

**GRAIN TRANSPORTATION FORUM
NEW IDEAS FOR A NEW ERA**

By

Robert J. Tosterud

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PROCEEDINGS OF THE
GRAIN TRANSPORTATION FORUM

NEW IDEAS FOR A NEW ERA

Under the General Editorship of
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EDITOR'S COMMENTS

The industry which handles, stores, transports, processes and exports American grain is unique in many respects. This industry, in one form or another, embodies almost every American business philosophy from free competition to total regulation; from individual entrepreneurs to massive conglomerates; from private ownership to public ownership. In short, a bushel of American grain which originates on the farm and is destined for the hold of an export "salty," moves through and is influenced by perhaps every type of market structure known to man. From a research point of view, the challenge of analysis and problem solving must be both extensive and intensive. The challenge would be difficult enough if this industry were changeless and static. Rather, the structure of the American grain handling and transportation system, especially during the last several years, has experienced dramatic policy as well as technological changes. These changes have in most cases resulted in gained efficiencies and enhanced America's competitive position in world grain markets. However, unlike other national industries, innovations in grain handling and transportation have been introduced for and specifically tied to individual commodities, firms, shippers, and geographic regions. More often than not, innovations in this industry are the result of an intermodal or intramodal competitive environment at a particular place, for a particular commodity, at a particular time, etc.

The objective of the Grain Transportation Forum was to measure the future challenge to America's grain handling and transportation system and to bring together at a particular place and at a particular time innovators in the grain handling and transportation industry to explain how this challenge will be met and the benefits as well as the costs of innovation. These innovators were taken from every segment of the grain handling and transportation system -- from grain producer to grain exporter. In addition, present grain handling and transportation methods were challenged by the presentation of futuristic ideas and opportunities by "visionaries" in the field of grain handling and transportation. The Forum concluded with a "no-holds-barred" panel comprised of interests representing North Dakota's grain handling and transportation system. Their reaction to previous comments made by the "innovators" and the "visionaries" brings the Forum back down to earth.

In view of the energy crisis, inflation, world and even domestic food shortages, the financial collapse of the Penn Central Railroad and the serious financial difficulties of several Midwestern railroads, and recognizing the importance of American agriculture to the very viability of our national economy via our balance of payments, the proceedings of the Grain Transportation Forum are enlightening, provoking and timely. The Proceedings will be welcomed by all those that work within the grain handling and transportation industry and those that teach, study, or are otherwise concerned with, the technological and policy issues it so ably presents.

Upper Great Plains
Transportation Institute

Robert J. Tosterud

TABLE OF CONTENTS

Introduction	<i>Dale O. Anderson</i>	1
The Challenge to America's Agricultural Handling and Transportation System	<i>Paul L. Mills</i>	4
Grain Handling and Trans- portation Needs of the Grain Exporter	<i>William H. Fisher</i>	12
The Grain Handling and Transportation System as an Integral Part of Feeding America	<i>James R. Scoggin</i>	19
The Challenge to North Dakota's Grain Handling and Transportation System	<i>Melvin G. Maier</i>	31
Question and Answer Session for Panel: "The Challenge to America's Agricultural Handling and Transportation System"		38
Transportation and Rural Development in the Great Plains	<i>Howard W. Ottoson</i>	42
The Transportation Challenge Facing Grain Cooperatives	<i>Stanley K. Thurston</i>	50
A Country Elevator Adapts to Change	<i>Lowell T. Schultz</i>	60
Car Problems and How They Are Being Met	<i>Thomas J. Byrne</i>	63
Motor Trucks in the Trans- portation of Grains	<i>Forney A. Rankin</i>	71
The Price of Agricultural Transportation	<i>John O. Gerald</i>	82

Question and Answer Session for Panel: "Innovations in Grain Handling and Trans- portation"		92
The Transportation Crisis: Implications for Rural America	<i>Arthur A. Link, Governor, State of North Dakota</i>	104
Agricultural Transportation Research in the New Era	<i>Robert J. Tosterud</i>	111
Outlook of Movement of Grain by Barge in the Upper Great Plains	<i>Howard Thelen</i>	138
The Role of an Inland Port in Moving Great Plains Grain	<i>Robert W. Portiss</i>	145
Question and Answer Session for Panel: "Visionaries in Grain Handling and Trans- portation" (Part I)		152
The Grain Tube: Pipelining Your Grain to Market	<i>Gordon O. Davis</i>	160
Canadian Grain Transportation Modernization	<i>Donald A. Dever Jim M. McDonough</i>	164
Question and Answer Session for Panel: "Visionaries in Grain Handling and Trans- portation" (Part II)		176
Japan: North Dakota's Number One Consumer	<i>Susumu Matsuoka</i>	183
The North Dakota Rail Lines Reacted by Expanding Their Capacity	<i>Robert Kottke</i>	189
The Railroads Will Meet the Challenge	<i>Ralph O. Avery</i>	194
Grain Transportation and the Country Elevator	<i>Roger Bourn</i>	199
Truck Transportation in North Dakota	<i>Earl Northrop</i>	206

Transportation Problems and Needs as Viewed by a State Senator - Farmer	<i>Ernest Pyle</i>	209
A Producer Looks at Our Number One Problem "Transportation"	<i>Norman Weckerly</i>	212
Question and Answer Session for Panel: "North Dakota Reacts"		215
Concluding Remarks	<i>Robert Reimers</i>	222

INTRODUCTION

Dale O. Anderson¹

Good morning ladies and gentlemen!

It is a thrilling experience to stand before this vast audience and welcome you to the first Grain Transportation Forum in North Dakota. I am privileged to extend this welcome on behalf of the sponsors of this Forum: The North Dakota State Wheat Commission, the Greater North Dakota Association, and the Upper Great Plains Transportation Institute.

The theme for this Forum, "New Ideas for a New Era" has special significance. I can best develop the significance by briefly tracing the historical development of the Upper Great Plains Transportation Institute. The Institute was established by the 40th Legislative Assembly of North Dakota. The Institute began operation on July 1, 1967. The purposes of the Institute, as specified in the act, are to conduct and supervise research in the field of transportation and make public its findings, conclusions and suggested solutions. The Institute's first director was Dr. David C. Nelson who resigned January 1, 1972, to accept another position.

It is our feeling that 1972-1973 is the beginning of a new era for North Dakota agriculture. We know it is a new era for transportation research and education at the Upper Great Plains Transportation Institute. It is important and significant that we begin this new era together in a spirit of hope, pride and common purpose.

The Institute initiated a "New Era for Transportation Research in North Dakota" on July 1, 1973. This user-oriented research program was developed in cooperation with the Transportation Institute Advisory Council. The basic premise which provided the basis for developing our research program was that our transportation system should be used to improve the economy of North Dakota and to enhance our quality of life in every way we know how. We recognized that knowing how was the most difficult question to solve since factors affecting our transportation system were so complex and our understanding of them so limited. We believed that

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in order to obtain workable solutions to the transportation problems in North Dakota, we needed active participation from the finest minds among us including private industry, federal, state and local governmental agencies, farmers, legislators, citizen groups, and colleges and universities. In other words, we have reached a point in time when new approaches and different modes to problem solving must be utilized. New approaches which include research teams composed of economists, engineers and others directing their attention on high priority transportation problems. New approaches which include joint involvement of expertise from private industry, federal, state and local units of government, legislators, citizen groups, and colleges and universities. New approaches which include analysis of nontraditional transportation modes such as air, water and pipeline as well as rail and motor carrier.

The Institute has implemented a comprehensive grain transportation research program which, we believe, is critical to the future strength of agriculture in North Dakota. This program is designed to duplicate the system under which grain moves from farm storage to a domestic processor or export market. The program recognizes the critical dependency between and among the various elements which compose a grain storage, handling and transportation system. In other words, the ports are dependent upon the railways, the railways dependent upon the country elevators, and the country elevators dependent upon farm storage decisions.

A key element to the success of this type of research program is effective communication between different links in the system. It is essential to ease the lines of communication between the different segments of the system. Thus we can better understand each others problems, jointly work toward the development of effective and reasonable solutions and together provide a transportation and handling system capable of maximizing through-put at a minimum cost. We feel that a Forum of this type is a first step in improving the communication process. We are pleased to note that representatives of each step in the transportation and handling system have registered for this conference.

This conference entitled "New Ideas for a New Era" is designed to complement the research program entitled "A New Era for Transportation Research in North Dakota." This conference is intended as a forum for discussion by people who are thinking at the outer fringes of knowledge. We think it is exciting and innovative.

In order to facilitate the communication process and exchange of ideas, we have provided several opportunities for questioning the panelists and opportunities for the

panelists to react to your comments and suggestions throughout this two-day program. We have included in your packet of information a card which we would like for you to use in writing out your questions. We have provided only one point in each half-day program for your questions, so if there is a particular speaker you want to address your question to, write your question out on one of these cards and the card will be picked up before the question period begins. The presiding chairman for that session will conduct the question period and direct the questions to the appropriate speaker.

Lastly, but certainly most importantly, the conference that we are about to begin is the result of a lot of work and dedication on the part of my staff. First, Dr. Robert Tosterud, Assistant Director -- Dr. Tosterud is in charge of our research program development and implementation. Mr. Ronald Nichols is a transportation economist in charge of key elements of our grain transportation research program. Virginia Lepage who is in charge of registration for this conference is manager of our office staff. She has made certain that every detail of this program occurs in a first class manner. A graduate program is a key component of any effective research program. Two of our graduate students, Becky Janski and Mark Johnson, are here to work and learn at this Forum. It's this core of people which has made it possible to put this program together and to provide this Forum for an exchange of ideas.

If there is anything that we can do to make your stay more comfortable at the conference or productive to you, please contact any one of us and we will do our best to accommodate you. Again, on behalf of the sponsors, I am thrilled that you are here and we hope that this conference is as productive to you as it has been for us to develop.

THE CHALLENGE TO AMERICA'S
AGRICULTURAL HANDLING AND
TRANSPORTATION SYSTEM

Paul L. Mills¹

The theme you have chosen for this conference, "New Ideas for a New Era," is especially appropriate. There can be little doubt that we are indeed in a "New Era" as far as agricultural policies are concerned.

We are witnessing a new and dynamic period in U.S. agriculture. The Agricultural Act of 1970 set the stage for a revitalized U.S. farm plant and the Agriculture and Consumer Protection Act of 1973 has opened doors leading to restoring the market decisions to producers for the first time since the 1930's.

It is unlikely that those doors will ever be closed again. Farmers and those who handle and transport their crops are rediscovering what everyone had always known -- that our society is based upon the incentive system -- and production will always respond to price incentives.

We have moved from an artificial price structure to an open market price structure where the law of supply and demand can operate without restraints. No longer does federal farm policy dictate production restrictions, price ceilings, or inventory levels. No longer does the Commodity Credit Corporation become the reserve inventory for domestic and world demand. These functions are now in the hands of those who should benefit from price incentives and who should benefit from the risks that must be taken in an incentive oriented market.

Farmers are no longer producing grains just for a government loan program. They are producing for a world wide market that is sending signals back to U.S. farmers that say we need what you have and we are willing to pay the price.

Domestic processors of grains are also now finding that they must compete with world demand for grain. They must now bid competitively with exporters for country grain stocks.

Just what is meant when we talk about the "world market"? Most of us tend to think of our largest customers, such as Japan or the Soviet Union or maybe something vaguely referred

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to as "Europe" or the "Far East." During the last six months of 1973, this nation exported wheat to 72 countries around the world.

Let me name them for you:

Algeria	Ghana	Malaysia	Surinam
Argentina	Greece	Malta	Thailand
Bangladesh	Guatemala	Mexico	Trinidad
Belgium	Guyana	Morocco	Tunisia
Bolivia	Haiti	Netherlands	Turkey
Brazil	Honduras	Nicaragua	United Kingdom
Cambodia	Hong Kong	Nigeria	U.S.S.R.
Chile	India	Norway	Venezuela
China (Taiwan)	Indonesia	Pakistan	Vietnam
Columbia	Iran	Panama	Yemen
Costa Rica	Iraq	P.R. China	Yugoslavia
Cyprus	Israel	Peru	Zaire
Dahomey	Italy	Philippines	
Dominican Republic	Jamaica	Poland	
Ecuador	Japan	Portugal	
Egypt	Jordan	Saudi Arabia	
El Salvador	Kenya	Sierra Leone	
Ethiopia	Korea	Singapore	
France	Lebanon	Spain	
West Germany	Libya	Sudan	

World demand for food has increased and the rate of increase has accelerated in recent years. Strong economic growth and higher incomes have strengthened the demand for food in many countries. As people get enough calories in their diets, they start trying to improve the quality of their food -- which generally means more protein.

This general demand situation is true in most areas of the world today and it helps explain why our grain exports have expanded in the last several years. For example, when the U.S.S.R. had a short grain crop in 1972, grains for both food and livestock feed were imported rather than consuming less as was done in 1963.

Wheat usage in 1973-74 is running about the same as last year's record of nearly two billion bushels. Domestic disappearance is edging slightly lower as a decline in wheat feeding is more than offsetting a small increase in other domestic processing. World import requirements remain strong this season and U.S. exports for the 1973-74 marketing year are estimated at 1.2 billion bushels, a new record.

Although we are seeing new records, USDA economists are projecting much higher levels by 1985. No one, of course, can predict what world crop conditions might be in any one year in the future, but based upon current economic analysis

of demand, USDA is projecting for 1985 a nine billion bushel corn crop, compared to 5.6 billion in 1973; a 2.3 billion wheat crop, compared to 1.7 billion in 1973; a 2.3 billion soybean crop, compared to 1.6 billion in 1973; and a 300 million ton feed grain crop, compared to 208 million tons in 1973.

The world is changing rapidly. It is no longer possible to hide behind trade barriers or quotas. There is a freer exchange of ideas and products between nations today than ever before. A new foundation of world peace is being built upon it.

During the past six years, world grain use has increased at an average rate of 30 million metric tons a year. That's about equal to the combined annual wheat crops of Canada, Australia and Argentina!

Something profound is happening to the demand for grain: something far more important than just the sudden \$1 billion grain sale to the Soviet Union that has received so much publicity.

One part of the explanation is people. From 1950 to 1960, world population increased by about 49 million people each year. From 1960 to 1970, the rate of increase jumped to about 65 million more people each year. For the single year of 1971, the net increase was about 72 million more people.

Nearly two-thirds of the world's people live in just seven nations: The Peoples Republic of China, India, the Soviet Union, Japan, Indonesia, Pakistan, and the United States. Of these, only the United States is likely to substantially increase its exportable supply of food in the near future.

The other part of the explanation of the demand factor is economic growth -- the comparative wealth of those people. For the first time much of the world has the economic power to enter the cash market for grains. The character of demand for this country's grains has changed dramatically from one of food aid to cash buying power.

These changes, and others yet to come, will present new challenges to the American farmer -- to the elevator operator -- to our scientists -- to the banker -- to the exporter -- to the cooperatives and to the transportation industry.

The saddest thing that could happen would be for those I've just named to fail to read the signals correctly and presume that current demand is a one-shot deal. Change

is always painful, but the pain of resisting or ignoring change is even worse.

Someone has said, the only difference between a rut and a grave is the depth. In many ways, some of the changes now taking place will literally force some of us out of that rut into a more exciting, more rewarding life.

I'm sure that each one of you has your own ideas of what needs to be done, and by whom.

Here is my list of ideas. You might agree with some of them -- you might disagree with some of them. No list can be all inclusive. I've mentioned those segments of the agricultural public which I believe are on the cutting edge of the new era. You can no doubt add to the list or change the mix -- and I hope you will because that's what this conference is all about.

Farmers, who have withstood many changes, are nevertheless being challenged today with many new kinds of decisions. Wise marketing will be as important to farmers as making the correct production decision. With farm input costs soaring, even today's high grain prices may not be enough to keep an operation in the black if the wrong marketing decisions are made.

For the first time in decades, young people are deciding to stay in the farming business. According to FARM JOURNAL, "Last year 80% of the graduates in Farm Operations at Iowa State University grabbed diplomas and headed back to the farm. From the entire College of Agriculture at Iowa State one in five went directly into farming. The University of Illinois and Purdue report similar figures."

With the current average age of farmers at slightly over 50 years, it is vital that we make the farm a place where opportunity exists for young people who will be the farm leaders of tomorrow. The opportunity at home has to compete with a job away from the farm.

Those now on farms must recognize their responsibility to the young people by assisting them in getting a college education and by opening up opportunities for them when they return.

There are thousands of young rural people today that may be headed for a job at the local plant or a filling station, because of lack of funds or incentives to dream of a better life. Farmers who have the resources can change that for some and at the same time enrich their own lives.

Elevator owners, perhaps are facing the biggest challenge of all. With markets reflecting every little event that might affect supply or demand, the elevator owner must sharpen his marketing skills beyond anything expected of him in the past. He must be more in tune with the signals that are likely to bring a sudden change in the market.

At today's values, financing purchases has become a disaster for many elevator owners who found their lines of credit woefully short of their needs. Many have had to ask producers to wait for their money until the grain could be sold and delivered. Many have also had to refuse grain brought in because of the lack of transportation or elevator space.

It's difficult to understand, but there are still many country elevators that have not changed their spouting to accommodate covered hopper cars. Yet, the supply of boxcars on which they depend are becoming scarce. Those elevators are doomed as rail shipping points. Each year they will die a little bit more.

Today, there is a trend toward larger, more modern elevator centers where large volumes can be handled. Country elevator owners who are faced with some of the problems I've mentioned, would do well to begin thinking about alternatives before time passes them by. Instead of hoping that everybody else is wrong, why not plan for meeting this new trend in grain merchandising?

If there is just no way an individual can swing a new facility on his own, I suspect that his competitor down the road a few miles is faced with the same problems. Why not join forces and together provide the resources? Each would do better than now and farmers would be served more efficiently.

Scientists will be called upon to increase their efforts to improve yields of most food grains. Emphasis upon research to increase production has waned in recent years when federal policy limited production. But with enlightened policies now in effect, a much higher priority for research should develop.

Bankers, especially those bankers serving rural communities, are still bewildered by the colossal amounts of cash required to finance grains at current price levels. Many banks and some bank systems have not yet fully met this new challenge. As a result, many customers, including farmers and elevator owners, have been forced to by-pass local banks and seek financing elsewhere.

Banks, including the Bank for Cooperatives, should be the vehicle for financing this expanded agriculture. They too will have to examine their response to this demand and determine if their rut isn't getting a little too deep.

Exporters must continue to improve their information systems in order to better plan and control export movements to the ports. In recent years we have seen exporters increase their investment in both interior and port facilities. A commitment of increasing investment, especially in port facilities will be required to accommodate future export volumes.

My own personal belief is that our West Coast facilities are desperately in need of new investment. Some expansion, by those already operating on the West Coast, is warranted. For those exporters not now operating facilities on the West Coast, you should constantly evaluate the opportunity and returns from such investments.

Cooperatives, particularly grain cooperatives, must take a careful reading of the depth of their rut. There is a real danger that they may tend to plateau out in terms of improving their share of the market. There is also some evidence that service to members may have reached a status-quo.

Young people now coming into agriculture are not aware of the sacrifices their fathers made to bring cooperatives from infancy to their present important role in serving farmers. They will be guided more by results than by loyalty.

Although cooperatives can be justly proud of their accomplishments in the past, it is the future that they must now plan for. World market conditions today require that cooperatives provide equal or better resources than their competitors.

The most important resource any organization must have is people. Cooperatives must select and train the most competent people available if they expect to grow. And just as importantly, cooperatives must provide incentives for those competent people to remain.

With greater incentives to respond to the market place instead of artificial pricing structures, the price relationship among all commodities takes on added significance in determining what kind and how much of the different crops are planted. Farmers will respond quickly to the demand of export and domestic markets. Cooperatives must also be flexible and attempt to broaden their capabilities to deal with changing markets or changing crops.

In my opinion, regional grain marketing cooperatives have barely scratched the surface in world export trade. While some direct export sales have been made -- usually to sister co-ops overseas -- the vast majority of export sales are made as a supplier to the large independent exporters. There is room for both and the time may well be at hand when cooperatives should consider actively moving into international marketing on a permanent and professional basis.

The transportation industry is a vital link between the farmer and the consumer. Grain has little value where it is produced. It is not until transportation provides the means of making it available where it is needed that grain takes on added value.

From a practical standpoint, the railroads have always been the predominant mode for the movement of mass quantities of grain -- during all seasons. Whether or not the railroads shall continue to be the dominant mode will depend upon their ability and their inclination to respond to the challenges of an expanded agriculture.

I believe the railroads are responding to the challenge. Yet, I also believe that they have a long way to go. When we are constantly running between 20,000 and 25,000 cars short daily for grain loading, it is obvious that the railroads have their work cut out for them.

Better car distribution plans and better control of turn-around time should be the first priority of any major grain railroad. Frankly, the record isn't too good in either of these areas. Hundreds of country elevators today report receiving only three or four cars in a month's time. Some cases are even worse. While at the same time, many elevators have received three or four blocks of cars from 50 to 100 each.

In fact, today there are millions of bushels of grain awaiting shipment in country elevators but much of this has become isolated from the market due to inadequate transportation.

No doubt the railroads are working very hard to overcome these problems. They currently have over 73,000 cars on order. In the last year they have purchased about 15,000 covered hopper cars -- mostly for grain traffic. These are tremendous investments which tell me they are committed to the continued growth of agriculture.

But more cars, without significant gain in productivity, will not solve the grain problem. We still haven't reached the point where an empty car always gets the same priority treatment as a loaded car. And we still haven't reached the point where loaded cars are always moved promptly and directly to the receiver.

Some railroads are doing much to change all this. Some are trying new approaches to car distribution by supplying cars only to shippers who have orders to a common destination, or to a destination pre-selected by the railroad. In

some cases this may work well -- but in others it turns out to be just another form of autocratic railroad philosophy.

As pointed out previously, the grain business today is a world market. A local elevator today may sell grain beyond the traditional geographical market. Thus, the railroads must recognize they cannot dictate the flow of commerce.

To the extent they can bunch cars to be loaded at several elevators going to the same market, they certainly should do so. But at the same time they have some responsibility to the elevators that may have grain sold in a different direction.

These are my thoughts on "The Challenge to America's Agricultural Handling and Transportation Systems." No doubt you have thoughts of your own. Also, other speakers will cover specific areas of concern. I hope these thoughts will stimulate each of you to examine the depth of the rut you operate in and determine if there isn't a better way.

GRAIN HANDLING AND TRANSPORTATION NEEDS
OF THE GRAIN EXPORTER

William H. Fisher¹

I am indeed pleased to be asked to join with you in this Forum. It's been my experience, particularly during the last year and one half, when we've had to contend with extremely active markets (to say the least), that it's too easy to get "chained to the desk," and it's a welcome and refreshing change -- a kind of recharging of the batteries, as it were -- to get back into the interior where it all starts, to get the benefit of your experience and thinking, and generally to try to get a new perspective on things.

So, my compliments to the sponsors of this Transportation Forum for putting this program together. It deals with a most fundamental facet of our business -- and one that has taken on an added dimension of importance in the last year or two, and your attendance here is evidence that you agree as to both the importance and timeliness of these discussions.

Before getting into the specifics of the grain handling and transportation needs of the exporter, it might be well, as a kind of backdrop to the rest of this discussion, to give you a brief summary of the market we West Coast exporters are looking at today. And, while I don't want to bore you with a lot of statistics, I think it's important to refresh our memories of how this overseas market has grown in just the past ten years.

Total PNW Wheat Exports

(million bushels)

<u>Class</u>	<u>1962-63</u>	<u>1972-73</u>
White	96.8	147.8
Hard Red Winter	37.4	65.2
Spring	.8	66.2
Durum	<u>.4</u>	<u>2.0</u>
TOTALS	135.1	281.3
(Barley	<u>25.0</u>	<u>39.0)</u>
GRAND TOTAL	160.0	320.0

¹William H. Fisher is Regional Manager, Cargill Company, Portland, Oregon.

It's a truly remarkable story, isn't it? And, of course, as anyone who's familiar with it will tell you, it didn't just happen. On the contrary, it is the culmination of a carefully planned, aggressive and imaginative market development program that, to this day, remains the classic example of what can be done when producer groups (who started it all by taxing themselves), working with the U.S. Department of Agriculture, the export trade and the interested transcontinental rail carriers, all commit themselves to work together towards a common objective. It must be particularly gratifying to those North Dakotans -- some of whom are here today, I'm sure -- who actively contributed to this total effort -- to know what this market growth has meant to the wheat producers in this state.

However, I think it's well to remind ourselves that we in the Northwest during these past many years have had a lot working in our favor in this Asian market which has become so important to us. The simple fact is that one of the things we do best in the Northwest is to raise and market wheat. We have the high-yielding white wheats in the Pacific Northwest, the hard red winter wheat from Montana, Kansas, Nebraska and Colorado, and the spring wheats and durum -- primarily from North Dakota. Thus, the Pacific Northwest is the only shipping range in the world from which an overseas buyer can buy every class and quality of wheat he may conceivably need.

Among our buyers we do see a great variance as regards their basic needs and preferences. For example, we expect in the future, as in years past, to continue to ship some of our wheat to the so-called developing nations, who are essentially "price buyers," and who seek to buy the cheapest wheat available -- simply to keep their hungry fed. I refer to India, Pakistan and Bangladesh in this category. Yet, at the same time, we will also expect to continue to effectively and efficiently serve some of the most sophisticated and demanding quality buyers in the world. This class of buyer is typified by the Japanese, who use wheat for noodles, all manner of breads, hard rolls, pastries and even donuts and pasta products. They have the dollars to spend, they know what they want, and they have modern milling and baking industries to produce quality products.

So this, roughly, is the shape and size of the market we are looking at today.

But, to put things in proper perspective, special note should be taken of the surge in marketing that has taken place during that last 18 to 20 months. Certainly, I think we would all agree that the last year and one-half has challenged U.S. agriculture and our grain marketing system -- at all levels and in all its functions -- as it has never been

challenged before; and the record shows that, despite tremendous logistical difficulties, it has responded admirably. Contending with a market that was and still is characterized by extraordinary price swings, we have moved an unprecedented volume of grains at an unprecedented pace. With the value of grains trebling and quadrupling during this period, it has tested the integrity of every element of our marketing system -- and found it reassuringly sound. Our transportation industry and our commodity futures markets have been hard pressed to handle and accommodate to a record volume of business that has strained their capabilities, but the job is getting done.

So, if the integrity and efficiency of any system are best tested under conditions of stress, then it is fair to say that the grain marketing system met a truly severe test with virtually universal excellence.

So much for where we've been and where we are.

Now, I would like to turn to what I might call the new dimensions we see ahead for U.S. agriculture -- new dimensions in production and new dimensions in marketing.

All of us can recall a time not so long ago, when a wheat crop of 1.5 billion bushels, a corn crop of 5 billion bushels and a soybean crop of 1 billion bushels represented reasonable targets for American agriculture. In crop year 1974, the targets are substantially higher; a wheat crop of 2 billion bushels or more, a corn crop substantially above 6 billion bushels and a soybean crop of 1.5 billion bushels or more. If U.S. farmers reach these goals, they will be making substantial contributions to the health and well-being of consumers here and abroad.

Yet, these production goals cannot be translated into improved diets here and abroad unless these commodities can be moved efficiently from areas of surplus where they are produced, to areas of deficit where they are consumed. In the final analysis, farm products are of value to producers only if they are of value to consumers.

And this is where we come in.

The contribution of the grain marketing and distribution "team" -- a team of which each of us in this room is a member -- is to bridge the gap between areas of production and areas of consumption, and to translate surplus at time of harvest into reasonably priced, adequate food supplies year around.

Since farmers have varied their production goals to meet rising food demand here and abroad, it is fair to ask what the grain marketing and distribution system has done to improve the quality and timeliness of its services. In other words, if the new dimension of production is substantially higher supplies, then the new dimension of marketing is innovation to accommodate this increased availability, and to distribute it with greater efficiency.

The challenge to the grain industry, then, takes several forms. It would seem to include:

- (1) To protect and strive to improve the quality of what we produce.
- (2) To seek to improve our abilities to store and handle large volumes of grain in the interior, so as to be able to absorb larger and more quickly completed harvests, and to do so at lower unit costs -- while maintaining quality throughout.
- (3) To more efficiently use existing transportation, and to work with carriers in improving its total capabilities; and, finally,
- (4) To continue to provide better service to our customers by upgrading the export facilities we presently operate and by building new facilities as business potential and economics permit.

Let me elaborate in a little more detail on each of these challenges.

As regards quality, my point is that, while our track record in supplying a quality product has been good, we can ill afford to be smug about it. In this new era of higher prices, the quality-conscious buyer will be more discriminating than in the past. Let's not be deluded into assuming that the seller's market that we have enjoyed the past year and one-half will continue indefinitely. Rather, let's assume that, as the economies of these developing countries grow, that they, too -- albeit at a slower pace -- are going to join Japan, the Philippines and Taiwan as quality-conscious buyers. Competition for these markets from Canada and Australia will continue to be strong and aggressive. So, we must continue to support the wheat breeding and other research programs and projects that will assure us a quality product -- from farm to ship -- that will meet the requirements of the most demanding end user.

The second challenge mentioned pertained to the industry need to improve our abilities to store and handle large volumes of grain in the interior -- to accommodate the larger and more quickly completed harvests.

This is a general statement that is perhaps more applicable to the corn and soybean producing areas of the country, where vastly accelerated harvesting capabilities have not been matched with sufficient facilities that receive, dry and maintain the quality of these crops as they start their movement to market.

It's well recognized that there's no shortage of grain storage space in North Dakota, even considering the increased spring wheat acreage that is projected. And, generally speaking, the quality of what you raise year in and year out is good to excellent, and presents no condition problems to the warehouseman, be he a farmer, a country elevator operator or an overseas buyer.

But it is no secret that the country elevator business here, as in other parts of the country, is undergoing some steady changes. The small, older facilities are being taken over by farmers to supplement their on-farm storage, and the larger, better located and more efficient elevators will continue to prosper and serve as the backbone of the country marketing system. They must continue to upgrade their capabilities -- particularly in their ability to load rail cars more expeditiously, so to make optimum use of rail cars as they are made available.

They must continue also to work ever more closely with their farmer customers in gearing their contracting for and their receiving of producer grain to match and complement their ability to sell and to get and load rail cars. At today's prices and today's cost of money, it behooves all of us to be constantly aware of the costs of carrying grain, and careful logistical planning at all levels of the marketing chain can do much to keep these variable costs at a minimum.

Unfortunately, the nature of the export market is characterized by its vagaries and its variables. Seldom do we find that our volume moves out at any evenly scattered rate over the 10 to 12 months of the marketing year. We are not our own masters in this regard, as the business is done, both as to timing and at a pace that is of the buyer's choosing. Thus, peaks and valleys in our marketing are an inescapable part of the business. The exporters, operating as they do, through facilities of limited storage capacity, can do just so much in leveling off these peaks and valleys of activity, so it becomes increasingly important that the other members of this marketing team -- the country elevator and the farmer -- work closely to help to solve this logistical puzzle.

Many of the comments I have just made, of course, pertain to the third challenge that I suggested faced the grain industry; namely, to more efficiently use what transportation is today available and to work with carriers in improving its total usage and capabilities.

We are all concerned, I'm sure, with what appears to be a chronic shortage of rail equipment. It is worse at certain times than others, but there is no denying that it is a chronic situation that persists to one degree or another much of the time. And in all fairness -- the exporters must accept some of the blame. As much time as each of us devotes to the logistics of this business, congestion of cars at tidewater facilities and resultant embargoes still occur. Each of us is doing a better job than we did in the past, I believe, but with the many variables that exist, over which the exporter has no control, this matching of inbound to outbound will never be a perfect science, but we continue to work at it.

This, then, leads up to the fourth challenge that I cited as facing the exporters particularly -- to continue to provide better service to our customers by upgrading existing export facilities and by building new facilities as business potential and economics permit.

Time precludes me from giving you chapter and verse on this, but let me assure you that some of this is going on today.

In addition to ongoing improvements in some established facilities, some of you in this room may have had occasion to visit the new Port of Seattle elevator that is operated by my firm, Cargill. It has been fully operative only two years, and it is considered the optimum in speed, efficiency and automation, and in calendar year 1973 more than 60 million bushels were put into export channels through that one elevator.

Another new facility is now under construction in Tacoma, Washington, that should be operative by this time next year, and will be leased to and operated by some firm by the name of Continental Grain Co.

In summary, then, we do have an export market that has shown remarkable growth in the past ten years, and U.S. agriculture, particularly the grain producer, for the first time in many years, is enjoying some measure of equity in this growth, both in market penetration and in price.

While there is much reason for optimism, one note of caution should be sounded, and this relates to the world fuel crisis. The tremendously higher costs for fuel that all of our overseas customers are now facing is bound to have an adverse effect of some degree on imports of grain. However, this new factor has been with us too briefly to fully evaluate its impact on world grain commerce, but it bears close watching.

Meanwhile, we have, within this country, sufficient logistical challenges to keep us fully occupied, and I'm confident that this Forum addresses itself to a subject that could not be more timely or pertinent.

THE GRAIN HANDLING AND TRANSPORTATION SYSTEM
AS AN INTEGRAL PART OF FEEDING AMERICA

James R. Scoggin¹

In discussing the topic "The Grain Handling and Transportation System as an Integral Part of Feeding America," it seems appropriate to take a look at what the system is. The system as it applies to North Dakota's primary crop, wheat, is depicted in Figure 1.

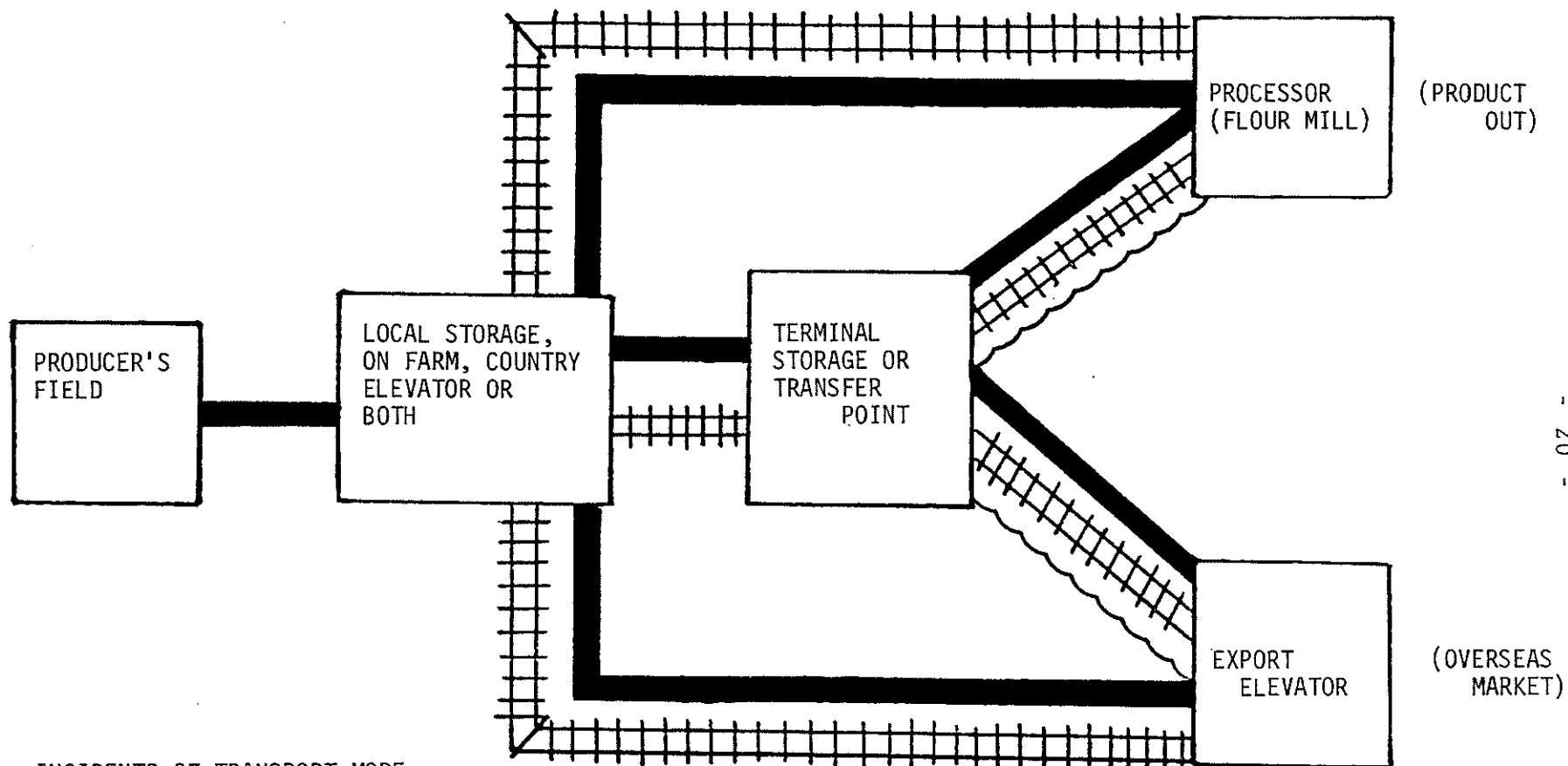
We start with wheat harvested on the farm at one end and at the other, we find a flour mill or an export elevator. We stopped with the flour mill because it is a grain system we are talking about and not one of products. We also stop at the export elevator because we are concerned with the system within the boundaries of the continental United States. We ignore, for the purposes of this discussion, that portion of the wheat crop which branches out into feed or seed.

It would be possible for the producer to carry his own grain directly to a flour mill or to an export elevator as soon as it is harvested with no intermediate handling, but this is seldom, if ever, done.


Why go through all of this handling system between field and user? There are the traditional functions to be served between the time it is harvested and the time it is accepted by a flour mill or an export elevator. Some of these have to do with time, which is to say that grain is stored because someone thinks it will be more valuable at another time than immediately upon harvesting. Another of the functions has to do with quality -- that is, cleaning and blending in order to make wheat more valuable. When other grains are involved, drying may become more important. The third intermediate function has to do with changing the place of the grain because it is going to be more valuable somewhere else than in the producer's field. These changes of place may happen in order to reach the


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FIGURE 1. GRAIN HANDLING AND TRANSPORTATION SYSTEM (WHEAT)



INCIDENTS OF TRANSPORT MODE:

 HIGHWAY CARRIER; FARM TRUCK, SEMI, DOUBLE BOTTOM: PROPRIETARY, GRAIN HAULER, BACK HAULER.

 RAIL CARRIER: SINGLE CAR, MULTIPLE CAR, UNIT TRAIN: FULL SERVICE RATES, NO FRILL RATES.

 WATER CARRIER, LAKE VESSEL, RIVER BARGE.

ultimate market, to reach a point where it is to be stored, cleaned, blended, or to reach a point where it can be transferred to another mode of transportation such as to a rail or water system.

It is only in order to serve these functions of time, quality and place that a grain handling and transportation system exists. For obviously, it takes energy, investment and labor, all measurable in terms of substantial numbers of dollars, in order to make the system work.

Another incident to the grain handling and transportation system is that frequently changes of ownership occur during the process. And these various owners are the ones who decide what aspect of the system will apply next. At one time or another, the grain might be owned by the producer, by local marketing organizations, by regional or national marketing organizations, by processors or by exporters. These may be all sorts of different varieties of business organizations ranging from the sole proprietorship to partnerships, corporations, cooperatives, associations or multi-national business organizations, perhaps even foreign governmental agencies.

Thus, we see in Figure 1 boxes representing intermediate grain handling facilities together with strange sorts of lines linking these boxes representing various modes of transportation used in moving the grain from one sort of handling facility to another.

I have indicated in the first box beyond the producer's field, local storage which might be on the farm, or at a country elevator, or at both places. This local storage function is greatly over simplified in the sketch because there is, of course, the opportunity for the wheat as it leaves the field to move into farm storage, into country elevator storage, or to move first into farm storage and then into country elevator storage. Obviously, transportation is involved in this stage of the game and it consists of movements by motor carrier such as the farm truck or some other locally-based trucking system.

