

Grain Receipts at Columbia River Grain Terminals 1980-81 to 1998-99

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by

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EWITS Research Reports: Background and Purpose

This report is the twelfth 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 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 useful, therefore, 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 1998-99. The survey was done in Fall of 1999 by examination of actual firm records by R. C. Guimary 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, if 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.

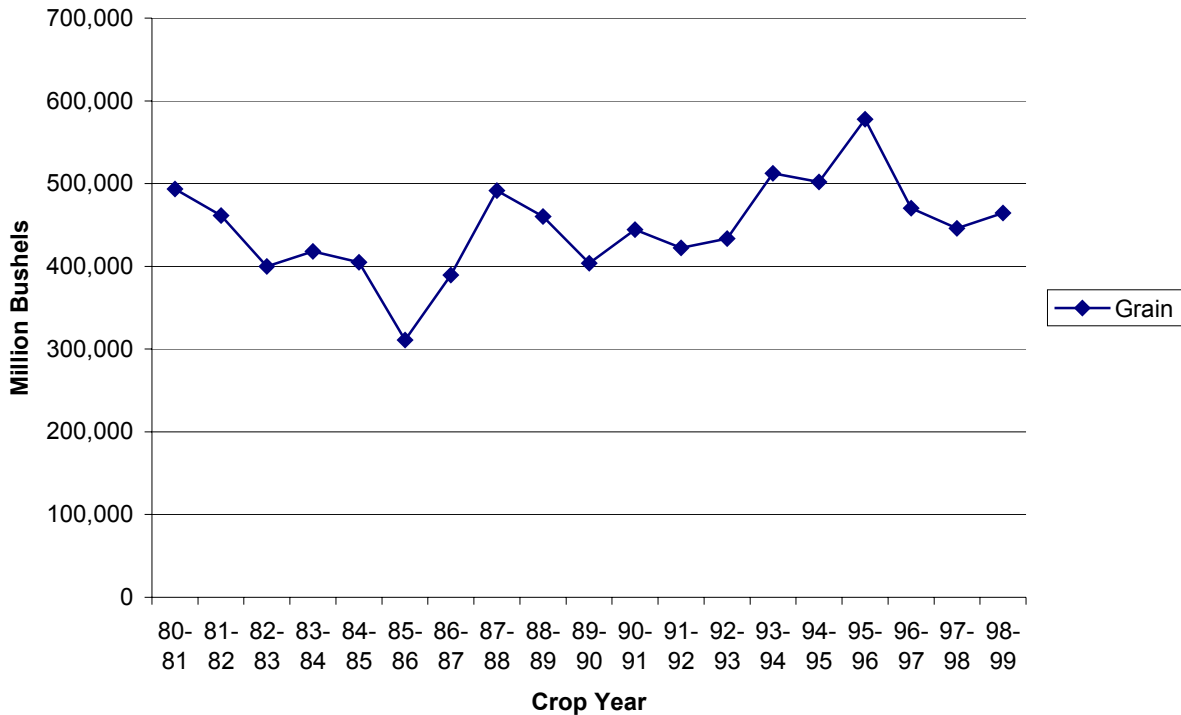
Volume of Shipments

The total grain receipts from the last 19 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. The total receipts increased by 4.2 %, to 464 million bushels in 1998-99. The general changes in the grain volume over the 18-year period from 1981-82 to 1998-99 are apparent with an average of 397 million over the first six years, 442 million over the next six years, and 495 million for the most recent six years. Within the last six years, exports ranged from a low of 434 million bushels to a high of 578 million bushels. Unpublished data (due to confidentiality) shows that in the 1998-99 crop year, 217,825,918 (46.9%) bushels of grain were received by Columbia River exporters and 246,813,179 (53.1%) bushels were received by Willamette River exporters. In 1995-96, the split was 41% and 59%, respectively, in 1996-97 the split was 45% and 55%, respectively, and in 1997-98 the split was 46% and 54% respectively.

