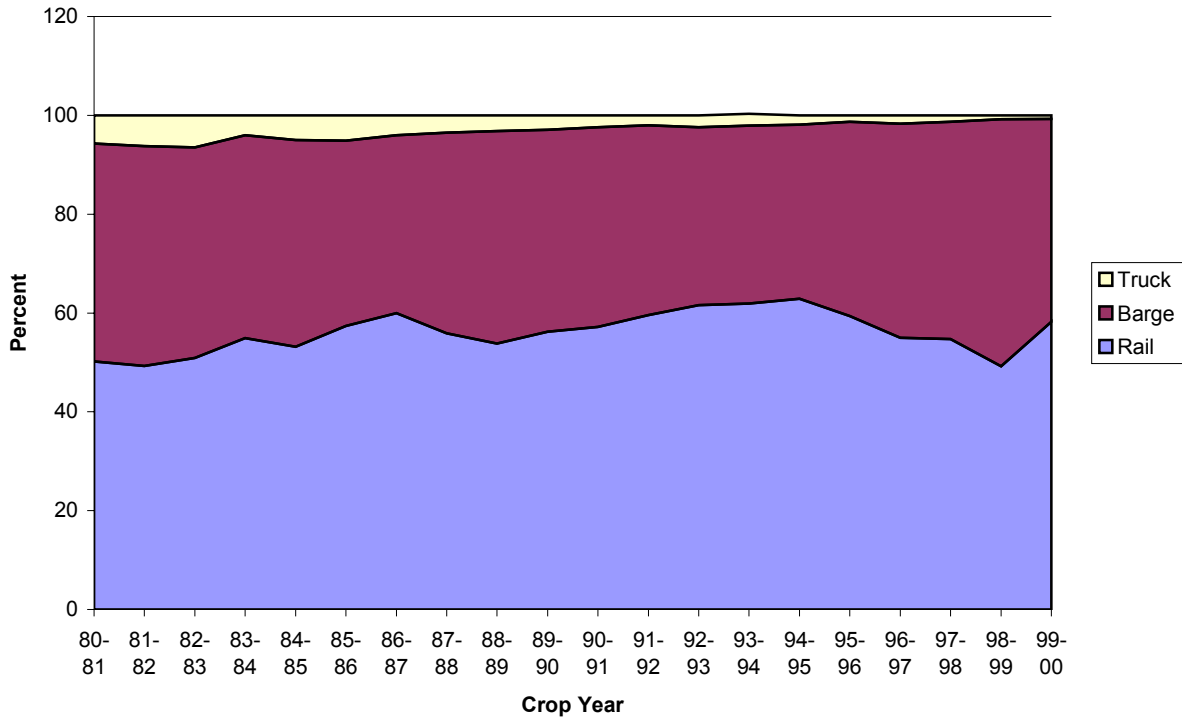


**Figure 8: Percent of Grain by Truck at Columbia River Export Terminals, 1980-81 to 1999-2000**





**Figure 9: Percent of Grain by Rail, Barge and Truck at Columbia River Export Terminals, 1980-81 to 1999-2000**



### General Relationships

A better understanding of receipts by mode can be generated by considering source and volume of grain receipts, providing further insight into the overall shipping pattern. Truck is obviously used mainly for local gathering near the export elevators and the relative amount of this volume is decreasing. Most of the barge movements come from the Pacific Northwest states of Idaho, Washington, and Oregon. Substantial shipments in the early 1980's originated from Montana and the Dakotas. The advent of unit trains (100 cars), occasioned by the Staggers Rail Act of 1980, decreased those movements in the early 90's. It is also noticeable from Figure 10 that rail volumes closely follow total volume. This suggests that rail volume is usually more stable than truck-barge; thus, truck-barge movements could be considered to be a mover of traffic that is residual after rail capacity is utilized. This is also related to some long haul movements by rail from the Midwest production areas. However, this relationship did not hold in 1996-97, 1997-98 and 1998-99 when rail problems may have softened rail service in favor of barge service.

Rail car shortages have been identified by numerous shippers and commodity organizations. Even in such periods of shortage, the ability of rail to provide service is evident, possibly reflecting the railroads' willingness to provide cars on those long haul, higher revenue moves from the Midwest. Such car shortages are obviously not as important in low volume years such as the past season. It is possible that, if railroads or shippers increase rail car numbers or relieve congestion, then the barge share of total receipts may decrease relative to rail. However, in times of high grain volumes the critical role played by barge transportation is evident. The reader is reminded that modal shares of receipts at export elevators do not indicate the relative modal importance from each production area; such analysis is beyond the scope of this report.

**Figure 10: Total Receipts of Grain Relative to Total Receipts by Rail at Colombia Export Terminals 1980-91 to 1998-99**