Between the local storage function and the flour mill or export elevator, there is the possibility that the grain may move into a second handling facility which I have named Terminal Storage or Transfer Point. By transfer point, I mean primarily a means of changing the transport mode. Grain may reach the transfer point either by highway or by rail, and one of the important functions

for the transfer point to serve is to cause the grain to move out via an available waterway such as the Great Lakes at Duluth-Superior or the Mississippi System at Minneapolis-St. Paul. Another sort of transfer might be a point at which it is feasible to load grain into unit trains of 5,000 to 10,000 tons to move beyond to a single flour mill or export elevator.

There are, of course, other instances in which terminal handling is performed for the purposes of drying, cleaning, blending or otherwise preparing the grain for its ultimate user. We see that it is possible for the movement out of the terminal storage or transfer point to be by highway, rail, or by water.

It is also possible for the intermediate terminal storage or transfer point to be bypassed altogether and for the movement to the flour or export elevator to come directly from local storage -- that is, either from farm storage or from a country elevator, and this move might be either by highway or by rail. It would be rare to find water available at a local storage point.

Figure 1 is a very simple affair, and I think it can be said that in its basics, the grain handling and transportation system for wheat as outlined here is essentially a simple one.

However, there is the opportunity for almost infinite variations upon the basic structure shown. The storage facility may vary from the most modest of farm storage bins or country elevators to multi-million bushel houses with all sorts of sophisticated and enormously expensive storing and handling capabilities.

From the transportation standpoint, there is likewise the opportunity for almost infinite variations. The quantities moved could range from what is carried in a 300-bushel farm truck through a 25-ton load in a semi; from 60 tons in a boxcar to 100 tons in a hopper to 5 or 10 thousand tons in a unit train; from 1,500 tons in a river barge to 12,000 tons in a laker. Rates applicable to these transportation movements are about as simple or as complex as the mind of man can make them. They may range from a simple, on-the-spot contract with a trucker to an intensely complex arrangement defined by many pages of railroad tariff, delicately balanced and carefully regulated by the Interstate Commerce Commission.

This, then, is the basics on our grain handling and transportation system. If we were to talk about the sort of grain that is directly fed in large quantities to animals or poultry, we would have to put in some different sorts of boxes, but the system would remain pretty much the same.

I am very glad to know that later on in this program there will be suggestions as to how we might consider tying some of these boxes together by means of pipelines, airplanes, hot-air balloons or perhaps even by camel trains. I am all for that sort of consideration. We need to have all the inputs we can get.

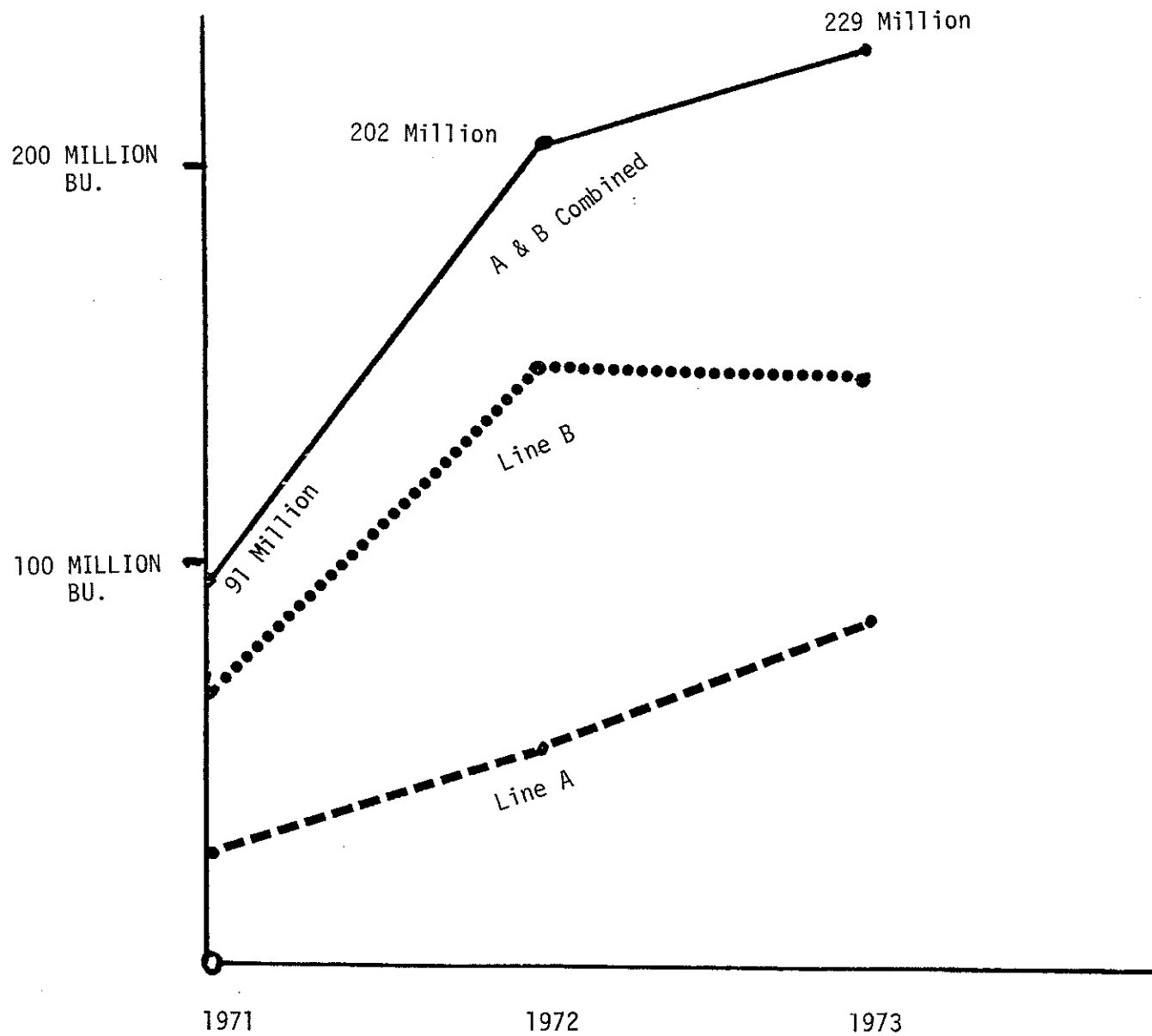
I would like to look at three aspects of this system. First, what is it going to be called upon to do in the next several years in terms of volume? Second, how does the system work in terms of fulfilling its functions economically? Third, what changes should be anticipated in applying this system in the future?

In looking at these questions, and they are enormous questions, we will try to isolate them to North Dakota wheat as the major point of reference.

It is our best judgement that the volume of grain forced through this system in the last several months, while extraordinary in terms of prior years' experience, may be an indication of what is to come in the years ahead. There will, of course, be periodic swings up and down reflecting varying supply and demand situations as they occur. I will not venture into estimating what future exports of North Dakota wheat may be, for another speaker may consider that to be his province. So far as domestic use is concerned, statistics available to us indicate modest growth in the domestic consumption of the products of wheat. There is reason to assume that the spring and durum wheats produced in North Dakota will participate in this growth. To the extent domestic consumption accounts for substantial portion of the use of North Dakota wheat, we would expect modestly increasing use to be made of the grain handling and transportation system. Assuming that the long-term outlook for exports of North Dakota wheat is in the same direction, we have to assume that this system will be called upon over a period of time to move larger quantities of grain than previously was the case.

How well does this grain handling and transportation system serve the needs of the commerce? It is appropriate to stand back and take a look at what happened over the last 15 months in moving North Dakota grain, particularly in the light of the demands that will be made in the future. The domestic and export demand for North Dakota wheat in calendar year 1973 was such as to require vastly increased movements out of local storage. Nationwide rail carloadings of grain increased 24 percent in 1973 over 1972. So far as North Dakota alone is concerned, available statistics indicate a little different picture. Figure 2 indicates the

FIGURE 2. WHEAT ORIGINATED IN NORTH DAKOTA
BY TWO MAJOR RAILROADS



rail origins of wheat within this state by two major North Dakota lines in 1971, 1972, and 1973. The figures surprised me. You see that the big increase occurred in 1972 over 1971 when total carloadings increased from 91 to 202 million bushels, a 123 percent increase. From 1972 to 1973 the increase was 27 million bushels, a 13 percent increase. Even more interesting is the fact that all of the increase in 1973 was on one of the two principal North Dakota lines, the other one not quite even holding its 1972 volume. This, I am sure, is the result of that line having reached its capacity in terms of available car supply, for certainly much more wheat was available for it to haul.

Motor carriers showed a very substantial increase. Receipts of wheat at Duluth-Superior increased from 26 million bushels in 1972 to 57 million bushels in 1973, a 123 percent increase. Certainly, a great deal of this wheat originated in North Dakota.

There were obvious problems involved in responding to the 1973 demand for transportation. Many country elevators could not get cars when they wanted them nor sufficient quantity overall. The switch to motor carriers to handle ever increasing portions of the total available to be moved caused the rates paid for motor carrier transportation to increase very substantially so that shippers were, contrary to prior prevailing practices, paying premiums over rail in order to get motor carrier service. It may be an open question whether more North Dakota wheat would have moved in 1973 than actually did move given the supply and demand prevailing if more overall transportation capacity had been available. It can also be asked whether the movement happened as it should have. From an overall economic standpoint considering costs of fuel, labor and investment, should a larger portion of the crop have moved by rail? Was the rail system used less efficiently and effectively than it should have been? Were there instances when rail cars and rail power were unnecessarily detained at intermediate railroad yards, at origins, at port elevators or at processors' facilities? I think affirmative answers would have to be given to all of these questions at least to some degree.

I happen to be closely associated with an inter-industry group whose objective was to monitor the rail movement of grain, to anticipate and report future movements, and to attempt to cooperate with everyone involved including railroad companies and governmental agencies in expediting the flow. While we were gratified by the fact that enough wheat actually moved so that exports

doubled over what had been exported over the previous calendar year, and processing plants, by and large, operated so as to make as much product as they intended, we were also struck by several factors which impeded the flow.

There are places within the United States where the road bed is not sufficiently maintained to handle such a high volume of traffic. For example, frequent derailments in certain areas constituted a serious obstacle to grain movements.

Railroad terminal facilities and various areas were bottlenecks impeding the flow. With respect to many channels of movement, adding more cars to the situation would only have increased congestion and not have moved more grain.

We did not get as much help as we expected from the inland waterway systems since high water closed the Mississippi for several weeks when the services of water transportation were badly needed. Actually, total waterway participation was not substantially higher than previously.

Port congestion was a problem to some extent. However, it was our opinion that the extent of this problem was minimized by a fairly effective system of embargoes which, for the most part, held down port rail car congestion to acceptable maximums. Nevertheless, there is room for improvement in this regard, and it is to be hoped that a better flow of information and better planning on the part of all concerned can hold future port congestion down to a lesser degree than was the case in 1973.

Car supply was and remains a problem in several ways. Many cars which were used to move grain and grain products ought not to have been used because they were neither safe nor secure. The use of open top hoppers and converted cattle cars is certainly less than ideal. In terms of absolute supply, we have no doubt that future years will call for a larger number of carloadings even than in 1973. Increased carloadings can come about through increased utilization of cars available to move as well as by increasing the total supply. It would certainly do no one any good to add cars to choke rail terminals which cannot handle what they have.

There is always the question whether unnecessary grain handling is involved. Perhaps there may be instances when grain is handled through farm storage, then through country elevator storage, then through one or more terminal and

transfer sort of situations before finally being moved to a processor or an export elevator. Much care and attention must be given to improving economics in this area as well as others, but we have in existence a very effective discipline which forces those questions to be answered correctly in time. Our competitive marketing system will find the cure to this problem, if there is one. This raises other kinds of important economic questions about how far grain ought to move by motor carrier, by rail and by water. From and to what areas, for example, is it economically sound for railroads to compete successfully with rail-water or highway-water routes?

In the same vein, there is the very familiar sub-terminal question so far as North Dakota wheat is concerned.

The term "subterminal" is, in my opinion, ambiguous. If one means to imply an interior rail transit house handling grain originating elsewhere by rail, the concept may be dubious. If, on the other hand, one has in mind a modern country elevator which perhaps looks more like a transfer point handling inbound truck grain and outbound multiple car or unit train rail movements, together with some of the more conventional shipping out functions, with or without the ability to do much in the way of local storage, this is something else entirely, and may deserve much attention.

Assuming that the intermediate facility is a point where grain is transferred into unit trains for concentrated movements to ports and flour mills, from what origin area is it economically sound for wheat to move presumably by highway carrier to the transfer point?

A similar question involves the location of flour mills. Assuming it is intrinsically less expensive to move wheat than flour via all three forms of surface transportation, and weighing this fact against other economic considerations such as land costs, labor costs, millfeed values, and available flour markets, where ought the mills to be located? Once again, our competitive grain marketing system will provide the answers to these questions.

All of these areas of concern lead one to wonder what improvements in the grain handling transportation do we foresee? Or for that matter, what deteriorations may lie ahead of us?

It must be acknowledged that railroads are a vitally important part of our grain handling and transportation system and many of them are in very serious difficulty. We are at this moment in the first stages of a national program to attempt to salvage something out of the private rail industry in the northeast part of the United States which is now bankrupt. Whether that can be done successfully is a very open question. In the minds of many in the transportation business, we have already begun a giant step toward an eventual nationalization of our rail transportation system which cannot be stopped. Maybe so -- maybe not. At any rate, the financial ability of railroads throughout the nation to respond to the demands that commerce places upon it is a very severe question in the minds of transportation people. We cannot sit back and assume that because our North Dakota railroads are relatively well off, we here in this state are not affected by this problem. As indicated before, the system of grain transportation and handling which begins with North Dakota wheat is a nationwide one and weak links in the system outside of North Dakota must be of concern to North Dakotans as well. I would have to say that securing a financially healthy rail system able to respond to the challenges it will face, is a matter of very high priority.

Another highly important incident to our transportation and handling system is the withdrawal of governmental agencies from storage, reconcentration, and from other aspects of the supply side of the market. This has, I think, a most significant influence on the system and seems to signal greater influence to be given competitive market forces in shaping the system to come.

The question of intermediate handling facilities is bound to be an interesting and challenging one. There is enough hard economic thought and planning going on into the question of interior train loading facilities in North Dakota to make it possible that there may be such operating within North Dakota before long. It is not too difficult to visualize 50-car (5,000-ton) trains moving North Dakota's wheat not only to export elevators, but also to flour mills. Actually, there are flour mills within the United States at points quite remote from North Dakota which use large quantities of North Dakota's wheat. A flour mill with 10,000 cwts. daily milling capacity, medium size in today's market, grinds enough wheat to require about 42 train loads at 50 cars per

train each year, or one train which could make a turn-around every eight or nine days. This would, of course, be very intense use of the rail system and there ought to be some substantial savings in rail costs in doing business in this way if it is indeed possible to accumulate millstocks at interior North Dakota locations in this fashion. In this connection, it must be noted that the density of production in North Dakota is very much different than is the case in Illinois, Indiana and in Iowa where interior train loading facilities moving are currently doing business in a pretty big way. Nevertheless, one cannot doubt the possibility that a modified version of this concept, patterned and designed to fit North Dakota circumstances, may come into existence before long.

Car supply is an area where there must be some improvements. We suspect from last year's experience that there was no real competition between railroads and motor carriers in moving North Dakota's grain because the railroad had all they could handle and had to turn away large quantities of traffic, lacking capacity to move more. If we are to achieve the economic balance which we seek, there must be greater rail capacity.

Unit trains of the sort spoken of above certainly are one possible way to achieve that increased capacity. We must also be assured that there will be sufficient ability for railroads to move cars in conventional single car service and not only in unit trains.

We must assume that before long the transition from boxcars to hopper cars as the basic grain moving car will be completed, and that boxcars will be used only for unusual peak-type movements. A lot of hopper cars have been put into grain service in the last several years and this has been through the activities not only of the railroads but of private shippers as well. I was surprised to learn that of the total number of hopper cars added to the national fleet in the last couple of years, private shippers were responsible for at least half of them, and that in the last eight months private shippers have been responsible for a good 60 percent of the increased fleet. Think where we would have been if only those cars supplied by railroads had been available to move grain!

I cannot emphasize too much that a large part of the answer to the car supply problem is more efficient use of the cars that we have and this means elimination of rail bottlenecks as well as improved handling on the part

of shippers and receivers. There has to be a lot of money and creative effort developed to improving the weak links in the rail system. We deserve reliable, predictable transit, and we are not getting it. In my mind, this is a matter of priority even ahead of obtaining added rolling stock. However, it is probable that additional cars will continue to be required if for no other reason than to replace the boxcars that cannot and should not continue to be used in grain traffic.

Improvements must be made in grain handling facilities as well as transporting capabilities. The train loading facilities previously spoken of are only a part of the system. Presumably they will, if they come into existence at all, be capable of loading 50-car or even greater train loads of grain in a very short period of time. Along with this must be the capability of flour mills and export elevators to handle these trains and unload them expeditiously. Actually, there is already a great deal of this sort of capability in the export elevator field and more is being added in a very intensive way. Some flour mills are capable of unloading unit trains and it would seem that the future will see more of this sort of capability. Where appropriate, flour mills are capable of unloading vast quantities of water-moved grain expeditiously as well. Perhaps there may be additional capacity of this sort in the years to come.

In summary, it seems certain that there is much more that can and must be done to improve the grain handling and transportation system in this country in such a way as to continue to feed the American people well and economically and at the same time take full advantage of the opportunities American agriculture has to service vitally important overseas markets. There are many areas of concern including the unacceptable financial state of certain important railroads, the rail nationalization question, and the need to secure substantial improvements in railroad equipment and utilization. The means by which these concerns may be satisfied are not at all clear. At the same time, we here in North Dakota face important and very interesting questions as to the form that the system may adopt in the next several years regarding train loading facilities and rail, highway, perhaps even water transportation techniques for moving North Dakota crops. We can be sure that competitive grain marketing will eventually find the form of grain marketing and transportation system that will do the job with greatest economy. Even though that may prove painful to some, we are sure that the nation's economy will be well and economically served.

THE CHALLENGE TO NORTH DAKOTA'S GRAIN
HANDLING AND TRANSPORTATION SYSTEM

Melvin G. Maier¹

It is a pleasure for me to be able to present my thoughts on a subject which many consider to be the single most important challenge facing the State of North Dakota. The ability to deliver our vast agricultural production is basic to the realization of market opportunities and thus the development of our state's economy. Beyond that we also depend on our transportation system to import the agricultural supplies that are needed to produce. We are the most agricultural state in the nation, but are situated at a greater distance than any other state from our customers and suppliers. We can't alter these economic and geographical facts. We can, however, concern ourselves with the development of an improved transportation system. Few would doubt there is need for improvement.

The nature of the problem is such that no one segment of our great agricultural industry can hope to solve it independently of all others. Indeed, North Dakota's producer and agri-business interests need to work with and cooperate not only with each other, but with our neighboring states, national agri-business interests, government, and the national carriers if we are to expect logical solutions of our problems.

Forums such as this one are a mini-structure of the kind of unified approach it will take for progress to be achieved. Progress, in this case, is the attainment and maintenance of a transportation system for our state which optimizes the needs of all interests -- producers, shippers and the carriers. During these two days we hope to look at the scope of the problem in terms of current and projected needs. Alternative transportation methods will be considered and evaluated. Most importantly, however, assembled here are individuals which represent the kind of cross-section of interests and effort that will be required on a national scale.

The movement of crops and livestock to market and fertilizer, fuels and supplies to the farmer, are as mentioned

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of greatest concern to agricultural producers and the agri-business interests of our state and region. In 1973 the total estimated new wealth generated by agriculture in North Dakota was just under \$2.4 billion. That represents return on investment and management to about 40,000 farm and ranch units in our state.

We live in a world of constant change, but it is beyond any of our wildest expectations that the agricultural industry of our state would ever be relegated to a secondary role in the decades ahead -- even with the major influx of the coal gasification industry. The area devoted to agricultural purposes in North Dakota is not likely to decline rapidly due to urban sprawl.

Indeed, the state's chief industry may just be coming into its own. There are signs that the productivity of the American farmer is finally being recognized by his city cousins. The world for many years has long depended on the United States as a dependable, economical food supplier. The productivity of the American farmer is the envy of nations the world over. This becomes highly important when you consider that world population is increasing at an overall rate of 2 1/2 percent per year. World food supply, on the other hand, is increasing at a rate of only 1 1/2 percent per year in developed countries, which includes the United States. In the developing nations, food supply is increasing at a rate of only 1/2 percent per year. Obviously, the food supply-demand gap is widening. The dramatic grain markets fluctuation witnessed since 1971 emphasizes the impact of this world demand for its basic need -- food to maintain the health and the very survival of millions less fortunate than even the most disadvantaged here in the United States.

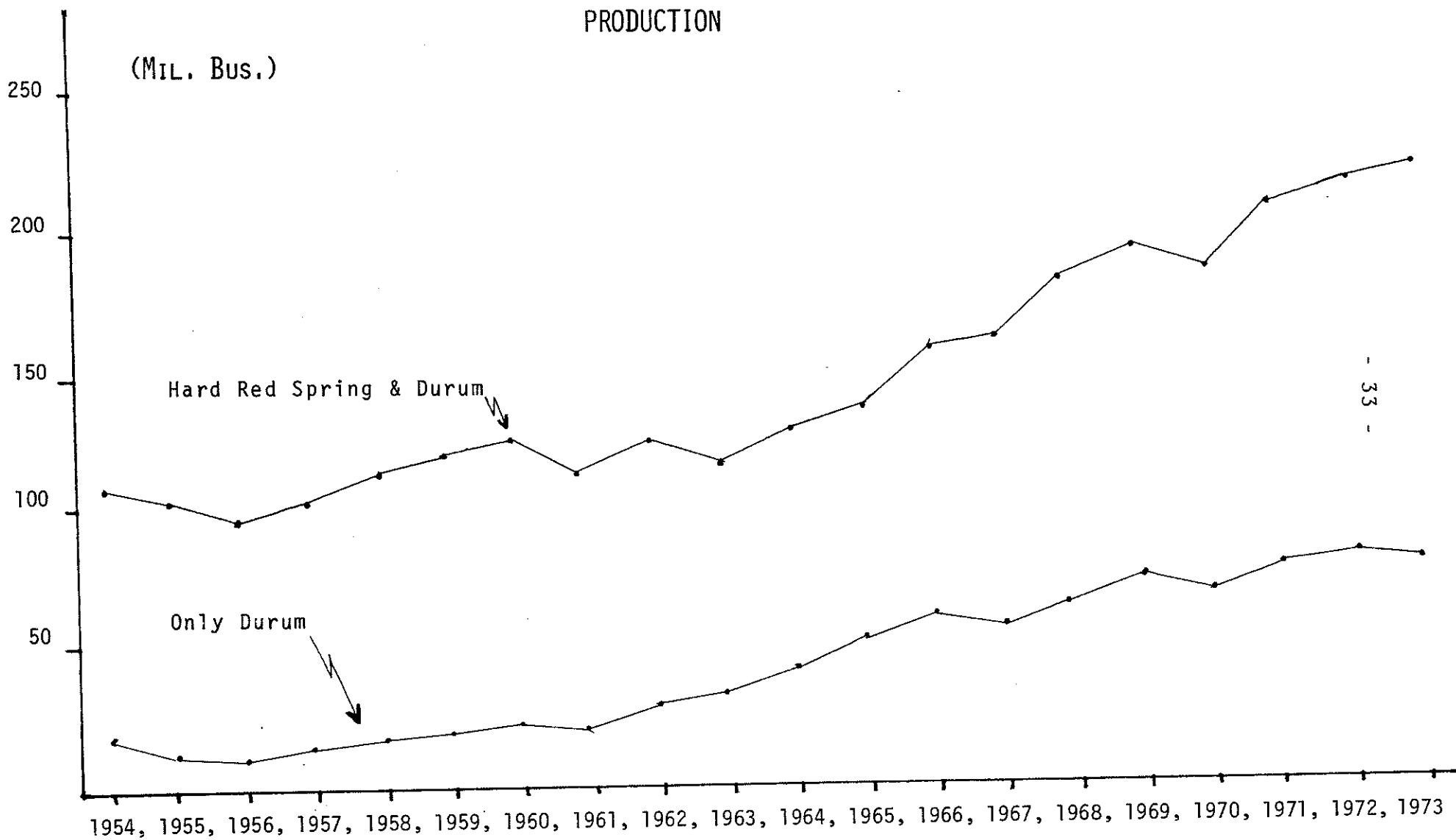
What is North Dakota's long-term capacity to expand its contribution to the world's food needs? Since the early 1950's, North Dakota's average annual wheat production has increased at a steady rate. Acreage, however, has not changed significantly. Technology in the form of disease resistant, higher-yielding varieties, chemical inputs and better management, has resulted in the increased productivity. (Figure 1)

Does this mean that we can expect productivity to increase at the same rate to the 1980's and the turn of the century? Perhaps not, but it is not beyond the realm of possibility that dramatic increase will occur.

Based on trend yields from 1950 to 1970, with normal wheat conditions, North Dakota's wheat production could

FIGURE 1
5-YR. MOVING AVERAGE
PRODUCTION

(MIL. BUS.)



approach 400 million bushels per year in the 1980's and be even higher by the end of the century.

Similar production patterns have occurred from the other major crops grown in North Dakota. During the 1940's, total cropland acreage increased and since then some additional native grass has been brought into production. There have, however, been some minor losses due to urbanization, the construction of dams, and reseeding of crop land into native grass. All in all, total crop land area in the state now remains relatively constant from year to year. Wheat acreage has actually declined since the 1940's.

Businesses all agree that there must be incentive for productivity to increase. Some assurance of additional return must exist before additional units of resources and cost will be committed.

From the burdensome supplies of the 1950's we have come full circle to fears of world food shortage. Our producers are again being urged by government and tempted by prices to vastly expand production. Whether this will again result in burdensome reserve levels is a question which concerns us all. Will North Dakota's grain bins again be full while people in other parts of the world are starving?

The answer may be the same as it was 20 years ago. Someone will need to pay enough to make it profitable to produce and to transport the food to world-wide consumers. It boils down largely to a question of distribution. Costs to the world's hungry, however, can be reduced if the transportation system is the most efficient, rapid and responsive that the mind of man can devise. It may take the same kind of imagination and commitment that was required for man to send one of his own kind to walk on the moon.

The challenges are great and fear of change is perhaps the major obstacle. During my work in Europe, it was a never-ending source of wonder to me that a people so much in favor of progress were so resistant to change. Perhaps this is also a major problem we face in this country in regard to transportation.

To understand the challenges, envisage with me for a moment a transportation system which could exist in North Dakota in the 1980's.

On-farm storage still predominates. The farmer's grain, as now, is still trucked to assembly points. These, however, may be country elevators which instead of shipping direct to market, feed larger subterminals located in the country.

Such a subterminal may itself be a receiving point for the farmers' grain. Grain may be purchased in the bin with trucking costs deducted from purchase price. At the subterminal, the grain is merchandised and rapidly whisked away by high-speed rail or pipeline to domestic mills and export facilities. Barges may come even farther up the Missouri River to load at inland terminals in North Dakota. At the deepwater ports there is, as now, trans-shipment into ocean-going vessels. Some grain is loaded directly into lighters which are loaded aboard ship and upon arrival in Europe move up the Rhine for direct unloading at inland mills.

Marketing would keep pace as well. Contracting would be a common practice assuring domestic and overseas buyers of a steady and continuing supply of identity-preserved quality grain from farm to processor. This marketing technique would provide a service frequently requested by the overseas customer. North Dakota wheat could be sold on specifications which go beyond statement of overall grade and protein.

The most exciting thing about this system I have described is that most of the technology already exists. We have seen consolidation and reduction in the number of country elevators and the growth of facilities at the major cities in our state. Every day trucks haul direct from country elevators and farms to the North Dakota Mill and Elevator, to Duluth-Superior, and to Minneapolis. Unit trains are widely used in other parts of the country and have been successfully tested here in North Dakota. There are plans for completely new subterminal operations in the state. The technology of pipeline construction and movement of grain has been thoroughly researched. Lighters aboard ship (LASH) are in use. There has been consideration of extending the barge facilities on the Missouri River -- even farther up river from Sioux City to North Dakota.

It would be foolish to say, however, that all of these changes have been or will be widely and popularly accepted. If they will result in more efficient transportation of grain, why haven't they already been adopted? Primarily, this is due to resistance to change. There is a reluctance on the part of the segments or the whole of our present transportation system to lead innovations. Changes which have been envisaged cause fears of social and economic upheaval in rural areas. The advent of more and larger subterminal operations is certain to have an effect on the number and operation of country elevators. The most efficient unit train requires rapid loading facilities, which means large storage capacities and fast-receiving facilities capacity as well. Few country elevators are now able to do so.

The railroads have since statehood been the dominant and in the early years the only method of mass transportation in North Dakota. Most existing country shipping stations were designed solely to load rail cars. That fact plus lower freight rates than trucks make rails the preferred shipment method for many. Yet the railroads which serve our state have seemed incapable of keeping up with the needs of producers and shippers. Perhaps this is because they have lacked the capital to modernize and improve service. Whatever the reason, they frequently seem to be unresponsive and immune to wishes and needs of producers.

This suggests that perhaps producers, the local grain trade, and shippers need to give more serious consideration to the development of truck movement and other alternative means of transportation. The St. Lawrence Seaway was opposed by rails yet it has meant millions of dollars in transportation savings to North Dakota farmers. In 1973 over 195 million bushels of North Dakota grain, for example, was exported through Duluth-Superior, an inland port only 270 miles from our border. Perhaps ports on the Missouri, within trucking distance, should also be developed.

Interstate pipeline schemes have been considered. Perhaps we need to crawl before we walk and consider one to Duluth-Superior before we try to cross the Rocky Mountains to the Pacific Coast. Pipelines might also be a means of bypassing dams on the Missouri for barge-to-barge transshipment.

It has been fairly well established that a large volume, perhaps up to one-third of all freight in the United States, is hauled at a loss. This has meant that survival of our national railroad system depends on a make up of such losses on other haulage. Unfortunately for North Dakota producers, grain is one commodity which pays for losses incurred on other freight. Competition is something that all businesses understand. Operating at rates which are well above cost plus a profit may be good business practice if there is no competition, but we in North Dakota find it difficult to accept.

If, as noted, there is a reluctance to lead innovations, how can North Dakota expect to assist in bringing about change in our transportation system.

Firstly, I would suggest that there must be more complete involvement of the entire North Dakota community in the problem. Our producers, government, grain trade and carriers must all work together in researching problem areas and

assessing opportunities. Knowledge of market potential is essential. A positive approach to studying the existing transportation system is necessary and a major first step.

Development of a common consensus of the problem facing the existing system is a logical second step. What expanded role can barges, pipelines, and air freight play in a modernized transportation system? Is a chronic shortage of boxcars the problem or is it a symptom of a larger problem facing the entire U.S. railroad system? What are the operating costs which strip profits necessary for capital investment? Producers need to know so that their effort, in concert with others, can be directed in a manner most likely to succeed.

With a clear understanding of the problem, hopefully will come realization of the actions that unified interests can take. A central core of opinion on how some of these problems can be tackled needs to be developed. One form of action may be in the adoption of federal legislation.

Throughout these three stages of change, one point is all important. There must be complete commitment on the part of an aroused North Dakota community to seek solutions and attain its goals. Without that commitment we are doomed to repeated rhetoric and today's challenges will be the same tomorrow and twenty years from now.

Question and Answer Session for Panel
"The Challenge to America's Agricultural Handling
and Transportation System"

Question to Mr. Mills:

Mr. Mills, I am hearing that the U.S. taxpayer is paying a subsidy for the grain going to foreign countries. Is this correct?

Answer by Mr. Mills:

Most of you are aware, of course, of the export subsidy that was maintained on wheat for many, many years to allow American wheat into what was then described as the world market. Our wheat domestically was priced higher than could be obtained on world markets. That subsidy, of course, was done away with some time ago. I'm not aware of any actual subsidies today. As a matter of fact, the world market for wheat today is exactly what you read in your newspaper. You are, in effect, setting the world market for wheat today. There are some arrangements, and I am not familiar with them, regarding ocean transportation subsidies, but that involves the American situation and I am not really competent to discuss it. There are some subsidies involved in that part of the transportation in getting this product overseas. Basically there are no subsidies being paid today by the American taxpayer to see that U.S. grain gets to foreign customers.

Question to Mr. Fisher:

What was the experience in the Pacific Northwest as to inland transportation efficiencies and capacity in handling the recent tremendous increase in export activity, compared with Midwest experience?

Answer by Mr. Fisher:

I think there is no doubt that we had our problems, but they were in no degree comparable to what went on at the Gulf: the Mississippi River flood that Mr. Scoggin made mention of, the confusion and delay as a result of the Russian grain deal, and so on; we lost a better part of five or six months in the shipping season. The ocean freight aspect of the thing was resolved, as to what bottoms were to carry this cargo to Russia. What was done in clearing these commitments to Russia particularly at the Gulf was a fantastic job considering that the Gulf started with one hand tied behind their back.

In the Pacific, we had a record export year and with relatively minor dislocations. We had our congestions and our embargoes. I would like to say that the ICC and the AAR have become more sensitive than ever before about watching for accumulations and potential congestion before they have developed. In recent months, and even in recent days, they have started implementing a policy whereby an elevator is gauged on the basis of its past weeks' performance and if more than a four day bank of cars is permitted to accumulate ahead of that elevator, an embargo may be imposed on that elevator. This policy is implemented elevator by elevator, port by port. I think it is proper that they do watch this as closely as they do and are as quick to move as they have been. It puts the responsibility on the individual port elevator operator to perform if he is to continue to keep that pipeline moving. On the other side of the coin, however, are the variables that the exporter is confronted with. Most of our grain in the Pacific Northwest is sold f.o.b. loaded to the vessel. The buyer is the one who charges the freight and puts it in. An ocean storm can set a bank of 30 or 40 vessels behind by several days and it is these kinds of unpredictable situations which are extremely difficult to cope with. By and large, I think we are learning lessons and are seeking more information and demanding better information on vessel arrivals. We are also making better plans in our own shop. In summary, I think the record shows that clearance through the Pacific is far better than that at the Gulf.

Question to Mr. Fisher:

How can quality of wheat be increased when all wheat is priced the same, poor quality or not?

Answer by Mr. Fisher:

I think I made some comments on this. It's true. When you are talking \$6 wheat the protein premium for 15 spring versus 13 spring, and so on, somehow gets swallowed up in the equation. I think we have to be careful about the maintenance of quality. Higher yielding varieties are a partial answer, but a partial answer only. We are seeing a very definite trend among our Asian customers and developing nations where economies permit, a predictable change in demand toward a higher quality of wheat and more sophisticated products. It is important that quality always be maintained. I think the segregation of quality is one of the aces we hold. However, segregation of quality also creates some logistics problems. We have, this year, handled various qualities of barley, hard winter and spring wheats, and durum with various ranges of protein. It's not as if we were just handling ship load after ship load of ordinary protein hard red winter wheat as is the case with

many of the Gulf ports. Rather, we are trying to be all things to all people, maintain these markets, continue to develop a quality awareness, and to match the sophistication that is developing in these countries. Let's not give up protein or quality in the interest of just bushels.

Question to Mr. Scoggin:

Unit trains improve car utilization, but also increase inequities. For example, larger elevators receive benefits of lower rates and sufficient car supplies. Farmers located near large elevators receive greater benefits from unit trains than do distant farmers. The question: Should near-by farmers subsidize distant farmers?

Answer by Mr. Scoggin:

I really don't think anybody ought to subsidize anybody. I think that in any sort of a competitive market and system you just don't have subsidization. Everybody should be paying for what he needs to have, and I think that those who supply needs ought to supply them on a competitive basis. Things will work out best in that way.

The question, however, does bring up a very important point about the possibilities, in fact the existence, of discrimination in connection with unit trains. This is something that was of very much concern to shippers, to railroad companies, to the Interstate Commerce Commission, and to the Association of American Railroads in 1973 when unit trains began to be used in ever-increasing quantities in shipping grain to meet particularly export demands. Of course, unit trains were also used for domestic purposes. We did have this problem exist in 1973, and there is just no question about the fact that the unit train device can be applied in such a way as to unfairly discriminate against the single car shipper. There are two interests that have to be balanced. One is that the unit train is an excellent vehicle for increasing the capacity of railroads to handle grain transportation; this is important to everybody, whether they are single car shippers or multiple car shippers because the need to increase that capacity is there, and it is a very important need that has to be satisfied. On the other hand, you've got the fact that the guy who can only ship one car, or the guy whose sale is made to somebody who can only receive one car, has a right to be served too. There is just no question about the fact that if the unit train system is used in such a way as to put all of the transportation capacity in unit trains and leave the guy who can ship or receive only single cars out in the cold, then that is a discriminatory situation and one that should not exist.

The Interstate Commerce Commission was made very much aware of the possibility of discrimination through the undue use of unit trains to the exclusion of the single car shipper. In addition, the Congress was made very aware of it. I know from hearings in Washington that I have attended that this was a very, very tender and sensitive issue. One of the things that was done in response to this concern was the issuance of an Interstate Commerce Commission order that said, in effect, that only a portion, say 25 percent, of the large covered hopper cars owned by railroad companies could be devoted to unit train service as defined by the Interstate Commerce Act. This was, I believe, an attempt on the Commission's part to weigh two things: one, the need to increase total capacity, and secondly, the need to avoid discrimination for those movements that are not adaptable to unit train shipments. In making that kind of a rule, I think the Commission was very wisely giving consideration to both of these interests and balanced them in such a way that while certainly not perfectly agreeable to everybody, did, I think, result in an equitable solution. I think that this situation is going to continue in the future. There is no question in my mind but that the unit train device will be used more and more as time goes by and as we try to squeeze more grain into the system. The unit train device will certainly be used to increase that capacity. At the same time, however, in order to avoid discrimination, we must give consideration to the needs of the commerce that can only be satisfied by single car shipments.

Question to Mr. Maier:

What facts do you have to support your statement that revenue from grain hauls subsidize losses in hauling other commodities?

Answer by Mr. Maier:

I guess I would have to refer people to the testimony in the Barley Rate Case, for example. If the person who asked the question would like some answers, I would suggest that he talk to John Finsness, traffic counsel for the North Dakota State Wheat Commission, or someone like him. I think he can provide the data to answer that question.

TRANSPORTATION AND RURAL DEVELOPMENT
IN THE GREAT PLAINS¹

Howard W. Ottoson²

I have taken liberties with the title given me by conference organizers, namely "Agricultural and Rural Development in the Great Plains." However, I suspect that they will not be surprised.

This conference program is impressive; it covers grain transportation in detail, including alternative modes, market organizations, and technologies. This is appropriate; transportation is, or should be, a system and should be viewed as such.

I am going to assume a different perspective; rather than presuming to take a global view I am going to focus on transportation from the perspective of the rural community.

The Great Plains comprises a collection of rural communities -- farm cities or central cities -- surrounded by smaller satellite towns and open farm and ranching country. There is an occasional SMA (Standard Metropolitan Area) such as Omaha, or Sioux Falls, or Fargo which services large geographical expanses of rural society, in addition to engaging in manufacturing and other primary activities. When we speak of transportation problems in the Great Plains we are talking largely about the problems experienced by one or another rural community, and their linkage with each other, the SMA's, and the outside world.

The history of development in the Great Plains is not yet a remote chapter. A little over a century ago the Plains country was largely open space -- a blank map -- across which moved people on foot, on horseback, in horsedrawn vehicles, or by water. The trails were still delicate lines on this map -- easily erased by the exigencies of drought, disease, or economics.

But this soon changed. In the trail of the covered

¹This discussion has benefitted from the helpful comments of my colleagues Dale Anderson, Richard Felton, and John Muehlbeier of the University of Nebraska.

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wagon came the railroads -- shackling the open space with bands of iron -- forging permanent economic and social life lines with the rest of the nation. Town sites were laid out at intervals along the lines. Some were actually settled; others were not. Fanning out from some of the new railroad towns went branch lines along which developed other villages. The railroads brought settlers, machinery, barbed wire, clothing and staples. Farms were settled, grain elevators were built. As agriculture began to develop the railroads hauled away grain and livestock.

Subsequently there came other modes; roads were built for wagons and carriages, and later improved for automobiles and trucks. Barge lines were developed to service certain areas, the airplanes were a late arrival.

More recent history has seen the steady development of new farm technologies, larger farms, new consumer goods and increasing demands for them, the shrinking of rural populations, and increases in farm production per acre and per hour of labor as the machine has replaced human and animal power. The economic and social links between the rural community and the world around it increased in number, sophistication, and complexity.

