GRAIN VOLUME AVAILABLE TO THE GUELPH FARMER'S ELEVATOR COMPANY GUELPH, NORTH DAKOTA

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INTRODUCTION

Southeastern and south-central North Dakota is currently served by three railroads -- the Burlington Northern (BN), Soo Line, and the Chicago and Northwestern (CNW). The CNW extends only through the southeast portion of Dickey county; no North Dakota elevators are located on CNW trackage. The CNW rail segment between Oakes, ND and Aberdeen, SD is about 8 miles long and is listed as Category 1 (due to be filed for abandonment within three years) on the carrier's System Diagram Map. The BN segment between Ellendale and Ludden, ND is approximately 20 miles long and is also listed in Category 1 on the System Diagram Map.

Three grain elevators in the area would be affected by the proposed branch line abandonments. The three elevators are:

Maple Valley Farmers Coop -- Ellendale

Ellendale Grain and Seed Co., Inc. -- Ellendale

Guelph Farmers Elevator Co. -- Guelph

All three of these elevators are located on the Burlington Northern rail segment (Ellendale to Ludden).

The objectives of this report are:

1) to describe the grain production and marketing characteristics of the southeast-central portion of North Dakota, with particular attention paid to Dickey and Sargent counties,

2) to estimate the volume of grain which may be available to area merchandisers through a local elevator, with particular emphasis on volume available to the Guelph Farmers Elevator Co., Guelph, North Dakota, and

3) to discuss and address alternatives and issues of concern to the marketing sector in the above-mentioned area, particularly alternatives concerning the Guelph Farmers Elevator Company.

Grain production in the Guelph Farmers Elevators trade area would most likely lie within an area contained in Dickey and Sargent Counties in North Dakota, and Brown and Marshall counties in South Dakota. Characteristics of the Guelph elevator trade area will be focused on these four counties.

Characteristics of Area

Grain production in the study area is concentrated primarily in the production of wheat (HRS and durum), sunflower, corn, barley and oats, with limited quantities of several other crops also produced. Over the five year period, 1976-80, these five crops collectively acounted for an average of approximately 10.1 and 9.9 million bushels in Dickey and Sargent counties, respectively (Table 1). Brown and Marshall counties in South Dakota accounted for an average of 13.7 and 6.5 million bushels over the same time period, respectively. Only part of this grain is actually exported from the area through the local country elevators, however. Truck and rail grain shipments from elevators in Dickey county averaged 5.6 million bushels over a five year period, only 55.5% of the quantity actually produced (Table 2). Similary, only 73.7 percent of the grain produced in Sargent county was actually exported from the county through local grain elevators.[1]

[1]The remainder is presumed fed to livestock or consumed as food or seed on farms where grown, after adjustments for annual inventory changes. Proportion of grain actually marketed through grain elevators for Brown and Marshall counties was presumed identical to proportions for Dickey and Sargent counties, respectively.

TABLE 1. FIVE YEAR AVERAGE PRODUCTION OF MAJOR CROPS, SELECTED COUNTIES, 1976-80.

Crop	County			
	Dickey	Sargent	Brown	Marshall
	bushels			
HRS	2,698,000	2,324,000	4,402,000	2,133,000
Dur	412,000	536,000	202,000	76,000
Bly	1,296,000	1,123,000	1,737,000	591,000
Oats	1,483,000	1,167,000	1,712,000	1,245,000
SF	2,033,000	2,348,000	1,606,000	752,000
Corn[a]	1,819,000	2,120,000	3,605,000	1,384,000
Other[b]	400,000	243,000	418,000	279,000
Total	10,141,000	9,861,000	13,682,000	6,460,000

[a]Two year average, 1980-81.

[b]Includes rye and flaxseed.

Source: North Dakota Crop and Livestock Reporting Service, and South Dakota Crop and Livestock Reporting Service.

