Economic Evaluation of Grain Shipment Alternatives: A Case Study of the Coulee City and Palouse River Railroad

EWITS Working Paper Number 8
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by

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EWITS Research Reports:
Background and Purpose

This report is the sixth in a series of Working Papers current topics related to the mission of the Eastern Washington Intermodal Transportation Study (EWITS)) to accompany EWITS reports providing information on 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, Regional Administrator (WSDOT, Eastern Region), Richard Larson (WSDOT, South Central Region); Don Senn (WSDOT, North Central Region); Charles Howard (WSDOT, Planning Manager), and Jay Weber (Douglas County Commissioner 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 Working Paper, please contact Ken Casavant at the following address:

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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. 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.

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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.

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5. Jessup, Eric L. and John Ellis. "Estimating the Value of Rail Car Accessibility for Grain Shipments: A GIS Approach." EWITS Working Paper #5, April 1996.

6. Painter, Kathleen M. "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.

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Introduction

Governments often are encouraged to intervene in the market whenever the expected outcome without intervention is less desirable than with some assisted direction. Perfectly competitive markets generally produce economic efficient outcomes, but don't always account for all costs assumed by market participants. Whenever these externalities arise, and in large enough magnitude, some state or federal interest or involvement in a public-private venture is often considered.

The current situation involving the recent rail line sales in Eastern Washington presents a timely example. The recently merged Burlington Northern Santa Fe (BNSF) railroad has sold 277 miles of light density rail lines this year. BNSF, similar to most businesses, is primarily concerned with profit and generating positive dividends for its shareholders, and therefore acts in accordance with achieving this goal. The two branch lines from Coulee City to Cheney and Marshall to Pullman transport and connect agricultural and forest products from remote rural locations to processing facilities and markets, both domestic and abroad. Unfortunately, the volume of rail traffic on these branch lines evidently wasn't substantial enough for BNSF to consider them profitable long-term investments. But for a smaller railroad (a short-line rail company such as the Coulee City and Palouse River Railroad) the potential volume of rail traffic (which may increase or decrease over time) may be adequate enough for these lines to be profitable long term investments. Short-line railroads are free of many labor and regulatory requirements that large Class I railroads must adhere to, thereby giving them greater operational flexibility on track maintenance and upkeep. The smaller railroads are also typically regionally located and more aware of the local shipper's needs and in a better position to service those local needs, thus building greater shipper support and confidence, and ultimately rail traffic.

Any short-line railroad also operates with the need to make a profit and seeks to maximize profits whenever the opportunity exists. Often when short-line railroads purchase rail lines, the debt burden is relatively large and the rehabilitation costs of certain portions of the rail lines are extremely high. In an attempt to relieve some financial pressure, the short-line will sometimes reorganize rail flows by focusing their attention and efforts on the most promising sections of the rail lines at the expense of the least promising and most expensive to maintain portions. By dismantling and selling assets from the deteriorated portion of the rail line, the short-line can reduce debt and increase their ability to maintain the more promising portions of the rail line. In the worse case scenario, where the rehabilitation and maintenance for the entire rail line is too high, the entire rail line may be "scrapped".

This raises concern for at least three primary constituencies: 1)grain shippers (farmers), 2)Washington State Department of Transportation (WSDOT) officials, and 3)taxpayers and consumers. Grain farmers and handlers are concerned about higher transportation costs for shipping their grain to market in the absence of rail. Higher transportation costs translates into lower net price per bushel received for their product, and therefore smaller profit margins. In the absence of nearby rail, grain shippers can either transport grain via truck to another facility for rail loading or ship the grain via truck to a river port for barge transport. In either case, an identifiable increase in transportation cost is expected.

Washington State DOT officials are concerned about the increased truck traffic on state and local highways in the absence of rail. As planners and providers for the state's future transportation needs and infrastructure requirements, the prospect of accelerated highway deterioration from grain truck shipments causes some trepidation within the state DOT, especially given sooner than anticipated highway rehabilitation needs, at a time of dwindling highway rehabilitation funds.

Increased truck traffic on state and local highways also raises safety and environmental issues, as well as the question of who will pay for forthcoming road maintenance needs. Taxpayers and consumers are increasingly becoming more energy and environmentally cognizant and less tolerant of both energy and environmental waste. Transporting one bushel of grain for long distances requires considerably more energy (and therefore generates more emissions) with truck transport than with rail. However, barge transport is generally considered more energy efficient than either truck or rail. Consumers and taxpayers are also concerned with the possibility of increased taxes levied on the general population to generate funds for addressing road and highway needs and equally concerned about similar tax funds used to purchase rail lines and/or grain cars.