We hear a lot about rural development these days. This is a term not easily defined; it means different things to different people -- average real income per capita, employment opportunities, availability of public and private services, or quality of life. It means all of these. These attributes in large measure relate to specialization and exchange. We seek to produce those goods and services in which we have a competitive advantage, and exchange them for other goods which we desire. The more finely tuned this process, the higher our state of development. To trade is to develop, and to develop is to trade. And we forget that transportation is trade. The exchange function includes not only the setting of prices and the change of ownership, but also the hauling of goods and people from place to place. The crucial aspects of transportation are brought home to us when we experience a freight car shortage, when elevators cease taking grain, or when they pile it on the ground. When we hear of the two-month lag between the cessation of the Arab oil embargo and an increase in supply of gasoline at the local gas station we are reminded of the reality of transportation logistics.

Transportation is a matter of concern which goes beyond Congress, the Department of Transportation, U.S. and state departments of agriculture, marketers of grain, or non-regulated truckers. It is also the concern of the rural community. There is a transportation crisis in the rural community. An era has passed, and we are not sure about what should take its place. The energy problems to

which we have recently become accustomed add a new dimension -- they change the rules and redefine many of the issues.

Rural transportation problems did not arrive yesterday; they have been coming for a long time; they have profound effects on the rural community, and on the food and agricultural economy. The rural community has at least two major choices about transportation. We can wring our hands and bemoan the closing of a branch line (or try to prevent it by political action); or, we can seek to innovate and create alternative arrangements. I believe that the climate today is more favorable, more creative, regarding the finding of solutions to these problems than has been true for a long time. The topics of this conference support our willingness to explore alternatives.

For some reason discussions of Rural Development issues have frequently ignored transportation. The availability of transportation has been viewed as a given, like rain, or sunshine. I suggest that no group concerned with the development of rural areas can do this any longer. Transportation ought to be the subject of analysis, of evaluation of alternatives, and of planning. Transportation policy needs to become as familiar as farm policy, foreign policy or energy policy. Transportation policies can inhibit desirable adjustments and stand in the way of rural development; or, they can encourage development. Many transportation problems can be solved only by actions of society, or by larger shipper or carrier interests. Other problems are amenable to solution, directly or indirectly, at the local level. The community can play a more aggressive role in solving its transportation problems than it has in the past. The test is simple; it finally resolves to the cost of moving goods and people into the area, out of the area, and from place to place within the community. Transportation can be overwhelming in its adverse effects on development; or, it can be a key factor encouraging development.

What are the important transportation issues affecting the economic and social welfare of rural communities? We can illustrate with some well known examples.

The rail car shortage

This is not a new problem; there is evidence of concern about rail car shortage in hauling grain at least as early as 1887. The problem has been felt severely in recent years.

The effects are several:

- a) Grain stored on the ground, with associated losses.

- b) Refusal of country elevators to accept grain as storage capacity is overtaxed.
- c) Inability of shippers to meet contract deadlines.
- d) Higher interest cost of inventories.
- e) Straining of elevator credit resources.
- f) Losses because of poor quality cars brought into use.
- g) Delays in car pickup and movement.
- h) Losses to farmers who have delivered grain but who have not been paid, should an elevator fail.

All of these translate into higher cost of exporting the product to other regions, lower prices to shippers, and adverse economic effects on the rural community.

There is no single, simple solution. The problem must be approached in several ways:

- 1) Public policy: Felton has suggested changes in the car rental system.³ He calls for more flexible car rental rates which would respond to demand-supply conditions, making it possible for shippers to bid for cars. Rental prices would rise during periods of heavy demand, and decline during slack seasons. Shippers willing to pay the market price would be assured of having cars.
- 2) Industry and community innovations
 - a) Greater control of rail car inventories and movements by use of electronic devices, computer analysis, and information systems.
 - b) The use of more efficient, larger rail cars and unit trains to speed the movement of grain and haul it more efficiently.
 - c) Faster loading and unloading equipment.
 - d) Modification of transport vehicles to haul a greater variety of commodities, thus increasing back haul possibilities.

³John R. Felton, "The Utilization and Adequacy of the Freight Car Fleet," Land Economics, The University of Wisconsin Press, Volume XLVII, No. 3, August, 1971, pp. 267-73.

- e) Institution of containerization and pallet handling systems and other improvements in packaging and handling.
- f) Coordination of truck and rail system to collect grain at country points and speed it to concentration facilities for loading on unit trains.
- g) Coordination of rail and water transport systems.

You will note that some of the innovations mentioned could be initiated by transportation firms; others would involve joint action by transportation firms, shippers, and local communities. Of course, a national transportation policy should be concerned with the whole issue of how to economize on the movement of commodities and people.

Abandonment of branch lines

This development, of great concern to rural communities, has come about as the profitability of large volume shipments relative to small ones has widened. We have failed to develop replacement methods and technology to handle small volume shipments. So far we have had more complaints than innovations.

Fundamentally, creativity by transport firms, shippers, and communities is needed if we are to solve the problem. A number of ideas need analysis and experimentation:

- a) Methods of small volume transfer.
- b) Local purchase and operation of branch lines.
- c) Special car service involving movement of cars at night and loading in the day time.
- d) Integrated truck-rail methods, with subterminals for concentration.
- e) Containerization.

Again, we are seeking to devise new approaches which will serve the rural community; these systems will include taking advantage of lower cost large cars and unit trains moving from terminal points with sufficient volume, coupled with tailor made methods to cope with the more costly assembly of product from the country at the terminal points.

Rural passenger service

Problems of rural passenger service have arisen from the combination of decreasing population density of the plains and

the increasing economies of size of grocery stores, schools, medical care facilities, professional services, and cultural and recreational services. The latter facilities and services have been reduced in number as they grew in size, and have tended to concentrate in the larger towns. Of course, most of us have thus far been able to drive an automobile over long distances to avail ourselves of goods and services provided by these establishments. This has created heavy demands for better roads, but has also lessened the demand for public transportation, causing carriers to reduce the quality and quantity of their services. The deterioration of these services further discourages their use, and a vicious circle results.

Particularly affected by all of this have been those people who do not own automobiles, and especially the infirm and elderly. Now, rapidly increasing cost of energy causes worry about how we are again to provide more public transportation.

Again ingenuity is called for; we will have to explore new alternatives for transporting small loads of people between smaller communities. For example, a system of minibuses operating between several rural towns has been established on a three-day per week schedule in southeastern Nebraska.

Railway Freight Rate Discrimination

This is fundamentally a policy issue which has had a serious impact on the Plains rural community. It involves establishment of rates for regulated public carriers which are higher, in relation to the cost of carriage, for one good than another (commodity discrimination), or for one location compared to another (place discrimination) or for one length of haul compared to another (long hauls being discriminated compared to short hauls). The northern Plains have been particularly subject to such discrimination.⁴ For

⁴See (a) Dale G. Anderson and Brian L. Mariska, Place Discrimination in Rail Shipments of Wheat from Great Plains Origins, University of Nebraska Agricultural Experiment Station Research Bulletin 243, June 1971, 52 pp. (b) Orlo Sorenson, Dale G. Anderson, and David C. Nelson, Railroad Rate Discrimination - Applications to Great Plains Agriculture, Kansas Agricultural Experiment Station Research Publication No. 165, Great Plains Agricultural Council Publication No. 62, 1973, 55 pp. (c) John R. Felton, "Commodity Rate Discrimination in Railroad Transport," in Transportation Problems and Policies in the Trans-Missouri West, Jack R. Davidson and Howard W. Ottoson, eds. (Lincoln: University of Nebraska Press, 1967), pp. 55-80.

example, it has been relatively more expensive to ship grain from the Dakotas than from Texas or Louisiana origins; it has been more expensive to ship grain in the Dakotas than to ship industrial goods.

Rate discrimination reduces the competitive advantage of the community discriminated against and represents a subsidy given by rural communities specializing in producing farm products to those who buy or sell non-agricultural commodities.

Non-discriminatory rates are equal for goods for which the costs of hauling are equal. Transportation costs for shipments from the Great Plains are high enough; we do not need the additional disadvantage of having to pay part of our competitors costs as well.

This is a policy issue; the primary implication in my mention of it is the need for rural citizens to know the facts, and then to apply pressure as needed for change.

Research and Extension in Transportation

I am sure that the need for more research on problems of agricultural transportation will be enunciated several times at this conference. I will be the first to agree that we need much more research on a variety of transportation issues. I am not alone in doing so. In 1973 the Science and Education Staff of the USDA published a 43-page document entitled "Research Needed to Improve Transportation for Agriculture and Rural America." This publication outlines a series of research topics relating to policy issues, technology, and a variety of possible improvements in transportation systems in rural America. Although the transport of 680 million tons of agricultural products costs 20 billion dollars annually in the U.S., the USDA and the State Experiment Stations reported only 42 research projects involving 33 SMY's (Scientific Man Years) in 1973.

The Great Plains Agricultural Council, involving the ten Land-Grant Colleges in the Plains states and the USDA agencies active in the Plains has had an active interest in transportation research for some time. A regional project involving North Dakota, Nebraska, and Kansas, as well as Montana and ERS-USDA, has produced several publications on problems of transporting agricultural products in the Great Plains; a North Central regional project on transporting grain, involving Iowa, Nebraska, and Kansas is now active. But we need more research effort, and the Land Grant Universities and USDA will certainly be asked to devote more scientific energy to

transportation research in the future. In fact, I was asked by the Research Committee of the Great Plains Agricultural Council to organize an ad hoc committee and report back on research needs at its meeting next summer.

When we are speaking of research we cannot forget extension work in transportation. We are as short in this area as we are in research. My committee is examining these needs also, as well as course offerings and curricula in transportation at the Land-Grant Universities.

A Systems Approach for Research

I have not attempted to identify all the research topics in transportation which seem important, or which will come to your minds. Typically such topics will deal with the effects of a particular policy on the economics of marketing a commodity, or on a particular kind of shipper, the economics of a particular technology, or the impact of some organizational innovation. However, I would also like to leave in your minds the need for research viewing the rural community as its laboratory. We need to take systems approach to transportation, in the context of the community. In doing so, we should evaluate alternative modes, or combinations of modes, alternative technologies or combinations, and not only alternative methods but combinations, and see how such systems best can serve the rural community, reducing the cost of the transportation system, through improved efficiency, and providing a positive stimulus to the development of these communities.

THE TRANSPORTATION CHALLENGE FACING GRAIN COOPERATIVES

Stanley K. Thurston¹

In my work with grain marketing cooperatives I have become increasingly impressed with the importance of transportation. We all know that farm products must be transported, but have you ever stopped to realize how much it costs in relation to the value of products. In a study by Farmer Cooperative Service, we estimated the transportation bill for products handled by farmer cooperatives at \$1.5 billion -- almost 8 percent of the value of all the products they handled.

Consider the price of wheat today that sells in Rotterdam for about \$6.56. Your price is about \$4.75 a bushel. The difference is \$1.81 a bushel. How much of this is transportation? The rail rate from Minot to Duluth is about 34 cents a bushel. The ocean rate from Duluth to Rotterdam is about 82 cents a bushel making a total transportation cost of \$1.16 a bushel for export grain.

Such transportation cost for grain from Minot to Rotterdam adds about 25 percent to the value of grain. It's apparent that transportation costs vitally affect your North Dakota prices. Your 25 percent reduction in rail rates in December, 1971, on eastward movements of wheat is a good example.

Grain marketing is becoming increasingly complicated. And I submit that one of the major contributing factors to those complications is transportation. There is evidence the transportation system is dictating to an increasing extent, how, when, and where grain is marketed. A lot of changes have occurred in recent years that contribute to the transportation challenges and problems that cooperatives and others face today.

Recent Trends

For example, in the last eight years (1964 to 1972)

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farm sales of wheat have increased 21 percent for the U.S. and 45 percent for North Dakota. U.S. exports of wheat remained relatively steady until 1973 when exports about doubled that of previous years because of the large Russian demand. In the next several years, it's estimated that U.S. wheat production and exports will be at a higher level than existed prior to the 1972 crop.

Total U.S. farm sales of corn, wheat and soybeans have increased 65 percent since 1960. By 1985, a further increase of 36 percent in farm sales is expected. About 30 percent of farm sales of corn, wheat and soybeans were exported for the 1960 crop compared to 49 percent for the 1972 crop. During the next 10 years, it's expected that about 35 to 40 percent will be exported. By 1985, it's estimated total exports of these three grains will be 84 percent greater than in 1970 and about 20 percent greater than our estimate for 1974.

With the expected increases in grain to be shipped in the years ahead, cooperative grain elevators and others throughout the country are rightfully concerned about rail car supply and rail service.

Since railroads are the principal carriers of grain let's look at what has happened to this carrying capacity in the last several years. In 1960, there were 692,000 boxcars and no covered hopper cars. In 1972, the number of boxcars declined to 309,000 -- less than one-half of the 1960 level. Of this total, only about 60 percent were of the type to haul grain.

Large covered hopper cars, on the other hand, have increased in numbers. Early this year, railroads had about 150,000 covered hopper cars and shippers had about 54,000 hoppers -- a total of 204,000. That's an increase of 13 percent over 2 years ago. However, in terms of estimated total annual capacity it means an increase of only 4.3 percent, or about 2 percent a year. In comparison, the volume of grain sales has increased an average of about 8 percent a year. Rail carrying capacity in relation to grain sales is clearly lagging behind. To me, this represents the most important transportation challenge to cooperatives. For many, it means leasing or owning hopper cars in order to be assured of having the necessary hopper cars.

There has been a dramatic increase in shipper owned or leased covered hopper cars. On January 1, 1974, privately owned covered hopper cars for all purposes totaled

53,771, about 31 percent above two years ago. In comparison, railroad owned hoppers increased only 10 percent.

The trend is clear. More and more shippers are owning or leasing hopper cars. Recent conversations with railroad officials indicated they expect grain shippers to own 1/3 to 1/2 of their hopper car needs. This is exactly what is happening in Iowa where unit train grain shippers are leasing a high percentage of their requirements, principally for export movements. This same trend is occurring in several of the other Midwestern grain producing states. Often these shippers are losing money on leased hoppers because the shipper mileage allowance doesn't entirely pay for the lease cost.

Many Elevators Have Little or No Rail Service

Another pressing rail problem is rail line abandonments which have been occurring at an increasing rate in recent years. Since 1960, track abandonments by linehaul railroads have averaged about 1,000 miles annually. However, abandonments up to now have not been as serious as the problems associated with light weight rail lines, poor track conditions, and the lack of rail cars. Rail service for grain movements to many communities in the U.S. is practically non-existent even though the rail line has not been abandoned. In effect, cooperative elevators that are located in these communities have been to a large extent competitively "neutralized." Generally, they cannot effectively compete with nearby country terminals located on heavy duty track with lower multi-car or unit train rates. For cooperatives located on these secondary lines, it represents a tremendous challenge. How can they continue to adequately serve their farmer members under these conditions?

As I see it, the alternatives for country elevators with no rail service and those located on secondary and light weight rail lines are:

- (1) Serve as a "feeder" elevator to a nearby country terminal that has lower unit train or multi-car rates.
- (2) Truck to distant terminals, processors, river elevators, and livestock feeders.
- (3) Utilize to the extent possible, their own limited rail service.
- (4) Concentrate more on grain bank and feed services, fertilizer, and other farm supplies and minimize the handling of grain.

Country Terminals Are Increasing

In recent years, there has been increasing volumes of grain moving by rail, truck and barge. At the same time the rail situation has become worse. Truck transportation has been getting an increasing share of domestic grain movements. Railroads with their unit train rates and unit train movements have increased their grain volume on main lines, principally for export movements. Many country terminals have been modernized or built to load out 25-50 or more cars for one shipment. Rates for unit train shipments to the Gulf or East Coast from the Midwest are commonly 2 to 7 cents a bushel below the single car rate.

Farmer Cooperative Service recently made a grain marketing study in Iowa where we found that there are about 35 elevators that can load out 25 car trains, 37 elevators that can load out 50 car trains, and 5 that can load out 100 car trains. Other grain states such as Minnesota, Illinois, Indiana and Ohio are also adding elevators with unit train capabilities. Export grain moves from the Midwest principally to the East Coast, Gulf, and Lakes; however, it's probable that in the future grain will move in unit trains from Iowa, Nebraska, and the Dakotas to the Pacific Coast.

High Utilization of Rail Cars is Essential

High utilization of rail equipment such as hopper cars, locomotives, barges, towboats and trucks is essential in order to make a reasonable rate of return. Experience indicates tremendous possibilities for relieving transportation shortages through increased utilization of existing equipment.

For example, in the case of single rail cars, it has been demonstrated that large shippers can increase car utilization by over 50 percent by better car control, use of computers and scheduling loadings and unloadings. When these improved methods were applied to hopper cars in multi-car and unit trains, grain transporting capacity was increased five times overall.

Another example of improved utilization concerns time. A 54-car unit train composed of pickups at single locations can move about 185,000 bushels of grain from Iowa to Houston and theoretically return in 24 days. In comparison, a 54-car unit train originating all cars at a single point can theoretically make the trip in just 10 days. With this kind of utilization, I'm sure you can see the reason for expanded use of unit trains and the existence of lower rates for these movements.

Consideration in Establishing Unit Train Elevators

For any region, there are two main requirements for the extensive development of large country grain elevators with the capability of shipping 50 to 100 cars: (1) the trade area should have a relatively high density of farm grain sales per square mile, and (2) multi-car or unit train rates for export should be from 2 to 7 cents a bushel below the single car rate.

In studying the feasibility of establishing a unit train capability, consideration should be given to two facility alternatives: (1) upgrading present facilities, and (2) building a new elevator.

Each situation or community is different and must be carefully evaluated. We usually specify five important requirements for upgrading existing facilities or in building a new unit train elevator:

- a) Locate on a main line railroad that is likely to offer the required service for the next 15 years or more.
- b) Present elevator to be upgraded should be readily adaptable to proposed expansion without excessive cost, and if a complete new country terminal elevator is to be built, it should have the potential for future expansion to ship 50 to 100-car unit trains depending on the region.
- c) Elevator should have the ability to draw the needed volume of grain. A new elevator will require a greater rate of turnover than a remodeled existing elevator.
- d) Elevator should be capable of complying with EPA regulations.
- e) The projected net cash flow should provide a rate of return on the added investment great enough to pay off the loan in 10 to 15 years, and provide a rate of return of at least 15-20 percent.

In order to have adequate volume to justify investment in a unit train elevator, it's often necessary for two or more elevators to go together formally or informally to jointly assemble, handle and ship grain. The arrangement can range from one central elevator handling grain from other elevators on a fee basis all the way up to a formal merger of facilities into a "one-decision" unit. In some instances a separate corporation can be formed to receive grain from feeder elevators.

Our studies have shown that generally it was more feasible to upgrade existing elevators than to build a new elevator.

However, in some instances, a completely new elevator may be the most feasible action. The cost of a new elevator with unit train capability is so high that it must operate on a very high annual volume. For example, a 700,000 bushel elevator would need a turnover of at least 4 to 5 times which is higher than most elevators of that size have today. In order to have adequate volume, it's usually necessary for two or more elevators to join together to build.

In North Dakota, you have areas of high density grain sales but the lower multi-car rates haven't developed. If you can get the cars, you can make multi-car shipments at single car rates and there are a few economies in this. However, such benefits will accrue mostly to the railroad. If you can get good turnaround time and car utilization it will probably pay to lease covered hopper cars, especially if you can't otherwise obtain them. If you plan to lease cars you'll probably find it takes two years to get them. Before investing in or leasing cars, you should thoroughly develop and evaluate your transportation plan for the future.

It appears the development of country elevators or mini-terminals making unit train shipments will come slowly in North Dakota unless relatively lower rates are established for multi-car rail shipments. I feel that you should continue to push for such rates and be prepared to adjust when they come.

If it happens, some of you will want to modernize or build new facilities. You'll be concerned with elevator plans, joint efforts among elevators, and assembly methods.

The Search for Innovations

Cooperative elevators in other states are searching for a better new elevator design especially for unit train elevators which will give them greater efficiency at a lower cost.

One midwestern cooperative is planning an innovative unit train elevator whose headhouse consists of one large concrete silo with only two bins whereby a unit train can run beneath the silo for rapid loading. The supporting annex will consist of three large diameter concrete silos. The large diameter tanks tend to minimize construction costs.

You've probably heard of a proposal a couple of years ago by Goodyear to move grain 225 miles across Iowa with a 42 inch grain belt to the Mississippi River. Maybe the general idea isn't so bad. One midwestern cooperative has suggested using a similar belt to move grain from satellite grain elevators without rail service to a large central elevator for unit train shipments. I think the economics might show this feasible if the right-of-ways could be arranged. Maybe the right-of-ways of abandoned rail lines could be used in some cases for a 10 mile or more movement of grain by belt.

Suppliers of hopper cars are considering the automatic opening of hatch covers on hopper cars as they are spotted for grain loading. This can speed loading and reduce labor. They are also considering the automation of the unloading of hoppers. As the hopper car pulls into place, two double bottom doors hinged along the length of the car would automatically open to unload between the rails. To sum up, such a car could be loaded as fast as you could drop grain into it and it could be unloaded in 15 seconds. I don't believe many of our originating and destination elevators are ready for this yet, but it's probably going to be the hopper car of the future.

A structural engineer in Wisconsin has recently perfected an improved design of inflatable grain storage structure that is raised and supported in place by air pressure. Size of structure goes up to 200 feet wide and 400 feet long with a semi-elliptical roof covering. Cost is reported to be about 1/5 of the cost of conventional structures.

Northeast Rail Reorganization Has Implications

Now let me turn to two subjects that I believe have implications to you as grain handlers -- the Northeast rail crisis and the energy crisis.

As you know several railroads in the Northeast, particularly the Penn Central are in financial difficulty. Recognizing the need, Congress has come up with a law that will be satisfactory to most interests yet provide the best solution to the problem. It's called the Regional Rail Reorganization Act of 1973. It involves up to eight bankrupt or near bankrupt railroads in 17 states in the midwest and northeast. This act provides for the reorganization of these railroads into a viable railway system and the granting of loans to rebuild the system.

The Department of Transportation recently released a 1,000 page report for this 17 state area east of the

Mississippi River. The report urges abandoning 25 percent of about 61,000 miles of track in these 17 states and eliminating service to hundreds of small communities. The lines proposed to be eliminated are low traffic lines. They estimate a new system could accommodate 96 percent of the traffic now carried on rail lines.

This study and related testimony at public hearings will be used to develop recommendations for a new rail system which is expected to result in abandonment of a significant amount of trackage.

This Act doesn't directly affect you now, but you should be interested because if this type of endeavor is successfully implemented it could spread to areas west of the Mississippi.

Energy Considerations

One of the hottest subjects throughout the country these days is the energy crisis. Its possible effects on transportation generally concern shortages of fuel and how we can best use what we've got.

When discussing freight transportation, reference is increasingly made to a study titled "Energy Intensive-ness of Passenger and Freight Transport Modes 1950-1970" by Eric Hirst, and published by Oak Ridge National Laboratory, Oak Ridge, Tennessee.

What the study shows, briefly, is that pipelines are the most efficient users of energy followed closely by boats and railroads. Actually, in 1970, the latest year studied, boats and railroads were about the same when it comes to energy efficiency. The marked improvement in railroad energy efficiency was due to the shift from steam engines to diesel engines.

Trucks, on the other hand, according to this study are about one-fourth as efficient as railroads or boats when it comes to energy use. Airplanes are by far the least efficient energy users for transportation of freight.

I've seen numerous references in journals, newspapers, and trade magazines to statements by Government and industry leaders stressing the need to consider efficiency of energy use by various transportation modes before decisions are made on rail line abandonments, highway or waterway regulations or restrictions. You will be

hearing more about this in reference to freight transportation.

The energy shortage can have a direct effect on transportation of agricultural commodities and farm supplies. Lengths of truck trips could be restricted. The river drawing area could be reduced to shorten truck hauls. There may be requirements that trucks have two-way hauls to better use fuel. This would present particular difficulties for agriculture as it's often hard to match up outbound shipments of grain with commodities moving back to the farming community.

The energy shortage can also affect the ocean movement of grain. At present, the worsening fuel situation for ships has caused the ocean freight rates to favor the East Coast over the Gulf because of the shorter haul to Europe. Some grain that normally moves from the Midwest to the Gulf is now moving to the East Coast.

Giant Ships May Move Grain

There is talk of using so-called giant ships (200,000 tons capacity or more) to haul U.S. grain and tied in with return hauls of energy sources such as coal, oil, or gas.

Operating costs for a 200,000 ton ship are about half the costs for a 30,000 or 50,000 ton vessel.

Puget Sound harbors such as Seattle are the only U.S. harbors that can handle such a giant ship fully loaded. A recent study made for the Corps of Engineers recommended a super port be built at Hampton Roads, Virginia.

Because of the continental shelf, costs of deepening Gulf ports to handle such ships are considered prohibitive. Therefore, Puget Sound and Hampton Roads seem to be the current candidates for super ports to handle dry bulk commodities.

Economic advantages of giant ships coupled with their use for two-way hauls of grain and fuel could possibly affect flow patterns for Midwest and North Dakota grain. An increasing amount of Iowa and Illinois grain could conceivably flow East instead of South to the Gulf for export. Also, greatly increasing amounts of Dakota grain could flow to the Pacific Coast. While I don't expect this to happen to any great extent in the near future, I do believe it bears watching and consideration in your future planning.

Coordinated Transportation Needed

One final item. Grain cooperatives, of necessity, have obtained hundreds of hopper cars. Fertilizer distributing cooperatives are doing the same thing. Several cooperatives also lease their own barges.

A study that we in FCS recently completed shows there are tremendous opportunities for reducing transportation costs and improving service if grain and farm supply cooperatives would go together on a coordinated program and jointly operate barges, towboats and rail car equipment.

We believe the time has come for cooperatives to go together and operate their own transportation system to provide a part of their total transportation needs. Transportation of your products has become so vital in marketing that you can no longer afford to stand in line begging someone to haul your grain. Cooperatives in the Midwest have the power -- the power of tonnage -- to jointly own and operate a pool of freight cars and a barge line to provide the service they will need in the days ahead. Farmer-owned cooperatives in North Dakota can join in this type of endeavor.

A COUNTRY ELEVATOR ADAPTS TO CHANGE

Lowell T. Schultz¹

The project for planning, building and operating a sub-terminal for six cooperating country elevators originally started on April 23, 1973. There are six elevators involved in this venture. They are as follows: Farmers Co-op Elevator, Heron Lake, Minnesota, Les Swanger, Manager; Farmers Co-op Elevator, Lakefield, Minnesota, Gene Lundquist, Manager; Farmers Co-op Elevator, Okabena, Minnesota, Frank Seydel, Manager; Farmers Co-op Elevator, Jeffers, Minnesota, Loren Moore, Manager; Farmers Co-op Elevator, Westbrook, Minnesota, Ray Haack, Manager; and Farmers Grain Company, Storden, Minnesota, Lowell Schultz, Manager.

We decided at the outset to meet with the Board of Directors of each Co-op elevator and to present them with the decision to either support the project 100 percent or to get out entirely. We received 100 percent support from all six Board of Directors. It was agreed that the Board of Directors of the new company would consist of the six elevator managers and the president of each of the elevators' Board of Directors. We agreed that we would spend approximately \$1 million for this project with each of the six elevators investing \$60,000 with the rest of the money, \$640,000, being financed by the St. Paul Bank for Cooperatives. We wanted to build a facility with approximately a 440,000 bushel capacity so that we could immediately begin to load 50-car unit trains and have ample storage so that we could load 100-car unit trains when the time came. The Heron Lake, Minnesota, site was chosen for the location of the new facility because it was on the main line of the Chicago and Northwestern Railroad and was approximately located in the center of the six cooperating elevators in the group. While the existing trackage at this site could handle 50 cars, this trackage had to be rebuilt and altered to some extent. We then proceeded to set up and file our articles of incorporation and bylaws for the Southwest Grain Terminal and secured our loan with the St. Paul Bank for Cooperatives.

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Our next step was to let out a contract for building our elevator. The elevator was to consist of a 280,000 bushel house and a 160,000 bushel concrete annex with an attached cement block office. Grain handling facilities were to include a 70-foot scale, two 10,000 bushel per hour legs, a ty-rocket scalper and screener, and two rail loadouts with automatic samplers. The elevator does not have a hoist and, therefore, all grain is received in either hopper bottom trailers or tandem trucks with hoists. Incidentally, Jacobsen Construction Company of Bismarck and Minneapolis was our contractor.

Labor was our next need and we hired a manager, a bookkeeper, and one driveway man. When we are loading trains each elevator puts in one man. Therefore, we have a total of nine people on hand when we load our trains. Our objective was to hold down labor costs and avoid trying to hire part-time help.

As of this date, we have loaded 220 cars or about 770,000 bushels. We have estimated that we will handle approximately 6 million bushels through this terminal the first year. It is our hope to continue to increase this throughput from here on.

Now to regress a bit. The reason this thing started was that the six elevators all had primarily one problem -- lack of transportation. Railroad cars were far and few between and, therefore, we depended primarily on trucks. But we couldn't even get enough trucks. In addition, the elevators at Lakefield and Okabena were on Milwaukee Railroad branch lines and elevators at Jeffers, Westbrook, and Storden on branch lines of the Chicago and Northwestern. Neither of these lines were heavy enough to carry the jumbo grain hoppers. We came to the conclusion to build at Heron Lake from the standpoint that this location required, at the most, 23 miles for any one elevator to deliver; and, of course, the closest elevator would be right in Heron Lake. Our grain is hauled in using 900 bushel hopper bottom grain trailers and several tandems with hoists.

We didn't know whether we were on the right track but we did know we had to do something for ourselves. We were delivering a significant amount of grain to river terminals at Savage and Red Wing, Minnesota, which was 130 to 150 miles from our elevators. Like everything else, truck rates were increasing right along. We felt that if we could ship grain truck-water to the Gulf we could ship grain truck-rail to the Gulf. This would work very well during the winter months and particularly well during the summer months.

As I have mentioned, we have on our Board of Directors the six elevator managers and the presidents of each of the six Co-op elevator Board of Directors. I was the original president of the group and after we hired a contractor, and filed our articles of incorporation with the state of Minnesota, we elected one of the Board presidents, the man representing the Okabena Co-op, as the president of the Southwest Grain Terminal.

We are now loading 50-car units and, as I have mentioned, we hopefully, when the time comes, intend to load 100-car units. In our opinion, we had no choice; we had to adapt to change because there were other facilities around us which had already adapted and were loading trains. For example, an elevator at Worthington, Minnesota, approximately 35 miles from us, was loading 25-car units and a facility at Linden, approximately 19 miles from us, was also loading 25-car units. Our operations, singularly, were getting to the point where at times we were not competitive in grain buying.

As we look back on the planning of the project, there probably would be several things that we would do over again. One item I would probably change would be the location of our office which is attached to the elevator. I believe I would build it away from the elevator with a scale. If this were done and if you ever wanted to put in two dumps you could do this without any problem. However, as it stands, we are now locked in with one dump. Also, we don't run cars through any weigh hop or anything, rather we load cars right off the tanks. The cars are weighed on track scales located, for example, at Worthington or Sioux City. Being located on the main line of the Chicago and Northwestern has its advantages in that we have direct outlets going to Omaha and Kansas City and, via the Rock Island, to Houston, Galveston and other Gulf ports. Also, we can go on the Kansas City Southern Railroad to Baton Rouge and New Orleans or any of those southern ports.

I hope this has given you at least a rough sketch of what we did. In terms of our operating income, each elevator at this time is paying 5 cents per bushel. We operate on a minimum financing route. By minimum financing, I mean the elevator has their money in the grain up until the time it is loaded out of the terminal and the terminal receives its advance. The elevator then receives its advance in the same proportion.

CAR PROBLEMS AND HOW THEY ARE BEING MET

Thomas J. Byrne¹

I want to express my appreciation to Dr. Anderson for asking me to participate in this Forum.

My remarks will emphasize the demand made on railroads for transportation and the adjustments and innovations which were made in railroad operations to meet the unprecedented challenge from American agriculture during the past two years. I daresay if the small shippers and elevator operators in the State of North Dakota and, yes, any of the grain-producing states, were polled on this question, the answers might vary; but very few would be favorable to our rail system.

For many years our nation was faced with car shortages of various degrees, and each year there was much squabbling over the real dimensions of the shortages and the reason for them. This year we are faced with the worst car shortage in history. Squabbling is not, however, specifically confined to car shortages. Other shortages share the spotlight. Economists and our nation's leaders are squabbling over the real dimensions of the energy crisis, as well as being divided on the right strategy to cope with the growing economic crisis. These crises in no way diminish the freight car crisis. In fact, greater emphasis is being placed on the importance of carriers to supply suitable cars this year than ever before.

Any increase in our nation's economy will only add to the existing freight car shortages. Since late fall of 1972 carloadings have been increased by an unprecedented rail movement of export grain, placing a demand for freight service on the railroads of this country never before experienced.

There has been no substantial let up for freight cars since late 1972. In addition to grain, shipments of other commodities have increased, placing greater demands on the railroads for equipment.

It should be pointed out that prior to October 1972 there were very few freight car shortages of any type reported for 1971 or 1972. However, a few weeks after the announcement of

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the huge Russian wheat sale in September 1972, surpluses quickly disappeared and shortages of boxcars and covered hopper cars quickly reached a new record high.

All during the harvest of 1973 acute shortages of boxcars and covered hopper cars continued. Millions of bushels of grain were placed on the ground in certain areas of the country because of the lack of elevator space or freight cars.

Shortages of freight cars to move grain have continued with devastating results; and, from the Commission's point of view, there is no immediate relief in sight. Heavy export movements are expected to continue through most of 1974; and with an anticipated record harvest, the outlook for an improved car supply is, in my opinion, very gloomy.

It is true that flooding of the Mississippi and Missouri rivers paralyzed barge traffic during April and May of 1973, placing still greater burdens on the railroads who, incidentally, did not escape the flood themselves and suffered much track and bridge damage. Key classification yards heavily involved in the movement of export grain were adversely affected by the high waters.

The disruption to barge traffic resulted in grain being diverted to the rails in addition to other traffic normally moved via barge, including a large volume of potash, phosphate, and fertilizer. In all fairness, we must say that the railroads did an admirable job despite the many obstacles they encountered in moving a record high volume of traffic.

Many of our railroads have improved overall efficiency by maintaining a low bad-order ratio and by increasing car capacity in the equipment acquired. They have also made various improvements in operation, including increased train speed, run-through trains, and modernized terminals. Measures taken to improve railroad operations and equipment may not solve the freight car shortages, but they certainly are contributing factors toward alleviating it. Last year the railroads, car leasing companies, and certain shippers placed orders for a total of 106,000 new freight cars of all types. That was the most new cars ordered in a single year since 1955 -- and with this buying spree it appears the carriers might have finally reversed the decline in our total national freight car fleet.

Since September 1 of last year the number of cars in the overall fleet has increased by 3,700. This trend is expected to continue. On January 1 the backlog of cars on order but undelivered totaled nearly 68,000 cars. A vast majority of these will be put into service this year.

Contrary to what many railroad officials believe, the continuing decline in the ownership of plain boxcars has indeed been a decisive factor in the shortage dilemma, particularly in the movement of grain. It is true that carriers have increased their covered hopper car ownership substantially in the past two years but not nearly enough to take up the slack caused by the heavy retirement of boxcars. The Commission did try to stymie the decline of boxcars by its order Ex Parte No. 252 (Sub-No. 1), which placed an incentive per diem on plain boxcars. However, very few carriers that benefitted from this order financially have used the monies to augment their plain boxcar fleet.

Grain shippers were not the only users of boxcars that suffered because of their inability to obtain cars in sufficient numbers to meet their demands. During 1973 there were sporadic shortages of cars for transporting lumber and several instances of acute shortages plaguing shippers of fertilizers, and related ingredients. In addition, shippers of other commodities, including paper, furniture, brick, and cotton, were unable to get boxcars to transport their traffic.

The picture of 1974 is certainly not a comforting one either for the carriers or the ICC and certainly not an encouraging one for the shippers.

Very little lessening in the movement of export grain is expected; and, coupled with an anticipated record harvest of all grains, the heavy demand for cars will continue. We all hope that our country will be spared from the ravages of flooding so that barges will be able to render more assistance this year than was given last year. Conversely, however, little or no help may be expected from the substitution of open hopper cars this year. The energy crisis has taken care of that. With an increasing demand for coal for generating energy, the coal-carrying roads who contributed heavily to furnishing cars for moving grain last year will need every car they own to meet the demands of the coal mines.

This year there is a very heavy demand for boxcars and covered hopper cars for transporting fertilizer and the ingredients needed for the manufacture of this commodity so vital to our agricultural industry. With the spiraling prices of grain, soybeans, and other commodities, there is and will continue to be unprecedented demand for fertilizer, the movement of which will require the same types of cars needed in the transporting of grain and other bulk commodities.

Lumber is another commodity for which there should be a heavy demand this year and one which is also moved in boxcars, as well as on flat cars, the supply of which is also

diminishing while the demand is increasing. Here, again, the energy crisis can partly be blamed for the increase in demand for flat cars, as there has been a considerable volume of traffic diverted from the highway to the rail to be moved via piggyback. Nevertheless, it adds one more type of car that must be placed in the shortage column.

There has been an increase in the movement of scrap iron and steel via rail, which traffic requires the use of gondolas and flat cars. In addition, there will be a greater demand for these types of cars for transporting highway and construction materials, as well as farm implements, in the next few months.

I think the only cars I have not mentioned are stock cars and refrigerator cars. With the institution of "feed lots," the demands for stock cars have nearly disappeared; and many of these cars are being conditioned for moving grain and other commodities. However, the story of refrigerator cars is different.

When the Commission permitted the carriers to discontinue icing services, it was not clairvoyant to foresee the energy crisis and the subsequent heavy demands that would be placed on the carriers for equipment to transport perishables in the pursuing months. The carriers assured the Commission that they would have an adequate fleet of mechanical refrigerator cars available to handle the traffic requiring protective service prior to getting permission to discontinue icing.

Today, things look different, with perishable traffic being diverted to the rails from the highways because of the high fuel costs or lack of fuel or because of the unavailability of mechanical refrigerator trailers. There is much concern regarding the availability of mechanical refrigerator cars to meet these heavier demands.

Perishable shippers are greatly concerned about the shortage of rail refrigerator equipment. Their concern is magnified greatly by the energy picture.

The Commission is coping with this problem in the best manner it can. Service orders were issued to require the mechanical refrigerator cars to be returned empty to the loading areas and to prohibit the appropriation of these cars for loading commodities other than those requiring protective service. A service order was also issued requiring expeditious handling of railroad equipment; and this order was expanded to include refrigerator cars, both loaded and empty. As shortages become more severe, more drastic action will be taken to promote maximum utilization of this equipment.

What is the answer? Is it fair to ask the railroads of our country, many of which are not on strong financial grounds, to invest in the acquisition of freight cars that are used only in standby service to other modes of transportation. Undoubtedly, the problem of freight service and car supply is closely associated with the overall financial situation of the individual carrier. On the other hand, something must be done to insure the shippers that they will be able to get cars to move their commodities.

Whether or not new legislation is passed giving the railroad industry assistance to acquire equipment, the fact remains that our country is now in the throes of the worst car shortage in history, with no immediate relief in sight. The available car fleet, though totally inadequate to meet the present demands, must be utilized to the maximum degree by all. The Commission has taken many actions in an effort to help.

In October, 1972, Service Order No. 1112 was issued requiring carriers to place, pull, and forward cars within twenty-four hours; to require carriers to see that all debris, dunnage, etc. were removed before cars were accepted as being released; and placing a penalty on the excessive holding of assigned equipment. Since the issuance of this order, many carriers have been fined for violating the provisions of the order; and fines totalling well over \$300,000 have been assessed and collected. The diligent policing of this order since its inception by our field staff has undoubtedly contributed to better utilization by promoting more expeditious handling of traffic by the carriers and prompt loading and unloading by the shippers and receivers.

Service Order No. 1121 reduced free time on cars held at ports and increased demurrage rates, while Service Order No. 1124 increased demurrage rates on domestic traffic. The purpose of these orders is, of course, quite obvious.