Table 1--Receipts of Grain Transported by Mode, in Bushels, 1980-81 to 1998-99

Crop Year	Rail	Barge	Truck	Total
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

Figure 1: Total Receipts of Grain at Columbia River Export Terminals, 1980-81 to 1998-99



The volumes by each mode over this time period are also 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. Rail movements reflect the same decrease in the 85-86 crop year as total movements, but the strength in movements by rail is clear 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 8.5 % 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. 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 has increased dramatically by 99 % during the past 13 seasons and peaked at a record 232 million bushels during this 1998-99 season.

Receipts by truck showed a pronounced and steady decline over the 19-year study period, decreasing from 28 million in 1980-81 to a low of 3.4 million in 1998-99, with a small increase noted in 1996-97. Even in the record crop year of 1995-96, truck shipments showed a decrease in total volume of 18 % from the previous year. 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 1998-99

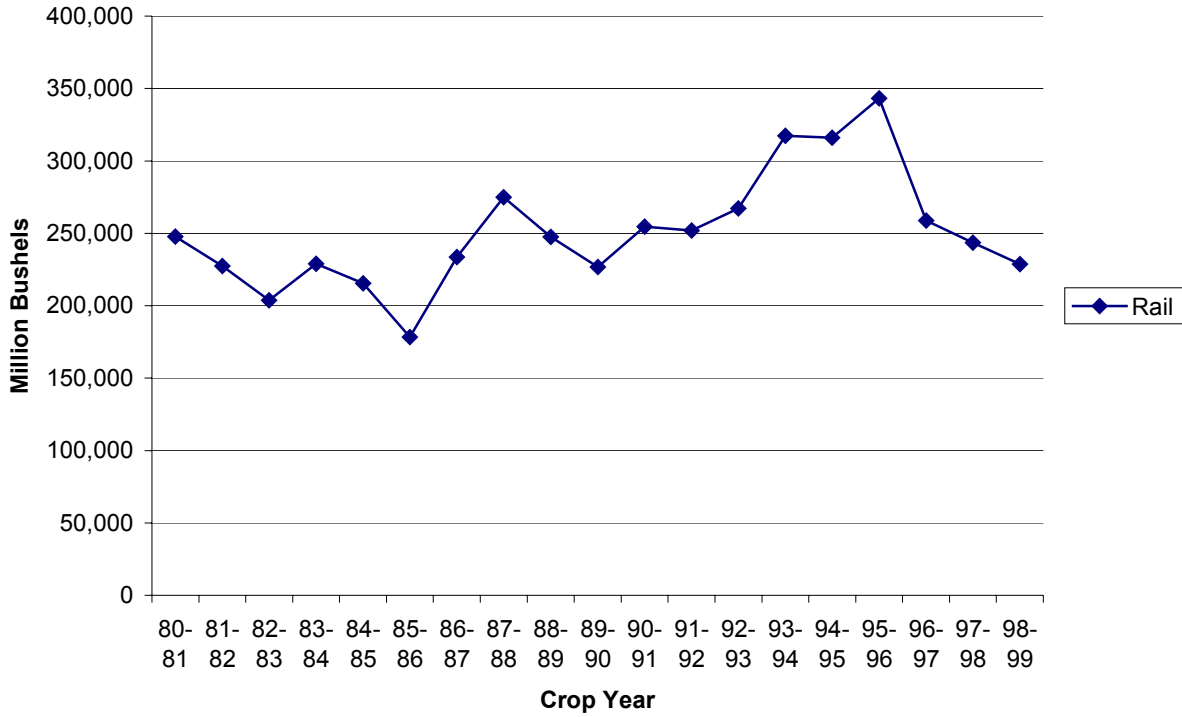


Figure 3: Receipts of Grain by Barge at Columbia River Export Terminals, 1980-81 to 1998-99