The costs that are not accounted for via the market transaction in this situation are actually external to the line sales and private firm decision making, hence the economic term "externality". They involve the potential increased expenditures on selected highways to support the increased traffic should partial or total abandonment occur, and the safety and environmental risks associated with this event.

The bottom line is that there are no quick and easy answers to this dilemma and many questions exists. This brief and targeted research effort is aimed at providing information that may facilitate discussions working toward answers to these questions and solutions in this region.

Study Objectives

The overall goal of this study is to investigate the characteristics of grain shipments for elevators located on the recently sold Coulee City to Cheney and Marshall to Pullman rail lines and calculate changes in shipping patterns and routes if rail service is eliminated or improved on these lines. The specific objectives are:

1. Compile, review and analyze previously existing data and information on grain movements and operating characteristics of elevators served by the Coulee City to Cheney line and the Marshall to Moscow line.

2. Survey all elevators on these lines to determine current volumes, port facilities used (river and ocean), transportation mode choice, reasons for that choice, destinations, and total cost from the elevator (rates plus ancillary costs such as grading, inspections, elevations, etc.) by rail and by a truck/barge combination.

3. Determine likely transportation routing (specific highway segments) and costs if rail service is lost at each elevator and determine the transportation routing during times of inadequate or adequate car supply.

4. Identify the net impact to shippers (marginal cost increases including shipping and handling costs) if rail service is discontinued at these locations.

5. Prepare a final report detailing the information obtained, analysis of those data, and conclusions drawn.

Method

The initial information provided in this study originates from the 1993 Eastern Washington Road Needs Survey sent to over 400 grain elevators in Eastern Washington. The survey provided detailed information concerning grain movements, by mode, in addition to shipping rates and handling charges. Updated information on the specific elevators located on rail lines proposed for sale was obtained from detailed phone surveys in September, 1996 to each grain company owning each facility. Questionnaire design for the phone survey allowed identification of updated grain flow volumes, modal usage and transportation and handling charges. In addition, questions concerning where and how grain would be shipped if shippers had either unlimited car availability or no rail service on the two branch lines were investigated. All Eastern Washington rail lines, and those elevators with rail access, are displayed in Figure 1. Elevators located on recently sold rail lines, and the focus of this study, are displayed in Figure 2.

Figure 1: Eastern Washington Rail Lines and Elevators with Rail Access

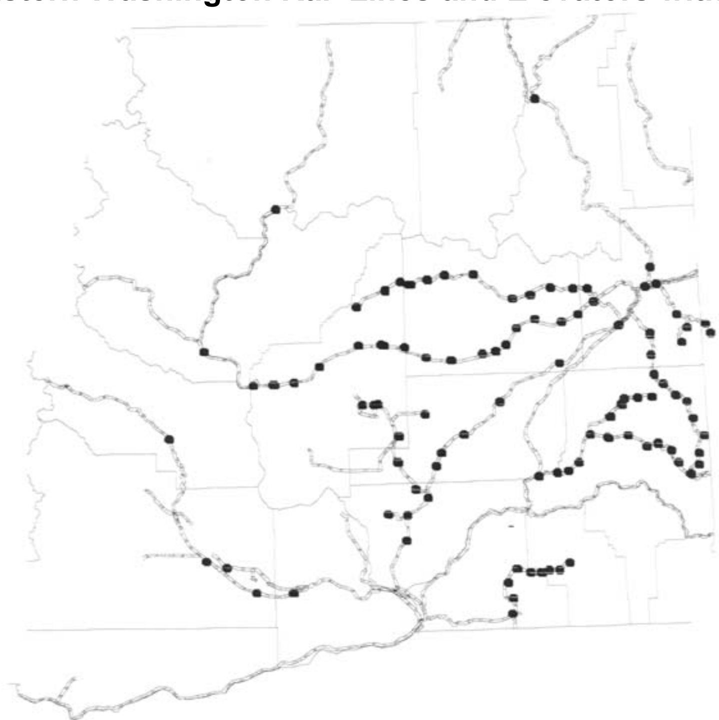
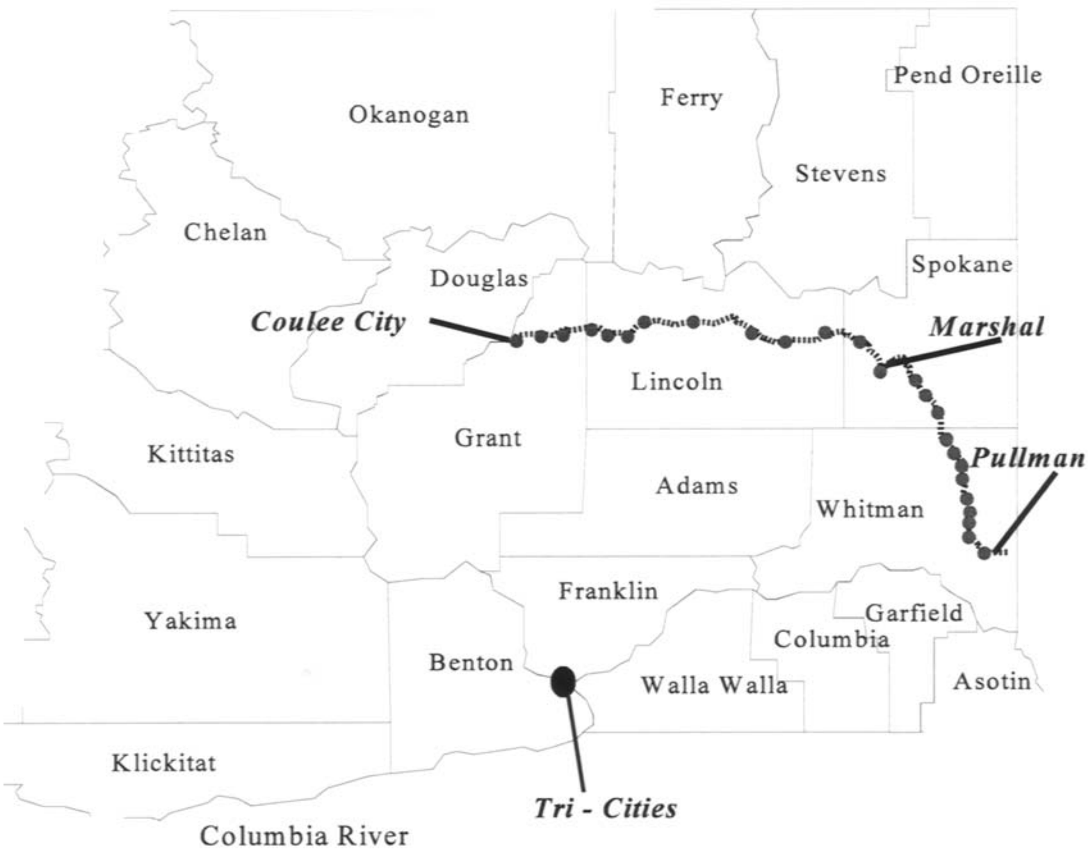