TABLE 2. GRAIN SHIPMENTS FROM COUNTRY ELEVATORS, SELECTED COUNTIES, BY DESTINATION, 1976-77 TO 1980-81.

Crop Year	Duluth/ Superior	Minneapolis	Pacific Northwest	Other	Total
			bushels		
Dickey County					
1976-77	783,547	1,347,803	69,987	871,837	3,073,174
1977-78	983,622	1,636,247	235,939	921,991	3,777,799
1978-79	1,664,755	2,630,415	603,819	1,299,667	6,198,656
1979-80	2,556,001	2,667,810	315,602	1,347,690	6,887,103
1980-81	2,615,699	2,311,489	1,105,688	2,150,880	8,183,756
Five Year Average	1,720,725	2,118,753	466,207	1,318,413	5,624,098
Sargent County					
1976-77	978,359	1,588,533	128,988	607,829	3,303,809
1977-78	2,954,966	2,862,492	343,629	991,309	7,152,391
1978-79	2,937,194	2,146,619	782,496	647,433	6,513,742
1979-80	3,234,390	2,700,062	1,105,150	1,260,452	8,300,054
1980-81	3,613,653	4,092,747	1,863,831	1,496,518	11,066,749
Five Year Average	2,743,712	2,678,091	844,818	1,000,728	7,267,349

Source: Upper Great Plains Transportation Institute, North Dakota State University, Fargo. Unpublished data.

Grain Volume Estimate

The "trade area" or region from which a country grain elevator is able to attract grain will vary in size depending on many factors. One of the most important of these factors is the freight rate (rail or truck) which can be utilized by the elevator to ship grain to terminal markets. The freight rate is the major factor in determining the elevators local basis and consequently the elevator "board price" or price paid to farmers. Other factors which will influence the grain volume available to an elevator are: density of grain production in the area, the physical road network in the region, elevator services available, and overall elevator managment skills. Also, comparable cost of shipping from farms to competing elevators will influence producers' decisions as to where to haul grains.

The methodology used herein utilizes comparative freight rates and distances to competing elevators to estimate the trade area of the Guelph Farmers Elevator Company. It is presumed that a farmer's decision on where to ship his grain is affected by two variables: 1). the elevator "board price" (which is determined by the elevator's applicable freight rate), and 2). the relative distances the producer must haul his grain by farm truck to area elevators. The producer's net farm price can therefore be represented as:

$$FP = EP - TC/bu\ mi\ (D)$$

where: FP = net farm price

EP = elevator board price

TC/bu. mi = farm truck cost per unit of distance

D = distance from farm to elevator.

The "net farm price" or the net price per bushel will be equal to the elevator board price less costs of trucking from farm to elevator.

At some point between two competing elevators, the net farm price of hauling to the two markets will be equal. That is, the producer would be indifferent as to which elevator he would haul to: his net price per bushel would be the same. This point where the net farm price is equal at both elevators would define the boundary of market areas. Producers on the "elevator A" side of this point would receive a higher price/bushel by shipping to elevator A than elevator B, and vice versa. For example, the straight line distance between Guelph and Ellendale is approximately 14 miles. At some point along this 14 mile segment the net farm price to producers would be equal hauling to either elevator. Assuming a three car rail rate at both elevators, that point of equal net return can be identified as follows:

$$EP_G - \$.0035/\text{bushel-mile}\ (X) = EP_E - \$.0035/\text{bushel mile}\ (14.3-X)$$

Using an identical terminal market price available to both elevators and applicable freight rates, the point of equal net returns is:

$$.544 - .0035X = .544 - .05005 - .0035X$$

$$X = 7.2$$

Therefore, producers within 7.2 miles of Guelph would be better off shipping grain to Guelph rather than to Ellendale. In this case, the point of equal net return is midway between the two elevators because the applicable freight rates are the same for both elevators. The procedure involved herein computes that point of equal producer

returns for all elevators surrounding Guelph. The territory contained within the cellular shaped figure converting these points would define the drawing territory or trade area of the Guelph Farmers Elevator.