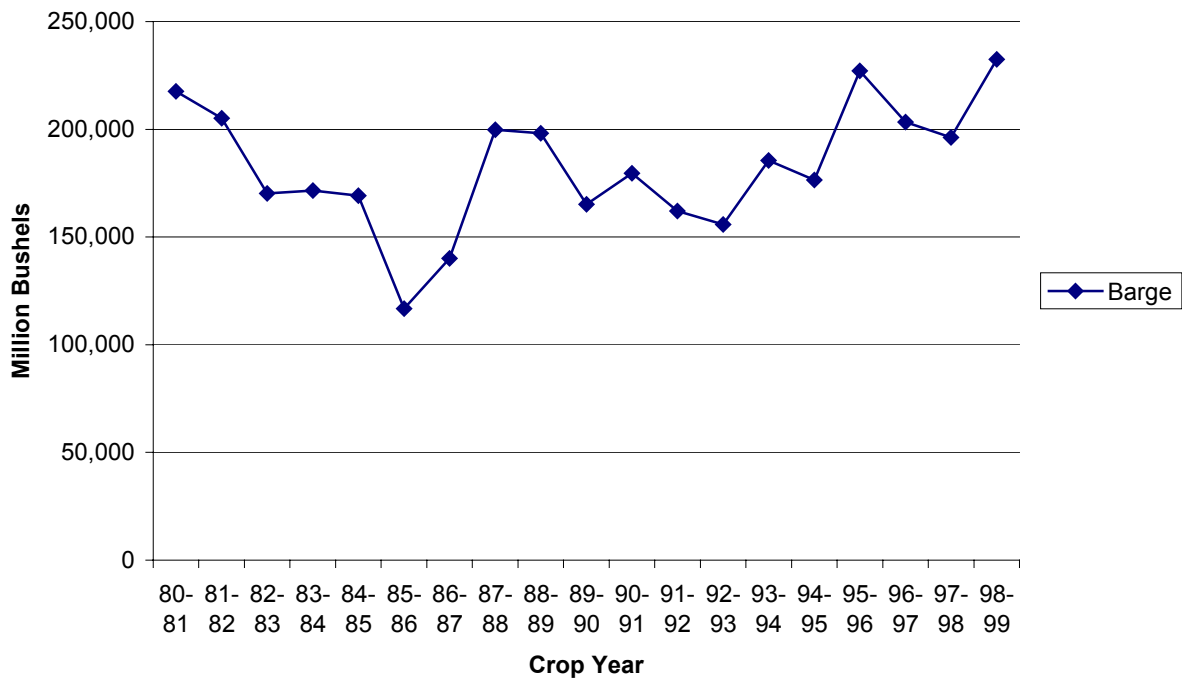


Figure 4: Receipts of Grain by Truck at Columbia River Export Terminals, 1980-81 to 1998-99