Figure 2: Elevators Situated on Recently Sold Lines



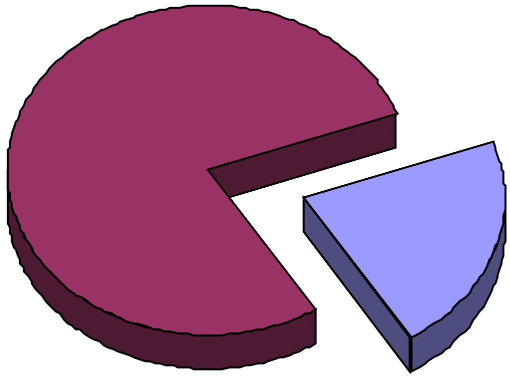
Data specific to each elevator are not revealed in this report due to promised confidentiality. The analysis involves only the grain which moves through those elevators located on the two branch lines and offers three scenarios including: 1) the present grain flow situation, 2) grain flows if elevators had unlimited access to grain cars, and 3) grain flows if rail service on the two branch lines ceased. Each scenario includes modal distribution and shipper transportation costs.

Results

It is first useful to provide some perspective on the actual amount of grain handled by elevators situated on the two branch lines, especially in relation to the total amount of grain handled by all elevators in Eastern Washington, as displayed in Figure 3 (see scenario results in Appendix tables A-1 to A-3). Approximately 111,309,188 bushels of wheat pass through elevators annually in Eastern Washington. Twenty-two percent of this volume (24,154,246 bu.) comes from elevators located on the two branch lines, representing a sizeable amount of the state production. The remainder of this analysis focuses on this 24 million bushels of wheat, identifying how this grain currently moves and the cost to grain shippers for transporting the grain using, various modes.

Figure 3: Proportion of Wheat Handled by Elevators on Branch Lines

Total Volume for All Eastern Washington Elevators = 111,309,188

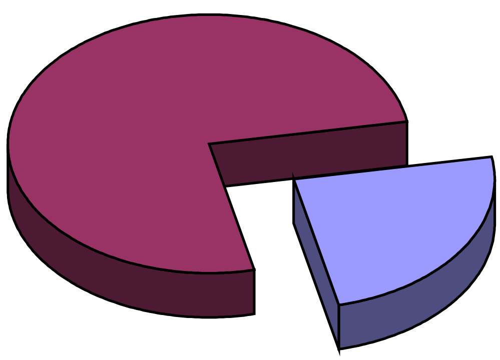


Scenario I. Current Situation

The dependency of these elevators on rail is quickly evident. The large majority of grain leaving elevators located on the two branch lines is shipped via rail, as illustrated in Figure 4. Seventy-six percent of the wheat volume (18,300,741 bu.) utilizes rail transport, with the remaining 24 percent (5,853,505 bu.) transported via truck-barge.