Service Order No. 1120 limited the number of jumbo covered hopper cars that may be dedicated to unit-train service. While much greater utilization is obtained by use of the unit train, the assignment of too many cars in this service, which can be enjoyed only by the large shippers, has an adverse effect on the smaller shippers.

Orders have also been issued pertaining to specific types of cars and to assist specific carriers.

Over the years regional imbalances have tended to increase. The western area, including North Dakota, historically has been an area suffering the greatest shortages of cars.

In past years the Commission did, in times of acute shortages, issue service orders directing the return of empty cars to the owning carriers. In the years 1968 and 1969, when we

were also faced with heavy shortages, the Commission collected fines totalling over \$2,000,000 from carriers violating our car directives. About two years ago the railroad industry instituted punitive measures in its orders, whereby carriers violating special car relocation directives issued by the Association of American Railroads could be fined. In view of this, the railroad industry requested the Commission to withdraw its orders and give the industry an opportunity to perform their own distribution of equipment during times of shortages. The Commission did grant this request, with the understanding that if there was any breakdown in the performance of the work of the AAR, or in the event a carrier requested such assistance from the Commission, the Commission would take over the job. This explains the existence of some of our service orders requiring the return of cars to respective carriers, while we allow the AAR to do the job for others.

Unfortunately, the return of cars empty to the owning carriers contributes nothing to car utilization, but who is more entitled to the use of a car other than its owner. Unfortunate, also, is the fact that many railroads are unable to accelerate their car-building and buying programs in order to obtain a sufficient fleet of equipment to meet the requirements of their shippers.

Legislation to provide carriers aid in the form of loan guarantees has been passed by the Senate and is now being considered by the House.

Despite the apparent reluctance on the part of the carriers to acquire general-service freight cars, the car-building programs have a backlog of over a year, with orders for specialized equipment, including covered hoppers and flat cars for use in TOFC service.

Some relief seems to be forthcoming for the boxcar dilemma with the formation of a pool of 50-ft. plain boxcars to be established within the railroad industry, and which pool will be comprised of 10,000 free-running cars to start. An application for this project is now being considered by the Commission.

Perhaps the new legislation and the new pool proposal are not the final answers to the car problem, but they are giant steps toward solving at least the boxcar problem; and one thing is certain - the nation's shippers are looking for a solution; and it behooves the carriers, the shippers, and the Government to work toward finding such a solution.

Transportation is not only an indispensable adjunct of agriculture and manufacturing; it is also the lifeline of modern distribution of all necessities, making possible the development of international, national, and regional markets, as well as placing great varieties of products of our mines, forests, fields, and

factories within the reach of our people. We in the Commission are well aware of what transportation means to the grain people, and particularly to the small shippers and the country elevator operators.

Freight car shortages have had, over the years, a habit of repeating themselves. History, too, repeats itself, but it usually teaches us to profit by the mistakes of others. It is quite evident that we have not learned as yet to benefit by the mistakes of the past where freight car shortages are concerned. Carriers continue to allow their general-service car fleet to deteriorate; shippers continue to use one mode against another regardless of the consequences; rates, rather than reliability of service and car supply, are given top priority when bargaining; and finally, the Government has failed to place the importance of rail transportation in relation to the country's economy and national defense.

From the small towns of the Midwest, grain is heading for the Soviet Union, Japan, and dozens of other countries. There is little doubt that the present export program is having a tremendous effect on our transportation system. On top of this, the domestic users of wheat are fearful of the diminishing supply and reserve. The unprecedented demand for wheat and grain of all kinds is placing a never-before-experienced requirement for fertilizer. If the railroads are unable to satisfy the demands of the shippers of all of these commodities, there will be those ready to blame the railroads and the Commission for any increase in price, although they will know full well that the blame is being ill-placed. It should be pointed out that many of these commitments are made without any thought as to how the railroad industry could cope with the heavy influx or impact of traffic. In other words, no time is given for the railroads to prepare for these unprecedented demands.

Let us all awaken, face the facts, and share the burdens, as well as the blame!

I have deviated quite a bit from the suggested subject of "new ideas and innovations in railroad grain transportation." This was done deliberately to give you a clear picture of how things actually are rather than elaborating on the new ideas and innovations adopted by many of our carriers.

The technology and computerization advances made by our railroads must be recognized and certainly are commendable. It is true the railroads have put into practice many new ideas and innovations during the past few years. It is true they have spent vast sums of monies to improve facilities. It is true they have spent much for research and development. It is true they have made many improvements in an effort to increase the capabilities of their plants.

In Ex Parte No. 265 and 267, the Commission required the railroads to submit to it a quarterly report on the improvements made to render more adequate service. These reports are reviewed carefully and they certainly indicate a sincere effort on the part of many carriers to give faster and more dependable service.

The reports show many carriers are acquiring more diesel and electric locomotives; adding thousands of cars to their fleet; installing microwave and other ultra modern communications; placing into service the latest billing and accounting procedures; installing automatic train controls and scanners so as to implement the rail industry's completion of Phase II of TRAIN; and exploring other aspects of operation in order to do a better job.

It is difficult to extol the progress made by the railroad industry while knowing that thousands of shippers throughout our country have been unable to get freight cars for weeks after ordering them. It is difficult to explain why transit time on traffic has increased. It is difficult to explain to shippers why a carrier will place cars unfit to load or why the same carrier will pull a car as an empty before it is completely unloaded. It is difficult to explain why a carrier will allow a car to remain on a shipper's siding for two or three days after it is released either empty or loaded and why thousands of assigned cars are allowed to remain idle awaiting placement while other shippers are unable to obtain a car for weeks.

To find the answers to many of these questions might require further exploration and a review of long-term trends in the economy and in the real demands for transportation.

The new ideas and innovations of the rail industry have undoubtedly eased the car shortage to some degree but there is much room for improvement.

Despite the separate ownership of railroads, the ability of our rail system to perform satisfactorily is dependent upon its weakest link. If one carrier does everything possible to expedite the movement of traffic over its line only to turn it over to another carrier where it is delayed, the chain of dependability is broken and the traffic is delayed and once again the rail industry is given a black mark as performing poorly.

Our railroad industry must adjust to changing circumstances. New ideas and innovations must continue to be pursued if an efficient and reliable rail system is to emerge. One carrier cannot do it alone. There must not be any weak links and each carrier must consider itself as an integral part of our nation's rail system capable of giving the shipping public a dependable and adequate service.

MOTOR TRUCKS IN THE TRANSPORTATION OF GRAINS

Forney A. Rankin¹

There is an old theory -- or maybe it's an old economic law of some kind -- or maybe a tradition, which I understand is something "old," too -- that grain movement in the commercial channels of commerce should be the function of the railroads and barge lines. That's the way it used to be:

And maybe that's the way it ought to be today and in the foreseeable future.

There is no doubt about it, the truck trailer holds a mere speck of grain compared to the train or the barge. Grain transport by trucks is expensive -- in terms of equipment, fuel and manpower. Some grain truck operators tell me the break-even point, in terms of distance, is 200 miles. That's what one of your North Dakota operators told me the other day. But in Texas the geographic limit must be much greater -- up to, say, 500 miles. A trucking company that I know in Corpus Christi successfully hauls feed grains from the Panhandle to the embarkation port at Corpus. And this without a backhaul.

Obviously the so-called distance limit varies from one part of the country to the other. But any way you look at it, the truck is NOT, in theory at any rate, the ideal inter-continental carrier of small grains.

The facts of life are that trucks are moving grains, in ever-increasing amounts, and from all points of origin and destination. Whether this is because of the Russian wheat deal, high prices, shortage of rail equipment, diversion of trucks from less-desirable traffic (such as livestock transport) -- well, I don't know all the "why's." Nor do I know all the "who's" and "what's" and "where's." Maybe I can make some reasonable guesses.

As to how large a percentage of commercial grain traffic is handled by trucks, let me make a stab at it, given the caveat that these estimates are at best fairly well-informed guesses: Under the "residue formula" (total production less the reported deliveries by rail and barge,

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leaves the balance, or "residue," as motor traffic), occasionally employed by the USDA in spot checks on this traffic the ratios are 40 percent rail, 40 percent truck and 20 percent barge. This method has some obvious weaknesses, not the least of which is the duplication in counting unloads.

For the last year, rail traffic in small grain is reportedly 150 percent of the previous year. Considering the tremendous increase in grain movements following the Russian wheat deal, I would have to assume that motor truck traffic in this trade has increased more than 150 percent the last year.

As to how close to capacity are the railroads which are handling this traffic, we can get some idea from a statement made by ICC Commissioner, Alfred T. McFarland, at a farm cooperative meeting in New Orleans last fall. He said that the agricultural crisis in the U.S. boils down to a present daily shortage of 13,000 boxcars.

Motor trucks have been called upon to perform an even greater role in moving grain throughout the marketing system.

The best information we can get indicates that trucks move over 35 percent of all grain in commercial channels. Our estimate is based upon such occasional spot surveys as the USDA has made, some reports from Boards of Trade in the principal embarkation points, conversations with some of our ATA members who are regularly engaged in this traffic, and from numerous conferences and seminars on this subject. Even though I have confidence in this figure, I would not suggest that anyone else put reliance upon it.

With that background I should like to take a look at motor transport in this state. This ought to be an excellent place to look at exempt motor transport. North Dakota is supremely an agricultural state. A very large percentage of everything you produce has to be shipped hundreds, even thousands, of miles to market. You have 166,208 motor trucks in service in this state now, some 108,368 or 65.2 percent are used in agriculture. You employ 37,100 people in truck operations here, who earn \$266 million per year for their efforts. Last year those trucks paid over \$25 million in state and federal taxes for highway construction and maintenance -- 45.47 percent of all the highway user taxes paid in this state.

Nearly 9 percent of all the communities in North Dakota are without rail service -- completely dependent on surface transport for commerce, trade and personal travel.

Now every year you are faced with boxcar shortages, trailer shortages -- shortages of any and all means of moving (and storing) your abundance. The trucks have been moving a larger lading of this grain every year, and they will carry an even larger share in the future.

I am always impressed by the agricultural statistics of North Dakota. To me -- a Southerner -- it doesn't seem that, 'way up here, you should have such a viable and lucrative farm economy. But the figures tell the story:

In 1972, total cash receipts from agriculture in North Dakota were \$899,716,000. Wheat was the most important commodity with cash receipts of \$314,727,000 or 35 percent of the total. North Dakota was second only to Kansas in cash receipts from wheat.

Preliminary data for 1973 indicate that total cash receipts from agriculture increased to \$1,737,486,000 which represents a 93 percent increase over 1972.

Cash receipts from livestock in 1973 are estimated to be \$460,100,000, an increase of 26 percent over the \$364,271,000 received in 1972 and cash receipts from crops, which includes wheat, rye, barley, oats, corn, soybeans, and hay, increased by 139 percent in 1973 over 1972. Cash receipts from crops in 1973 are estimated to be \$1,277,386,000 compared to \$534,455,000 in 1972.

In 1973 the income per farm in North Dakota was \$21,238 per farm, ranking it third in the nation. (California was first with \$22,978 per farm and Nevada was second with \$22,118 per farm.) In 1972 North Dakota income per farm was only \$8,165. The \$21,238 per farm in 1973 represents a 160 percent increase over the previous year.

In less than 15 years, the total volume of wheat shipped from elevators in North Dakota has increased from a little over 103 million bushels in the 1956-57 growing season to almost 179 million bushels in the 1969-70 growing season, an increase of a little over 73 percent. During the same period of time, truck shipments from North Dakota elevators increased from 3,612,000 bushels to 55,866,000 bushels, 15 1/2 times as many bushels, or 1,400 percent.

To put it another way, in the 1956-57 growing season, trucks moved only 3 1/2 percent of the wheat shipped from North Dakota elevators. In 1957-58 truck shipments were 5.4 percent of total; in 1958-59 they were 15 percent; in 1963-64, 12.4 percent; in 1967-68, 27.4 percent; in 1968-69, 26.6 percent. In the 1969-70 growing season, the latest for which data are available, trucks transported 31.2 percent of the wheat shipped from North Dakota elevators, or almost 1/3 of the total shipments (Table 1).

Table 1
TRUCK SHIPMENTS OF WHEAT BY NORTH DAKOTA
ELEVATORS - 1956-57 THROUGH 1969-70
(1,000 bushels)

<u>Crop Year</u>	<u>Volume Total *</u>	<u>Shipped Truck</u>	<u>Truck Percent</u>
1956-57	103,200	3,612	3.5
1957-58	123,444	6,666	5.4
1958-59	99,087	14,863	15.0
1963-64	108,786	18,820	17.3
1965-66	153,395	19,021	12.4
1967-68	153,977	40,240	27.4
1968-69	182,753	48,632	26.6
1969-70	178,870	55,866	31.2

*Estimated using truck volume and truck percent of total.

SOURCE: Truck and Rail Shipments of Hard Red Spring and Durum Wheat from North Dakota Elevators, David C. Nelson, Agricultural Experiment Station, North Dakota State University.

With that bit of information on North Dakota motor transport let's move briefly to the national scene for a look at the trucking industry overall.

Today, motor transportation moves about three-fourths of all freight to the ultimate consumer. There are now over 21,000,000 trucks in the U.S., including nearly 3,000,000 used in agriculture, and this fleet is growing rapidly. Vehicles hauling agricultural commodities total about 10 percent of all trucks over 26,000 pounds.

The trucking industry serves every farm, city and factory through the use of our highway systems. No other transport mode has the overall flexibility or scope of operations that is found in motor transport.

Here are additional facts which may help you understand more fully our situation and our operations:

Class I, Class II, and Class III carriers file financial reports to the Interstate Commerce Commission. There are some 2800 Class I and Class II motor carriers in this country, employing 650,000 people, with annual payrolls and fringe benefits of over \$8 billion. The average wage per employee in for-hire operation is about \$12,782.

In addition, there are about 12,200 Class III motor carriers in the U.S., as well as tens of thousands of private, exempt for-hire, and intra-state carriers not subject to federal economic regulations. In 1972, Class I, II and III motor carriers reflected operating revenues of \$18.5 billion; however, the total value of all motor carrier services -- regulated and unregulated -- would be approximately triple that amount. It is also estimated that private and for-hire trucking provides employment for more than 8 1/2 million persons.

Today's trucking fleet has equipment designed for every type of standard or specialized transportation operation. In addition to the familiar tractor semi-trailer van combinations, there are tens of thousands of special tank, hopper, cattle, flat bed and other specialized trucking units. Relatively new to the scene, except in the West, are the twin trailer combinations -- two short trailers pulled by one truck tractor. Such modern, efficient combinations are now permitted, at 65 foot lengths, in 30 states as far east as Maryland and Delaware, and are under consideration in several other jurisdictions.

Trucks carry over 95 percent of the livestock, and 70 percent of meats, close to 100 percent of the poultry and poultry products and of fluid milk, 70 percent of the fruits and vegetables and probably more than 35 percent of the grain.

Special truck taxes amount to almost \$6 billion, and trucks pay over one-third of highway construction costs.

One out of every nine paychecks goes to a worker in the trucking industry. And we are a young -- a growing industry -- equipped to play our part in our expanding economy.

The census experts tell us our population of 201 million will grow to over 235 million people by 1980. We shall have over 29 million trucks on the road by that date -- 8 million more than we have now.

The total national product, they tell us, will be close to \$2,011.5 billion a year compared to \$1,288.2 billion now.

The ATA has estimated that truck registrations will increase more than 38 percent by 1980 -- to a total of 29.1 million. One of the greatest rates of growth will be in the heavy (over 26,000 lb) trucks and combinations. At this rate of growth, trucks will increase faster than our population. This is but one measure of the increasing reliance which the nation will place on highway transportation.

By 1980, intercity truck ton-miles will increase by 23 percent, and trucking will represent almost one-fifth of all intercity ton-miles. Railroads and inland waterways will lose a slight percentage share of the market, but pipelines and air lines will increase theirs. Also by 1980, federally-regulated intercity trucks will increase their share of the regulated freight revenue to 55.77 percent (presently 53.97 percent). It is interesting to note that regulated motor carriers will grow more rapidly than will non-regulated for-hire and private carriers (an increase of 38 percent compared with an increase of only 12 percent). Thus, in the future, the regulated carriers will become more dominant. Part of this may be attributed to a trend away from exempt commodity hauling with some presently-exempt commodities coming under economic regulations.

Industry will continue to be dispersed -- will move from the congested areas to the country. More and more industry sites will be selected without reference to rail facilities. The motor truck is, already, an essential part of a nationwide assembly and distribution line -- and

will become increasingly more important in the decade ahead.

Its natural and great advantage is flexibility, which railroads and barge lines cannot match. This flexibility alone assures our continuing growth. Add to this technical advances constantly being made, and completion of our interstate highway system, and you have a pressurized operation which will force impediments to yield -- impediments like size and weight limitations for instance -- and third-structure taxes.

While equipment is already both varied and sophisticated, even greater progress may be expected in the future. Engines are becoming more powerful and efficient, and the truck turbine is not now far from full development. Light metals and techniques are paring deadweight pounds from vehicles in order that they may carry larger payloads. Self-contained blowers for dry flowable commodities, such as grain and feed, are already well developed and will be more utilized when carrying capacities increase. Special hopper cars and container-carrying flatbeds are only two more of the new types of highway vehicles.

In the export-import trade, containers will play an ever-increasing role in the future. With greater highway weights, bulk containers for commodities such as grain will become practical and common. It is likely, however, that there will be a large-scale switch to containers for domestic service. The same situation exists with regard to piggyback service. At present, two-thirds of all piggyback freight comes not from the highway carriers, but from the rails themselves. It is former rail carload freight. This trend will continue into the future, with little or no effect on the highway transport industry.

Finally, tomorrow's improved equipment, operating over improved highways with the benefit of new devices including computerized scheduling, will be safer and more efficient than at present. While loads will be greater, and speeds higher, the trucking industry expects to continue to improve its commendable safety record. The twin trailer units will play a part in this, as will all of the other vehicle components such as engines, brakes and lighting.

Once relieved of archaic restrictions, the motor carrier industry will be able to take advantage of new and better hardware which is already "on the shelf."

With respect to sizes and weights of motor trucks engaged in interstate commerce, the following is being proposed by ATA:

Briefly, it is proposed to increase single axles from the present 18,000 pounds to 20,000 pounds. Tandem, or double, axles would go from 32,000 pounds to 34,000 pounds. Gross weights, now pegged at 73,280 pounds maximum (except for specific exceptions), would be based on a sliding formula controlled by the number and spacing of axles.

When adopted, the present tractor semitrailers could carry about 5,000 pounds more cargo on the Interstate system while the 65-foot twin trailer combinations (with present five axles) could increase their payload from 12,000 to 13,000 pounds. With a sliding gross weight limit, even greater economies and payloads will be possible with longer twin trailer combinations of six or more axles.

The twin trailer has its greatest effect -- at the present time -- in the handling of light and bulky commodities. This is due to the present federal "freeze" on vehicle axle and gross weights -- which results in little added weight advantage to the twin trailer used in many states. Where cargo weight can be obtained through the use of twins, these combinations have proven to be very efficient vehicles for the transport of bulk and dry and liquid flowable commodities. Included in this category is bulk wheat and feed, as well as bagged and barrelled grain and products.

Both the twin trailer and the tractor semitrailer combinations lend themselves to use in piggyback and containerization.

In the future, the twin trailer combination will become the intercity standard. Composed of two short (24 to 28-foot) trailers, the unit is easier to load, unload and maneuver. It affords an opportunity to mix freight more readily, and be separated into two short units for spotting or for deliveries of small quantities.

The best vehicle is inefficient on a poor road, and even an older vehicle can be better utilized on a good road. Therefore, modern highways are of primary importance to the motor carrier industry. Right now, the nation is in the midst of the greatest road construction program in history. We are building a 42,500-mile system of rural and urban superhighways -- all limited access, at least four lanes, and spanning the country from coast to coast and border to border.

The Interstate highway program was commenced in 1956. Today, more than eight-tenths of this system -- about 35,000 miles -- is open to traffic. Completion is scheduled for 1979. The cost is over \$76.3 billion. Already these highways have had a great influence on highway transport. Vehicles move more quickly and more safely between and within cities and towns. Operating costs are reduced and scheduling is improved. To build such a system costs money, of course, and the present \$76.3 billion cost will probably go higher before completion. Trucks, which are only about 16 percent of all vehicles, are now paying almost 37 1/2 percent of the total federal highway taxes levied to cover these costs.

The construction of the Interstate highways and other similar superroads has made possible expanded use of more efficient and larger trucks. As noted earlier, only an easing of present size and weight restrictions is needed for the trucking industry to make full, efficient use of these highways.

Highway construction will not end when the Interstate system is completed. Recent public and private analyses show that thousands of miles of additional rural and urban high-type roads are needed to serve our expanding population and economy. These will cost many billions of dollars -- money that must be spent if we are not to stagnate and become strangled in our own traffic. By 1980, highway traffic will almost double. By the year 2000, the number of metropolitan areas (places of 50,000 or more) will triple. The need is and will be for up to 100,000 miles of multiple-lane limited-access highways, serving all parts of the nation.

Today the trucking industry is doing amazing things with the equipment it is permitted to use on the highways we now have. When we are permitted to utilize our already-developed new vehicles and techniques, on an integrated system of freeways and access roads, we will be able to give transportation service better than any other in the world.

However, the trucking industry has gone just about as far as it can in applying new equipment and techniques to hauling freight under the present vehicle size and weight limits. Any further development must wait upon greater axle and gross weights and vehicle sizes.

The reason for this lies in the nature of motor vehicle equipment itself. A truck operates within a legal

box -- with absolute limits on weight. Any weight added to the equipment itself is at the expense of the weight of cargo which may be carried. Larger and more powerful engines, more sophisticated hopper trailers, self-contained blowers for dry flowables -- these all add dead weight which cannot be recouped with higher cargo load under present laws.

The equipment has been developed and tested. It is "on the shelf." It will be used for more rapid and efficient grain transport as soon as higher weight and size limits make its use feasible and economic.

What I have given us, so far, is the over-all picture, much of which applies aptly to the transportation of grains and feeds. While there is no reliable body of information regarding transportation of grains by motor truck, there are some data on the subject which we might take a look at.

Increased coordination between trucking and other modes of transportation is nowhere more evident than in new truck/water and truck/air facilities which are being constructed at many locations. Expanding river and inland waterway ports are being designed to accommodate truck traffic delivering and picking-up bulk, general, and containerized freight. Much of the intermodal freight handled at these ports is grain and feed. These commodities are delivered from farm and country elevator to the river barges by truck. Especially noteworthy in this regard is the port of St. Paul where trucks have revolutionized the local transportation of grain.

Such coordinated operations would not be feasible without the special grain-handling vehicles which have been developed by the trucking industry. The key word here is speed. Vehicles are now in use which can be loaded and unloaded in a very short time. These include dump hoppers, blower "tanks," and trailers which can be tipped on their sides by a giant mechanical "hand."

Although we can get but little data on grain shipments via truck or barge because of the "exempt" status already discussed, the transportation of grain products and feeds is regulated and, therefore, subject to ICC reporting. They become measurable in terms of mode of transport.

The 1967 Census of Transportation shows significant movements of grain products and feed by truck. The 1967 census showed that all grain mill products plus, unfortunately, beet and cane sugars transported totaled 85.7 million tons. Of this amount, 39.3 percent moved by motor truck up from 31.5 percent in 1963. The truck hauls tended to be shorter than those of the rails, however,

since motor carriage accounted for only 16.6 percent of the 26.5 billion ton-miles. More than half of the total grain mill product hauls were less than 200 miles -- prime candidates for truck transportation. At present, however, almost half are in shipments of more than 60,000 pounds -- beyond the present legal weight capabilities of motor carriers.

Up to this point I have spoken in fairly general terms, and to some extent I have particularized in sharp detail. I have not told you what motor truck services will be available in the future to grain shippers. But now I will tell you: You will have whatever the shippers demand of the trucking industry. The motor carrier industry has the technology to build the equipment to carry the freight -- rapidly, efficiently, flexibly. We have all the skills in management and operations to man any fleet required to do the job.

The man-made impediments that we have discussed -- the agricultural commodities exemption, the Federal limitations on sizes and weights, interstate trade barriers (such as ton-mile taxes), must be eliminated in the public interest. Surely those illogical obstacles will eventually be eliminated.

We of the trucking industry are well aware of the value of grains and feeds as direct shipments or as back-hauls. We have steadily improved our equipment. We have moved quickly to utilize modern truck loading and unloading facilities along our waterways and at terminal facilities. Lighter metals have permitted enlarged cargo space and lower gross weight. Tractors are more powerful and more efficient.

We are working with many interested groups on special industry problems -- standard containers, interchanging equipment, etc. We are seeking broader authority in the use of twin trailers. In a word, we are trying to tool up to meet all the demands now upon us -- and we try to anticipate the future.

The big problems facing our industry, which are also those of the shipper, are problems which must be dealt with on a continuing basis, for such is the nature of progress.

I began this talk by questioning whether or not the trucking industry ought to be in this grain hauling business. Well, as we have seen, we ARE in the business. I don't think I stick my neck out very far in predicting that we shall be hauling grains hither and yon from now on. The grain "trucker" is a very viable fact of economic life.

THE PRICE OF AGRICULTURAL TRANSPORTATION

John O. Gerald¹

"New Ideas for a New Era" is a useful theme for a forum of this type, and in some instances, such forums produce harbingers of the application of new ideas in organizing productive activities. When one views conditions in grain transportation, one may feel an urging to believe that this conference will unveil some harbingers.

If one reads the headlines, verified statements presented to regulatory commissions, speeches at grain trade conventions, and documents printed for use of the United States Congress, one learns that conditions in grain transportation are, to understate, bothersome. Freight cars are in a very tight supply situation, but even so they sit around waiting to be loaded, unloaded, entrained, detrained, switched and repaired for many more days per year than they move.

Elevator operators and exporters are desperate to trade, yet rail lines in port areas are clogged with loaded cars waiting for space to unload. Cars reportedly take much longer now to return to grain country for reloading than in earlier periods. Barges and trucks are not readily available even for those shippers willing to pay the rapidly inflated rates for their services. Ocean freight rates are three or four times higher than they were two short years ago, and oil for bunkering the ships at ports of call is uncertain.

These conditions serve to size a canvas. An artist can now hope to find an audience avidly awaiting the spreading onto the prepared canvas of any new picture the artist's imagination can conjure up. My purpose here is not to retard the artists' imaginations. Rather, it is to caution the audience not to bid on the creative work until the paint is dry, and to advise the artist to design a picture that will withstand the test of time. Otherwise, the price paid will not reflect the value of the service rendered.

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(Editor's Note: Mr. Gerald's paper was presented by Mr. Dwaine E. Umberger, Transportation Economics, Economic Research Service, U.S. Department of Agriculture, Washington, D.C.)

This gets me to my assigned subject -- the price of agricultural transportation. I will discuss the role that progress in transportation technology has had in the past history of our nation's agriculture, and then move into the role that price has played recently in allocating freight traffic among the several modes of transport. But first I want to sketch the approximate magnitude of agricultural transportation for the United States in 1970 and for North Dakota in 1972-73. The estimates for the United States come from the Economic Research Service. Those for North Dakota were made at the Upper Great Plains Transportation Institute.

Agriculture's Transportation Needs

"Agricultural and forestry producers, handlers, and rural people are major users of long-distance transportation, and handlers of food products are major users of intracity transportation services. About 100 million tons of inputs such as petroleum, farm equipment, and fertilizer move annually to farms and ranches throughout the United States. Perhaps as much as 30 million tons of inputs are used in forestry operations annually. About 425 million tons of products move annually from farms and ranches, and 125 million tons from forests." (1, p.1)

The cost of moving the 680 million tons to and from farms, ranches and forests was estimated to be nearly \$20 billion, or about 22 percent of the national freight bill. This estimate includes exports, local assembly transportation, and intracity transportation as well as the long-distance transportation called intercity transportation. We have no comparable estimate for any earlier or later year for comparison with this estimate.

We do, however, have one series of transportation costs. This is what we call the intercity transportation bill (truck and rail only) for domestically produced and domestically consumed food. This bill for 1972 was \$6.1 billion, \$2 billion greater than in 1962, and nearly \$1 billion greater than two years earlier in 1970. The increase from 1962 to 1970 was, in large measure, due to the increased volume of farm foods marketed, but the increase from 1970 to 1972 was due primarily to increases in freight rates. The industry-wide negotiative and regulatory process in setting rail rates for most products appeared to delay rate increases justified on the basis of sharp cost inflation that began about 1966 to 1967, and consequently several increases occurred in succession from late in 1969 to 1972.

Now let's look at North Dakota's transportation bill -- not quite in total since only the grains are estimated. According to UGPTI, from July 1972 to June 1973, about 12 million tons of grain moved from North Dakota. The transportation bill for this grain to domestic mills and ports of exit was estimated at \$168 million, or 57 percent of the total cost of handling, storing and transporting unmilled grain. This was \$14 per ton just for transportation, not including the transportation intercity of the products from milling the grain or the transportation intracity involved in their distribution. When the bulk nature and long distance of North Dakota's transport environment are considered, this \$14 per ton rate is not unbelievable. The gross rate for the 680 million tons of farm, ranch and forestry inputs and products in 1971 was \$22 per ton.

Enough of these millions and billions that may or may not be nearly correct! I cite them here for one reason only -- to stimulate the imaginations of artists who are waiting to begin their painting of innovative approaches for handling agriculture's massive transportation job. I feel quite confident that either the \$20 billion bill at the national level or the \$168 million bill for North Dakota grains is of sufficient magnitude to encourage those having alternative ideas for doing these jobs to present them. The rewards going to those gaining the rights of producing transportation services for agriculture can be substantial -- but again, in my role as the devil's advocate, the artist who presents the most immediately appealing picture is not necessarily the best artist. His paint may run, fade, crack or oxidize. If he succeeds in selling his new picture and it later proves unsatisfactory, we could find that we had prematurely discarded our old, weatherworn, but valuable picture. To give us and the artists some perspective for judgment, I now turn to the history book.

Woodsides and Iron Horses Take Over Transportation

The United States is handsomely blessed with land and water resources. Before Adam Smith wrote The Wealth of Nations, England, France, Holland and Spain had sailed the seas and were already in the process of developing these land resources. Unutilized and underutilized human resources from Europe, and captive human resources of Africa, were settled on lands accessible to coasts and navigable rivers. Much of this population knew how to farm and little else, in part because the "state of the arts" in agriculture required that people spend most of their waking hours in farming. Over 90 percent of our population was on farms during colonial days. (2, p. 151)

Land situated on navigable waters was soon filled, that in the South with plantations and slave labor, and that in the North and Mississippi River valley complex with family commercial farms. Land with no access to means of transport accommodated a self-sufficient agriculture for awhile. The pace of immigration then began to build up American cities.

Toll roads and canals were extended inland in attempts to commercialize new lands to provide food and fiber for people in our cities and in Europe, but these means of transportation were slow and expensive to develop and/or operate.

Railroads arrived on the scene. Thirty-five years before the creation of USDA -- 60 years before the authorization of the agricultural experiment stations -- 130 years before the first computer solution of an "ideal" geographical pattern of farming activity -- the technical means for reducing long distance transport costs by as much as 50 to 1 was invented. (3, p. 3)

The railroads served in one respect to delay the industrialization of the U.S. They helped to retain a comparative advantage for agriculture in this country. They obliterated all other forms of long distance overland transportation, and greatly reduced the importance of the Mississippi River and coastal rivers as the lifelines of urban America and Western Europe. This new technology permitted self-sufficient farmers to become market-oriented, and brought supplies desirable or necessary for family living to a now mobile rural population.

The number of farms increased very rapidly as the rail technology drove into new lands -- from 1.5 million in 1850 to 6.5 million in 1920. Land in farms grew from 294 to 956 million acres over the same period and the value of land and buildings on farms from \$3.3 billion to \$66.4 billion. The distribution of population shifted even more heavily toward rural areas and farming. In 1850 there was one farm for each 16 persons but this changed to one farm for each 12.5 persons by 1880. By 1920, a reversal had set in and our urban population had grown so that we were back to the point we had reached in 1850 in terms of numbers of persons per farm (4). Nonetheless, we did not reach our peak of 6.8 million farms until 1935. (5, p. 68)

But that is not the total story told to us by the history book. As the rail network of the country expanded, so did the rail network in other undeveloped areas. The new lands opened for farms by the railroads caught up with the

hunger of the exploding populations of Europe in the 19th century, and food and textile markets were flooded. Prices fell. Barriers to free trade grew. Railroads competed vigorously for the rights to market shares. Rate structures were not firmly bedded on cost of service in such an internationally competitive environment, and varied widely and frequently. With inland, rail-served farmers in Canada, Mexico, South America, Africa, Oceania and Asia all competing vigorously with those in the United States for the limited markets, farm prices fell drastically. Railroads were blamed for the problems, and curiously enough, more so by farmers inland who managed to stay in production than by those in coastal areas of eastern United States and Western Europe. Farmers in those water-served areas were bankrupted by the coming of the railroads. We had too much transportation because of an explosion of technology that still is alive and competitive today. The coming of age of water transportation and the development of the motor truck have made and are making ripples, but the tidal wave effect of the railroads, both in monopolizing surface transportation and in relocating economic activity and people, is yet to be duplicated by new ideas, in my opinion. Some disagree.

Transportation Prices

To give a brief sketch of what happened to the price of transportation in the U.S., mostly agricultural, as these and later forces of transport technology unfolded their colors on the world's landscape, let me divide history since the Civil War into four phases.²

Transport Supply Relative to Demand for Transportation. -- Most of our railroad system was developed between 1850 and 1895. As the network expanded, rate structures crumbled, dropping rail revenues per ton mile from 20 mills in 1865 to 7 mills in 1895. Rates for the longer hauls declined as much as 50 to 1. This was due in large measure to growth in the unused capacity of the railroads to produce transport services, despite the growth in the same period of the demand for transport service.

Rail Regulation. -- The coming of rail regulation in 1887 stabilized rate levels and likely, rate structures until about 1916, when inflation lowered the rates of return to railroads. Several percentage increases in all rate tariffs resulted in

²Interpreted from 3, pp. 12-13.

revenue increases per ton mile from about 7 mills in 1916 to 13 in 1922. Rates might have increased more if the Federal Government had not assumed management and operation of railroads for the period 1917-1920.

Intermodal Competition. -- Competition from trucks and barges, the Great Depression, and price control during World War II resulted in declining rail revenues between 1922 and 1946, from 13 mills to 10 mills per ton mile. Federal regulation of trucks and water carriers began in 1935 and 1940, respectively, in part in response to demands by the railroads for equality of regulatory treatment. Following World War II, inflation caused the railroads to seek several successive percentage increases of all rates. Rail revenues per ton mile increased from 10 mills in 1946 to 15 in 1958, but growing competition, particularly from private trucks, reduced the railroads' share of traffic substantially, especially in short-haul, high-rated manufactured products. The private automobile and air and bus lines captured passengers. Major waterway improvements and our Interstate Highway System were authorized, and jet planes also came into commercial use during this period.

Railroads' Counteractions. -- Railroads responded to the growing competition of trucks and barges. Beginning in 1959, indexes of rail freight rates for agricultural products showed sharp declines. By 1966, they stood at less than 90 (1957-59=100). All of these declines accrued from selective rate reductions rather than from percentage or absolute decreases of all rates on file. Most people acquainted with traffic and rate conditions assume that rail rates being undercut by truck or water carriers decreased while other rates held somewhat stable. However, analysis of the rates for agricultural products which we maintain has so far revealed no specific geographic pattern, although commodity patterns are apparent, and these may mask geographical patterns. I am inclined to credit rail productivity gains for most of these decreases in rates, although the growing threat of the barges and trucks may have provided the spur leading to productivity gains.

In 1967, the railroads petitioned ICC for selective percentage increases averaging about 3 percent; in 1968, a similar average level of increase; in 1969 and 1970 increases of 6 percent each across all rates. Truckers petitioned for general increases of approximately the same or larger magnitudes. Other increases have occurred since, and it is too early to know how the energy situation is going to affect transportation prices and modal shares.

Price Decisions Require Information

Let me give you an example at this point of how the price of transportation can in some instances alter the rate of application of new technology -- the innovation. In the late 1940's and 1950's, the group of economists with which I am associated made several studies of the distribution of agricultural products' traffic among the several modes of transport. These studies revealed the strong inroads being made by trucks and barges on certain traffic formerly moving by rails. This research was aimed at discovering some facts concerning the state of competition in agricultural transportation. These facts proved to be relevant for revising the conclusions seemingly guiding railroads and Interstate Commerce Commission officials until the late 1950's in establishing minimum rail rates. Simplifying to the ultimate degree these conclusions seemed to be: (1) Costs of railroading are increasing; (2) traffic for the railroads to haul is captive; and (3) rate increases proportional to cost increases will permit the railroads to cover increased costs. These supposed conclusions overlooked the fact that railroads had lost their technological monopoly in long-haul land transportation as early as the 1920's. The use of ratemaking policies based on such a set of conclusions would be consistent with the fact that the railroads experienced no growth of traffic during the 15 year Post-World War II period when total intercity traffic in the U. S. increased by nearly 50 percent.

Our studies, along with the facts turned up in other studies and in testimony at various hearings, may have led to a revision of the conclusions on the part of many railroad and ICC officials. Conclusions appear to have been revised somewhat as follows: (1) Cost components are increasing per unit of input; (2) in the long run traffic will only move by rails if rail rates are competitive; and (3) adoption of new technology and practices, such as fuller utilization of equipment and reduction of nonessential services to reduce input units per unit of output, will be necessary if costs are to be covered at current or reduced rates. Railroads made some striking recoveries in traffic and earnings in the 1960's. They are now hauling more freight than they carried during World War II, although their share of the freight has declined substantially.

We continued some similar research into the 1960's and one of our studies (6) prompted Mr. Ben W. Heineman, Chairman, Chicago and Northwestern Railway, to comment as follows: "An excellent illustration of our problems and opportunities is a report put out by the United States Government involving

one commodity that most railroads handle in greater or lesser degree -- grain." Mr. Heineman added, "All railroad executives should read this interesting report because within its very few pages and very simple tables lies a comprehensive lesson in railroad economics. The report demonstrates a fact of life that really does not require, one would think, extensive discussion, namely, that price moves merchandise. This report demonstrates to anyone who will take the time to read its very simple language that competition does not go away. It increases."³

The conclusion that price moves merchandise, which Mr. Heineman drew from our grain study, also seems to hold for meat. An examination of rail freight rate indexes (7) for meat and the relative share (8) hauled by the railroads in the Post-World War II period revealed a strong correlation. When rates rose, the relative share dropped, and vice versa. Meat, as you know, is not an exempt commodity. Exempt truckers cannot compete for meat traffic. There was, nonetheless, competition between railroads, regulated motor carriers, and private motor carriers for the traffic in meat. Regulated motor carriers lost ground in meat transportation between 1958 and 1963. Railroads more or less maintained their relative share, so private motor carriers must have picked up the share lost by the regulated truckers. Costs to shippers of operating their own trucks proved attractive relative to rates of the for-hire carriers.

This role of price or cost is no less important for the transportation firm than for the mode or the transport industry as a whole. In fact, it should be more important. Any transportation firm which faces mounting competition from either similar firms or other modes must do a careful job of determining those costs which are pertinent to specific traffic movements. Means for getting the firm's costs down to or below the competitors' costs must be stringently applied. ICC provides certain average cost data for regulated common carriers. USDA has made studies of exempt for-hire truck costs (9, 10, 11). These various cost studies provide some guidelines to carriers and would-be carriers as to the probable nature of the competition they may face.

But technology installation decisions today must consider costs in a broader sense than was required in the past.

³Mr. Heineman made these comments in Traffic World, January 1, 1966, in an article entitled, "Wanted: A Railroad Consensus."

Noise, air pollution and other adverse effects on the environment are considered and to the extent feasible, internalized to the firm. Thus, historical cost studies done are no longer adequate for final decision.

Summary

My summary is brief. The lesson of history is clear -- any new transportation technology must compete with existing technology for a share of the traffic. Price is the force which determines market shares whenever competition is present. Cost in relation to price determines survival of the mode and technology helps determine cost.

I now yield to the artists. Come and show us your new pictures -- or better mousetraps.

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Question and Answer Session for Panel
"Innovations in Grain Handling and Transportation"

Question to Mr. Byrne:

How many car service agents does the ICC have now? Is this less than 10 years ago? Do you have enough agents? In general, to what extent have the railroads complied with the AAR and ICC?