Two different situations were analyzed for the Guelph trade area, both dealing with appropriate freight rates at Guelph. In the first scenario, Guelph is assumed to utilize a three car rail rate for all shipments; all competing elevators are presumed to utilize three car rates or applicable truck rates, exclusive of Monango and Crete, who have facilities capable of loading 20 car trains. In the second scenario, Guelph is presumed to have the physical capability to utilize a 26 car rail rate.

Sceanrio 1

The first situation analyzed involves Guelph competing against area elevators as the situation exists today -- Guelph utilizing a three car rail rate and other elevators using either a three or 26 car rail rate, or applicable truck rate as outlined below:

Location of Competing Elevator	Applicable Freight Rate	Location of Competing Elevator	Applicable Freight Rate
Monango	26 car	Amherst, S.D.	3 car
Fullerton	3 car	Claremont, S.D.	3 car
Norway Spur	3 car	Hecla, S.D.	Truck
Oakes	3 car	Frederick, S.D.**	Truck
Crete	26 car	Ellendale	3 car
Cogswell	3 car		
Newark, S.D.	3 car*		
Kidder, S.D.	3 car		
Britton, S.D.	3 car		

*3 car rail rate plus 5 cents/cwt. cost of car spotting and delivery to BN mainline.

**26 car rail rate from Monango and cost of trucking grain from Frederick to Monango.

Under Scenario 1, Guelph's trade area extended an average of 5.4 miles from Guelph to competing elevators (Table 3). The trade area is irregularly shaped, due primarily to the fact that the competing elevator at Crete is theoretically able to draw grain from areas around and even beyond Guelph.

TABLE 3. DISTANCES FROM GUELPH TO COMPETING ELEVATORS DEFINING GUELPH TRADE AREA, SCENARIO 1.

Competing Elevator	Total Distance	Distance from Guelph Included in Guelph Trade Area
	miles	
Monango	19.6	2.1
Fullerton	13.4	7.6
Norway Spur	9.2	2.9
Oakes	10.7	2.8
Crete	17.9	-3.9
Cogswell	22.6	7.0
Newark, S.D.	22.3	8.6
Kidder, S.D.	26.9	8.3
Britton, S.D.	28.4	9.1
Amherst, S.D.	25.1	7.4
Claremont, S.D.	26.8	8.3
Hecla, S.D.	10.7	4.1[a]
Frederick, S.D.	18.7	3.4
Ellendale	14.3	7.2

[a]Assuming $1.09 per running mile and 100% backhaul for truck shipments.

Total grain production contained within the Guelph trade area after adjustments for non-marketed grain was 315,000 bushels. Approximately 97 percent of this total is contained in North Dakota, the remainder in Brown County, South Dakota. This total was computed assuming Hecla, S.D. utilizes truck service and varying applicable truck rates. (Table 4).

TABLE 4. VOLUME OF GRAIN AVAILABLE TO GUELPH ASSUMING DIFFERENT APPLICABLE TRUCK RATES AT HECLA, SOUTH DAKOTA, SCENARIO 1[a]

Backhaul Percentage	Applicable Truck Rate at Hecla	Grain Volume Contained in Trade Area
	cents/cwt.	bushels
50%	99	315,000
75%	85	315,000
100%	74.5	228,000

[a]These figures are based on truck costs of $1.09 per running mile and round trip distance of 682 miles.

Currently, Hecla, S.D., uses complete truck service and is charged a rate lower than the rates cited in Table 4 due to a favorable truck availability/backhaul situation. The rates in Table 4 were computed on a total cost per trip and percentage backhaul basis and are assumed to represent more realistic long term costs of shipping grain to Duluth.

Scenario 2

Grain volume available to the Guelph Farmers Elevator was also estimated assuming Guelph has physical capabilities of loading 26

car trains and utilizing the associated rail rate. Competing elevators are assumed to use the same rail or truck rates as outlined in Scenario 1.