Figure 4: Modal Distribution

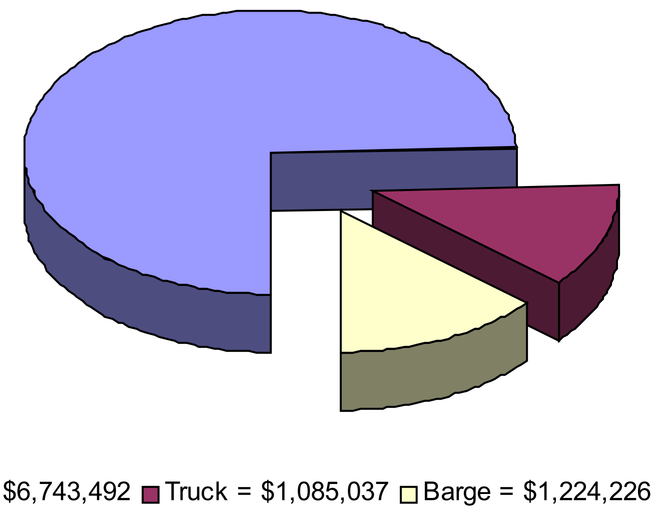
Total Wheat Volume = 24,154,246 bushels



The transportation cost to ship this volume from elevators to market using current truck, rail and barge rates is $9,052,794, as displayed in Figure 5 (see Appendix Table A-1 for rates). The largest portion of this transportation cost is from rail shipments ($6,743,492), as expected from the considerably larger volume utilizing rail. The remaining $2,309,303 is divided between truck and barge transport. The weighted[1] average shipping rates for truck-barge and rail shipments were 39.45 and 36.84 cents/bushel, respectively. The 2.61 cents/bushel differential represents the marginal change in cost of shipping wheat via truck-barge instead of rail for the elevators on these lines.

Figure 5: Shipper Cost by Mode

Total Transportation Costs = $9,052,794



Certain Eastern Washington highways are extremely important for truck shipments from elevators to river ports, and especially for those elevators located on the Coulee City or Palouse rail line, as displayed in Table 1. The river port facilities, and the highways traversed to reach those ports, are identified for each elevator on the Coulee City and Palouse rail line. Fourteen different highways are utilized for truck shipments to river ports. North-South routes (odd number highways) are utilized more than East-West routes (even number highways), as expected.

[1]Weighted by the actual volume of grain shipped via each mode.

Table 1--Important Highways to River Ports for each Elevator on Sold Lines

Elevator Code	River Port	Important Highways
1	Pasco	SR21, SR395, SR2
2	Pasco	SR21, SR395, SR2
3	Pasco	SR21, SR395, SR2
4	Pasco	SR17, SR395, SR2
5	Almota	SR27, SR194
6	Almota	SR27, SR194
7	Windust	SR21, SR2, SR263
8	Pasco	SR17, SR395
9	Windust	SR21, SR2, SR263
10	Windust	SR21, SR263
11	Windust	SR21, SR28, SR263
12	Windust	SR21, SR28, SR263
13	Central Ferry	SR27, SR272, SR127, SR26
14	Windust	SR21, SR28, SR263
15	Windust	SR21, SR28, SR263
16	Central Ferry	SR127, SR26, SR272
17	Almota	SR27, SR194
18	Windust	I90, SR231, SR21, SR263
19	Windust	I90, SR231, SR21, SR2
20	Windust	I90, SR231, SR21, SR2
21	Central Ferry	SR195, SR127, SR26
22	Central Ferry	SR195, SR127, SR26
23	Central Ferry	SR195, SR127, SR26
24	Almota	SR27, SR194
25	Almota	SR194, SR27
26	Almota	SR194

SR 195, 395 and 26 receive most of the traffic. If rail service is lost, these highways will experience the majority of the road impacts.