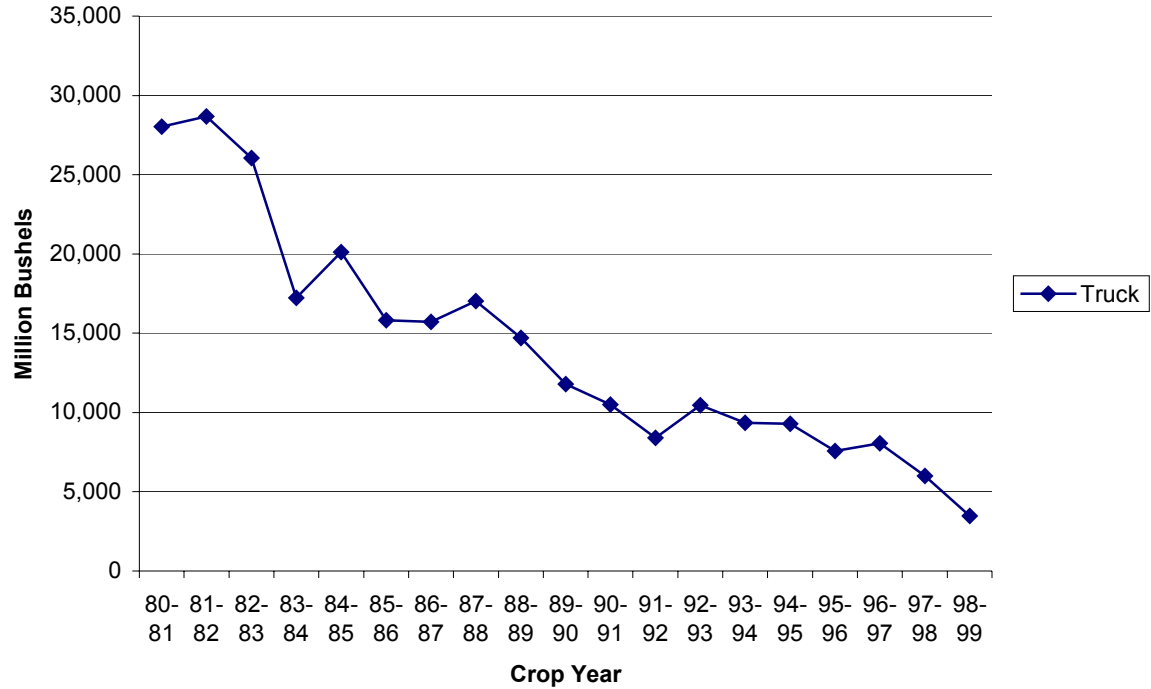
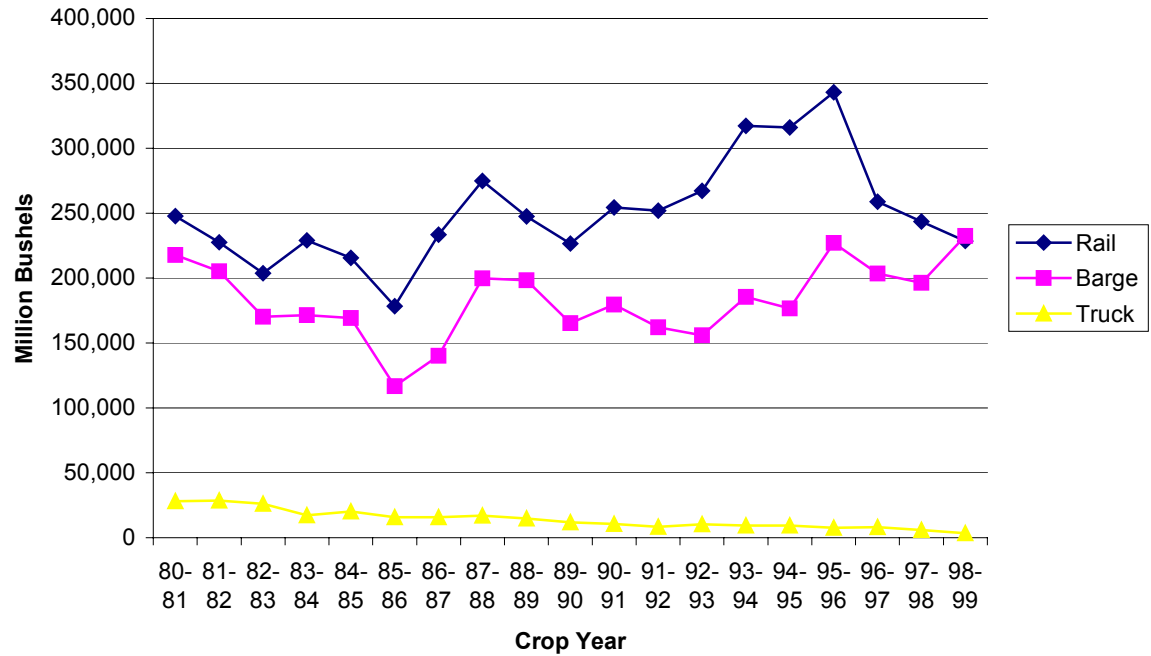


Figure 5: Receipts of Grain by Rail, Barge and Truck at Columbia River Export Terminals, 1980-81 to 1998-99



Grain Receipts by Modal Split

The arrival pattern of grain receipts, by mode, is indicated in Table 2 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 noticeable and continuing decrease in rail share over the last four years, falling to 49.2 % in 1998-99 (Figure 6).