Answer by Mr. Byrne:

We have approximately 70 car agents, which is an increase of 15 or maybe 20 over what we had 10 years ago. I would say we never have enough agents. With the number of stations, freight stations, and yards to check in this country you would have to have at least triple your force you have now. I might also add, that we have your two Senators from North Dakota to thank for helping us to get some of these additional agents. They supported us 100 percent, as did some of your Congressmen. It's quite evident from what I am seeing here today why those fellows in Washington know so much. They must have pretty good teachers.

In response to the last part of the question, about two years ago the railroad industry wanted the privilege of policing their own orders. The ICC gave them that privilege and we told them that we would be looking over their shoulders and if there were any breakdowns, we would take the job over. We almost had a breakdown a few months ago but then the railroad industry decided among themselves that they would try to do a better job and were given another chance. The ICC has fined the railroads about \$400,000 since Service Order 1112 has been in effect, which has been since the shortage about 18 months ago. I understand the AAR has assessed and collected close to a half million dollars for violation of their car service directives.

Question to Mr. Byrne:

Can you be more specific on the devastating results of the freight car shortage?

Answer by Mr. Byrne:

Just last week we had to issue an order requiring eleven Class 1 carriers to send to the Coastline 100 covered hopper cars each. We had to do that in order to get the ingredients for fertilizer out of the fields in

Florida. The lumber people are accusing the Commission now of allowing freight car shortages in the Northwest to affect the price of lumber. The Cost of Living Council is constantly calling us over to their offices asking us why the cotton shippers can't get cars, why fertilizer people can't get cars, and why the lumber people can't get cars. With this kind of a picture being painted to the Commission by the Cost of Living Council and the White House, I believe that if shortages continue and our carriers allow their plain boxcar fleet to deteriorate in the manner they have allowed them to in the last ten years, this situation certainly can have devastating results on our economy.

Question to Mr. Byrne:

Railroads were given high land grants to help develop a national transportation system. I understand the railroads, as corporations, are investing capital into other enterprises other than transportation. Shouldn't railroads be made to invest the income from their operations and landholdings to improve transportation?

Answer by Mr. Byrne:

My answer to that would be definitely, yes. I think the Commission is taking a real good hard look on the monies being invested by the railroads and what effect these conglomerates are having on the actual operation of the railroad per se.

Question to Mr. Byrne:

How come the railroads are able to lower their rates to knock truckers out of business?

Answer by Mr. Byrne:

I would say that if a vote were taken among grain shippers today they would want truckers regulated. They would want the exempt commodity truckers regulated because they are the ones that are using the gun on the shippers and not the railroads. I think it is an old belief that the railroads lower their rates in order to put truckers out of business. I don't think it will hold much water today.

Question to Mr. Byrne:

Explain your assigned car situation. How many bushels would have to be guaranteed to get assigned cars and what other requirements are there?

Answer by Mr. Byrne:

Car assignments are usually made to large automobile shippers, large feed people and paper people. They are normally what we call DF cars, or cars other than plain

boxcars. There are about 200,000 cars assigned to large shippers in this country today. While I mention that, the production of automobiles, as most of you know, is down and the industry is releasing a lot of cars that have been assigned to them for years. The AAR is picking these cars up and putting them in general service. My way of thinking is that cars shouldn't be assigned to large shippers unless it involves very specialized equipment -- cars that are adapted and made for the sole purpose of transporting a certain commodity that cannot be accommodated in an ordinary boxcar.

Question to Mr. Byrne:

It was brought out by the Burlington Northern that only 50 percent of their equipment is on their lines. How can we get the per diem rental rate increased to get these cars back?

Answer by Mr. Byrne:

The present per diem rate is, of course, measured in terms of time and mileage and based on cost, depreciation and also the interest on the money invested. The Commission several years ago did try to increase the per diem rate. The courts, however, ruled that the Commission could not increase the per diem for the purpose of giving more return on the investment of the carriers. I understand now that there is something underway where a question will be brought to the Commission for increasing the per diem mileage on these cars. The Burlington Northern and other Midwestern carriers as well are in bad shape as far as getting their cars back. That was one reason why we issued our orders back a few years ago which were eventually taken over by the AAR. I don't think the Burlington Northern ever had more than 70 or 80 percent of their cars on-line. I don't think that they would want more than 70 or 80 percent of their cars on-line. But they certainly aren't getting the cars back as well as they should.

Question to Mr. Byrne:

If all the cars were available, would the roadbeds be able to carry the loads at high speed and weight?

Answer by Mr. Byrne:

Most of the carriers are capable of handling trains at high speeds. As pointed out this morning, there are carriers in poor financial straits and there are some carriers and roadbeds in very bad shape. That's why I pointed out in my remarks that often times this reflects a bad mark on the entire railroad industry when some carriers can't move trains or cars. We have found cars sitting for weeks in yards of Midwestern lines.

Question to Mr. Byrne:

How is the determination made regarding which roads would supply fertilizer cars to the Seaboard Coastline?

Answer by Mr. Byrne:

The determination was based mostly on the participating carriers that were involved in the road haul movement of fertilizers to points in Iowa, Kansas, Nebraska, Michigan, Ohio, and Illinois. We didn't want to take cars away from some of the carriers that also had potash fields, such as the Santa Fe. In addition, we wouldn't want the Union Pacific to be hauling their empty cars down as far as the Seaboard Coastline. These railroads don't, or very rarely anyhow, enjoy any part of the road haul.

Question to Mr. Byrne:

Is the ICC going to issue a car distribution order for grain elevators?

Answer by Mr. Byrne:

The answer is yes. However, I'm embarrassed in saying that because for months now we have been trying to get an order out of the Commission on the allocation of privately owned cars. One of the provisions in a distribution order would have to cover privately owned cars and we don't want to prejudge the Commission in issuing an order on distribution. But, it definitely will come out and it's needed because I think every railroad serving the grain area has a different set of rules for distribution of cars.

Question to Mr. Byrne:

Who is helping the railroads most in technology, the ICC or DOT?

Answer by Mr. Byrne:

The ICC has no money. All the expertise is over in DOT, and all the work is done in the Commission.

Question to Mr. Byrne:

Would an additional 5,000 cars alleviate the present critical shortage of available equipment across the nation?

Answer by Mr. Byrne:

I would say yes. An additional 5,000 cars put in grain service would certainly do much towards alleviating shortages.

Question to Mr. Byrne:

Why isn't the ICC able to force the rails to do things they are officially requested to do?

Answer by Mr. Byrne:

Believe me, our biggest job is trying to get the railroads as well as the trucking companies to perform in the manner they are obliged to do under the Act. They are common carriers. They have an obligation to furnish shippers adequate service. The Commission is definitely trying to get that done and we won't stop trying until we get you people more cars and better service.

Question to Mr. Schultz:

Do you feel that you have benefited yourself over all with this arrangement?

Answer by Mr. Schultz:

Yes, we have. As I mentioned earlier, there are times during the year when the benefits are greater than at other times. During December, January, February and March when the rivers are frozen, we were receiving approximately one train car a week at our local elevator. The terminals weren't taking grain at all. If they were, they were taking it at a heavy discount because they had to take this grain into their river terminals by truck, load it onto trains and send it to the Gulf themselves.

Question to Mr. Schultz:

Do you find that any of your customers are bypassing your elevator and going directly to the subterminals?

Answer by Mr. Schultz:

No, they are not. Our members can not sell grain directly to the terminal. They can deliver it, but they still sell it through their local elevator. We have not, as of this time, set any firm stipulations on the size of trucks that will be used. We have had farmers with tandems hauling 500 bushels of grain. Grain is sold to one of the six elevators and delivered to the terminal.

Question to Mr. Schultz:

Do you have a contract with the railroad to load so many trains per month; so many cars per month?

Answer by Mr. Schultz:

No, this we do not have. The only thing that we have with the railroad is that these cars must be loaded in the allotted 24 hour time period.

Question to Mr. Schultz:

What is the final destination of the grain? Domestic or foreign sale?

Answer by Mr. Schultz:

Foreign sales primarily.

Question to Mr. Schultz:

Would this differential be useful only during the winter months when the barge system could not be used?

Answer by Mr. Schultz:

The differential makes us much more competitive during the winter months than during the summer months. It all depends on the level of barge rates. Our system will compete with barge rates at about 160 percent of rate. If they dip down to 140 percent we are primarily equal.

Question to Mr. Schultz:

Are you committed to the railroad to make the five consecutive turnarounds with that train to maintain a reduced tariff?

Answer by Mr. Schultz:

When we receive our own cars, we will be. However, at this time we are using, for example, cars owned by Continental Grain Company and they are the ones that are committed to the railroad.

Question to Mr. Schultz:

Does the local co-op do his grain merchandising or is it done by the subterminal?

Answer by Mr. Schultz:

In our case, the subterminal does the grain merchandising. He calls us a bid every day just like any track buyer would call a normal elevator.

Question to Mr. Schultz:

Did you negotiate this reduced rate?

Answer by Mr. Schultz:

No, this rate is in the tariffs of the C & NW railroad. It was an established rate.

Question to Mr. Schultz:

The incentive for you to do what you did was because that rate was already in the tariff, isn't that correct?

Answer by Mr. Schultz:

That's true. Yes. For example, the single car rate out of Storden, Minnesota, was 63 cents per hundred weight in comparison with a 45 cents per hundred weight 50 car unit rate out of Heron Lake, the site of the terminal. Therefore, this gave us a trade advantage permitting us to truck our grain into the terminal plus a handling allowance to move the grain out.

Question to Mr. Thurston:

Do you have figures on the production density necessary to support the unit train? Secondly, what is the name, number, etc., of the FCS study on the unit trains you mentioned?

Answer by Mr. Thurston:

Any figures that I would have on production density would pertain to primarily Iowa and Illinois. In these areas the density that we found necessary for unit train shipments was somewhere around 17,000 to 20,000 bushels per square mile. That's a pretty high density. You might be able to go lower. In this area it might be different. You have quite a variety of grains so I think you might have a special situation here. In regards to the second question, I don't know the exact name but I believe it's the "Coordinated Transportation Study." If you write down "Coordinated Transportation Study for Cooperatives" and send it to the Farmers Cooperative Service, USDA in Washington, 20250, they will know what you are talking about. If you want to write me, I'll send you a copy.

Question to Mr. Rankin:

Local governments fear that increased truck traffic resulting from rail branch line abandonment will necessitate increased highway construction and maintenance, the cost of which will be greater than revenue from fuel and license taxes paid by trucks. Please comment.

Answer by Mr. Rankin:

With respect to rising costs of highway construction, or any other costs for that matter, I don't believe anyone is really an expert. The inflationary spiral of our economy includes, of course, highway construction. I don't think we have any reason to assume that revenue from fuel and license taxes paid by highway users will not be adequate to build and maintain our highway system. I would remind us that motor trucks, which represent only about 16 percent of total vehicle registrations in this country, are paying about 40 percent of the costs of highway construction and maintenance.

Question to Mr. Rankin:

Did you say the agricultural exemption is an archaic impediment? If so, why?

Answer by Mr. Rankin:

I said that the agricultural exemption is an "archaic impediment to sound transportation." Here's why: A great

variety of freight is being transported as agricultural freight when in fact it is manufactured items and has precisely the same transportation characteristics as regulated freight. To mention a few: Processed poultry, processed dairy products, processed nuts, re-dried tobacco. Obviously, this makes no sense. Besides, the agricultural exemption was enacted by the Congress a generation ago (1935) -- at a time when agriculture itself was drastically different from what it is today. Needless to say, agriculture, like the rest of industry, has reached the machine age, the electronic age, the computer age. Exemptions enacted a generation ago, which were supposed to have been applied to transportation of raw agricultural commodities, are as out of date as are the horse and buggy.

Question to Mr. Rankin:

Is ICC issuing any temporary permits for farm commodities at this time?

Answer by Mr. Rankin:

I am not aware that the ICC has issued temporary permits for transportation of agricultural commodities. The fact is, such permits are not necessary, since the law provides in Sec. 203 (b) (6) that anyone can transport exempt agricultural commodities for-hire in interstate commerce as long as the exempt commodities are not hauled in the same vehicles with regulated commodities. You or I, the railroads -- or anyone else who can acquire a truck for the purpose -- can become an "exempt hauler" without reference to ICC.

Question to Mr. Rankin:

Why doesn't ICC lift the restrictions on farm commodities so the grain hauler can haul these commodities as long as the rail and ICC permit carriers can't begin to keep up with the service?

Answer by Mr. Rankin:

There are no ICC restrictions against motor carriers hauling grain since grain is exempt from ICC regulation when transported in motor trucks. Please note my reply to the previous question.

Question to Mr. Rankin:

What are "third structure taxes" or whatever you mentioned in your talk?

Answer by Mr. Rankin:

There are two basic tax structures which have been used traditionally to obtain revenue for the construction and maintenance of our highway system, namely fuel taxes

and vehicle registrations. (A number of excise taxes have been adopted since the Interstate Highway Program was started in 1957.) The "third structure" that I spoke of refers to such taxes as mileage taxes, taxes on vehicle weights, taxes on sizes of vehicles, and taxes on number of vehicle axles. These form a group of onerous taxes which cause a great deal of inconvenience to the carriers and shipping public. They are difficult and expensive to administer. The ATA has always maintained that adequate tax revenue can be obtained through the two traditional structures and that there is no need to resort to the "third structure."

Question to Mr. Rankin:

Your estimates on 1980 -- do they take into account the energy shortage?

Answer by Mr. Rankin:

At the time the ATA estimates of motor transportation expansion by 1980 were made, we did not take into account the energy shortage, but since that time we have examined the energy shortage and we found that we are becoming less energy intensive as we go. Our trucks are becoming more efficient in energy use, therefore, we see no reason why the energy shortage will inhibit our growth.

Question to Mr. Rankin:

What impact will an energy-conscious society have on the "rosy" future you painted for truck growth, especially if energy considerations are reflected in costs and rates?

Answer by Mr. Rankin:

The answer to the previous question applies equally to this question, too. Obviously, all costs have to be taken into account in establishing a rate structure, but fuel is a very minor part of our total costs. It seldom runs to more than 6 - 8 percent of the total costs.

Question to Mr. Rankin:

What is the trucking industry doing to conserve fuel and cut down on polluting the environment? Who will pay for damage to roads caused by heavier and unsafe trucks?

Answer by Mr. Rankin:

As to what we are doing to conserve fuel and cut down on pollution, we are trying to improve our route efficiency and loading efficiency. Our trucks are more fully loaded at all times, with less mileage in transit wherever shorter routes can be used. We have adopted a number of smaller

but, in total, significant innovations, such as streamlining, better times, more perfectly-tuned engines, etc. Additionally, the trucking industry has to adhere to a complicated and rather rigid set of standards promulgated by the Environmental Protection Agency. Finally, we are assured that the diesel engine is the least polluting of all types of motors used in transportation.

On the matter of paying for damage to roads caused by vehicles, I must point out that there is no scientific data to prove that "heavier motor trucks" do more damage to standard highways than any other vehicles. The implication that "unsafe trucks" operate on the highway in large numbers is not borne out by the records of regulatory authorities, who have found that trucks are the safest vehicles on the highway.

Question to Mr. Rankin:

What will be the result if trucks are required to pay full cost of right-of-way?

Answer by Mr. Rankin:

With respect to this question it must be categorically stated that motor trucks are already paying more than their share of the cost of maintaining the highways. Again, the assumption that increased weights of motor trucks "increases highway maintenance costs" is simply not correct. The Federal Highway Administration, in fact, has conducted studies which show that increased highway maintenance costs are but slightly affected by increased sizes and weights of motor trucks.

Question to Mr. Rankin:

We are up to our "axles" now with highways, why not use public monies to provide roadway for the more energy-efficient railroads?

Answer by Mr. Rankin:

The assumption that by applying more public money to railways would make them more efficient is an absurdity which has been proven by the facts of recent years. To assume that railroads are more "energy efficient" is equally fallacious. It is not economically reasonable to compare costs of point-to-point rail service with door-to-door full distribution service provided by the motor truck. The tremendous growth of motor carriage in my adult lifetime has been due largely to the growing need of our industrial society for flexible, efficient, dependable, motor transportation. The fact that the truck goes anywhere there is a road and delivers to any place

required by the shipper cannot be duplicated by any other mode. It is not reasonable to compare this full service by truck with the service offered by railroads, which tend to specialize in full-carload shipping only, and which offer no service at all to more than 35,000 U. S. communities.

Question to Mr. Rankin:

Do you think complete truck regulation will put trucks in an uncompetitive position?

Answer by Mr. Rankin:

Obviously, any trucking company which operates under ICC regulations is literally up to its neck in competition. The Commission encourages competition. I cannot accept your assumption that truck regulation by the ICC would disadvantage this mode of transportation against railroads and other modes of transport. It is a significant fact that after nearly forty years of ICC regulations under the Motor Carrier Act there are still some 15,000 separate regulated motor carriers engaged in interstate transportation under ICC economic (rate) regulation.

Question to Mr. Umberger:

Would you advocate an upper limit to the "zone-of-reasonableness" of rail rates on agricultural commodities? If so, is 110 percent of fully-allocated cost realistic?

Answer by Mr. Umberger:

I suspect ICC follows some such rule in its current rate setting practices. One of the problems is determining fully allocated costs. A level of 110 percent of fully allocated costs seems realistic.

Question to Mr. Umberger:

To your knowledge, is Economic Research Service doing any research on the impact of energy on grain transportation?

Answer by Mr. Umberger:

To my knowledge, the Economic Research Service is currently doing little research on the impact of energy on grain transportation. However, I believe this to be an important area of research and ERS will be investigating the situation as resources permit.

Question to Mr. Umberger:

Your topic, "The Price of Agricultural Transportation," was included under the subject of "Innovations in Grain Handling and Transportation." Do you view new pricing arrangements as innovations? Would deregulation of rail tariffs be considered a desirable innovation?

Answer by Mr. Umberger:

Yes, I view new pricing arrangements as innovations. The question of deregulation of rail tariffs is a complicated one. DOT has contracted a study analyzing the possibility of a box car rental market. The price of a car would vary as demand changes. One of the unknowns is the attitude of shippers toward the rate uncertainty inherent in an unregulated market.

THE TRANSPORTATION CRISIS: IMPLICATIONS FOR RURAL AMERICA

The Honorable Arthur A. Link¹

Thank you for the opportunity to be with you tonight, and to participate in this Grain Transportation Forum. I want to first compliment the sponsors of this event -- the Greater North Dakota Association, the North Dakota Wheat Commission, and the Upper Great Plains Transportation Institute -- and the many cooperating agencies involved. This Forum, and other cooperative informational and educational efforts like it, are truly a service to the people of North Dakota.

Tonight I am supposed to talk about the transportation crisis and its implication for rural America. I'd like to start by reminiscing about the days when a broken wagon axle was a true transportation crisis.

This kind of transportation crisis began with the getting up before daybreak; heading for the barn; and watering, currying, harnessing, and feeding a team of horses. Back to the house for a quick bite of breakfast and return to the barn to hitch the team to a wagon with a 60-bushel grain box on it.

The wagon was then backed up to the granary, or driven along side close enough not to spill the grain, and then one would shovel the grain out of a grain window by hand until the box was filled -- usually with about 55 bushels of 60-pound wheat.

The double box, as it was called, was 26 inches in depth, and held two bushels per inch. Thus, level-filled, it would hold 52 bushels. But with a 6-inch "top box," one could load from 55-60 bushels. This load was then hauled by team to our closest railroad station elevator four miles from home over a wagon trail.

If I remember right, three trips a day made a very good day's work, after which man and beast were both tired out. One had no thought of playing golf, swimming or going to the movies. But one had the proud accomplishment of having moved to market a little over 150 bushels of wheat.

¹Arthur A. Link is Governor, State of North Dakota.

One of our horses never did get used to walking over the steel grate that was a part of the shivering scale. His anxiety was multiplied when the airlift would raise the front wheels of the wagon high enough to dump the grain, and the tongue and eveners created an unnatural tension on the harness.

Once when my father was delivering a load of grain into the elevator, the team bolted and charged through the driveway and, in the process, the wagon was tipped over.

Now ... this created a real transportation crisis. The heavy front oak axle of the wagon was broken, necessitating a repair job at the local blacksmith's. You can bet a broken axle had implications for rural America.

The blacksmith hewed a new axle out of a solid 6 x 6 piece of oak timber to get our grain transportation outfit back in operation.

In order to realize a little more return on our grain, we loaded a few cars "on track" with the scoop shovel.

All this reminiscing goes to prove that we've come a long way.

But we're still not where we want to be. We're not where we want to be when the great productivity of North Dakota's soil is stymied in reaching the markets where the positive results for both producer and consumer can be realized.

We are a state which is producing 50 percent of the nation's hard red spring wheat and 90 percent of the durum. We are producing many thousand head of cattle. Our agricultural efforts have resulted in the highest level of productivity.

All this ... and yet we cannot assure timely transportation of our bountiful and excellent products to market.

How could any other industry function long with such a situation? Could an industry producing machinery put up with sporadic, unscheduled and often unavailable means of transportation? The answer, of course, is no. Such an industry could not, and would not, put up with this kind of transportation trauma.

Fortunately, our farmers have had surplus in the past so that when the transportation was available, the corresponding goods were available to go to market. Grain had been stored.

However, this circumstance is changing. If 20 to 30 percent more grain is produced in 1974 over last year, then we can't use the explanation of stored grain to account for our increased transportation needs. With durum plantings expected to increase from 30 to 40 percent, and the wheat harvest by at least 20 percent, and with favorable weather we can reach no other conclusion than increased production.

The consumer is now beginning to feel a shortage of grain products, some bakers cry. When I was in Washington early this month for a National Governors' Conference meeting, the public discussion between the bakers and grain producers was being aired.

It seemed we touched on nearly every subject, during that trip to Washington, related to the old nursery rhyme, "The butcher, the baker and the candlestick maker." We discussed the economics of cattle feeding and the scarcity complaints of the bakers. Unless the energy crisis is soon resolved, the next thing we may be talking about is the candlestick maker.

Well, in North Dakota we have the products for the bakers' bread. The Wheat Commission indicated that this month more than 100 million bushels of high-quality hard red spring wheat and durum are available on North Dakota farms and in country elevators.

The question is: "Can we get the grain to market when we want to?"

The transportation dilemma has caused a serious problem to grain elevator people. Because North Dakota producers have been unsure about the transportation system, they haven't been able to deliver products to the terminal point. This has, in many cases, caused severe economic hardships in North Dakota. Contracts have had to be broken because they have expired.

The orderly marketing of agricultural products has long been recognized as essential not only to the producers, but to the consumer as well. Any situation which interferes with this process has far-reaching effects upon many persons other than the producer.

It used to be that a shortage of transportation facilities meant a slight congestion and limited availability of grain boxcars for a few weeks at harvest time. This is no longer the case, because of two predominant factors:

- (1) The rail transportation industry has simply not kept up with the increased demands for grain rail transportation service.
- (2) We have witnessed a tremendous increase in the total volume of bushels of grain harvested almost each succeeding year.

Nearly 20 years ago, in 1955, North Dakota farmers were harvesting 18,012,000 acres a year. They were producing 292.3 million bushels of grain.

In 1960, the total volume increased to 311.2 million bushels. In 1970, the figure climbed to 373.1 million bushels. In 1973, North Dakota's total volume produced was 455.7 million bushels.

Over the years, we can look back to 1920. North Dakota had just under 2,000 elevators, the highest number of elevators ever recorded in the state.

In 1964, there were 800 elevators with a capacity of 122 million bushels. However, in 1973, the number of elevators dropped 20 percent; yet the bushel capacity rose 9 million to 131 million bushels. I might add that a significant portion of those 131 million bushels is ready to go to market.

Let's take a look at railroad car capacity in this nation during the last 20 years.

In 1955 in the United States, there were 660,000 boxcars, compared to 326,500 in January, 1974. In other words, only half the amount of boxcars available in 1955 are available today. Boxcar capacity is down from 32.3 million tons in 1955 to 18.6 million tons in 1974.

Let's look at hopper cars. The number of hopper cars in 1955 totaled 37,700, compared to 150,500 in 1974. I'm sure you share my appreciation for the increase in the hopper car model, because they are certainly an improvement over the boxcar. The hopper car capacity increased from 2.6 million tons in 1955 to 13.4 million tons in 1974.

The most significant figure comes when we add the total of all cars -- boxcar and hopper -- available in 1955 and compare this figure to the same total in 1974. The result is that in 1974, we have nearly 3 million tons less capacity in all types of grain rail cars than in 1955. Yet our production is increasing by leaps and bounds.

The combined capacity of our national railroad boxcar and hopper car fleet has declined in the last 19 years by 8.4 percent. In the same 19 years, the tons of wheat and barley shipped from North Dakota increased by more than 100 percent, from 4.3 million tons in 1955 to nearly 9 million tons in 1973. Is it any wonder we experience transportation problems?

Trucks hauled between 2 1/2 million and 3 million tons of wheat and barley from North Dakota in 1972.

During the 1972-73 crop reporting year in North Dakota, 133,900 rail cars moved a total of 323 million bushels. During the same crop reporting year, 114,400 truckloads moved 110 million bushels.

About 25 percent of North Dakota grain is going to market by truck. There is little effective management and administration of the federal regulations which do exist with regard to the railroads. I am not speaking now, of the rail rates, but rather of the way in which car distribution has been handled, or mishandled.

Last January, after I had been in the Governor's Office less than 30 days, a representative of my office went to Washington to appear before a Senate Committee concerning North Dakota's grain marketing problem. He told the committee that "totally inadequate planning and regulation at the federal level is the major cause of the present transportation breakdown."

He said that "when a farmer or shipper wants to market his grain, but can't due to a lack of transportation facilities, he is courting economic disaster."

Although perhaps railroads should not bear the brunt of all criticism, the handwriting is on the wall as to how the railroads plan to serve North Dakota. Perhaps the railroads find it necessary to look elsewhere for economic alternates and North Dakota farmers are going to have to look for new transportation alternatives

for themselves. They must look into buying trucks, on a cooperative basis, if necessary. They may even have to consider the purchase of railway boxcars and some trackage.

An interesting idea surfaced recently in the ranks of agricultural carriers (and in the North Dakota Motor Carriers Association) in North Dakota. The suggestion was made that all grain trucks be equipped with radio communications and that there be a central telecommunication station in North Dakota, as well as in two major terminal centers, Duluth and Minneapolis.

By this method, truckers could be in constant communication as to where the loads are, and elevator operators could know where the truckers are. Better utilization could be made of return trips.

At this Forum you are considering all kinds of new methods to move grain -- by pipeline, and air, among others.

Perhaps we should consider air-freighting flour and bread products, rather than grain.

If the milling industry doesn't think North Dakota is a good place to mill flour, then maybe our state must consider a half-dozen more state mill and elevators. Maybe when we produce the finished product, the transportation situation might change. After all, what industry is cleaner environmentally, or more logical in terms of North Dakota productivity?

Just a word or two about freight rates before I close. North Dakota farmers want freight rate structures which are based on the fully allocated cost concept. They do not want artificial rates.

Since 1880, North Dakota farmers and shippers have paid out untold millions in excess freight rates. I hope, and I truly believe, that the trend is now towards cost-based freight rates.

Economically fair and numerically adequate rail transportation is as important to the consumer, as it is to the producer.

In closing, let me say that I am a little concerned about the fourth portion of the program entitled "North Dakota Reacts." It's just semantics, probably, but I want to see North Dakota lead, rather than react. And we must begin to act. We must be brave enough to demand what is fairly ours. We must do this for our producers and for consumers nationwide. We must help create our own new ideas for a new era.

Grain Production in Bushels

Type of Grain	1955	1960	1970	1973
Corn	12,626,000	8,932,000	6,171,000	10,080,000
All Wheat	109,336,000	127,500,000	156,564,000	252,476,000
Oats	54,740,000	66,129,000	120,056,000	73,800,000
Barley	81,698,000	84,672,000	65,892,000	103,230,000
Rye	8,816,000	6,666,000	5,249,000	3,157,000
Flax	23,750,000	15,054,000	16,440,000	7,464,000
Soybeans	1,364,000	2,288,000	2,715,000	5,476,000
TOTAL	292,330,000	311,241,000	373,087,000	455,683,000

(Figures from the Federal Crop Reporting Service)

AGRICULTURAL TRANSPORTATION RESEARCH IN THE NEW ERA

Robert J. Tosterud¹

Why Research?

An elementary text on the subject defines research as "A method of study by which, through the careful and exhaustive investigation of all the ascertainable evidence bearing upon a definable problem, we reach a solution to that problem. Research is an instrument which mankind has perfected very slowly over a period of several centuries, and it seems to be at present our most reliable means of advancing our knowledge. Its purpose, like that of all other methods, is to discover facts and ideas not previously known to man."²

Because of man's insatiable desire and perhaps need to expand and advance his knowledge, "research," whether we're for it or against it, will go on forever. It will go on forever because there is nothing we can do to stop it, because every year, every month, every day, every minute, every second, everyone learns new facts and ideas if only by chance, trial-and-error, and experience. The individual from birth accumulates, affirms, and reaffirms these encounters, learns them, and then turns and teaches them to the next generation. Individuals gather in tribes, villages, states, nations, and societies; they compare their accumulated experiences and observations and they establish a mutually acceptable "common knowledge" or what at that time appears to be a permanent body of useful information about the world. Complementary to this common knowledge is a set of attitudes and traditions.

At the heart of research, even research methods such as chance, trial-and-error, and experience, is imagination. It is this marvelous spark of speculative power which teases man beyond these elementary research methods to

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²Tyrus Hillway, Introduction to Research, Houghton-Mifflin Company, Boston, 1965, p. 5.

the next step in the development of his discovery techniques -- logic. Logic is no more than putting two and two together to get four; to combine two or more experiences in the mind or in the laboratory, previously learned, to reason things out, and to create a new experience.

Perhaps as uncontrollable as man's desire to "discover new truths" and add new dimensions to his life is his growing passion to organize. Building on the methods of our primitive forebearers, extending through man's ability to reason, the latest step in this evolutionary process is "scientific inquiry." Scientific inquiry is perhaps no more than the combination of a trained imagination, common sense, and organization. Scientific inquiry is the professional or modern research technique and is based on a conscious-directed method or planned procedure -- a formal and organized "search for the truth." This scientific method, believe it or not, is based on a belief and an assumption; the belief is that a natural explanation can be found for every observable phenomenon; the assumption is that the entire universe is ordered and organized, and everything that happens in that universe has a discoverable cause.³ The same elementary text noted earlier, describes this scientific or professional research method as a process consisting of several very definite steps:⁴

- (1) Identification of the problem to be investigated;
- (2) Collection of essential facts pertaining to the problem;
- (3) Selection of one or more tentative solutions to the problem;
- (4) Evaluation of these alternative solutions to determine which of them is in accord with all the facts; and
- (5) Final selection of the most likely solution.

Following this step-by-step plan and isolating himself from personal and imposed biases, the professional researcher derives conclusions supported by evidence and objectivity.

³Ibid., p. 12.

⁴Ibid.

Through the method of chance, trial-and-error, experience, logic, the scientific inquiry, and to a certain extent intuition, man has available to him today an awesome volume and variety of information and knowledge. It is from this base that professional and nonprofessional researchers must build. And we must build. Not for the sake of adding one more volume to the library, but to make a significant contribution toward the betterment of mankind.

Why Independent Research?

While we all do it, some of us make a living from doing it. Each year in both private and public sectors of our economy, a lot of money is spent adding to man's knowledge. For example, total United States government research expenditures in 1960 were \$7.8 billion and the estimated expenditures for 1974 are \$17.6 billion.⁵ If one adds expenditures by state and local governments, private industry, and colleges and universities, the national research outlay would likely be astronomical. A very large number, if not all of these research expenditures, are spent in support of knowledge seekers. The magnitude of this support is justified on the grounds that pursuit in this fashion has proven to be at present our most reliable means of advancing our knowledge. In return for financial support the professional researcher assumes the responsibility to provide to his benefactor, whether General Motors or the American society, an honest and complete treatment of the assigned problem. While beneficial results or results of any kind are not guaranteed, the ultimate objective of the research is, in a very real sense, to produce a product; not a duplicate product but a product previously unknown. The process is not unlike building an automobile, farming, or constructing a house; all follow a previously reasoned out and conceived plan, a selection and combination of various inputs (knowns), making a judgement in regard to how the final product will look, and then, following construction, standing back and looking at the results. If the result is not satisfactory or realistic the research process begins anew, making necessary modifications yielding yet another result. In any and all cases the result, conclusion, or recommendation must be original -- something that previously didn't exist.

⁵Transportation Association of America, Transportation Facts and Trends, Tenth Edition, October, 1973, p. 25.

In essence, the provision of new insights into old problems, recent problems, or problems as yet unencountered, is the responsibility of the conscientious researcher. This is his eight-to-five job so to speak. However, as mentioned earlier, everyone whether he recognizes it or not, carries on research to some extent. Curiosity is really the only necessary prerequisite. The housewife looking for a new dress is "pushing back the boundaries of her personal ignorance."

However, there are those of us in this economy that get paid for this exercise. The source of this payment can come from a variety of sources including local, state, and federal governments, universities, and private industry. We put up for sale a most precious human attribute -- our imagination and curiosity in addition to our formal education and training. The researcher offers a package quite different, I believe, than other offerings in the labor market.

There is a variety of markets for researchers. While all professional researchers supposedly should have the "scientific method" in common, there are some rather fundamental differences within the profession, depending upon the employer. The researcher in private industry has a particular product or a particular service to improve upon, with the ultimate objective being to enhance the profitability of the product and the service and, therefore, the firm. His efforts are directed toward the achievement of some company goal, for example, to increase its competitive position within its industry, reduce costs, etc. People doing research within or for the private firm perform, for lack of a better term, "privately managed research." On the other hand, people that supply their research services to local, state, and federal governments and universities perform, again for lack of a better term, "publicly managed research." The latter group might be referred to as "independent" researchers, but independent only in terms of their scope of problems and responsibilities. These public researchers, quite like their private counterparts, still essentially do what they are told. All researchers and research, public or private, is, to a certain extent, managed.

Perhaps the quickest way to get to the point I am trying to make is to give an example. The Upper Great Plains Transportation Institute is totally financed and supported from public funds. It is managed by and directly responsible to the public. The private researcher, whether in the employ of a particular railroad or trucking firm, grain dealer, etc., is financed and supported by the individual private firm. His research endeavors

are managed by and responsible to the firm. Realizing the amount of funds spent annually by private industry in research and development, the private researcher in general has proven his worth. The public, independent, "free thinker," "ivory-tower" researcher, on the other hand, finds it exceptionally difficult to adequately justify his existence each fiscal year primarily because he is at the same time responsible to nothing yet everything, to no one yet to everyone. However, his reason for being -- my reason for being -- is important and justified on at least four counts, and I believe transportation research provides an excellent example:

- (1) Our concerns and interests are multimodal and multi-industry. That is, we will push back the boundaries of human ignorance, whether that ignorance is related to the railroads, truckers, elevator operators, farm storage, etc.
- (2) We can and do serve as liaisons between, at times, conflicting interests within the industry and between the industry and the public.
- (3) By necessity we are required to look at the big picture. For example, the public can quite rightfully demand of its researchers the analysis of the grain handling and transportation system; that system being composed of activities from farm storage to the placing of grain in the hands of a domestic user or in the hold of an export salty.
- (4) The results of our research or scientific inquiry are made public.

Independent Transportation Research

Not surprisingly, the largest independent transportation research organization in the United States is the federal government, with estimated 1974 expenditures on transportation research totaling \$865 million, or approximately 4.9 percent of all U.S. government research outlays.⁶ Compare this public commitment to some indicators

⁶Ibid.

of the importance of transportation to the American economy: Approximately 20 percent of our gross national product is spent either directly or indirectly for transportation of one kind or another (\$221.4 billion); approximately 16 percent of our total federal taxes come from transportation sources (\$31.3 billion); nearly 10 percent of our total net civilian investment in privately owned assets is for transportation facilities (\$210.2 billion); over 12 percent of our total civilian employment is in transportation or transportation related industries (9.7 million employees); the transportation industry consumes 75 percent of all the rubber consumed by all industries in the United States, 24 percent of all the steel, and 53 percent of all the petroleum; the total American freight bill in 1971 was estimated to be \$101.2 billion.⁷ Revenues from shipping freight increased from \$5 billion in 1939 to \$33 billion in 1971, better than a six-fold increase.

① The United States Department of Agriculture in a recent publication estimated that 22 percent of the total freight bill of the United States is spent to transport farm and forestry products and supplies. In 1971 terms, this agricultural freight bill would have likely exceeded \$22 billion.⁸ A committee was selected by the United States Department of Agriculture to help determine research effort of the USDA and the land grant universities on agricultural transportation problems. The committee reviewed the research projects reported in the Current Research Information System (CRIS) and found, "of the 21,000 projects involving about 10,400 scientific man-years reported in CRIS, only 42 projects involving 33.2 scientific man-years were identified as transportation research." The estimated 1974 budget for United States Department of Agriculture research in transportation is ^{USDA} \$10.4 million.⁹ In a nutshell this is the situation: Agriculture's freight bill as a percentage of America's transportation bill (freight plus passenger) in 1971 was approximately 10 percent; federal government expenditures on agricultural transportation made by the United States Department of Agriculture represented only 1.2 percent of total U.S. government research expenditures.

⁷ Ibid.

⁸ United States Department of Agriculture, Science and Education Staff, Research Needed to Improve Transportation for Agriculture and Rural America, Washington, D.C., March, 1973.

⁹ Op. cit., Transportation Facts and Trends.

In other words, the transportation of agricultural commodities carries 10 percent of the total U.S. transportation burden, but receives federal government research attention amounting only to 1.2 percent. This inequity might be justifiable if we had no problems in agricultural transportation. Rather, on the contrary, we are all very aware that this is just not the case. In fact, this big industry has big problems requiring, in my opinion, a bigger commitment on the part of all ~~independent~~ *State and Federal agencies concerned with transportation* ~~researchers~~. The problems are and will be getting bigger. It's interesting to note that the USDA's budget for transportation research has been cut by almost a half-million dollars from 1972 to 1974. (It gives me a great deal of pleasure and pride to say that where the problems come home to roost, for example, in the state of North Dakota, the trend is the reverse.)

If we are in or approaching a new era for American agriculture requiring the movement and handling of agricultural product volumes previously unimagined, *as some experts predict,* we must complement this new horizon with a new era for agricultural transportation research. However, this new era for research is perhaps even more necessary if these last two years are, as some say, just a flash in the pan and American agriculture will return to "normal" years represented by large surpluses and extremely competitive world markets. Or perhaps the future holds, as even some other experts contend, that the demand for American agricultural products is going to be cyclical, characterized by surplus-scarcity-surplus-scarcity conditions. Boom or bust, it's critical that consumers as well as agricultural product producers and state and federal policymakers recognize and accept the challenge and take needed action to stimulate and encourage a new era for agricultural transportation research. In the interest of all Americans, the primary objective of this research effort is to utilize its professional and financial resources to insure that the future of agriculture in the United States is neither constrained, limited, or burdened by its agricultural product transportation and handling system; *it is in our national and international interest* ~~it is the responsibility of independent agricultural transportation researchers to~~ show America and the world that the future of agriculture is limited only by the ability to produce and consume, not by the inability to deliver. I believe that American consumers have yet to recognize that an inefficient and high cost food transportation system is as much a burden on them as it is on the producer of agricultural products: inefficient and high cost service is both passed back to producers and passed forward to consumers. It must be emphasized that America's new commitment to agricultural transportation research will provide benefits to both producers and consumers of American agricultural products.

Visions of Grain Transportation Research

I am relatively new in this "independent agricultural transportation research" game. I believe I was put on this visionaries part of the program because some people think that I haven't received my share of lumps and disappointments. The comments following could quite likely bring me up to date.

7 There is currently great activity in Washington to develop a National Transportation Policy. As my contribution, I am calling for a National Agricultural (Food) Transportation Policy. If we're selling it to producers we're going to refer to it as an Agricultural Transportation Policy; if we're selling it to consumers, we're going to call it a Food Transportation Policy. Such a policy is necessary for several reasons:

- (1). The importance of agriculture and the importance of transportation to the American economy and the American way of life is self-evident.
- (2) Likely 99 percent of all the food produced in the United States is virtually worthless to both producers and consumers without transportation.
- (3) An efficient agricultural transportation system that is responsive to changing market requirements can be an effective competitive tool in the world agricultural market.
- (4) Our national balance of payments and therefore the very viability of our economy is becoming more and more dependent upon agricultural product exports.
- (5) As was witnessed in recent years, America's agricultural capabilities can be an effective peacemaker in the world.
- (6) For lack of a better way to put it, at today's prices two bushels of wheat equal one barrel of oil.
- (7) The economic dependency on agriculture and transportation is even more critical on the individual state or regional level.