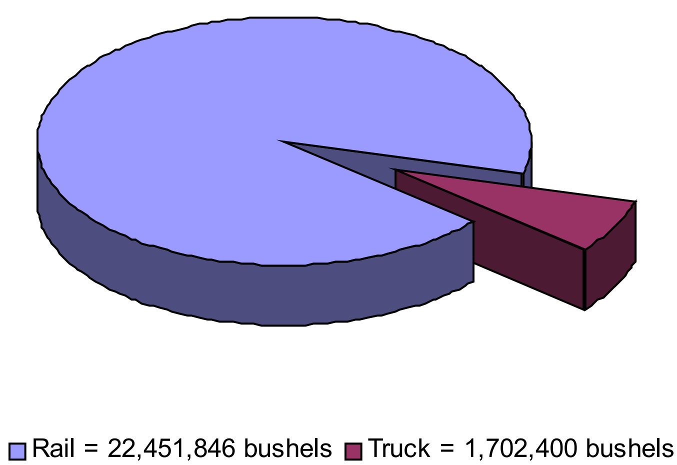
<u>Scenario II. Unlimited Access to Grain Cars for Rail Shipments</u>

The first scenario identified actual grain movements by mode and the cost associated with each movement for current grain flows from elevators located on the two branch lines. Scenario II offers a more optimistic view where grain shippers are not constrained by the availability of grain rail cars. In reality, shippers do face significant rail car shortages during critical time periods throughout the year, which forces grain to be moved truck-barge that would otherwise utilize rail transport. This scenario should provide a rough estimate of potential rail volume given adequate rail car availability. It also identifies the annual cost of not having rail cars available for the movements on these lines.

The total volume of grain handled by elevators on the two branch lines is still 24,154,246 bushels, but the modal distribution is different, as illustrated in Figure 6. Ninety-three percent (22,451,846 bu.) of the grain volume is shipped using rail and only 7 percent (1,702,400 bu.) moves to market using truck-barge, based on using the mode with the lowest transportation rate.

Figure 6: Modal Distribution

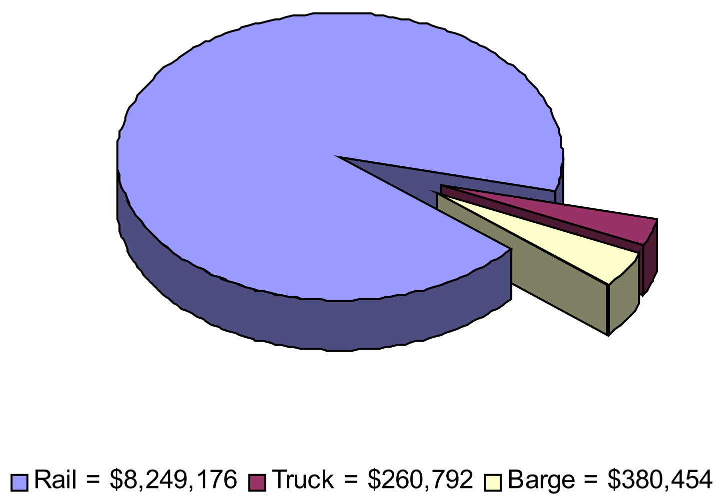
Total Wheat Volume = 24,154,246 bushels



The total transportation cost with this scenario is considerably less than the first scenario where rail car shortages forced non-optimal grain movements. With no rail car constraints, the transportation cost is $8,890,423, as illustrated in Figure 7. Grain shippers realize $162,371 transport cost savings when grain cars are available. The weighted average shipping rate for truck-barge and rail movements is 37.66 cents/bushel and 36.74 cents/bushel, respectively. The narrower margin between truck-barge and rail rates reflects the more efficient distribution of grain to each mode.

Figure 7: Shipper Cost by Mode

Total Transportation Costs = $8,890,423

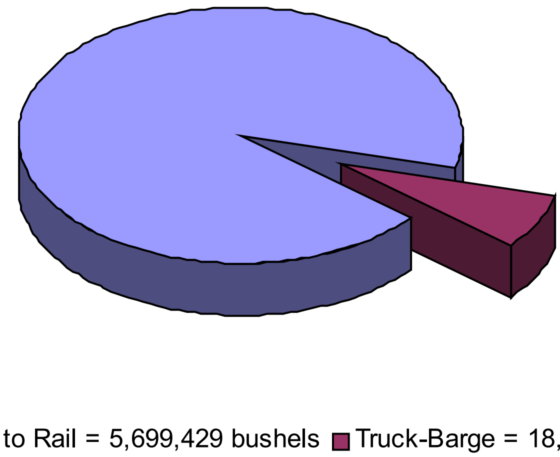


Scenario III. No Rail Shipments on the Coulee City or Palouse Branch Lines

The final scenario considers the situation of complete rail abandonment on the two branch lines. Hence, no grain shipments may be shipped via rail on these two lines. That leaves basically two alternatives for grain shippers to transport grain to market: 1) truck-barge and 2) tranship to another rail facility on the main rail line. The large majority of grain would utilize truck-barge transport (76 percent or 18,454,817 bushels), as presented in Figure 9, because it is the lowest transportation rate. Approximately 28 percent (5,699,429 bushels) would be transhipped to another facility for rail loading. However, elevator managers' responses indicated that the amount transhipped to another facility would be greater if not for the capacity constraints at the transhipment destination. Thus with added capacity in the region, larger volumes would be transhipped and overall transportation cost will go down.