Barge receipts have experienced a fairly steady increase in modal share, with a more pronounced resurgence during the past four 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, the percent of grain shipped by barge increased to 39%, an increase of 28% in volume over the previous year. In the following three seasons, the barge share continued a steady increase to 43.2%, 44% and 50 % respectively.

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 1986-86. As evidenced in Figure 9, the modal strength of rail during the past two decades is apparent. Yet, in the 1998-99 season, the volume transported by barge had grown to the point where for the first time, it was greater than rail volumes. In the most recent year the modal split was rail - 49.2%, barge - 50% and truck - 0.8%.

Table 2--Percent of Grain Transported by Mode, 1980-81 to 1998-99.

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

Figure 6: Percent of grain by Rail to Columbia River Export Terminals, 1980-81 to 1998-99

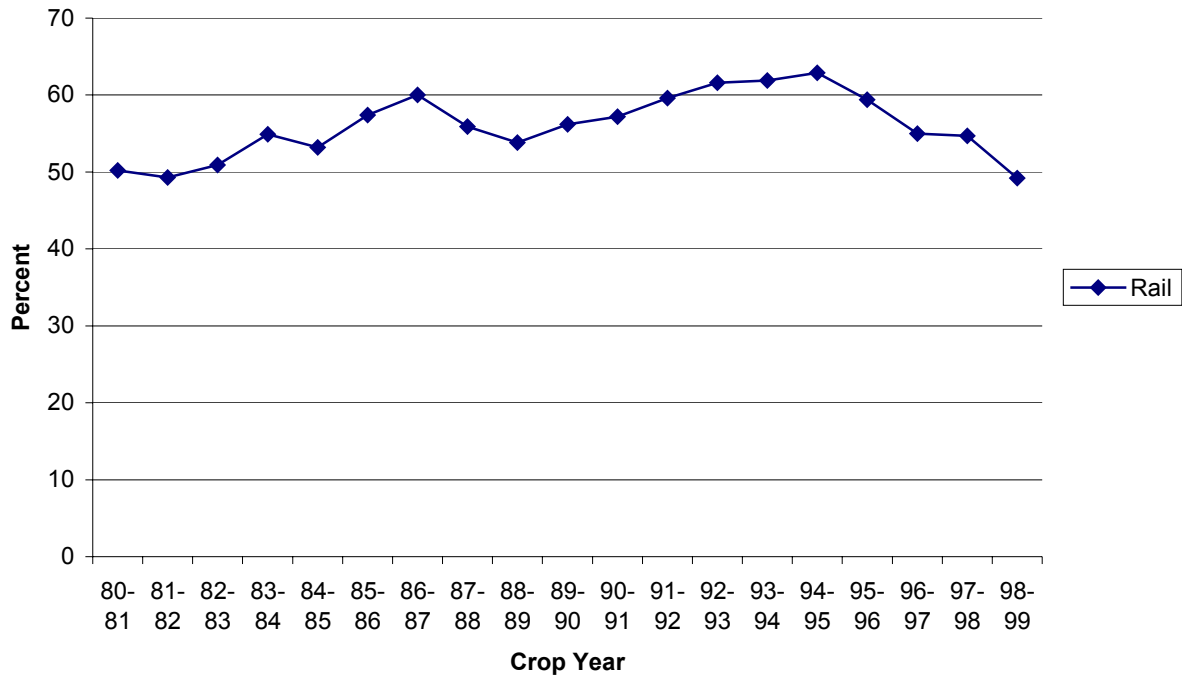


Figure 7: Percent of Grain by Barge at Columbia River Terminals, 1980-81 to 1998-99