With today's declining farm prices and rising input costs

- (8) The cost of transportation can significantly influence production decisions; that is, low transportation costs can be an incentive for higher production.
- (9) With fuel, labor, and general inflationary cost increases, transportation will likely be taking bigger and bigger bites out of the consumer dollar in the future.

I guess what it all comes down to is that I'm recommending that agricultural transportation be given its just recognition at the national level. I believe it's an all too obvious fact that this part of our economy has forever gone unnoticed and taken for granted. One can only imagine the terrifying results should the wheels of our food delivery system come to a halt for whatever reason.

But the wheels are squeaking, grinding, and wobbling under the awesome responsibility to "carry the commerce of the nation." The most obvious signs of this weakness in our transportation system include the northeast rail crisis involving the near shutting down of the Penn Central and five other bankrupt railroads -- railroads which haul approximately one-fifth of all the nation's freight; several midwestern railroads which are operating at substantial deficits; and ~~the~~ recent shutdowns by independent truckers protesting uncontrolled high fuel costs. Coming a little closer to home: unprecedented boxcar shortages, plugged country elevators, embargoed ports, coal-grain and livestock-grain cars, inequitable car allocation rules, bankrupt country elevators, excessively high truck rates, the Mississippi River flood and stranded barges, and the list goes on. Mr. Thomas J. Byrne, to whom many of you listened to yesterday, was quoted in Traffic World:

"That about the only things that could ease the shortage of cars would be a government ordered ban or restriction on grain exports -- unlikely -- or a sudden drop in the status of the economy."

The headline on the article that contained Mr. Byrne's comments read, "Grain Car Shortage Reported Nearing Last Year's Record; Worst Yet to Come." A recent USDA publication reported daily car shortages for grain alone peaked at 17,700 boxcars and 16,600 covered hoppers last spring. In addition, the fertilizer industry experienced a car shortage amounting to 4,000 cars, which significantly

hindered the movement of fertilizer to farm production areas. Mr. Paul Mills of the United States Department of Agriculture, our Forum's keynoter, recently commented:

"This unmet demand for transportation from agriculture has caused serious economic marketing losses for producers. Millions of bushels of grain sold for delivery months ago are still waiting for transportation. Millions more cannot be sold by producers because of the lack of transportation. The added costs of carrying these stocks beyond normal limits, plus the severe penalties for late deliveries, are costing grain farmers a large piece of current grain values."¹⁰

(3) Perhaps I'm asking too much (I know I'm asking too much). People -- and I include myself in this category -- have a tendency to ignore and become apathetic to problems until they reach crisis proportions. But, surely, it doesn't take a wizard to look down the road and see that some day there will be no fossil fuels to power our traditional transportation system. They will at some point in time, simply cease to exist. However, even before that day comes, our transportation system will go through an entire series of crises: Beginning with exponentially rising fuel costs as the fuels become more scarce, reaching a point in time when available fuels will have to be rationed or allocated to priority users with transportation likely being on the priority list, and then finally just before the great disappearance act, the priority list will get shorter and shorter until our agricultural export transportation system falls off the list and it is pronounced illegal for trucks to transport commodities in excess of, e.g., 200 miles. But, that day will never come, *many argue* you argue; science and technology will save us. But, then I'll refresh your memory, recall these earlier statistics? In 1974 the U.S. federal government ~~is going to spend~~ approximately \$17.6 billion on "science and technology." Of this \$17.6 billion, \$865 million ~~will go~~ ^{will be} to transportation "science and technology" and of this \$865 million, a little over \$10 million ~~will be~~ ^{will be} allocated to agricultural transportation "science and technology." In other words, the federal government is currently devoting 0.059 percent of its total research effort toward agricultural transportation "science and technology." To perhaps put it in a more perspective fashion, out of every thousand dollars spent by the federal government on science and technology \$49 is spent on transportation science and technology and

¹⁰Paul Mills, United States Department of Agriculture, A talk at the 1974 National Agricultural Outlook Conference, Washington, D.C. December 18, 1973.

59 cents on agricultural transportation science and technology. This, in support of an industry which takes 20 cents out of every dollar the average wage earner makes.] If you are an agricultural producer this figure is envious.

The North Dakota Grain Handling And
Transportation Research Program

I am through complaining about the higher ups -- those people who make the decisions setting priorities concerning the allocation of research funds. I would like to now speak to the lower downs -- my compatriots in the field of independent agricultural transportation research.

Whether we like it or not, we have the responsibility and are accountable for finding solutions to agricultural transportation problems in the United States. The public will simply not let us hide behind the "59¢-per-thousand-dollar-excuse" if one day the farmer wakes up and finds bulging storage facilities and the consumer a bare cupboard. But, what can we contribute? In the face of these seemingly overpowering responsibilities and problems, as I see it, we could do one of four things:

- (1) Ignore them;
- (2) Become immune to them;
- (3) Anticipate and half-heartedly welcome conditions which will cause demand to recede and therefore become more in line with our ability to market; or
- (4) We can combine and coordinate the powers and talents available in our profession for their solution.

Obviously, if we are to make a positive contribution and live up to our responsibility we cannot out of apathy, self-pity, or default submit to any of the first three alternatives. Therefore, as an integral part of the National Agricultural Transportation Policy, I am advocating a National Research Policy in Grain Transportation. While the National Agricultural Transportation Policy would likely be no more than a statement of spirit, the National Research Policy in Grain Transportation could and should be an action program. Grain transportation research in my opinion is a natural for this kind of effort because its

scope is both narrow enough in that it is commodity-specific yet wide enough to take on a national perspective; in other words, I sincerely think we can grab ahold of it. In addition, there are services and facilities that can be almost totally assigned to the movement and handling of grain. In other words, it is possible to fully describe and evaluate "the grain transportation system of the United States." This of course must be the first objective of the National Grain Transportation Research Program and could be accomplished at the state-by-state or region-by-region level. For example, it would be the responsibility of a cooperating state to fully describe its grain transportation and handling system from origin to destination. The federal coordinator of the project, likely the United States Department of Agriculture, would be responsible for establishing a common framework of description to be used by the individual states or designated regions and assembling and putting together the pieces composing the United States grain handling and transportation system. After the puzzle has been put together, the several states and the federal coordinating agencies would begin the second phase of the project-system evaluation; that is, the identification of modal, regional, and commodity interrelationships and the identification of bottlenecks and regional inequities in the system. The third phase of the project, for lack of a better term, is called "rationalization." Here the general objective would be to suggest, develop, and determine the economic, political, and social feasibility of various alternatives and modifications to existing grain transportation and handling techniques. In other words, with the knowledge gained during the description and evaluation processes, we will be able to present reasonable and logical alternatives to present techniques used in handling and transporting American grain. Some alternatives might include branch line abandonments, using existing elevators as satellites to a subterminal system, perhaps an inland terminal system, or a system composed of existing elevators capable of high-throughputs, unit trains or grain trains, and even the feasibility of introducing alternative modes of grain transportation like pipeline, air, and barge. It must be strongly emphasized at this point that these are alternatives which, if we, as independent grain transportation researchers, don't look at, will simply go unappraised.

The preceding was a brief sketch of the North Dakota grain handling and transportation research program currently active at the Upper Great Plains Transportation Institute. I am proud to say that the grain handling and transportation system of North Dakota has been completely described

and costed-out (See Appendix). In addition, North Dakota's "grain train" and railroad company car allocation procedures have been evaluated. We are currently evaluating other components of the system. The "rationalization" procedure is about to begin. The research method for rationalization is a computer model which Dr. Trychniewicz of the University of Manitoba and I developed approximately a year-and-a-half to two years ago. While the data requirements of the computer model are extensive and complex (for example, it requires the locating of individual farmers and elevators and the estimation of individual farmer grain deliveries), the procedure does work.¹¹ & ¹²

This research approach takes advantage of our independent researcher advantages. That is, the entire grain handling and transportation system, with all its variety of components, is included in the analysis. To use an "in" phrase, it is our responsibility -- no one else's -- to view the handling and transportation of grain as a "logistics system." While it has been defined in a variety of confusing ways, logistics in essence is nothing more than the management and control of the movement of a commodity through various marketing channels. A system-oriented research approach means that wherever possible in examining individual system elements, e.g., on-farm storage, country elevators, trucks, railways, subterminals, port terminals, etc., and activities, we will make every attempt to suggest important interactions to be expected to happen between related elements.

Perhaps the best example that I can think of in describing what a system is, is to recall a plastic toy my son had a couple years ago. It consisted of several gears mounted on spindles in such a way that the teeth of the various gears meshed. As the handle on one gear turned it drew all the rest into action. All gears were dependent upon each other. My son later demonstrated that if you stuck gum between the teeth of one gear, the

¹¹Robert J. Tosterud, A Simulation Model for Rationalizing the Grain Transportation and Handling System in Western Canada on a Regional Basis, unpublished Ph.D. thesis, University of Manitoba, May, 1973.

¹²Edward W. Trychniewicz and Robert J. Tosterud, "A Model for Rationalizing the Canadian Grain Handling and Transportation System on a Regional Basis," American Journal of Agricultural Economics, 55:805-813, December, 1973.

toy came to a standstill, or, as he did, if you pull a gear out, it would cause some gears to stand virtually idle, while others would clunk along in a meaningless fashion. In many ways this toy typifies the American grain handling and transportation system; its various parts are extremely interrelated with each other and a bottleneck or a collapse in any one particular part can literally "gum up the system." I believe as independent researchers we can build the toy that represents our grain handling and transportation system and once constructed, we and public policy makers can turn the handle, discover how the mechanism works, and recommend where a little grease is necessary to make the system work more effectively. I can't emphasize strongly enough that if we don't do it, it won't get done.

Summary and Conclusions

The challenge to, and the responsibility of, independent agricultural transportation researchers is ominous. Perhaps our first objective is to see to it that our food delivery system in the United States is given its deserved recognition. Once this PR job is done, we push for the enactment of a National Agricultural (Food) Transportation Policy based on the very fundamental principle that Americans have grown accustomed to eat. We, at that time, will offer our services in the development of a National Research Policy in Grain Transportation. We will build the toy, we will turn the crank, and Americans will continue to eat.

I've used this opportunity to be perhaps more naive than visionary. However, for much too long our national leaders and policymakers and, yes, our researchers, have wrongfully adhered to the assumption that production and consumption occur at the same place and at the same time. There are professionals and policymakers that close one eye and look either strictly at production or consumption, then there are those that use both eyes and look at both production and consumption. Neither perspective is sufficient in terms of the challenges that lie ahead. I guess what I'm asking for is people with three eyes; with one in the middle of their heads so they can take a serious look at what occurs between the production and the consumption of agricultural products. Pardon the pun, but there can be many a slip between the crop and the lip.

Perhaps I'm too close, too affected, too involved in the problems and perhaps feeling too accountable for their solution, but my patience has worn thin (and I've

been on the job only a year-and-a-half!). A farmer complains that all the elevators in his area are plugged and he can't make delivery; the elevator operator complains that he can't make delivery because of the box-car shortage; the railroad complains that they can't make delivery because of an embargoed port; the embargoed port complains that they can't make delivery because no ships are available; the ship owners complain that they can't take delivery because their ships are tied up at world ports, and so it goes. During the last two-and-one-half months the Interstate Commerce Commission has approved railroad grain rate increases and the railroads have recently proposed another rate increase which in the end will cost North Dakota grain producers over \$9 million. One elevator operator I talked to last year lost almost \$18,000 because it was necessary for him to transfer from March to July futures due to the boxcar shortage. During just the first three months of 1973 another elevator operator was forced to incur \$7,000 in excessive interest costs for the same reason. And when you try to fight, the Interstate Commerce Commission in a "landmark decision," in regard to admittedly excessive high barley rates, assumes the position that, "obviously when many rates are established at a level less than full cost to meet competition, others, not affected by competition, must return more than full costs if the carriers are to earn sufficient revenue to continue to provide service." And then, finally, with all due respects, a couple weeks ago the Secretary of Transportation, speaking to Congress regarding the need for a National Transportation Policy, suggested that:

"Federal research and development work on transportation should be directed to a limited number of programs with a high potential payoff to the nation as a whole and with little likelihood of being adequately handled without some federal support. Near-term programs that meet this criteria include: (a) improving the energy efficiency in all transportation systems, but especially automobiles, (b) improving motor vehicle, driver, and highway safety, (c) improving the air traffic control system to increase the capacity of the airways, (d) improving highway traffic control for automobiles and buses..."¹³

It's these types of technological, political, and regulatory dilemmas which bring me, and many like me, to work in the morning and puts us to sleep at night.

¹³Traffic World, "DOT Secretary Tells Congress He Finds National Transport Policy 'Elusive, Vague'," March 11, 1974, p. 19.

Table 1
THE TRANSPORTATION OF NORTH DAKOTA GRAINS, 1967-68 TO 1972-73

Crop	Year						Percent Change From 1971-72 to 1972-73
	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	
Hard Red Spring	101,788	113,164	120,330	105,800	119,944	191,696	+59.8%
Durum	52,189	69,589	58,540	27,317	66,184	83,351	+25.9%
(All Wheat)	(153,977)	(182,753)	(178,870)	(163,117)	(186,128)	(275,047)	+47.8%
Barley	58,705	60,869	74,528	68,996	70,883	78,384	+10.6%
Oats	24,128	29,296	37,008	55,049	44,537	44,222	- 0.7%
Rye	3,370	4,580	1,672	4,675	4,193	5,009	+19.5%
Flax	<u>9,617</u>	<u>11,788</u>	<u>13,133</u>	<u>13,540</u>	<u>9,159</u>	<u>11,411</u>	<u>+24.6%</u>
Total	249,797	289,286	305,211	305,377	314,900	414,073	+31.5%

Information on the Handling and Transportation
of North Dakota Grain

APPENDIX

Table 2

North Dakota Grain Transportation: 1972-73 Version*

Prepared By: Upper Great Plains Transportation Institute
Source: North Dakota Public Service Commission's
"Grain Movement Report"

A) Each Day (7 days a week, 365 days a year):^a

	No. Boxcars Loaded	No. Hoppers Loaded	Sub-Total Railcars	No. Trucks Loaded	Total No. of Units Loaded
Hard Red					
Spring	146	40	186	114	300
Durum	68	19	87	34	121
(All Wheat)	(214)	(59)	(273)	(148)	(421)
Barley	47	8	55	74	129
Oats	15	4	19	41	60
Rye	3	1	4	6	10
Flax	3	1	4	30	34
Miscellaneous	7	4	11	18	29
Total	289	77	366	317	683

B) Each Month (30 days per month):

	No. Boxcars Loaded	No. Hoppers Loaded	Sub-Total Railcars	No. Trucks Loaded	Total No. of Units Loaded
Hard Red					
Spring	4,380	1,200	5,580	3,420	9,000
Durum	2,040	570	2,610	1,020	3,630
(All Wheat)	(6,420)	(1,770)	(8,190)	(4,440)	(12,630)
Barley	1,410	240	1,650	2,220	3,870
Oats	450	120	570	1,230	1,800
Rye	90	30	120	180	300
Flax	90	30	120	900	1,020
Miscellaneous	210	120	330	540	870
Total	8,670	2,310	10,980	9,510	20,490

*Time period covers 12 months, July 1972 to June 1973.

^aIncludes CCC loadings.

Table 2 (Continued)

C) For 12 Months (July 1972-June 1973):

	No. Boxcars Loaded	No. Hoppers Loaded	Sub-Total Railcars	No. Trucks Loaded	Total No. of Units Loaded
Hard Red					
Spring	53,555	14,618	68,173	41,461	109,634
Durum	24,773	6,924	31,697	12,453	44,150
(All Wheat)	(78,328)	(21,542)	(99,870)	(53,914)	(153,784)
Barley	17,332	2,940	20,272	26,907	47,179
Oats	5,310	1,456	6,766	14,831	21,597
Rye	1,204	227	1,431	2,092	3,523
Flax	935	449	1,384	10,212	11,596
Miscellaneous	2,613	1,561	4,174	6,523	10,697
Total	105,722	28,175	133,897	114,479	248,376

*105,722 boxcars were loaded-----234,243,409 Bu.
 * 28,175 hoppers were loaded----- 89,039,446 Bu.
 *133,897 railcars were loaded-----323,282,855 Bu.
 *114,479 trucks were loaded-----109,924,961 Bu.
 *248,876 units were loaded-----433,207,816 Bu.^a

^aIncludes CCC shipments.

Table 2 (Continued)

D) Makeup and Destinations of North Dakota Grain Shipments- 1972-73^a (Bushels in Thousands)

	Duluth-Superior			Minneapolis-St. Paul			West			Miscellaneous			Total		
	Bushels	%Rail	%Truck	Bushels	%Rail	%Truck	Bushels	%Rail	%Truck	Bushels	%Rail	%Truck	Bushels	%Rail	%Truck
(All Wheat)	(153,783)	(84.9)	(15.1)	(77,984)	(80.2)	(19.8)	(16,596)	(97.5)	(2.5)	(24,386)	(81.9)	(18.1)	(272,749)	(84.0)	(16.0)
HRS	95,733	84.0	16.0	60,736	76.1	23.9	15,901	98.0	2.0	17,558	80.8	19.2	189,928	82.4	17.6
Durum	58,050	86.4	13.6	17,248	94.4	5.6	695	86.1	13.9	6,828	84.6	15.4	82,821	87.9	12.1
Barley	23,614	19.4	80.6	42,407	94.7	5.3	7,545	51.4	48.6	4,217	51.3	48.7	77,784	65.3	34.7
Oats	7,133	40.0	60.0	27,060	60.2	39.8	2,371	20.6	79.4	5,547	19.5	80.5	42,111	49.2	50.8
Rye	1,752	48.8	51.2	1,227	75.0	25.0	268	0.3	99.7	426	32.8	67.2	3,671	52.2	47.8
Flax	2,986	20.4	79.6	6,236	21.3	78.7	232	9.0	91.0	773	5.0	95.0	10,227	19.6	80.4
Miscellaneous	6,078	63.1	36.9	3,431	56.4	43.6	3,492	92.7	7.3	6,105	36.8	63.2	19,107	58.9	41.1
TOTAL	195,346	73.6	26.4	158,345	78.3	21.7	31,199	78.6	21.4	41,454	62.4	37.6	425,649	74.6	25.4

^aDoes not include CCC shipments.

Table 2 (Continued)

E) Origin of Shipments:

		Percent of bushels shipped which originated in each crop reporting district ^a									
		Crop Reporting District									
Grain	Bushels Shipped	1	2	3	4	5	6	7	8	9	State
HRS Wheat	189,927,964	15.3%	5.8%	16.5%	8.4%	9.9%	14.7%	13.2%	7.3%	9.0%	100%
Durum	82,820,693	31.9	18.2	25.4	4.5	9.3	2.8	2.7	1.1	4.2	100
(All Wheat)	(272,748,657)	(20.3)	(9.6)	(19.2)	(7.2)	(9.7)	(11.1)	(10.0)	(5.4)	(7.5)	100
Rye	3,671,382	10.0	8.8	3.2	2.7	11.1	7.3	7.0	3.5	46.4	100
Flax	10,227,236	5.0	13.8	9.0	6.5	20.0	13.1	0.6	8.6	23.4	100
Barley	77,784,055	7.4	10.5	31.7	1.8	8.9	25.4	2.5	1.3	10.7	100
Oats	42,110,704	12.4	10.9	11.4	3.1	8.8	20.6	3.1	2.0	27.8	100
Miscl.	19,106,908	0.1	0.2	10.8	0.5	2.0	43.4	0.0	0.1	42.9	100
Subtotal	425,648,942	15.9%	9.5%	19.8%	5.5%	9.3%	16.1%	7.2%	4.2%	12.6%	100%
CCC	7,558,874										
Grand Total	433,207,816										

^a(For counties included in Crop Reporting Districts, see following page.)
STATE TOTAL MAY NOT ADD DUE TO ROUNDING

<u>^aCrop Reporting District</u>	<u>Counties Included in District</u>
1	Burke, Divide, Mountrail, Renville, Ward, Williams
2	Benson, Bottineau, McHenry Pierce, Rolette
3	Cavalier, Grand Forks, Nelson, Pembina, Ramsey, Towner, Walsh
4	Dunn, McKenzie, McLean, Mercer
5	Eddy, Foster, Kidder, Sheridan, Stutsman, Wells
6	Barnes, Cass, Griggs, Steele, Traill
7	Adams, Bowman, Golden Valley, Hettinger, Stark
8	Burleigh, Emmons, Grant, Morton, Sioux
9	Dickey, Lamoure, Logan, McIntosh, Ransom, Richland, Sargent

Table 3

PRELIMINARY COST ESTIMATES OF HANDLING, STORING AND
TRANSPORTING THE 1972-73 NORTH DAKOTA GRAIN MARKETINGS
FROM ON-FARM STORAGE TO THE PRIMARY MARKETS OF
MINNEAPOLIS-ST. PAUL, DULUTH-SUPERIOR AND WEST

TWELVE MONTHS, JULY 1972 TO JUNE 1973

North Dakota
1972-73 Grain Marketings

Minneapolis-St. Paul	162,662,170 Bu.
Duluth-Superior	197,132,589 Bu.
West	31,302,391 Bu.
TOTAL	391,097,150 Bu. ^a

I. Farm Storage Costs^b

A) 391,097,150 Bu. X 4.09¢/Bu.....\$15,995,873
TOTAL.....\$15,995,873

II. Collection of Grain by Farm Truck to Country Elevator^c

A) 391,097,150 Bu. X 5.00¢/Bu.....\$19,554,858
TOTAL.....\$19,554,858

III. Grain Handling and Storage in Country Elevators^d

A) Receiving by Farm Truck
391,097,150 Bu. X 1.86¢/Bu.....\$ 7,274,407

B) Storage
391,097,150 Bu. X 9.09¢/Bu.....\$35,550,731

C) Loaded-Out by:

1) Rail
297,026,035 Bu. X 1.80¢/Bu...\$ 5,346,469

2) Truck
94,071,115 Bu. X 1.51¢/Bu....\$ 1,420,474

TOTAL.....\$49,592,081

IV. Grain Transportation From Country Elevators to
Primary Markets^c

A) To Duluth-Superior

1) By Rail
145,044,344 Bu. X 25.00¢/Bu..\$36,261,086

2) By Truck
52,088,245 Bu. X 25.00¢/Bu...\$13,022,061

Table 3 (Continued)

B) To Minneapolis-St. Paul
1) By Rail
127,381,804 Bu. X 25.00¢/Bu...\$31,845,451
2) By Truck
35,280,366 Bu. X 25.00¢/Bu...\$ 8,820,092

C) To West Coast
1) By Rail
24,599,887 Bu. X 80.00¢/Bu...\$19,679,910
2) By Truck
6,702,504 Bu. X 80.00¢/Bu....\$ 5,362,003

TOTAL.....\$114,990,603

V. Handling and Storing Grain in Duluth-Superior Terminal Elevators

A) Receiving by:
1) Rail
145,044,344 Bu. X 1.37¢/Bu...\$ 1,987,108
2) Truck
52,088,245 Bu. X 1.34¢/Bu....\$ 697,982

B) Storage
197,132,589 Bu. X 6.19¢/Bu.....\$12,202,507

C) Loaded-Out by:
1) Water
151,476,681 Bu. X 0.82¢/Bu...\$ 1,242,109
2) Rail
45,655,908 Bu. X 1.47¢/Bu....\$ 671,142

TOTAL.....\$16,800,848

VI. Domestic Grain Transportation by Rail and Water from Duluth-Superior East

A) 59,139,777 Bu. X 15.75¢/Bu.....\$ 9,314,515

TOTAL.....\$ 9,314,515

VII. Handling and Storing Grain in Domestic Eastern Terminal Elevators

A) Receiving by Water and Rail
59,139,777 Bu. X 2.32¢/Bu.....\$ 1,372,043

B) Storage
59,139,777 Bu. X 6.01¢/Bu.....\$ 3,554,301

TOTAL.....\$ 4,926,344

Table 3 (Continued)

VIII. Handling and Storing Grain in Minneapolis-St. Paul
Terminal Elevators^{d,e}

A) Receiving by:

1) Rail	
127,381,804 Bu. X 2.00¢/Bu....\$	2,547,636
2) Truck	
35,280,366 Bu. X 1.16¢/Bu....\$	409,252

B) Storage

1) Export	
113,864,007 Bu. X 4.45¢/Bu....\$	5,066,948
2) Domestic	
48,798,163 Bu. X 4.45¢/Bu....\$	2,171,518

C) Loaded-Out by:

1) Water	
44,179,235 Bu. X 0.98¢/Bu....\$	432,957
2) Rail	
68,546,132 Bu. X 1.66¢/Bu....\$	1,137,866
3) Truck	
1,138,640 Bu. X 2.75¢/Bu.....\$	31,313

TOTAL.....\$11,797,490

IX. Grain Transportation From Minneapolis-St. Paul to
Southern (Gulf Port) Terminal Elevators, by Rail
and Water

A) By Water	
44,179,235 Bu. X 21.00¢/Bu.....\$	9,277,639
B) By Rail	
68,546,132 Bu. X 21.00¢/Bu.....\$	14,394,688

TOTAL.....\$23,672,327

X. Handling and Storing Grain in Southern (Gulf Port)
Terminal Elevators^d

A) Receiving by:

1) Water	
44,179,235 Bu. X 1.42¢/Bu....\$	627,345
2) Rail	
68,546,132 Bu. X 1.37¢/Bu....\$	939,082

B) Storage

112,725,367 Bu. X 17.74¢/Bu.....\$	19,997,480
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C) Loaded-Out by Water

112,725,367 Bu. X 0.73¢/Bu.....\$	822,895
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TOTAL.....\$22,386,802

Table 3 (Continued)

XI. Handling and Storing Grain in West Coast Terminal Elevators^d

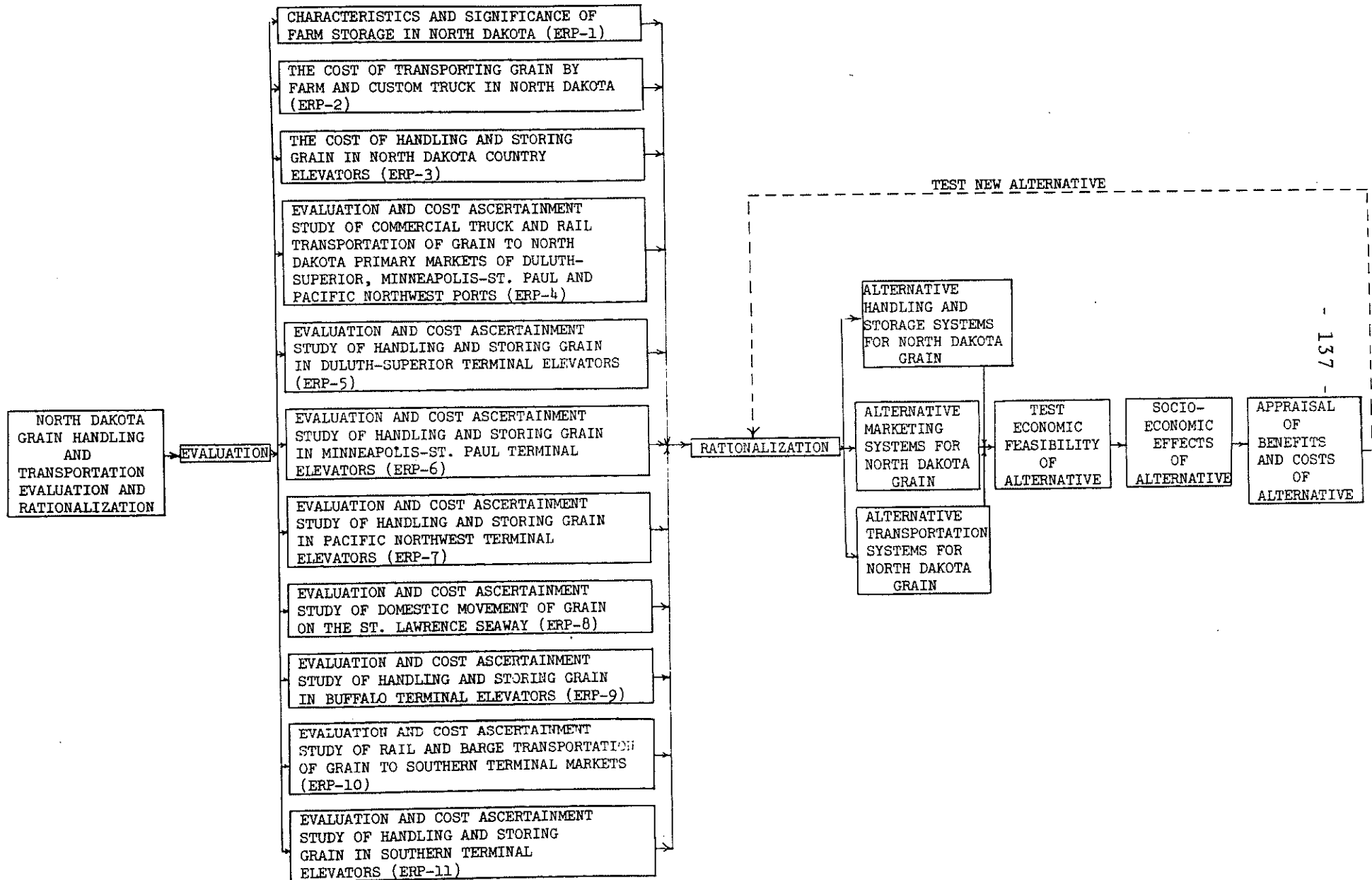
A) Receiving by Rail	
24,599,887 Bu. X 1.75¢/Bu.....\$	430,498
B) Receiving by Truck	
6,702,504 Bu. X 2.02¢/Bu.....\$	135,391
C) Storage	
31,302,391 Bu. X 14.71¢/Bu.....\$	4,604,582
D) Loaded-Out by Water	
31,302,391 Bu. X 0.99¢/Bu.....\$	309,894
TOTAL.....\$	<u>5,480,365</u>
GRAND TOTAL.....\$	<u>\$294,512,106</u>
Average Cost/Bu.....	<u>75.30¢/Bu.</u>

	<u>Total System Activity Costs</u>	<u>Percent of Total</u>
Handling	\$ 27,835,863	9.45%
Storage	\$ 99,143,940	33.66%
Transportation	<u>\$167,532,303</u>	<u>56.88%</u>
Total	\$294,512,106	99.99%

- a) Represents 90.28 percent of all grain marketings to all destinations.
- b) Cost estimate taken from: Farm Stored Grain on the Prairies, A study prepared for the Grains Group, Bruno Friesen, Alberta Wheat Pool, Calgary, Alberta, February, 1971. (Cost of 4.09¢/Bu. specifically applies to the Province of Manitoba, Canada.)
- c) State average "guesstimates."
- d) Country and terminal cost estimates taken from: Cost of Storing and Handling Grain and Controlling Dust in Commercial Elevators, 1971-73----Projections for 1973-74, USDA/ERS, Washington, D.C. March, 1973.
- e) Domestic and export splits and water-rail-truck load-outs were estimated from: "Volume of Grain Handled by Minneapolis-St. Paul Area Elevators: Reported to the Minneapolis Grain Exchange."

NOTE: Exempt truck and barge costs are unpublished and were assumed to be competitive with published rail rates. During the latter part of 1972-73, truck and barge charges, primarily due to shortages in rail equipment, increased substantially.

UGPTI RESEARCH PROGRAM/PROJECT FLOW CHART



OUTLOOK OF MOVEMENT OF GRAIN BY BARGE IN THE UPPER GREAT PLAINS

Howard Thelen¹

I appreciate the opportunity to address this Forum and to share with you our views with respect to the potential for movement of grain by barge over inland waterway to the Upper Great Plains.

Good water in plentiful supply has always been one of our critical natural resources; and its availability or lack of it plays a major influence in the development of any region. Transportation by water goes back in time to when man first began his wandering on earth. Man's needs forced him to follow and live with water. Areas where water is absent will find man absent. It's natural then, that as the United States was settled, the waterways were followed and so to the Great Plains rivers came the pioneer. In these early days the pioneer's needs and his rich fur produce brought the Keel Boats and the Packet Boats into our vast central region. Fort Benton, Montana, was a key river port for these craft, and it took from four to six months to make a single round trip from St. Louis to the upriver ports.

The reach below Fort Benton had been navigated commercially in the 19th century; in the year 1860, the side-wheeler "Spread Eagle" was the first steamboat to reach Fort Benton. With this demonstration of feasibility, navigation on the Upper Missouri increased by leaps and bounds and reached its peak in 1880. In that year, 332 boats transited St. Louis, with 46 of these arriving at Fort Benton.

Meanwhile, the railroad reached Fort Benton in 1887 and sounded the demise of commercial navigation above Sioux City. The last arrival of a merchant vessel at Fort Benton was about 1890.

Modern navigation began with the authorization of the River and Harbor Act of 1912 (6', K.C. to mouth) and was supplemented by the authorities of the River and Harbor Acts

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of 1927 (6', Sioux City to mouth) and 1945 (9', Sioux City to mouth). These acts charged the Corps of Engineers with the responsibility of providing and maintaining a navigation channel 9 feet in depth by 300 feet in width by "Open River" methods within a stabilized channel from Sioux City, Iowa to the mouth. The principal methods used to contract and stabilize the waterway, so the flowing river forms a navigable channel of the desired dimension, consist of revetment of banks and construction of permeable dikes.

This project is now about 90 percent completed, with most of the remaining work to be done between Sioux City, Iowa and Omaha, Nebraska. The project provides protection to highly productive farmlands in the valley from bank erosion and provides for the further development of commerce.

Our engineering has proved so successful that 1973 marks the 8th consecutive year that no navigation dredging has been required on the Missouri in the Omaha District. The Sioux City to Omaha reach of the river is an outstanding example of a self-scouring channel.

There are currently 29 terminals served by five barge lines operating within the Omaha District.

This combination delivers, stores, and distributes upbound cargoes of fertilizer, salt, molasses, cement, sugar and newsprint, and the return downriver of the rich harvest of the Midwest consisting of corn, soybeans, milo, wheat and alfalfa. To date, upriver tonnage continues to exceed the downriver tonnage (60%/40%). The ideal situation is, of course, an equal balance of trade.

The main inducement to barge shipping is bulk handling and low cost. A standard barge is 35 feet wide by 195 feet long and, depending upon draft, is capable of holding 800 to 1400 tons of cargo.

This is equal to 40 railroad cars. An average tow of three barges would equal the capacity of a 120-car railroad train.

In the early days, freight to Fort Benton cost the shipper 18 cents per pound. Barge rates today vary by cargo and length of haul, but average about 3 mills per ton mile.

Towboats on the Missouri River have a capacity of 1500 to 3600 horsepower. This enables them to transit the river with tows at speeds of 10 mph downstream and 4 mph upstream.

These towboats operate 24 hours a day, seven days a week during the navigation season.

Disadvantages to barge shipment are the slow speed of delivery and the FCC regulation that precludes LCL-type (less than carload lots) shipments.

Kansas City to Omaha -- by truck or rail -- is a matter of hours, but 2 1/2 days by barge.

With controlled releases of water from the upstream reservoirs, a minimum navigation flow of 30,000 cfs is required at Omaha from late March or April through November.

River ice and low water preclude year-round navigation on the Missouri River. Ice cover on the river may span 30 to 100 miles in a stretch at thicknesses of 12 to 18 inches.

In 1971, a record 2.8 million tons of cargo was moved by barge on the Missouri River, of which 1.5 million tons was within the Omaha District (Sioux City, Iowa to Rulo, Nebraska).

Tonnage in 1972 amounted to 2.7 million tons.

At the beginning of the 1973 navigation season, we anticipated a record-setting year exceeding 3 million tons. But prolonged flooding on the Mississippi River and on the lower Missouri River closed the river to navigation between April 1 and May 20. The 1973 tonnage was approximately 40 percent less than the 2.7 million tons transported in 1972.

A navigable waterway, such as is being provided by the 9-foot channel improvement on the Missouri River up to Sioux City, Iowa has a profound effect upon the general well-being of the areas served. Benefits from navigation on our inland waterways are many. A waterway helps materially in the development of industry such as has come about in the Ohio River Valley. Lower freight rates brought about by savings in transportation costs are generally attributed to the effects of waterways. Bulk commodities, such as grain, fertilizer, coal, petroleum, sand, and gravel, are moved economically by barges on our inland waterways. Coupled with the facilities of railroads and highways, a navigable waterway rounds out the picture to meet any transportation need.

The future of commercial navigation on the Missouri River below Sioux City looks bright. Additional terminals and river ports are being planned and two barge lines now operating on the Mississippi River are considering expanding their operations into the Missouri River.

It is estimated that Missouri River tonnage could reach 5 million tons per year within 20 years and ultimately may reach 8 to 12 million tons per year, depending upon the continued industrial growth in the Upper Great Plains.

Further navigation developments above Sioux City on the Missouri River or on tributaries such as the James River will be dependent on the overall continued development of the valley area. Irrigation, fertilizers, and improved farming technology are annually advancing the agricultural productivity of our region, and as population increases, will place large demands on our water and land resources. From an engineering standpoint, marine railroads could be constructed to portage the large main-stem dams to extend navigation into the Northern Region. Other rivers such as the James River could also be developed for multiple purpose use through construction of slack-water control systems.

A slackwater system is one which utilizes a series of locks and dams to form still-water pools above and below the structures, as contrasted to the free-flowing channel now used for navigation on the Missouri River. Such a system, similar to those on the Ohio and Mississippi Rivers, has been advocated by certain interests on the basis that it would require less water for navigation purposes and would thereby permit flexibility in power generation. The saving through additional power generation, or the lack of it, has always been a controversial item. Slackwater pools for navigation would eliminate much of the channel improvement required for open-river navigation; however, some channel work would be required at the head ends of the slackwater pools.

The first step in extending navigation above Sioux City would be the development of that reach of the Missouri River between Sioux City and Gavins Point Dam at Yankton, South Dakota. The recently passed Water Resource Development Act of 1974 authorized limited bank erosion control in this reach. Navigation was not included as a part of this project, because of the desires of local interests, including the states of Nebraska and South Dakota, and because of objections voiced by environmentalists. Also,

the feasibility of navigation is doubtful. Without development of navigation on the Missouri River in this reach, the reality of movement of grain by barge to the Upper Great Plains obviously becomes highly unlikely.

Development of navigation on the Missouri River to Fort Benton, Montana would require using a system of slackwater dams and locks. Very preliminary estimates indicate that this system would require as many as 17 dams and locks. Not too long ago the Omaha District made a very preliminary estimate of the cost of extending navigation up the Missouri River to Fort Benton, Montana, using slackwater dams and locks. The figure was two billion dollars.

Upstream navigation by either the Missouri River or the James River would meet the needs of the same service area of the Upper Great Plains.

The development of navigation on the James River would require more water than the James River basin is capable of producing. For open channel navigation, we would need a flow about ten times the present average flow for eight months of the year. Ice would probably stop navigation for the other four months. Since it is evident that the "Jim" River could not produce that much water, the answer would appear to be a diversion of water from another basin in combination with a system of dams and locks for slackwater navigation. It has not been determined how much water a lock and dam system would require, but it does appear feasible to utilize return flows from the Garrison Irrigation Diversion, plus water from dams on the tributaries of the James. If we confine our discussion to developing just the James River, we estimate, in a very tentative way, that nine or ten dams and locks would be needed.

As you know, annual benefits must exceed annual costs for any federal water resource project. Assigning a price tag at this time to the cost of developing navigation on the James and Missouri Rivers would only be misleading. The Arkansas River navigation project is roughly equivalent to the type of project we are discussing. It is about 400 miles long, and it cost \$1.2 billion.

For talking purposes, however, let's use the \$300 million figure that was quoted several years ago in an article in the Dakota Farmer concerning navigation on the James River. We feel that \$300 million is highly conservative; the cost of developing navigation on the James could, in our estimation, run a billion plus dollars at today's costs.