Figure 8: Modal Distribution

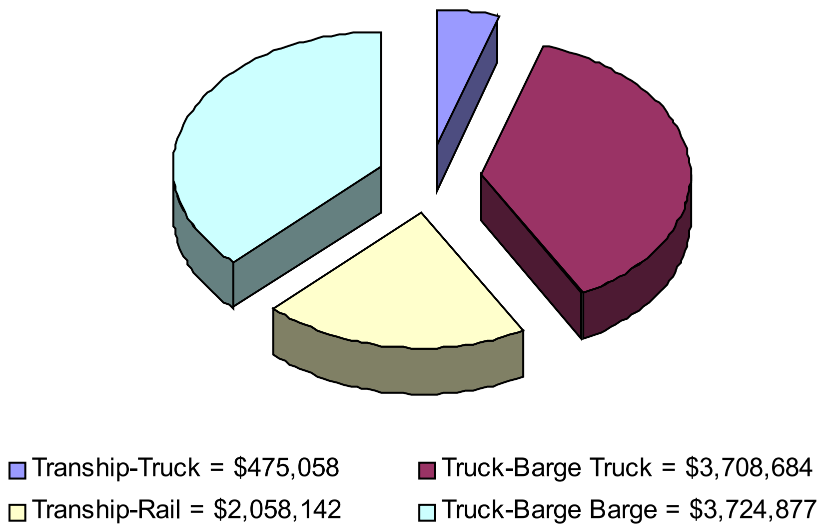
Total Wheat Volume = 24,154,246 bushels



The total cost to transport grain to market increases significantly to $9,966,760 with branch line abandonment. This is more than a ten percent increase in shipper transport cost from the $9 and $8.8 million in scenarios I and II. Seventy-four percent of the cost ($7,429,561) is attributed to truck-barge shipments, as displayed in Figure 9. The remaining 26 percent ($2,533,200) is due to truck transhipment and rail charges. The weighted average shipping rate for truck-barge shipments is 40.28 cents/bushel, almost a cent and a half greater than when rail and cars were available. For grain that is transhipped to another rail facility the shipping rate is 44.45 cents/bushel, almost eight cents greater than the previous scenario. Truck transhipment was 8.34 cents/bushel and 36.11 cents/bushel was due to rail charges at the transhipment point.

Figure 9: Shipper Cost by Mode

Total Transportation Costs = $9,966,760



Summary and Conclusions

This analysis has provided information on current wheat flows from elevators located on the two branch lines for sale, detailing modal usage, shipper cost and infrastructure impacts. In addition, two scenarios considering unlimited rail car availability and no rail shipments on the two branch lines were included to offer greater understanding of changes in transportation cost and infrastructure impacts, should either scenario occur in part or full.

The current rate difference between rail and truck-barge is 2.61 cents/bushel, weighted by volume. The optimal scenario for grain shippers is scenario II, where unlimited access to rail cars exists and the two branch lines remain in full operation. Transportation cost to shippers is considerably lower ($162,371) than with the other two scenarios and infrastructure impacts negligible in comparison. Maintaining the current grain flow situation suggests fairly significant increases in transportation cost to shippers and infrastructure impacts as more grain is shipped via truck to river ports. If rail line abandonment occurs on these two branch lines and shippers are forced to use truck-barge and transhipment alternatives, significant increases in shipper cost ($913,966) and infrastructure impacts can be expected.

Appendix A

Table A1--Wheat Volume and Transportation Rates* for Elevators on Sold Rail Lines

Elevator Code	County	Wheat Volume (bu)	Truck Rate to River cents/bushel	Barge Rate cents/bushel	Truck Barge cents/bushel	Rail Rate cents/bushel
1	Lincoln	0	24	19.1	43.1	38
2	Lincoln	640,000	24	19.1	43.1	38
3	Lincoln	240,000	23	19.1	42.1	38
4	Grant	221,000	25	19.1	44.1	38
5	Whitman	320,000	14	22.4	36.4	36
6	Whitman	282,000	14	22.4	36.4	36
7	Lincoln	923,374	24	19.1	43.1	37.5
8	Grant	2,358,512	23	19.1	42.1	37.5
9	Grant	2,216,992	25	19.1	44.1	37.5
10	Lincoln	1,947,118	23	19.1	42.1	37.5
11	Lincoln	2,000,000	21	19.1	40.1	37
12	Lincoln	1,400,000	23	19.1	42.1	37
13	Whitman	1,274,806	14	22.31	36.31	32
14	Lincoln	533,126	22.7	19.1	41.8	37
15	Lincoln	335,094	21	19.1	40.1	37
16	Whitman	400,000	15	22.31	37.31	36
17	Whitman	600,000	12	22.4	34.4	36
18	Spokane	624,000	23	19.1	42.1	39
19	Spokane	1,046,760	23	19.1	42.1	39
20	Lincoln	3,166,000	23	19.1	42.1	39
21	Whitman	440,000	18	22.31	40.31	32
22	Spokane	1,000,000	18	22.31	40.31	32
23	Whitman	564,000	18	22.31	40.31	32
24	Whitman	1,578,464	10	22.4	32.4	32.8
25	Whitman	3,000	10	22.4	32.4	32.8
26	Whitman	40,000	10	22.4	32.4	32.8
Totals		24,154,246	19	20	40	36