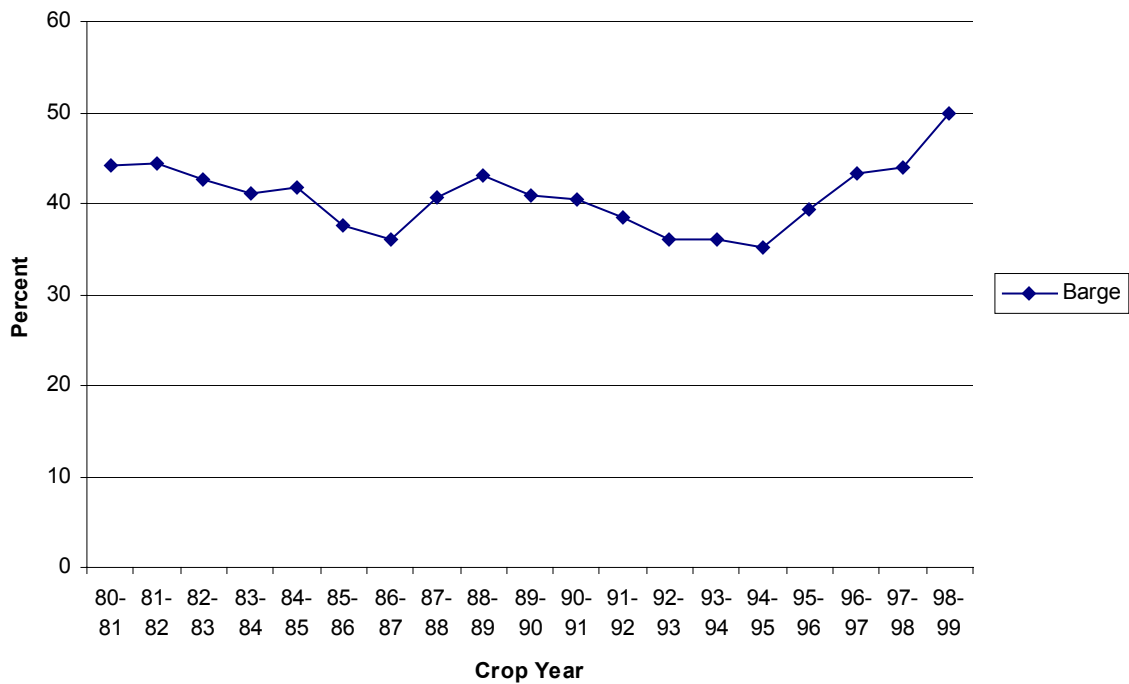


Figure 8: Percent of Grain by Truck at Columbia River Export Terminals, 1980-81 to 1998-99