Using the \$300 million as a base, however, steadily rising costs have inflated that figure to at least \$600 million today; but even this is a guesstimate; sufficient studies to arrive at a valid cost estimate have never been made because preliminary studies have shown that such a project is not economically feasible.

We need to justify our projects using a 5 5/8 percent rate of interest, and this type of project would require an additional 1-2 percent amount for operating costs. So we would need somewhere around 7 percent of the project costs per year to justify it. This means that we need about \$21 million per year in benefits if we assume it is a \$300 million project; and, if we assume a \$600 million project, we need about \$42 million in benefits.

Benefits would have to be charged off primarily to savings in shipping costs, although with the Arkansas River project, only 54 percent of the benefits were attributed to navigation. Flood control accounted for 9 percent of the benefits, and bank stabilization accounted for 9 percent of the benefits. Recreation, fish and wildlife benefits, and municipal and industrial water supply accounted for the remainder. On the existing Missouri River navigation project from the mouth to Sioux City, benefits from erosion control accounted for 77.3 percent of the benefits. Navigation accounted for only 17.8 percent and recreation use for the remainder.

Let us examine the commodity markets and transportation savings. In 1963, and again in 1967, we evaluated alternative transportation modes for prospective waterway shipments. In these evaluations we also projected prospective traffic into the future to determine the viability of extending navigation to North Dakota-Montana area via the Missouri or James Rivers. Since grain comprises the greatest bulk of commodities moved via a waterway, our primary emphasis was on this commodity. In our earlier study we found that of about 2.4 million tons of prospective grain movement, about 1.3 million tons might be shipped via a waterway at a cost saving of about \$1 million, or 80 cents per ton. In 1967, the previous values were again confirmed. Therefore, even if we were to project into the long-range future, which by the way indicates production increases on the order of three times the current level, our cost savings would range between \$1-\$3 million. Such savings are far short of the \$20 to \$40 million in savings needed to justify one-half to one billion dollars in investments to create a waterway. Moreover, for large-scale navigation to be profitable, two-way movements of cargo would be required. Cost savings would evaporate if barges were to carry cargo on only the downstream run.

We recognize, of course, that the value of agricultural products and of other commodities also will continue to increase, but you ultimately reach a point at which costs far outweigh benefits.

In addition to the economic requirements needed for justifying the extension of navigation on the Missouri, a project would also meet serious environmental problems.

Considerable amounts of the river bottomlands would be required for the slackwater pools and control structures. Parts of the Sand Lake National Wildlife Refuge on the James would be flooded. The water table would be raised in some areas. The change in water table could affect city water supplies and water quality. A thorough study of the effects on the environment and fish and wildlife would have to be made. From this we would have to develop an acceptable plan to minimize the adverse effects and to build in some improvements. Also, virtually all bridge crossings over the James would have to be eliminated or completely rebuilt to accommodate barge traffic. These and other problems in addition to lack of feasibility are what would have to be overcome to bring navigation to the Upper Great Plains.

The James River has been investigated on an almost continuing basis by principal federal water resources agencies for over two decades. Recent studies by the Corps of Engineers have failed to demonstrate economic feasibility of flood control, navigation, and related water resources developments under current conditions within the basin.

Further action on our current James River basin study has been deferred pending the results of a Level B study of the entire basin. That study will be a cooperative state and federal interagency investigation of the basin's resources problems and needs. Level B studies are conducted by direction of the Water Resources Council under the supervision of the Missouri River Basin Commission.

In summary, we must be honest and forthright and say that the near-term needs and prospects for creating a waterway on the James or extending navigation on the Missouri River upstream from Sioux City are not bright. Extending navigation from Sioux City to Yankton would be a necessary first step, and it currently is not being considered. It is engineeringly feasible, but we have not been able to find sufficient economic benefits to justify the costs.

THE ROLE OF AN INLAND PORT IN MOVING GREAT PLAINS GRAIN

Robert W. Portiss¹

A tremendous new transportation link that literally serves as a bridge to a whole new era of commerce is now available to the Great Plains states. This link resulted from the completion of the McClellan-Kerr Arkansas River Navigation System, the most ambitious project ever undertaken by the Army Corps of Engineers, topping both the Panama Canal and the St. Lawrence Seaway programs in magnitude. Nearly 440 miles in length, and representing a total investment of \$1.2 billion, the Arkansas Valley project will generate industrial development similar to the Ohio and Tennessee Valleys. Ice-free the year round, the Arkansas Navigation System leaves the Mississippi and climbs a 420 foot high stairway of seventeen locks and dams. It crosses the state of Arkansas and Eastern Oklahoma to Tulsa, America's newest port city. There, at the head of navigation for America's newest waterway, is the Tulsa Port of Catoosa. Up and down this waterway flows the productive wealth of a previously landlocked multi-state area which never before had the advantage of plentiful, low cost water transportation.

Water navigation complements and mixes readily with rail, highways, pipelines and air services, providing an intermodal transportation center at the Tulsa Port of Catoosa. Seven major highways and two major railroads have direct access to the Port. Four other railroads serve the immediate area. Some thirty local and transcontinental motor carriers provide service to a large distribution area. The Tulsa International Airport with its 10,000 foot runways, is a short nine miles away, offering passenger and air cargo services from six major commercial airlines. To complete the transportation spectrum, long distance pipelines connect with northern and eastern terminals.

Due to the larger hinterland area to the north and west, the 2,000 acre complex that is the Tulsa Port of Catoosa is destined to become one of the nation's largest

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river ports. It offers three miles of water frontage along a 1 1/2 mile nine-foot minimum draft port channel, plus complete facilities for water terminal users. Facilities available include a 720-foot concrete wharf, loading and warehouse facilities, heavy duty concrete roads, eight miles of railroad trackage, liquid and dry bulk barge handling facilities, and a 310,000 bushel grain elevator. A giant overhead traveling crane is equipped with two 100-ton hooks and two 10-ton auxiliary hooks to efficiently load and unload containers and large general dry cargo items.

The story behind Tulsa's Port of Catoosa is fascinating and very dynamic. On a brisk January day three years ago, thousands of interested river and port boosters, some skeptics, some just curious, lined the wharf at the Tulsa Port to be a part of history. These people, who perhaps had envisioned a sprawling port complex and something resembling an ocean-going vessel, saw a lone barge with its cargo of 650 tons of newsprint arrive from Calhoun, Tennessee. Little did they know what impact this port would have on the economy of this previously landlocked multistate area. This first barge of newsprint was unloaded at the Port for \$6 a ton, an \$8 per ton savings over other modes of transportation. Today, three years later, the Port has seen the docking of nearly 850 more barges and has logged an additional 615,000 tons of cargo. While the increase in barge traffic at the Port has been phenomenal, the Arkansas Navigation System itself has experienced extraordinary growth also. In 1969, when navigation only extended to Fort Smith, Arkansas, the System carried 2.6 million net tons of cargo. In 1972 the waterway handled 5.6 million net tons of cargo. When the navigation project was authorized, it was estimated that the annual potential traffic would be approximately 13,000,000 tons. The Waterways Journal now estimates that by the year 2020 annual traffic will reach 19,000,000 tons.²

What caused this tremendous growth that proved all the port prognosticators such arch conservatives? Much of it can be attributed to the growing acceptance of low cost water transportation for bulk shipping. By "low cost," I mean that a dollar moves a ton of freight 15.4 miles by truck, 66.7 miles by rail, and a whopping 333 miles by barge! Or, as Mr. "Bud" Mechling, President of Union Mechling

²Editorial, "New Horizons in the Development of Water Resources," The Waterways Journal, December 15, 1973, page 52.

Corporation, stated, "On the average, it costs three-tenths of a cent per ton-mile for a river shipment. By comparison, it is 1.6 cents per ton-mile by rail, 8 cents by truck, and 22.5 cents by air."³

It is almost a truism to say that growth in volume and diversification of types of cargo that a port handles dictates expansion and new equipment. With expected increases in the quantity of specific cargos handled, expansion of facilities and sufficient new handling equipment is equally necessary. Not facing up to these necessities means the ultimate collapse of any port enterprise. Shippers are not going to use a port with inadequate machinery for handling their cargo. In the long run, it is more economical for them to use more expensive modes of transportation because the time factor compensates for the higher cost. No one is more aware of these facts than our Port officials. Therefore, expansion of facilities and added equipment are a vital part of our program.

Presently under construction and due to be in operation by July, 1974, is a 310,000 bushel grain handling facility. This facility includes nine storage bins, covered conveyor belt, truck scale and dumper, scale house, office, and a rail receiving facility. The conveyor length from facility to barge is 330 feet -- about 100 feet of it underground in a tunnel. Initially the conveyor belt has been constructed to handle outbound barge loading only; modification for barge unloading can be added at a later date. The outbound belt will have a 25,000 bushel per hour loading capability which enables loading a standard barge (195' x 35') with 40,000 bushels in 2 1/2 hours. Grain can be loaded directly from truck and rail car to barge or into storage. The handling capacity for moving grain from rail or truck into the elevator is 15,000 bushels per hour, with top rotary distribution to any bin. The bins are 95 feet above ground to the roof and are emptied by gravity flow. Total height of the facility is 172 feet. It is equipped with a bucket elevator leg having a capacity of 15,000 bushels per hour to distribute the grain through a rotary distribution system. Other features include a 15,000 bushel per hour high-speed automatic weighing system and a dust control system.

Now that I have given you an overview of the Arkansas Navigation System and its head of navigation terminus, the Tulsa Port of Catoosa, I will focus my remarks on the role the Port can play in moving Great Plains wheat.

³F. A. Mechling, "The Rivers: The Past, The Present, The Future," Presented at the Propeller Club of Tulsa, Tulsa, Oklahoma, January 29, 1974.

The Port of Catoosa has many geographic, and therefore economic, advantages over other ports in respect to the movement of grain. However, the most important are probably the following:

- (1) The Port is located virtually in the heart of the world's productive wheat growing belt.
- (2) Unlike Minneapolis-Duluth, Sioux City, Omaha and Kansas City, the Port is ice-free the year round.
- (3) It will be further developed for grain processing and handling.
- (4) Unlike certain other river systems, the Arkansas has a 9 foot minimum draft, allowing barges to be fully loaded.
- (5) Unlike the railroads and major highway systems of the Dakotas, the railroads and highways serving the Catoosa area run in a northerly to southerly direction.

The waterway has brought navigation to this previously landlocked area and thus added a fifth spoke, if you will, in the wheel of a regional transportation system. Already in the system were railroads, trucks, pipelines and airplanes -- all of which are needed for a balanced growth within the transportation industry. It is the interaction or competition of all the different modes that result in optimum transportation efficiency. As an example, grain in North Dakota may be worth \$3 or \$4 a bushel as it leaves the field and enters the elevator. When transported 900 miles to the Port where it can be processed into feed or flour and sold to consumers or producers, the ultimate value could be ten times greater than when it left the field. And, of course, the lower the transportation cost, the more efficient the means of transportation, the more competitive your products are at distant markets. Your concern therefore should be with the efficiency of all modes of transportation. The product which starts by barge or rail is manufactured and delivered by truck or air. All modes form an interrelated system. If you know how to make the system work for you, you can accelerate the growth of the region and at the same time keep more of the new wealth in your own pocket.

The efficient utilization of all modes of transportation has become increasingly important during this past year due to scarcity of equipment and escalating fuel costs. No one mode can move all of our commerce. Thus, it makes good sense to join the best efficiencies of barging and of

railroads. There is no problem in doing this between trucking, barging and pipelines -- in fact, the relationship is highly cooperative. However, there is a lack of cooperation between the water carriers and the railroads which has deprived shippers of significant savings in overall transportation cost. The Dakotas have experienced this cooperation in moving grain by rail to Duluth and Seattle. Hopefully this same cooperation will be extended into the Catoosa area.

Through cooperation, substantial savings can be achieved by joining the best efficiencies of rail and water. As an example, a run to the Tulsa Port of Catoosa can give a railroad a long haul and a very quick turnaround on its equipment. And, of course, increased turnaround time is the secret of improved railroad profitability. In this period of freight car shortages, railroads don't like to see their equipment go off mainline and often water connection can prevent this. There are other advantages too. For example, the cheaper overall haul extends the market of a railroad that uses a water connection. This means expanded traffic. Naturally, equipment used more extensively reduces the need for additional equipment. Furthermore, by using a water connection, less units of energy are consumed. According to Mr. Mechling, a towboat only uses 500 BTUs of energy per ton-mile as compared to 750 BTUs by rail, 1,850 by pipeline, 2,400 by truck, and 6,300 by air. And, as he stated, "We need to impress the nation of this advantage."⁴

Aside from the mechanics of transportation, the waterway has opened up new markets for Great Plains grains. Grain is currently being shipped out of the Tulsa Port to mills in the Chattanooga, Tennessee area, as well as to the terminal elevators at Pascagoula, Mississippi and New Orleans, Louisiana. Other points are currently being considered. Grain is shipped out. Fertilizer and various non-agricultural products are shipped in -- each load averaging 1200 tons. This two-way movement of such large volumes results in significant savings to shippers.

As you can readily see, the waterway adds a new distribution system to the Great Plains market. It not only serves as an escape valve when the pressure gets great, but is also a means to even out the peaks and valleys in the flow of agricultural and non-agricultural products.

I am not an expert in the grain marketing business. But, in my few months of experience with grain operators who have

⁴Ibid.

an interest in our Port elevator, I have been informed of a few interesting trends occurring in the grain marketing area. Due to increased rail costs (I believe there were six increases in 1973) the interior mills are reportedly in trouble and thus looking for locations closer to large population areas which are adjacent to waterways. Thus, mills will probably locate closer to navigation channels so that their distribution costs can be reduced. The Arkansas Navigation System will probably be one of these areas due to being able to ship raw materials and end-products year-round and thus reduce costly inventories.

Another trend, due to increased rail rates, is the reduction in East and West rail movements of grain and increased grain movements by water.

A final change that is occurring in the agribusiness sector of our economy is the reduction in grain feeding of cattle which will increase the supply of grain for the domestic or foreign markets.

In essence, the increased cost of doing business will demand more efficient utilization of our transportation system. Since water transportation consumes less energy and is relatively low in cost, it will be used more extensively in the future.

Now that a few thoughts have been offered on the transportation and marketing of Great Plains grain in relation to a navigable waterway, I will report on some recent occurrences at our Port and my perspective about the future role of the Port of Catoosa.

Many grain marketing people said that grain would not be shipped out of the Tulsa Port. However, during the past five months the Garvey Grain Company has shipped nearly one million bushels out of our Port. The barges used for these shipments have either brought in fertilizer or iron and steel articles and thus eliminated inefficient empty backhauls. Our new elevator, scheduled to be in operation by July, 1974, will handle between four and eight million bushels during fiscal year 1975.

In addition to future grain shipments, I believe you will see a new intermodal containerization service implemented before the end of 1974 at the Tulsa Port. A recently completed container barge study, to be published at the end of the month, will reveal that area shippers can realize a \$50 savings per container by utilizing water transportation. Furthermore, the Uniroyal Company has developed a

new collapsible rubberized container called a Seal tank that will convert any vehicle into an "instant tanker." Made of synthetic rubber, the tank, fully equipped with pipe fittings, gauges, etc., has a liquid capacity of 1,500 to 4,750 gallons. When collapsed, a vehicle can handle 85 percent of capacity load of dry bulk. This innovation should make a combination truck- or rail-to-barge rate very competitive. How about Great Plains grain down, bulk liquid up?

In essence, the Tulsa Port can and should play a role in moving Great Plains grain and especially during the winter months when the Great Lakes are closed. However, I feel that it's important that you be aware of some action that could severely disrupt this potential and in fact, severely hurt our national transportation system. The action I'm referring to is the National Water Commissioner's recommendation to impose marine fuel taxes and lockage fees on our inland waterway system. To discourage use of the most fuel-efficient transportation mode at a time when a premium should be placed on fuel consumption is absurd!

Now that you've heard my story, I hope you will capitalize on the advantages on inland water transportation in moving Great Plains grain through the Tulsa Port. It obviously isn't a "cure all" or "gold mine" for the transporting of goods, but it can, I believe, offer some great efficiencies that all of us need to realize in this era of escalating prices.

Question and Answer Session for Panel
"Visionaries in Grain Handling and Transportation"
(Part I)

Question to Mr. Tosterud:

Who finances the Transportation Institute and what is its budget?

Answer by Mr. Tosterud:

The Upper Great Plains Transportation Institute, as of this time, is totally financed and supported by the people of North Dakota through primarily two sources: first, the State Legislature through their general appropriations and secondly, through the North Dakota State Wheat Commission. The grain transportation research program of the Institute is financed and supported by the North Dakota State Wheat Commission. Other projects at the Institute that we have under way or have on the horizon will be financed through appropriations from the North Dakota State Legislature.

The State Legislature approved a budget for the Institute in the area of \$225,000 for this last biennium. The North Dakota State Wheat Commission provides a substantial part of that budget. In addition, there are other sources of funds as well, through contract services and things of that nature.

Question to Mr. Tosterud:

What do you feel about railroad grain hold yards?

Answer by Mr. Tosterud:

I'm sorry but I don't know what is meant by railroad grain hold yards.

Question to Mr. Tosterud:

Isn't one of North Dakota's problems letting others determine what will be done? Should more emphasis be placed on who will do what? For example, should not commodity producers be the key to transportation marketing development?

Answer by Mr. Tosterud:

In my opinion, there is no doubt about it. I think North Dakota is in a position -- a very enviable position at this point in time -- to take an active stand and provide some real input and some real direction to the future of grain handling and transportation in North Dakota.

This opportunity is not available to other producers in this country: witness the massive abandonment of branch lines going on in such states as Iowa, Minnesota and South Dakota, where the future of their grain handling and transportation system is totally at the direction of the railroad. It is predominantly the railroad which will determine what kind of a system those states are going to have. While, on the other hand, in North Dakota I think we are at the point where we can provide some real alternatives. We can develop a system that is made by and for the people of North Dakota, and that is one of our primary objectives at the Transportation Institute. We want to take your ideas and your information as to what you would like to see in your grain transportation system and to use that information and present alternatives. Reemphasizing, I think we do find ourselves in a very enviable position. That is, we are not at the stage right now where things are going to be upheaved and turned inside out, rather, we can effectively provide directions and I think producer interests and producer input is especially critical at this stage.

Question to Mr. Tosterud:

Research has told us that grain marketing and transportation could be achieved at a lower cost with fewer, but larger elevators and fewer rail lines. Has research at the Upper Great Plains Transportation Institute told us how to reorganize to achieve the above mentioned economies?

Answer by Mr. Tosterud:

First of all, we are not going to tell you how to reorganize. The purpose of research is to provide information to people who will do the reorganizing. Along this line, the Transportation Institute has a publication out evaluating the subterminal type concept in the state of North Dakota. There are economies if the primary objective is to develop a low-cost and efficient grain handling and transportation system. Secondly, we have just completed an evaluation of the Burlington Northern's grain train movement out of the state of North Dakota. Those findings show that there are economies in this type of technology also. For those of you who are unfamiliar with the BN grain train operation, it is basically a multiple origin operation where a train goes up existing branch lines and collects grain from existing elevators, puts the rail cars together and sends them off to one particular market. Another research result of the Institute, which I alluded to in my talk, involves the complete description and costing-out of the existing system. The full cost of that system, which extends from farm storage

directly through to the point where the grain is either put in the hands of a domestic miller or put in the hold of an export salty, was estimated to be approximately \$300 million.

Question to Mr. Tosterud:

What proportion of the market value of agricultural products produced in North Dakota is spent on transportation? Is this a major production cost factor influencing production decisions?

Answer by Mr. Tosterud:

Right now, the proportion is likely in the neighborhood of 10 to 15 percent of the on-farm value for our products. I think that's a very significant part. That percentage does not include costs associated with the handling of grain in country elevators, or at inland terminals or at Duluth-Superior, Minneapolis-St. Paul, or barging down the Mississippi -- whatever the case might be. In addition, that's assuming \$5.50 or \$6 wheat. Should the price of a bushel of wheat drop to \$3, then we are talking more in the neighborhood of 25 to 30 percent. I think that this would be extremely significant in making production decisions.

Question to Mr. Tosterud:

The \$865 million figure for transportation research seems high; similarly, for the \$10 million figure for the United States Department of Agriculture. What was your source?

Answer by Mr. Tosterud:

My source was the Transportation Association of America and their publication, "Transport Facts and Trends."

Question to Mr. Tosterud:

Your comments about the extent of agricultural transportation research in federal government are not necessarily accurate or fair. Money is not the only measuring stick for research.

Answer by Mr. Tosterud:

That's very true, but you have to have money to get research. If you want research -- public research -- I think some commitment on the part of the public is necessary, particularly if you want a near-term solution to the agricultural transportation problem.

Question to Mr. Tosterud:

Air traffic control system development costs many millions. Research in freight car shortages, grain transportation simulation, etc., costs much less, even though they are as important as air traffic, and even though a significant

solution may be found.

Answer by Mr. Tosterud:

All right, it does cost a whole lot of money to make advances in terms of air transportation -- no doubt about it. But, certainly of equal priority is the maintaining of our food delivery system. The problems are not just freight car shortages and embargoed ports and things of that nature, but involves the entire transportation system. You can't deal with the entire transportation system in terms of 59 cents per \$1,000.

Question to Mr. Tosterud:

You overlooked general freight transportation research which will have important impacts on agriculture even though the projects and money are not specifically earmarked for agriculture.

Answer by Mr. Tosterud:

I guess all research has spin-off benefits to other areas. However, I think it is high time and necessary that we make a concerted effort in this particular direction in our research efforts to get the biggest possible payoff.

Question to Mr. Tosterud:

The Northeast rail crisis research you sighted will help agriculture. In fact, all of the money spent for railroad research, \$10 to \$30 million, should be considered important to agriculture, since agriculture is the key railroad user. Examples are freight car management, freight service reliability, improved terminal operations, and even railroad safety research programs.

Answer by Mr. Tosterud:

I would ask country elevator operators, producers, and other people out here in this state how much benefit they have gotten from freight car management, freight service reliability, improved terminal operations and things of that nature. The point is that the users of agricultural transportation haven't seen the real benefits and because I'm sure there are some, it's time that railroad people do a good PR job and tell us what they are doing for us.

Question to Mr. Tosterud:

Secretary Brinegar has on numerous occasions noted the importance of research in freight transportation, particularly railroads. This research will continue to grow in DOT. Money for this research can only do so much, however. Many of the problems with the shortages are institutional

in nature. Loan money and subsidiary funding might help these, but the potential for funding research is limited at least as a percent of the entire budget.

Answer by Mr. Tosterud:

And that gets down to the main purpose of my paper, which was to draw a comparison between the importance of agricultural transportation to the American economy and the effort that has been devoted thus far towards solving those problems.

Question to Mr. Thelen:

How much would barge tariffs need to be increased if barges were required to pay the cost of the right-of-way?

Answer by Mr. Thelen:

As I pointed out previously, in order for the Corps of Engineers to build any project, it has to be economically justified. That is, the benefits would have to exceed the costs of the project.

Question to Mr. Thelen:

What about barging on the river here in Bismarck? Can it work?

Answer by Mr. Thelen:

Engineering wise, yes. But again, to build it, it would have to be economically feasible.

Question to Mr. Thelen:

Can you take water from the Mouse River and put it in the James River?

Answer by Mr. Thelen:

Again, I don't know but I would imagine that it's feasible engineering wise. However, the cost is another question. I don't think our problem right now is really water. It could be in the future. Our problem right now is economic justification.

Question to Mr. Thelen:

What is the length of the waterway and does the cost coincide with the projected Corps of Engineer's figure of \$2 billion, which provided for 17 locks and dams on the Missouri for barge traffic development?

Answer by Mr. Thelen:

The length of the waterway is 440 river miles long. It was constructed at a cost of \$1.2 billion. The \$2 billion figure was only a preliminary estimate and it consisted of 17 locks and dams which would traverse the main

stream systems which would be a little more intricate than the Arkansas River System. It is only a preliminary estimate.

Question to Mr. Portiss:

Who is to operate the Catoosa grain elevator?

Answer by Mr. Portiss:

I don't know because a contract has not been signed as of this date.

Question to Mr. Portiss:

Will it be operated as a public elevator?

Answer by Mr. Portiss:

Yes.

Question to Mr. Portiss:

Has maintaining water depth in the channel had an adverse effect on water reservoirs above Catoosa?

Answer by Mr. Portiss:

To my knowledge, no.

Question to Mr. Portiss:

What happens in dry years?

Answer by Mr. Portiss:

Haven't had one yet, so don't know.

Question to Mr. Portiss:

Will more reservoirs have to be built?

Answer by Mr. Portiss:

Yes, because we still don't have adequate flood control.

Question to Mr. Portiss:

Would you advocate taking tax off trucks and railroads?

Answer by Mr. Portiss:

No, all forms of transportation should pay their own way as far as taxes are concerned. I am referring to business taxes and not tax in the form of user's fees.

Question to Mr. Portiss:

Is there a good rail route from the Dakotas to Tulsa?

Answer by Mr. Portiss:

No, but there are indirect routes which I believe are worth reviewing.

Question to Mr. Portiss:

In what way are the railroads uncooperative with the Port of Catoosa?

Answer by Mr. Portiss:

Refusal to provide river crossing rates. At present, domestic rates are much higher than the export rail rates.

Question to Mr. Portiss:

If the railroads lowered their rates to be competitive with barge costs, isn't the shipper being helped even if water transportation is not used?

Answer by Mr. Portiss:

Most assuredly.

Question to Mr. Portiss:

Do barges pay for the capital and maintenance cost of the waterways they use? Or is this a subsidized form of transportation?

Answer by Mr. Portiss:

They pay indirectly through taxation and yes, they are subsidized, just like the railroads.

Question to Mr. Portiss:

Who is going to pay the \$1.2 billion investment for the Arkansas River development?

Answer by Mr. Portiss:

It is already paid for. However, the return on investment has already greatly exceeded the money spent for the System.

Question to Mr. Portiss:

What transportation taxation do the barges pay?

Answer by Mr. Portiss:

I am not aware of direct transportation taxation but, as I understand, they do pay personal property tax on equipment.

Question to Mr. Portiss:

Water transportation may consume less energy per ton mile but isn't mileage between points generally longer by barge than by rail?

Answer by Mr. Portiss:

I don't know. However, I do know of some specific origins and destinations where river mileage is less than by rail.

Question to Mr. Portiss:

How does "point-to-point" energy consumption of barge and rail compare?

Answer by Mr. Portiss:

I don't know.

Question to Mr. Portiss:

How many rate increases have the water carriers had in the last year or two and how much?

Answer by Mr. Portiss:

Approximately three, two specific increases in the not too recent past, including a 6 percent overall rate increase and a 1.48 percent fuel tax surcharge.

THE GRAIN TUBE:
PIPELINING YOUR GRAIN TO MARKET

Gordon O. Davis¹

Pipeline history goes back about 7,000 years -- even predating the invention of the wheel. Throughout the thousands of years between then and now man has not only improved pipeline technology, but has consistently expanded the uses to which this silent and often unseen mode of transportation has been placed.

Capsule pipeline is a generic term applied to the transportation of large foreign bodies in a fluid flowing in a uniform conduit. There are two distinct divisions that fall under this term, and they can be quickly defined as liquid-solid transportation and gas-solid transportation systems. It is the gas-solid capsule pipeline classification that holds the greatest promise today for the economical transportation of grain.

The gas-solid capsule pipeline has nearly a century of commercial usage in the form of pneumatic tubes through which document-containing capsules are sent.² The 250-mile-long Pneumatique system is threaded through the sewer of Paris to provide rapid transportation of special delivery letters throughout the city. The pneumatic capsule-transport systems which have been developed commercially are low-speed, lightly loaded systems in which energy conversion efficiency was a secondary consideration. More recent developments have been directed toward achieving (a) higher speeds and (b) heavily loaded efficient capsule pipelines.

The impetus to develop high-speed capsule pipelines is to transport people, which at this stage of our technology is a vision that will remain in the realm of science fiction for some time to come.

The impetus to develop low-speed, efficient, heavily loaded capsule pipelines is to offer an ecologically more attractive alternative to rail and highway transportation of goods. Because pipelines are buried with stationary power plants, pipeline-transportation systems are unseen, unheard and unsmelled.

¹Gordon O. Davis is Manager of Marketing, TUBEXPRESS SYSTEMS, INC., Houston, Texas.

²Vivian, C. H. "Early Pneumatic Tubes," Compressed Air, Vol. 77 No. 1, January 1972, p. 8.

Improved knowledge -- through the scientific research labs of Georgia Institute of Technology and the engineering technology of a long time (over 20 years) gas-pipeline transportation system -- has produced TUBEXPRESS, a tested and proven solid-carrier pipeline.

TUBEXPRESS SYSTEMS, INC., formerly Trans-Southern Pipeline Corporation, one of the subsidiaries of multifaceted Transco Companies, Inc., has developed a transportation system of today and the future, using time-tested engineering technology. TUBEXPRESS has put it all together. Large operating prototypes are installed near Atlanta, Georgia and Houston, Texas, and an even larger one is in operation in Japan, belonging to Daifuku Machinery Works, Ltd.

NOTE: Film covers:

What is TUBEXPRESS and how does it operate? The essential elements of the system are the conduit, the vehicles, and the pumps. The conduit -- or the pipeline -- acts as a guideway for the cargo vehicles and the column of air that moves them at essentially atmospheric pressure (it is not a vacuum system and no airtight seals are required).

The vehicles -- usually gondolas -- are equipped with flat endplates at the rear and front, permitting the vehicles to circulate with the air column at nearly the velocity of the air. The vehicles roll on loadbearing wheels with guide wheels stabilizing them in the conduit.

The pumps are of a flow-through type that eliminates the need for valving or traps. Since they are in-line pumps, they can be placed as boosters along the line as required to permit the construction of a line of any desired length.

A closed-loop system gives TUBEXPRESS two-way traffic. At each end of the loop, the air column escapes through the top of the pipe into a by-pass system, which takes it into the return loop.

The simple, yet highly sophisticated, system is backed by more than 20 years of corporate pipeline design experience by Transco. The company was the first to use the big 36-inch gas pipe in the mid-fifties. A decade later, Transco pioneered the use of the biggest-inch line: 42 inches in diameter. Now, the modern TUBEXPRESS. But in spite of the advanced

technology, TUBEXPRESS components are off-the-shelf items, a fact which makes the system a very practical answer to many transportation problems.

Since the conduit -- or pipeline -- can be any size, shape, or length, and either suspended, laid on top of the ground, or buried underneath it, TUBEXPRESS can be as simple or complex as the job requires. The system provides an exceptional degree of flexibility for the solution of transportation needs with these wide variations in size, speed, and capacity.

Adaptable simplicity is, indeed, one of the prime advantages of TUBEXPRESS. Other advantages include low operating and maintenance costs, minimum labor through automation, few moving parts, long service life, non-polluting electric power plants, exceptional cargo security, and a system where operation is unaffected by weather.

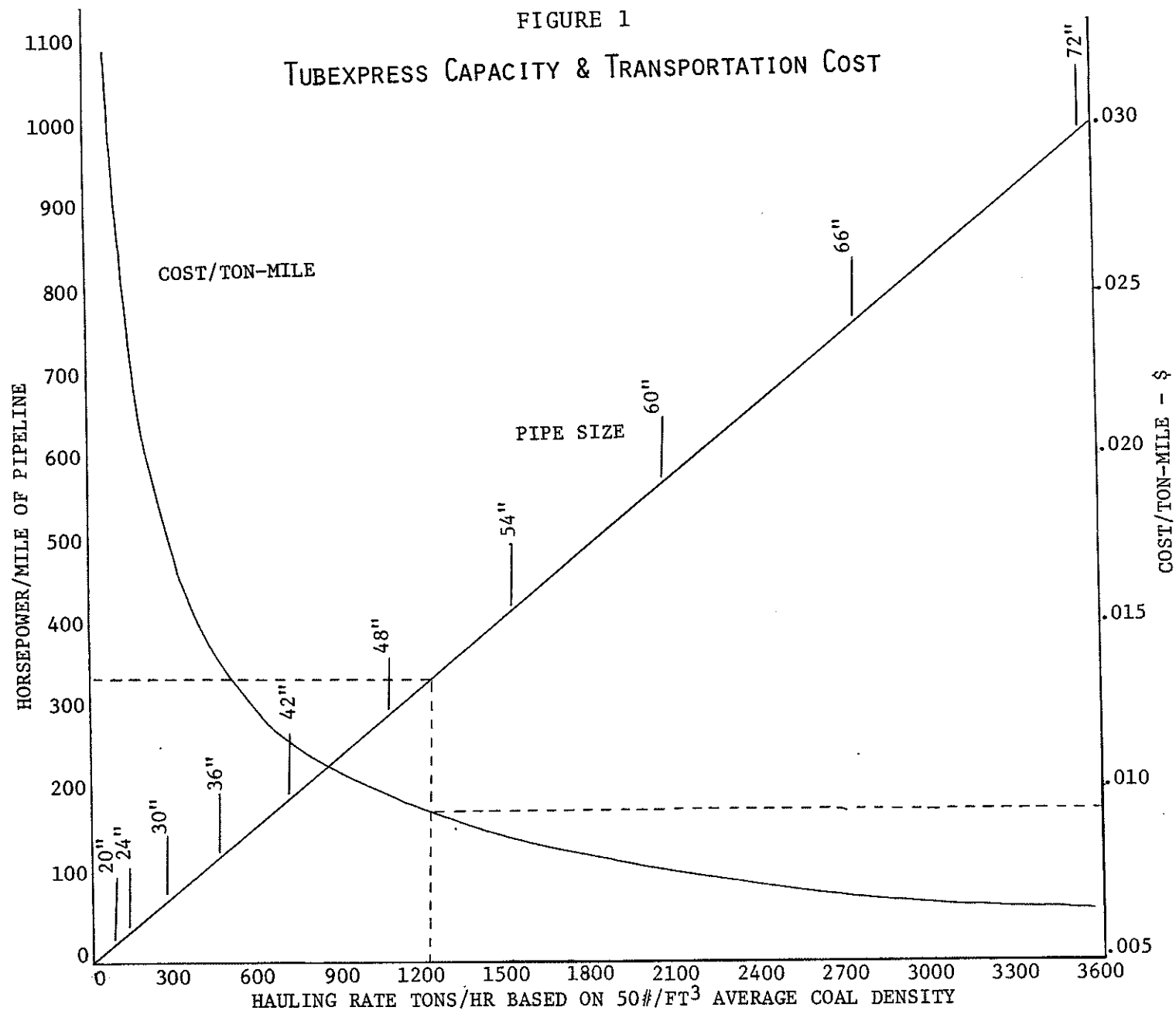
A TUBEXPRESS system applied to the transportation of grain offers economic as well as the many other advantages described above.

Our studies indicate that grains can be transported for a high of 2.5 cents per ton mile to a low of 5.2 mills per ton mile depending on system size and capacity. The 2.5 cents would apply to a shipment of 70 tons per hour while a shipping rate of 3500 tons per hour would reduce transportation cost to 5.2 mills per ton mile. (See Figure 1 attached.) These costs are based on average pipeline construction cost depreciated over a 33-year life, which is common to pipelines.

With the low maintenance and operating cost of TUBEXPRESS as only a small fraction of a system-calculated transportation cost per ton, these shipping costs are virtually unaffected by inflation.

Pipelines historically require little maintenance and have low labor requirements related either to investment or quantity of material transported. I therefore believe, as many of you will, that solid cargo pipelines will provide more and more of the transportation requirements of the present and future.

FIGURE 1
TUBEXPRESS CAPACITY & TRANSPORTATION COST



CANADIAN GRAIN TRANSPORTATION MODERNIZATION

Donald A. Dever and Jim M. McDonough¹

We appreciate very much being invited to take part in your Grain Transportation Forum. However, the responsibility is a grave one.

When your Director, Dale Anderson, wrote to us, he mentioned that our participation would provide an international flavor to your program. Since Winnipeg is only a few hundred miles away, and our life and attitude -- and indeed problems -- are not very different from your own -- we feel very much as we would be addressing a Canadian audience -- and certainly not jet-setting internationalists.

Even more unnerving is to appear on that section of your program for "visionaries." Now they say a prophet is never believed in his own land -- and I assure you nobody in Canada would accept us as visionaries!

Perhaps coming to the United States is our big chance to expound on way-out dreams one might have for a modernized grain transportation system. However, we will refrain from this, because our problems in Canada, like yours here, really boil down to some pretty practical and humdrum changes to be made. And we think basically that is what you want to hear about, as my invitation also suggested we discuss the "Hows" and "Whys" of Canadian grain transportation modernization.

By way of preamble, we would like to fill you in a little on what the Canadian Grains Council is, as despite your many successful commodity groups in this country, we do not believe you have a similar association in the U.S.

The Council was formed a little over five years ago. This was a time when Canada had just elected a new Prime Minister, Pierre Elliot Trudeau. As an eastern Canadian, with no background on the problems of our major grain growing area -- western Canada, he found the conflicting requests of the various interest groups connected with the grains industry, confusing.

¹Donald A. Dever is Secretary General and Jim M. McDonough is Liaison Director, Grain Handling and Transportation, Canada Grains Council, Winnipeg, Manitoba, Canada.

He, therefore, suggested that a Grains Council be formed. This organization took shape in late '68 and early '69. It is composed of 27 member groups, which represent many thousands in the industry across Canada. Within this membership, virtually every facet of the complex grains industry is represented -- not only grain producers, though these constitute a large percentage, but also the supporting industries, the elevator companies that store our grain, the railways that transport it, the millers and brewers that process it. There are feed manufacturers, shippers, traders, exporters and members of various agricultural organizations. The organization is funded jointly by our federal government and by the private membership, giving it a free voice to present a consensus to government on the needs and views of the grains industry as a whole. The principal aim of the Council is to increase Canada's share of world market for grains and grain products and to effect their efficient use domestically.

The Council meets as a body at least twice annually thus providing a forum for discussion for its members. Much of what the Council accomplishes is through committee work, where it deals with such matters as grain grading and specifications, conversion to metric units (which the Canadian grains industry plans to institute by August 1, 1976) and, of course, the major task of proposing, though not imposing, needed changes to Canada's grain handling and transportation system -- my topic today.

The Canada Grains Council became involved in the assessment of our grain transportation and handling system under two years ago. The Government of Canada had already prepared 13 studies on many different problem areas in the system -- had even looked at a number of alternatives to our present system -- such as reducing the present large numbers of country elevators to a smaller number of high through-put elevators -- and costed out these various alternatives. But the decision for change had not been made, and the implications of such changes not thoroughly studied. Indeed, this could not be done without the cooperation and willingness of the entire grains community.

The Council was, therefore, something of a 'natural' to be asked to undertake this task, as it is so widely representative of all sectors of the grains industry, right across Canada.

The Council undertook this monumental task, which it anticipates will take several years to complete, first by forming a special Grain Handling and Transportation Committee.

This Committee is composed of the heads of the railways, major elevator companies, including the co-operatives, the marine association, heads of the Canadian Wheat Board and Grain Commission and grain producers.

At its direction, the actual assignments are detailed out to a number of sub-committees, assisted by Council staff members.

In general, the work so far has progressed in three major fronts. First, there is a Technical Study Group which assessed and updated the earlier Grains Group reports, and are working on other research that must be done before decisions are finalized. Along with this, four practical men in the grains industry, from rail and elevator companies and government, prepared a "State of Industry" report as a starting-off point, detailing some of the history of how the system evolved and where it is at the moment.

Throughout all this, the Council has carried out an active communications program. Meetings have been held throughout western Canada -- in small communities and large -- informing producers of the costs and capabilities of their present system -- and getting feedback from them on what their suggestions are for an improved system.

Despite the work that the Council has done, to date, much of it has had to be theoretical. We began to 'champ at the bit' however, for something concrete -- in short, for some action.