Table A2--Current Grain Flows from Elevators on Sold Lines

Elevator Code	County	Total Wheat Volume (bu)	Truck Barge Volume (bu)	25/26 Rail Volume (bu)	Total Cost Truck	Total Cost Barge	Truck Barge Sum	Total Cost Rail	Total Transport Cost
1	Lincoln	0	0	0	0	0	0	0	0
2	Lincoln	640,000	32,000	608,000	7,680	6,112	13,792	231,040	244,832
3	Lincoln	240,000	12,000	228,000	2,760	2,292	5,052	86,640	61,692
4	Grant	221,000	11,050	209,950	2,763	2,111	4,873	79,781	84,654
5	Whitman	320,000	320,000	0	44,800	71,680	116,480	0	116,480
6	Whitman	282,000	282,000	0	39,480	63,168	102,648	0	102,648
7	Lincoln	923,374	18,467	904,907	4,432	3,527	7,959	339,340	347,299
8	Grant	2,358,512	47,170	2,311,342	10,849	9,010	19,859	866,753	886,612
9	Grant	2,216,992	44,340	2,172,652	11,085	8,469	19,554	814,745	834,298
10	Lincoln	1,947,118	38,942	1,908,176	8,957	7,438	16,395	715,566	731,961
11	Lincoln	2,000,000	400,000	1,600,000	84,000	76,400	160,400	592,000	752,400
12	Lincoln	1,400,000	280,000	1,120,000	64,400	53,480	117,880	414,400	532,280
13	Whitman	1,274,806	509,922	764,884	71,389	113,764	185,153	244,763	429,916
14	Lincoln	533,126	0	533,126	0	0	0	197,257	197,257
15	Lincoln	335,094	0	335,094	0	0	0	123,985	123,985
16	Whitman	400,000	280,000	120,000	42,000	62,468	104,468	43,200	147,668
17	Whitman	600,000	420,000	180,000	50,400	94,080	144,480	64,800	209,280
18	Spokane	624,000	218,400	405,600	50,232	41,714	91,946	158,184	250,130
19	Spokane	1,046,760	366,366	680,394	84,264	69,976	154,240	265,354	419,594
20	Lincoln	3,166,000	1,108,100	2,057,900	254,863	211,647	466,510	802,581	1,269,091
21	Whitman	440,000	286,000	154,000	51,480	63,807	115,287	49,280	164,567
22	Spokane	1,000,000	650,000	350,000	117,000	145,015	262,015	112,000	374,015
23	Whitman	564,000	366,600	197,400	65,988	81,788	147,776	63,168	210,944
24	Whitman	1,578,464	157,846	1,420,618	15,785	35,358	51,142	465,963	517,105
25	Whitman	3,000	300	2,700	30	67	97	886	983
26	Whitman	40,000	4,000	36,000	400	896	1,296	11,808	13,104
Totals		24,154,246	5,853,505	18,300,741	1,085,037	1,224,266	2,309,303	6,743,492	9,052,794