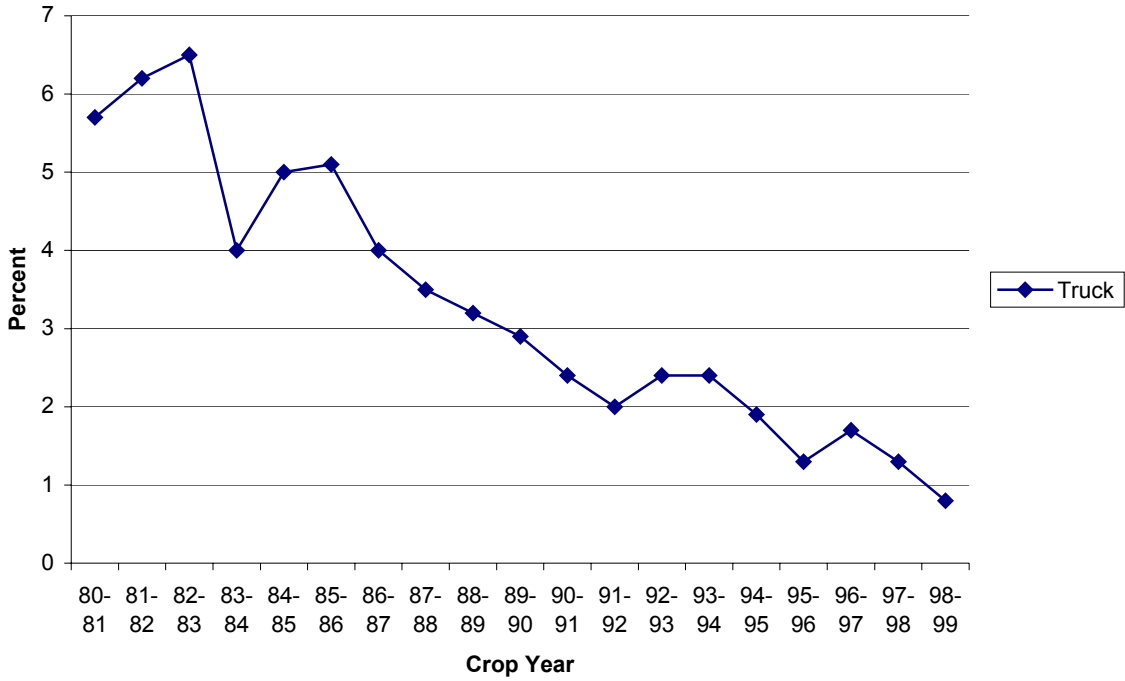
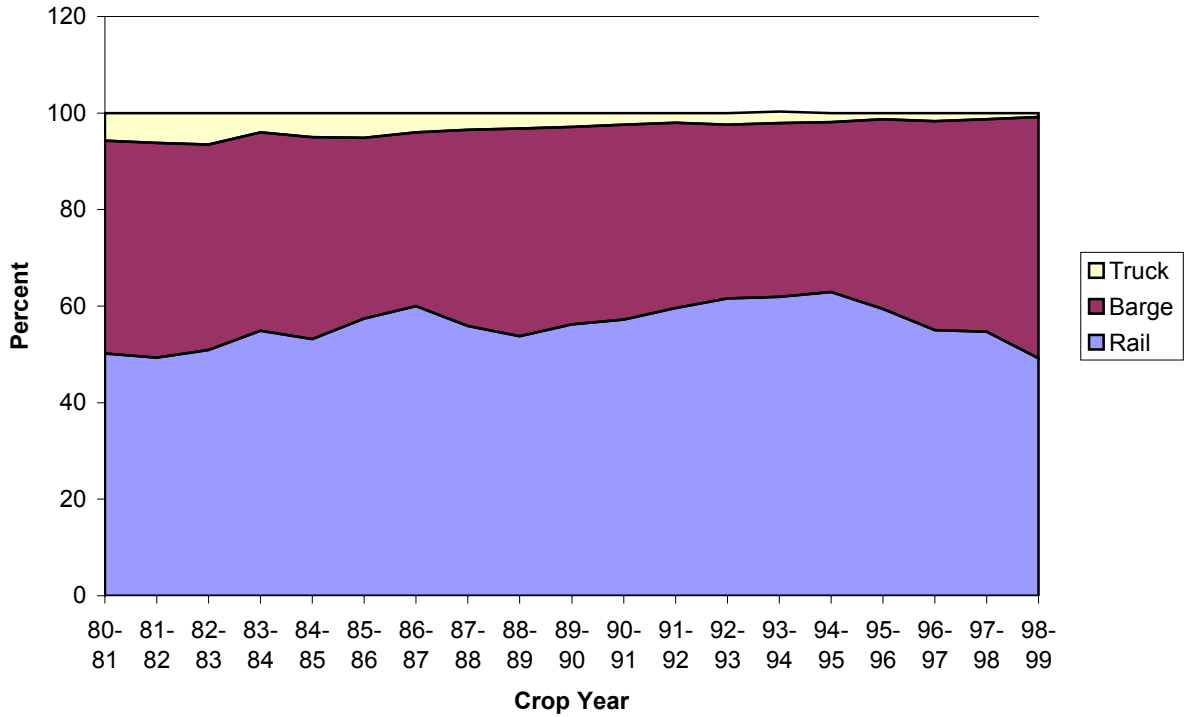


Figure 9: Percent of Grain by Rail, Barge and Truck at Columbia River Export Terminals, 1980-81 to 1998-99



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. It is possible that, if railroads or shippers increase rail car numbers or relieve the current congestion, barge share of total receipts may decrease relative to rail. However, at this time the critical role played by barge transportation is evident and is increasing. 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