Guelph's trade area is expanded under Scenario 2 due to the lower freight rate and resultant higher bid price to producers. The trade area extended an average of 13.9 miles from Guelph to competing elevators. (Table 5).

TABLE 5. DISTANCES FROM GUELPH TO COMPETING ELEVATORS DEFINING GUELPH TRADE AREA, SCENARIO 2.

Competing Elevator	Total Distance	Distance from Guelph Included in Guelph Trade Area
	miles	
Monango	19.6	10.7
Fullerton	13.4	16.1
Norway Spur	9.2	11.5
Oakes	10.7	11.4
Crete	17.9	4.6
Cogswell	22.6	15.6
Newark, S.D.	22.3	17.2
Kidder, S.D.	26.9	16.9
Britton, S.D.	28.4	17.6
Amhurst, S.D.	25.1	16.0
Claremont, S.D.	26.8	16.8
Hecla, S.D.	10.7	12.6[a]
Frederick, S.D.	18.7	11.9
Ellendale	19.3	15.7

[a]Assumes $1.09 per running mile and 100% backhaul for truck shipments.

Total grain production contained within the Guelph trade area after adjustments for non-marketed grain was 1,751,000 bushels. Approximately 76 percent of this total is drawn from Dickey County, North Dakota; the remainder is drawn from Brown County, South Dakota. The approximate shape of the Guelph trade area is shown in Figure 1.

Four competing elevators effectively determine the shape of the Guelph Farmers Elevator trade area. Those competing elevators are located at Crete, Monango, Frederick and Hecla. These four stations have more favorable freight rates, either truck or rail, and therefore are theoretically able to draw grain from a relatively larger area. However, due to the nature of the road network in the area and the actual distances between competing elevators, it is doubtful that some of the grain contained within this outlined area will actually be shipped to Guelph. Even though net farm prices to producers may be higher at Guelph, the sheer inconvenience of shipping longer distances to Guelph may preclude some shipments to Guelph. Although price may be the primary consideration when producers decide where to sell grain other factors will enter into the decision such as other services offered at local elevators, degree of cooperative patronage, etc.

An arbitrary assignment of outlying areas in the Guelph trade area as inaccessable reduces the total grain volume available to approximately 1,360,000 bushels. (Figure 1).