Table A3--Grain Flows with Unlimited Access to Grain Rail Cars

Elevator Code	County	Total Wheat Volume (bu)	Truck Barge Unlimited Cars	25/26 Unit Rail with Unlimited Car	Total Cost Truck	Total Cost Barge	Truck Barge Sum	Total Cost Rail	Total Transport Cost
1	Lincoln	0	0	0	0	0	0	0	0
2	Lincoln	640,000	0	640,000	0	0	0	243,200	243,200
3	Lincoln	240,000	0	240,000	0	0	0	91,200	91,200
4	Grant	221,000	0	221,000	0	0	0	83,980	83,980
5	Whitman	320,000	160,000	160,000	22,400	35,840	58,240	57,600	115,840
6	Whitman	282,000	141,000	141,000	19,740	31,584	51,324	50,760	102,084
7	Lincoln	923,374	0	923,374	0	0	0	346,265	346,265
8	Grant	2,358,512	0	2,358,512	0	0	0	884,442	884,442
9	Grant	2,216,992	0	2,216,992	0	0	0	831,372	831,372
10	Lincoln	1,947,118	0	1,947,118	0	0	0	730,169	730,169
11	Lincoln	2,000,000	0	2,000,000	0	0	0	740,000	740,000
12	Lincoln	1,400,000	0	1,400,000	0	0	0	518,000	518,000
13	Whitman	1,274,806	0	1,274,806	0	0	0	407,938	407,938
14	Lincoln	533,126	0	533,126	0	0	0	197,257	197,257
15	Lincoln	335,094	0	335,094	0	0	0	123,985	123,985
16	Whitman	400,000	280,000	120,000	42,000	62,468	104,468	43,200	147,668
17	Whitman	600,000	420,000	180,000	50,400	94,080	144,480	64,800	209,280
18	Spokane	624,000	0	624,000	0	0	0	243,360	243,360
19	Spokane	1,046,760	0	1,046,760	0	0	0	408,236	408,236
20	Lincoln	3,166,000	0	3,166,000	0	0	0	1,234,740	1,234,740
21	Whitman	440,000	154,000	286,000	27,720	34,357	62,077	91,520	153,597
22	Spokane	1,000,000	350,000	650,000	63,000	78,085	141,085	208,000	349,085
23	Whitman	564,000	197,400	366,600	35,532	44,040	79,572	117,312	196,884
24	Whitman	1,578,464	0	1,578,454	0	0	0	517,736	517,736
25	Whitman	3,000	0	3,000	0	0	0	984	984
26	Whitman	40,000	0	40,000	0	0	0	13,120	13,120
Totals		24,154,246	1,702,400	22,451,846	260,792	380,454	641,246	8,249,176	8,890,423

Table A4--Grain Flows with No Rail Service on the Coulee City and Palouse Lines

Elevator Code	County	Total Wheat Volume (bu)	Truck Barge (bu)	Truck to Other Houses Volume (bu)	Total Cost Truck	Total Cost Barge	Total Cost Truck from Tranship	Total Cost Rail from Tranship	Total Transportation Costs
1	Lincoln	0	0	0	0	0	0.00	0.00	0
2	Lincoln	640,000	153,600	486,400	36,864	29,338	24,320.00	175,104.00	265,626
3	Lincoln	240,000	57,600	182,400	13,248	11,002	9,120.00	65,664.00	99,034
4	Grant	221,000	53,040	167,960	13,260	10,131	8,398.00	60,465.60	92,254
5	Whitman	320,000	320,000	0	44,800	71,680	0.00	0.00	116,480
6	Whitman	282,000	282,000	0	39,480	63,168	0.00	0.00	102,648
7	Lincoln	923,374	878,129	45,245	210,751	167,723	2,262.27	16,967.00	397,703
8	Grant	2,358,512	2,242,945	115,567	515,877	428,402	5,778.35	43,337.66	993,396
9	Grant	2,216,992	2,108,359	108,633	527,090	402,697	5,431.63	40,737.23	975,955
10	Lincoln	1,947,118	1,851,709	95,409	425,893	353,676	4,770.44	35,778.29	820,118
11	Lincoln	2,000,000	1,040,000	960,000	218,400	198,640	48,000.00	345,600.00	810,640
12	Lincoln	1,400,000	728,000	672,000	167,440	139,048	33,600.00	241,920.00	582,008
13	Whitman	1,274,806	1,274,806	0	178,473	284,409	0.00	0.00	462,882
14	Lincoln	533,126	533,126	0	121,020	101,827	0.00	0.00	222,847
15	Lincoln	335,094	335,094	0	70,370	64,003	0.00	0.00	134,373
16	Whitman	400,000	400,000	0	60,000	89,240	0.00	0.00	149,240
17	Whitman	600,000	600,000	0	72,000	134,400	0.00	0.00	206,400
18	Spokane	624,000	299,520	324,480	68,890	57,208	38,937.60	116,812.80	281,848
19	Spokane	1,046,760	502,445	544,315	115,562	95,967	65,317.82	195,953.47	472,801
20	Lincoln	3,166,000	1,519,680	1,646,320	349,526	290,259	197,558.40	592,675.20	1,430,019
21	Whitman	440,000	363,000	77,000	65,340	80,985	6,930.00	27,720.00	180,975
22	Spokane	1,000,000	825,000	175,000	148,500	184,058	15,750.00	63,875.00	412,183
23	Whitman	564,000	465,300	98,700	83,754	103,808	8,883.00	35,532.00	231,977
24	Whitman	1,578,464	1,578,464	0	157,846	353,576	0.00	0.00	511,422
25	Whitman	3,000	3,000	0	300	672	0.00	0.00	972
26	Whitman	40,000	40,000	0	4,000	8,960	0.00	0.00	12,960
Totals		24,154,246	18,454,817	5,699,429	3,708,684	3,724,877	475,058	2,058,142	9,966,760