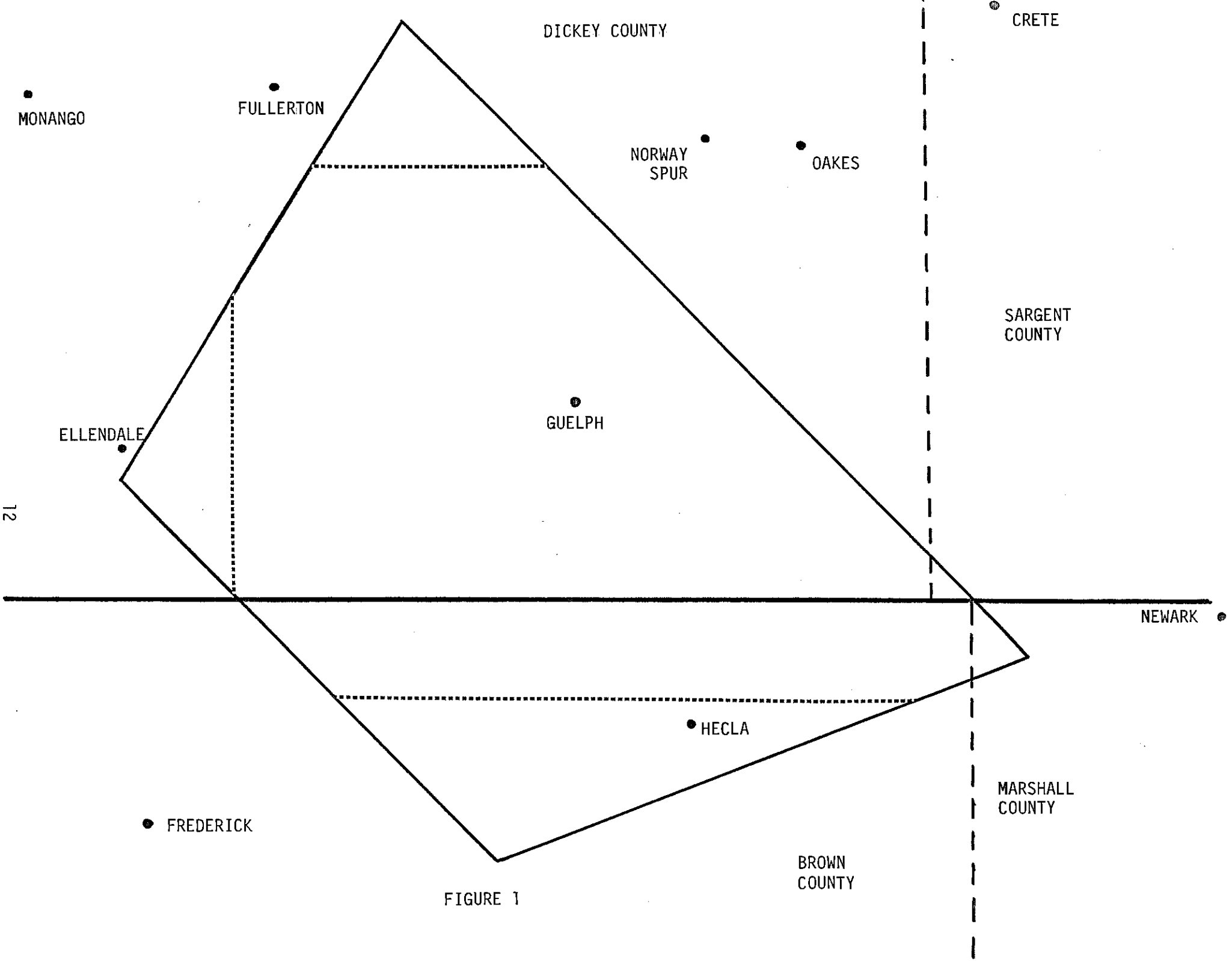
DICKEY COUNTY
CRETE
MONANGO
FULLERTON
NORWAY
SPUR
OAKES
SARGENT
COUNTY
GUELPH
ELLENDALE
NEWARK
HECLA
MARSHALL
COUNTY
FREDERICK
BROWN
COUNTY

FIGURE 1

Related Issues and Concerns

The volume of grain "available" to a grain elevator estimated using a comparative freight rate analysis must be viewed concurrent with other related issues as well. The procedure used to estimate grain volume contained in the Guelph trade area (Scenario 2) was based on the assumption that the Guelph elevator was capable of utilizing or having access to a 26 car rail rate.

The physical facilities at Guelph are not capable of loading 26 cars within the time period allotted in the railroad tariffs. Also, the rail trackage between Guelph and Oakes may not be of sufficient strength to support regular 26 car movements. If decision-makers chose to invest in both rail and elevator facilities to 26 car capabilities, any freight rate savings may be required to be retained in order to service the increased debt load. Any freight rate savings that could not be reflected in prices paid to farmers would effectively shrink the elevator's trade area and reduce the amount of grain available to the elevator.

The serving railroad's rail line abandonment plans may preclude the elevator from even using rail shipments in the future. Alternatives to this occurance may be opposing the abandonment through the Interstate Commerce Commission procedures. Alternatively, the affected shipper(s) may choose some sort of purchase or lease agreement with the abandoning railroads. Also, shippers on the line may choose to utilize only truck service or transship grain through a nearby station which will continue to be served by rail.