It was decided that what was needed was an on-the-spot study, for a location look at the problems of one area, and practical ways to improve it. The Brandon area of Manitoba was chosen. Within its boundaries are nearly all the components common to other prairie locations. It is a large grain growing area and includes a number of different elevator companies, large and small communities, and both our major rail lines. Getting away from the paper work, and out to the rural area -- gave us a fresh slant on solutions. I would like to deal with this more specifically in a moment, but first, I think I should give you a general run-down of the Canadian grain handling and transportation system -- which has aspects that are different from the U.S. Here are some of the specifics of Canada's grain handling and transportation system. We are a country of some 20 million people. We plant somewhere between 40 and 50 million acres annually to grain, mostly in our prairie provinces, and reap a harvest approaching a billion and a half bushels. But Canada's rich grain growing prairies are landlocked in the center of a continent, with rugged mountains to the west, arctic ice fields to the north and a seaway, icebound

for one-third of each year to the east. Our present country elevator system was built along with the opening up of the Canadian West, from the early years of this century. The major building boom for elevators ended somewhere in the mid-thirties. Naturally, over the ensuing years, a number of new large capacity elevators have been built, and some consolidation and improvements have taken place, but basically our elevator system is old, and the time is fast approaching when large capital expenditures will have to be made. The trade is naturally anxious to know what the trend is going to be -- and to a large extent this depends on the future plans for our rail system.

There are nearly 20,000 miles of rail lines in western Canada, mostly owned by our two major lines, the Canadian National Railway and the privately owned Canadian Pacific. Over 8,000 miles are light density rail lines that carry mostly grain. These are the lines that could be considered for abandonment when the government freeze on them comes off in 1975. Meanwhile the government pays a subsidy on them. The costs of operating these branch lines falls into two categories. First, there is the cost of maintaining the line, including roadbed repairs, taxes, weed control, snow removal, etc. Then there is the cost of running trains on the branch line, plus the costs of moving the traffic off the branch line to its destination. When the cost of moving a car of grain off the branch line to its destination is greater than the revenue received by the railways, the subsidy can increase as traffic increases.

Another problem for western grain handling and transportation is the fact that the freight rates for the railways carrying grain are fixed by an agreement, the Crows Nest rates -- dating back to an 1896 agreement with the Canadian Pacific Railway when it was given a number of land concessions to encourage its being built, in exchange for established freight rates. The terms have remained virtually unchanged since 1925. The controversy arises because the western grain farmer views them as a benefit, but the railways claim the revenue is insufficient to permit upgrading of the system.

While our system has its problems, as does yours, our system, like your U.S. one, has outdone itself in these recent years of high grain export. Despite the age, and other shortcomings of the system, we can move better than a billion bushels of grain a year, with a handling, storing and transportation cost of around \$300 million -- or at about 35-40 cents a bushel to our grain producers.

The trick is going to be to contain costs in these days of ever-escalating price rises, so that inflation does not erode the income of our grain producers. This we can only do by maximizing the efficiency of our system.

In Canada, we have over 165,000 grain producers who haul by truck an average of 7 miles to 1,612 elevator points. The grain is stored in 4,384 country elevators, with a total capacity of around 368 million bushels. Canada has 84 terminal, process or transfer elevators, and the total capacity of our elevator system is around 660 million bushels. Most of our grain moves east through Thunder Bay at the head of the Great Lakes. Here nearly 600 million bushels are handled. At the Pacific seaboard, we handle nearly 311 million bushels, and our northern port at Churchill on Hudson's Bay handles around 25 million bushels during its short summer shipping season.

Two very important factors have improved our grain handling system in recent years. One is an improved quota system, to bring grain in a fair and orderly manner to our elevators as the domestic and export market demand dictates. The other is a block shipping system, which results in the most efficient use of our boxcars. Canada has about 20-25,000 boxcars used for hauling grain, and our federal government has purchased a further 2,000 new grain hopper cars in 1972.

As you probably know, our export grain marketing of our wheat, oats and barley, (and we sell grain to around 68 overseas customers) is done through our centralized marketing agency, the Canadian Wheat Board, a federal government agency. The Canadian Wheat Board, in addition to handling all export sales, handles most of the domestic sales as well. While there are those in Canada who would prefer to see a freer marketing system such as the U.S. has -- the Canadian Wheat Board generally has hearty producer support. Certainly having a centralized agency, such as this, permits Canada to have precise knowledge and control of its supply, so that there is no danger of not being able to meet domestic demand. Our Canadian Grain Commission is another government agency which, in addition to other duties, regulates grades and quality to ensure our domestic and export specifications are maintained at a high standard.

I mentioned to you earlier that I would describe in more detail the on-the-spot study we have been conducting in a section of western Manitoba near the city of Brandon. We have found the results interesting, and they should have some application to other areas of our prairies.

Previous studies carried out by the Council, and other groups have identified various deficiencies in the system.

These studies have indicated that the operating costs of the country and terminal elevator systems are escalating and would impose a greater burden on the producer unless costs can be effectively reduced to a greater extent than the industry has been able to attain in recent years.

The area selected for study lies in the western part of Manitoba, and contains about 2.4 million acres of crop and summerfallow land (Figure 1). This region represents about 25 percent of the farm land in the province of Manitoba. The area lies north of Brandon and stretches from Portage la Prairie to the Saskatchewan border (Figure 2). The eastern tip of the study area is the city of Portage la Prairie, it is bounded on the south by the C.P. rail line through Brandon and on the north by the C.P. line through Minnedosa. It includes main lines on both railways and light density branch lines on which the total freight movement consists mostly of grain.

The rail network consists of 878 miles of rail line of which 270 miles or 31 percent are light traffic density lines.

The year used as a base was the 1971-72 crop year. The grain collection system at this time consisted of 120 elevators at 70 delivery points. Grain receipts and shipments for the year amounted to 28.3 million bushels. Actual operating costs for that year were established for farm trucking, elevator costs and rail costs. The Committee, recognizing the age and condition of the system in that area quickly realized that the system costs experienced in 1971-72 could never be repeated. Money must be spent to improve the system to provide that level of service. Because of the age of the system many of the facilities had been written off and their useful life is near an end without large inflows of capital. For comparison purposes with other alternative systems the Committee costed the system on a "rehabilitated" base which reflected adequate depreciation and return on investment costs needed to perpetuate the system.

Three alternative systems were then examined:

1. The present system rehabilitated with rail lines upgraded to a 263,000 lbs. gross carrying capacity capable of carrying 100 ton hopper cars.
2. The present system rehabilitated with all light density lines removed. Commercial trucks are employed to transport grain from off-line elevators to elevators on the basic rail network.

Figure 1

The Southern Portion of the Province of Manitoba and
the Brandon Study Area

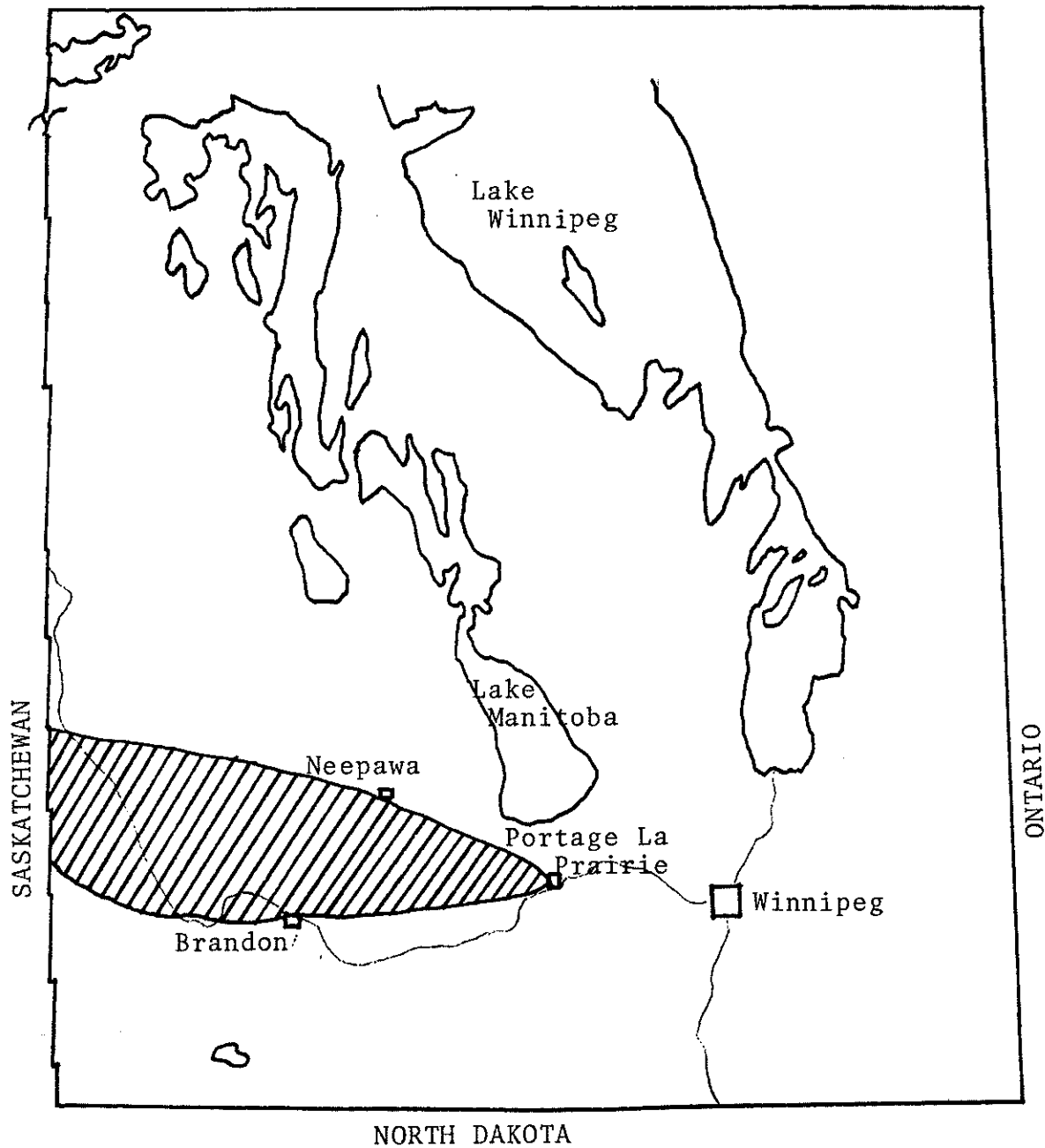
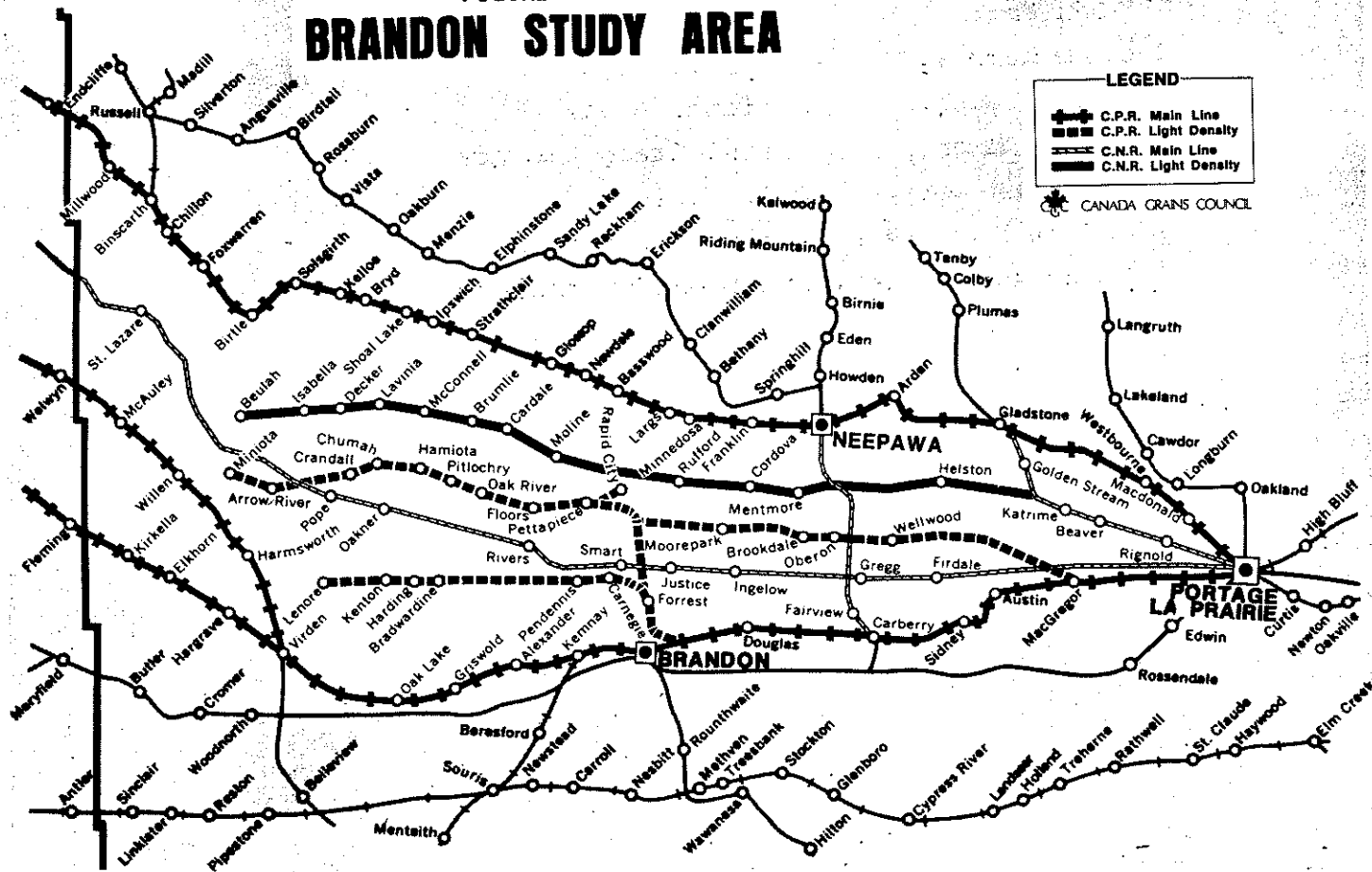


FIGURE 2
BRANDON STUDY AREA



3. The present system rehabilitated with all light density rail lines and the elevators thereon removed.

Well, money talks, and not least of all to the grain producers. Long held views against any form of rail line and/or elevator closure in the rural communities took on a new light when the costs of maintaining a way of life that was perhaps more relevant in the horse and buggy days than today, became known. Presently we have been conducting a series of meetings, extremely well attended, in the communities affected, and giving them the facts of the matter.

The facts are summarized in Table 1 with specific cost category breakdowns in Table 2.

TABLE 1. SUMMARY OF ALTERNATIVE SYSTEMS COSTS

	Rehabilitated System	<u>A L T E R N A T I V E S</u>		
		No. 1 (Hopper Cars)	No. 2 (Commercial Trucking)	No. 3 (Basic Network)
Light Density Lines	70.20	82.60	44.12	36.03
Basic Network	34.81	34.81	35.61	34.13
Total System	45.47	49.17	37.93	34.65

TABLE 2. SUMMARY OF SYSTEMS AVERAGE COSTS PER BUSHEL BY COST CATEGORY

Grains Originating in the Area now Served by	Costs as Experienced in 1971-72*	Average Cost Per Bushel ¢ Per Bushel			
		Present System Rehabilitated	Alternative System No. 1 (Hopper Cars)	Alternative System No. 2 (Commercial Trucking)	Alternative System No. 3 (Basic Rail Network Only)
<u>Light Density Lines</u>					
Producer Trucking	2.85	7.40	7.40	7.40	8.52
Elevator Costs	7.58	11.10	11.10	13.72	10.31
Railway Costs	32.80	51.70	64.10	16.20	16.20
Commercial Trucking	-	-	-	3.71	-
Roads & Highways	-	-	-	3.09	1.00
TOTAL COSTS:	<u>43.23</u>	<u>70.20</u>	<u>82.60</u>	<u>44.12</u>	<u>36.03</u>
<u>Basic Rail Network</u>					
Producer Trucking	3.10	7.62	7.62	7.62	7.62
Elevator Costs	9.37	11.79	11.79	11.79	10.31
Railway Costs	15.60	15.40	15.40	16.20	16.20
Commercial Trucking	-	-	-	-	-
Roads & Highways	-	-	-	-	-
TOTAL COSTS:	<u>28.07</u>	<u>34.81</u>	<u>34.81</u>	<u>35.61</u>	<u>34.13</u>
<u>Total System Brandon Area</u>					
Producer Trucking	3.03	7.57	7.57	7.57	7.87
Elevator Costs	8.95	11.60	11.60	12.31	10.31
Railway Costs	20.70	26.30	30.00	16.20	16.20
Commercial Trucking	-	-	-	1.01	-
Roads & Highways	-	-	-	.84	.27
TOTAL COSTS:	<u>32.68</u>	<u>45.47</u>	<u>49.17</u>	<u>37.93</u>	<u>34.65</u>

*The 1971-72 costs reflected the situation that existed in that year. If the system so costed were to be perpetuated, then its costs would be as shown in the Present System Rehabilitated column.

The total cost as experienced in 1971-72 was 32.68 cents per bushel. Rehabilitating the present system would cost 45.47 cents per bushel. The first alternative, the present system rehabilitated, but upgraded to accommodate hopper cars, would cost 49.17 cents per bushel. Next we costed removal of all light density lines and use of commercial trucks. This would cost only 37.93 cents per bushel. Cheapest of all, was the final alternative looked at -- the removal of both elevators and light density rail lines. This would result in a cost of 34.65 cents per bushel.

Looking at the figures in a larger framework, the total cost of using the present system rehabilitated amounts to \$12.9 million. Using the final alternative just mentioned, the present system rehabilitated but with the removal of all light density lines and elevators thereon, the amount would be \$9.8 million. Therefore the potential cost savings through adoption of that system would amount to a saving of \$3.1 million annually. Around 70 percent of the rail lines presently serving the area would still be retained, and yet a 24 percent saving in cost would be effected.

The study is not yet completed, other factors to consider before final recommendations are made include the impact of change on the 58 odd communities affected. These communities range in size from a population of four to five people up to 800. The Committee will also examine the feasibility of retaining some of the lines, and the further consolidation of elevators on the main lines through the construction of high through-put elevators. The economics of the larger elevator must be weighed against the additional trucking distances for producers.

So, this is the sort of thing we have been looking at in seeking ways to improve our grain handling and transportation system, to enable us to remain competitive in the grain markets of the world. As mentioned, we have very major problems of geography and weather to cope with in Canada. It is essential for us to have an efficient system at the most economical cost possible, to remain competitive.

Well -- to round off my talk to you today -- I better get right back on topic -- the modernization of the Canadian grain transportation system, and what we propose to do.

I would like to be able to make some dramatic announcements to you. Conveyor belts and pipelines -- or other technological innovations sound exciting. But we think perhaps

they would not be entirely practical for us in Canada.

More and more we are coming to the conclusion that, maintaining what is best in our present system, subtracting what has become redundant, adding where necessary, without too much upheaval, we can come up with a pretty efficient system. This may involve the abandonment of our uneconomic branch rail lines, and some of our smaller country elevators. There will probably also be the building of some larger elevator units at our major prairie centers. We may use 'unit' or solid trains more frequently which will travel non-stop from country elevators to our overseas shipment terminals, or perhaps directly to vessel-loading docks. We could see more cleaning of our export grain (and we take pride in its high standard) done on the prairies, so there is no delay when it reaches the seaboard. The Canadian Wheat Board in 1974 has embarked on their largest trucking program ever -- where grain is being trucked from country elevators to large interior terminals for drying and cleaning prior to shipment to seaboard.

There may be some adjustment needed in our freight rate structure to encourage upgrading of rail lines and rolling stock by our railways. The government itself may assist by supplying more grain hopper cars. We may also see increased use of trucks in hauling grain to larger centers.

Now the Canada Grains Council is not yet at the stage where it is ready to make major proposals to our government. More study and assessment is required. But these are the sort of things that we are looking at. We see improvements to our grain handling and transportation system as an acceleration of the trend to consolidation of and improvement to facilities which is already taking place.

The present high prices for grain which have cast a rosy glow over the industry, cannot be expected to last forever. As more realistic times return, the cost of moving his grain becomes increasingly important to our grain producers. And when large grain producing countries, such as the U.S. and Canada, are once again in a surplus position for grains, any competitive edge, such as reasonable transportation costs, will be needed. We feel in Canada that we can, and will, over the next few years, be able to come out with a more economical and efficient system -- and give you, our friendly rivals over so many decades in the world grain markets -- a good run for your money!

Question and Answer Session for Panel
"Visionaries in Grain Handling and Transportation"
(Part II)

Question to Mr. Davis:

What would be the cost of a pipeline that would transport grain: (a) 300 miles with a 24 inch diameter, and (b) 300 miles with a 72 inch diameter?

Answer by Mr. Davis:

These are going to be ballpark figures. At a 24 inch diameter we are looking at somewhere in the neighborhood of \$100,000 to \$200,000 a mile. This would be total system cost. These costs would vary drastically, of course, with terrain, river crossings, mountainous areas, rock, etc., but I think this is a good average figure. Seventy-two inch? This is really ballpark. The costs are likely in excess of \$1 million per mile. I'd say you would be approaching highway costs which can run between \$1 million and \$2.5 million a mile. We just don't have that much experience in 72-inch pipe because it hasn't been built in enough places to come up with an average figure. Those are real ballpark.

Question to Mr. Davis:

What is the estimated installation cost per foot of pipeline? What are the speeds and vehicle length limitations?

Answer by Mr. Davis:

If you take those figures I just gave you and divide by 5,280 you will come up with a cost per foot. We are most familiar with 30-inch pipeline, which has been used along the eastern side of the United States. The cost per foot of this line is approximately \$40. We have built two lines recently, one in the Alabama, Georgia, Louisiana area, which cost \$40 a foot, and another for the streets of New York City at \$390 a foot. You can see that these costs can vary greatly.

The system is designed for a vehicle length of twice the diameter of the pipe. This turns out to be a real usable figure and it doesn't limit us on the bends in the pipe. The pipe is not going to run straight in order to get where it is going. If we are able to keep the bends within normal pipeline construction usage, then twice the

diameter of the pipe would be the vehicle length. A 36-inch pipe could contain, therefore, a 6-foot vehicle, which would basically fill the pipeline.

Speed is hard to tie down. The system is predicated on the fact that we try to get the most economical use of our horsepower. What the system has to do is overcome rolling friction, and then, after you have done this and got the vehicle in motion, do no more work than is necessary to transport the load from point A to point B. This varies with pipeline diameter and it varies with the payload in the vehicle. Due to the nature of pipelines, the relationship is that when the air pressure necessary to overcome rolling friction is accomplished, the bigger the pipeline the faster the air will move, given sufficient horsepower. That is, the larger the diameter, the faster the vehicle will move. The 36-inch line, shown in the film, is a very lightly loaded system. Those cars only have a payload of about 450 pounds per car with a density of about 10 pounds per cubic foot. The speed of that system was 12 miles per hour. If we consider grain, which is in the neighborhood of about 50 pounds per cubic foot, this system would probably travel in the neighborhood of about 40 miles per hour. You need added energy to overcome rolling friction to move the load, but suddenly the load is moving faster. This is the economical breakpoint that we strive for.

Question to Mr. Davis:

Could grain be transported through a pipeline carried along at high speed in a flow of air and eliminate the vehicle?

Answer by Mr. Davis:

As you know, the Port of Houston is handling a good bit of grain. From what we have heard from the port people down there, they were thinking of trying to use an air slur system to move grain from distant elevators to another dock. While I don't really know the limit in distance, indications are that when you start approaching an air slur of say a mile or thousands of feet you end up with grain damage and spoilage. As far as we know, long distance transport by an air slur is not practical. What we are talking about in our system is a long distance transport with vehicle.

Question to Mr. Davis:

Is there a problem of wear on the vehicle itself or on the inner walls of the pipe? Also, is there a problem of plugging of the pipe, particularly if the pipe is buried?

Answer by Mr. Davis:

While I can't say that there isn't any wear, we don't see any appreciable wear. The system in Atlanta has more than 60,000 miles of usage. The type of vehicle we use tends to only polish the pipe. We don't see any excessive wear. Due to the nature of the system, any materials that are in there are swept out, so we don't end up with any abrasive action to speak of. We are hopeful of installing very soon a phosphate rock system. This rock is quite abrasive. We have been running tests on this system for some time now and find that with the continuous sweeping of materials out of the way of the vehicle passage, we don't see any inside wear in the pipe.

The only thing that could plug a buried pipe would be vehicle failure. However, indications are that with a minimum of preventive maintenance, you know a vehicle is going to fail long before it actually does. A vehicle has to fail pretty severely. For example, the loss of one wheel wouldn't necessarily stop the vehicle; it would limp into the next point where it could be taken care of. Even if something drastic did happen to stop a vehicle, the nature of this system is such that we can enter it at any point. In addition, we can have inspections of vehicles at any point in the system. The system doesn't require tight seals, so entrance is inexpensive. We would try to enter the system at the closest point and remove the damaged vehicle. If vehicular failure occurred in an area we didn't have access to, such as at a river crossing or in a swamp, or, as in the case of the New York City line where we didn't care to have too many manholes, we would actually have a power vehicle that would then go in and remove the damaged or jammed vehicle. However, this type of occurrence should be a rarity.

Question to Mr. Davis:

Is anyone anywhere building a grain tube right now?

Answer by Mr. Davis:

Not for the use of grain. However, as I mentioned, we hope to build one for hauling phosphate very shortly. In addition, the Japanese are going to build one that will be about three miles long to transport automobile parts back and forth between different assembly sections. This would be the first commercial use of such a system. The point is that pneumatic tubes have been used for years and this is what I was attempting to establish; but not as yet for this type of usage.

Question to Mr. Davis:

What would be the prospects for a grain tube from North Dakota?

Answer by Mr. Davis:

The system is capital intensive. It's much like building a brand new railroad: if you have the long-term usage and you have the load density at the time you start out then the system is economical and it is practical. It is just a matter of getting the capital investment together and doing it. Incidentally, some of the figures I have heard during this forum relating to barging and costs associated with the construction of waterways, would build quite a few pipelines. If you can justify that, then you can justify these. The figures I have given you include the purchase of right-of-ways. If a pipeline construction group were able to eliminate their right-of-way cost by, let's say, sharing a right-of-way, which we have done in some cases with power companies, these costs can be decreased substantially. While pipeline and system costs do represent a larger portion of total costs, right-of-way costs are sizeable.

Question to Mr. Davis:

Repeat the cost range for moving grain by tube.

Answer by Mr. Davis:

The two examples that I used and are shown on a graph that is attached to my presentation, are the 24-inch pipeline that is capable of hauling 70 tons per hour at a cost of about 2 1/2 cents a ton mile and the 72-inch line which could handle 3,500 tons per hour at a cost of 5.2 mills per ton mile. This is just a case of where the bigger the diameter the greater the efficiency; you simply get more transportation for the investment. Most of these costs are associated with the depreciation of the capital over a 33 year period. The operating cost of this type of system is about 1 percent of capital costs. Because operating costs are so small, cost per ton mile would be only slightly affected by labor wage increases, power increases and these types of things. The system is, virtually, inflation proof.

Question to Mr. Davis:

Would you be able to keep one shipper's grain separate from another in the pipeline? That is, could you take consigned shipments?

Answer by Mr. Davis:

Yes. In fact, this is what we are proposing to do right now. We have several grades of phosphate that we are going to pick up, which must be kept separate. The system is designed with what we call programmed removal in that we are able to selectively remove cars. The best example I can give you is the siding on a railroad track where you are able to swing a car off and let the rest of the train

go on by. We can bring them out and load or unload them selectively. So, yes, we could effectively separate materials. We could actually ship similar but different commodities. For example, coal has about the same density as grain so we could intermix shipments of coal and grain and separate them both for loading and unloading.

Question to Mr. Davis:

Did you say the grain would be mixed with water or what?

Answer by Mr. Davis:

No. This is a capsule system in that we transport the material exactly as it is given to us in protected containers. The best way to phrase it is that it's like a sailing ship in a pipeline or it's like individual rail cars in a pipeline. All we have done is to take the pneumatic system and make it as friction free as possible.

Question to Mr. Davis:

Would the vehicle be necessary in the movement of grain?

Answer by Mr. Davis:

This is what our system is predicated upon, so, yes, we have to have a vehicle.

Question to Mr. Davis:

Does the TUBEXPRESS for grain require a return pipe to return the vehicle.

Answer by Mr. Davis:

It turns out that if you use a low density economical pipeline with a large shipment the first thing you are going to run out of at the other end is a place to put all those vehicles. The storage of vehicles or the lost time in reversing the system would be so costly to the operation of the system that a second or return line becomes more economical. The cost figures that I have given you are on a one-way haul with a return line. Any backhaul of any nature would reduce these costs on a per ton mile basis.

Question to Mr. McDonough:

In the Brandon area where grain handling and transportation costs have been developed, what relationship is there between the railway costs and the rate which they have been charging for grain?

Answer by Mr. McDonough:

If we go back and look at the costs experienced in 1971-72

on light density branch lines, railway costs for movement of grain from those points to the lakehead amounted to 32.8 cents per bushel. If the system were rebuilt so that we could have a system which operated in perpetuity, costs would be 51.7 cents per bushel on those lines. Mainline costs were 16.2 cents per bushel. Railway revenues from the Crows Nest rate agreement amount to an average of about 9 cents per bushel. Even with the most efficient system that we have developed so far for the area, there is still a shortfall in terms of revenue as to cost of about 7 cents a bushel.

Question to Mr. McDonough:

Are you having heavy opposition from rural communities which might be affected as a result of trucking grain to mainline elevators?

Answer by Mr. McDonough:

I presume what is meant here is farmer opposition as a result of requiring them to haul greater distances. The Brandon area is probably not a typical area of western Canada in terms of grain hauled by producers. Producers in that area, right now, haul about 5 1/2 miles to an elevator. The change in the system by removal of all light density branch lines increases that haul by about 4 miles. I would say that we are not having heavy opposition. We naturally had had some opposition in moving to that type of system, but it certainly has not been a heavy opposition.

Question to Mr. McDonough:

What is the procedure for farmers handling their grain at harvest time, farm storage or direct field-to-elevator?

Answer by Mr. McDonough:

The procedure now is for farmers to handle their grain generally from field to farm storage, although there is some grain that moves directly from farm to elevator. For the most part grain is moved from field to farm storage and then moves in on a quota system.

Question to Mr. McDonough:

Where does the transportation and marketing of commodities rank in national priority?

Answer by Mr. McDonough:

I presume you mean Canada. Canada is a very sparsely populated country. We have 20 million people spread over a distance of some 5,000 miles in an east-west direction.

Transportation is a very important part of life in Canada and I would say it ranks pretty high in national priority. This is especially true at this time when we are looking at our grain handling and transportation system in western Canada. A lot of questions are being raised about transportation costs on other commodities as well.

Question to Mr. McDonough:

Isn't some kind of grain transportation cooperation between Canada and the U.S. desirable for south, Gulf bound traffic?

Answer to Mr. McDonough:

I would imagine the answer to that has to be yes, depending upon cost and also on whether or not you people have a surplus of rail grain handling facilities to handle what we might want to move. Discussing the potential for cooperation is probably a good place to start.

JAPAN: NORTH DAKOTA'S NUMBER ONE CONSUMER

Susumu Matsuoka¹

I am delighted and honored to be invited to speak at this Grain Transportation Forum being held here in Bismarck, North Dakota. Before coming up here from Washington, D.C., I naturally looked up Bismarck on the map. To my surprise I found that this city lies almost directly at the mid-point of the North American continent. As a native of a small island country, it is rather exciting to think that I am now standing at the center of this great continent.

Along with the excitement of coming to Bismarck, however, I was struck with a series of simple questions that seem particularly pertinent at this meeting. First, why have I been asked to speak here. No doubt, it is mainly because of the ever-widening trade relationship between Japan and North Dakota. Then, what is the core of that relationship? Simply speaking it is the forces that have enabled wheat to become such a strong bond between this state and Japan. Of course, one of the major reasons has been progress in the field of transportation, and it is this subject which you are now discussing at this forum so that even further progress may be made. Finally, in this connection, let me ask you a very simple question. Which do you think is farther, from North Dakota to the Pacific Northwest or from the Pacific Northwest to Japan? Of course, I'm asking this question in terms of "economic distance."

As the agricultural attache of the Embassy of Japan, I am always very glad to speak before Americans, especially American farm people, about my views and feelings of Japanese agriculture and its relationship to American agriculture. That is because I have a great respect for what you have achieved in building up the present strength of U.S. agriculture. As you know, this carries a measure of responsibility for the future well-being of not only Americans, but the people of the entire world. I also believe that, as farm people in the world of 1974, you are interested in truly understanding other countries' agricultures, including both their potential and limitations.

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When I talk about the U.S.-Japan relationship, I cannot help being clearly reminded of my boyhood days shortly after the end of the war when so-called "American culture" was flooding Japan. Popular music like the "Tennessee Waltz," comics like "Blondie," chewing gum, baseball, jeeps and Hollywood movies, to name a few -- all these were so fresh to the eye and ear of the people living in cities, towns, and villages of a war-wrecked and hungry Japan. Incidentally, in my boyhood days, I myself was particularly fond of western movies, and I can assure you that it is a dream of Japanese youth to see for themselves the vast manliness of the American West.

Since then it has taken only a quarter of a century for Japan to become one of the strongest economic powers in the free world, second only to the United States. The bond between the largest free economic units on either side of the Pacific has become so great as to be unprecedented in world history. Within this close relationship, agricultural trade, of course, occupies an essential part. In addition to American culture, some of which, by the way, has now become completely a part of Japan itself, you can find clothes and food made from U.S.-produced wheat, corn, soybeans, sorghum, cotton, tobacco and so forth, in all parts of Japan.

So, I was naturally quite happy and flattered when I was assigned to serve as the agricultural attache at the Embassy of Japan in Washington some twenty months ago. I came to the States in the mid-summer of 1972, not knowing, of course, of the approaching upheaval that would create such tremendous change in the world agricultural economy. I don't think it necessary for me to point out here those changes which have occurred during my short stay. Neither do I think it necessary to tell you how much of my Oriental black hair has turned gray in this short period from dealing with those changes. I only hope that in the near future the situation will not cause even more of my hair to turn gray so quickly.

At any rate, what I want to point out is that the midsummer of 1972 was the turning point, and that we are now living in a time of constant changes. It is my strong belief that as we encounter the problems of these changing times, it becomes more and more necessary for us to understand the fundamentals which govern the world agricultural economy, especially, the agricultural relationship between our two countries.

Bearing this in mind, let's begin with a very simple fact. It is already well-known that Japan is now the single, largest overseas customer for U.S. agriculture,

with her annual import of U.S. agricultural products reaching almost \$3 billion.

Let me give you just a few figures. In 1973, Japan imported from the United States, along with 132 million bushels of wheat, 117 million bushels of soybeans, 279 million bushels of corn, 117 million bushels of sorghum, 7 million cattle hides, 1.3 million bales of cotton, and 79 million pounds of unmanufactured tobacco. Other important items include soybean meal, tallow, lemons, grapefruit, pork and beef and so forth. This is really a huge amount indeed. The important thing, however, is not merely the size of the agricultural trade itself, but the fact that this trade covers, as we saw, quite a wide range of U.S. agricultural products, and that the Japanese agricultural market is, and has been, both stable and developing.

I don't think there are any precedents of a closer or wider agricultural relationship between two countries in history. Nowadays it has become very difficult, or almost impossible, for a Japanese to spend even one day without taking any food which has not originated in the United States. Even when we think of typically traditional Japanese foodstuffs, like Japanese noodles, tempura, soybean curd, and soysauce, it is often the case that their materials are "made in U.S.A." I am happy to believe that this tremendous growth of the export market for U.S. agriculture to Japan has greatly contributed not only to the overall trade balance of the United States, but especially to the increased income of American farmers.

As factors which have brought about these results, I think we can point out (1) the change in the food-intake pattern of the Japanese people of seeking more calories, more animal protein, more vitamins and more variety, and which has been made possible by the increased per capita income, (2) the adjustment in Japanese agriculture of production patterns to satisfy this demand change, and (3) the supply capabilities of U.S. agriculture. One of the results of these changes in the Japanese agricultural economy can be very easily demonstrated by the fact that perhaps nowhere in the world has the improvement of the physical condition of young people been more rapidly developing than in Japan. In fact, it is difficult to find a Japanese son or daughter of at least fifteen years old who is shorter than his father or her mother. I only regret that I am not young enough to fully share this improvement.

One important thing I must add is that what has happened in the agricultural sector of our rapidly developing island country clearly demonstrates what I believe to be happening more or less, in every part of the world where the per capita income is steadily rising.

Returning to the U.S.-Japan agricultural relationship, it is my opinion that the wheat trade has always been the foremost part and at the "core," so to speak, of agricultural trade. This is not a wonder, since in Japan, wheat is the most important food item after rice, and since from the American point of view, I presume, it is not only the oldest and most common crop, but the wheat industry depends to a large extent on export.

Because of the importance of wheat for the Japanese, the Japanese Government has long since been dealing with the buying and selling operation of wheat, along with rice. In this respect, when we consider agricultural trade between our two countries, what should not be overlooked are the continuous and persistent efforts made by the wheat people of both countries in building the wheat trade to its present level. In short, the famous phrase, "Rome was not built in a day" is nowhere more suitable than in reference to the wheat trade.

The result can be demonstrated by using my own daily food-intake in Tokyo as an example. I believe this to be somewhat typical of an average Tokyo-ite. I would eat two pieces of bread at breakfast and Japanese or Chinese-style noodles at lunch. Of course bread and noodles are not the only wheat products. We have all sorts just as you have, plus those Oriental wheat products peculiar to our culture. In this sense, I believe we can say that wheat is truly a bridge across the Pacific Ocean, and, if I may add, one which is becoming stronger and wider every year.

I don't think it necessary at this point to discuss at length the now-famous story of the export controls on soybeans last summer. Briefly, however, you can well imagine with what emotions the Japanese people heard the dramatic news of the U.S. imposition of export controls on soybeans. It was simply a shock, like one that an American would receive while visiting Tokyo for the first time during an earthquake. Though at that time this experience seemed to be a bad "mid-summer's night dream." Now speaking from hindsight, I think we can be glad of the experience if we have both learned from it and have become the wiser for it. In other words, one positive factor resulting from that recent event has been the

increased public awareness of the importance of agricultural trade and its vital implications for the sound development of the whole economy. This new interest and knowledge will, in the long run, surely provide a very constructive climate in which stronger and better ties between our two countries can be established. In this respect I am most pleased that the Japanese Ministry of Agriculture and Forestry and the U.S. Department of Agriculture, as well as agricultural people of both countries, have established a route of continuous dialogue.

In this sense we welcome the visit of Secretary Butz to Japan in the middle of April. The same can be said of the forthcoming visit of Governor Link to Tokyo. I'm sure these visits will be quite successful in bringing our great agricultural relationship even closer.

Finally, let me wish you a fruitful and successful conclusion to this Grain Transportation Forum. I'm not at all an expert in this field, but even I can see that the kind of discussions you are having here is quite significant, especially in these days of rapid changes.

It is evident that there will no longer be a market-oriented agriculture without the express efforts of agriculture people. What I mean is that the idea of market-oriented agriculture in itself contains great possibilities for the future, while challenging farmers to adjust their agriculture to the needs and demands of the market. Moreover, just as today's market is not what it used to be, tomorrow's market will not be what it is today. According to my interpretation, market-oriented agriculture demands a more active role on the part of the farmers themselves in that they will have to cultivate potential markets by creating conditions favorable to the demand for their products in all parts of the world. This, of course, includes the task of transportation in assuring the maximum degree of free flow of commodities throughout the U.S. As you know, geography of this country is such that perhaps nowhere in the States are the transportation problems more important than here at the mid-point of the great North American Continent.

In closing, I must again stress the importance to Japan of a stable and dependable supply of agricultural products. When we glance at the agricultural trade figures and the role that U.S. agriculture is playing in the Japanese agricultural economy, the importance of this stability and dependability cannot be exaggerated.

If I were to say that our two countries have no problems or troubles, it would be untrue. We do have problems -- troubles which we must solve in order to maintain and improve the basically cordial relationship concerning agricultural trade between us. I do not think, however, these problems are serious enough to hinder future development if both sides will try to find solutions based upon the spirit of mutual understanding and cooperation.

When we consider the extent of our bilateral agricultural trade, the huge amounts involved, and the importance it has gained in the lives of our peoples, it is nonsense to ponder which should come first -- as in the famous case of the chicken and the egg -- a stable and dependable import market or a stable and dependable export market. The essential thing is to recognize the inter-relationship and inter-dependence of the agricultural economies of our two countries and to develop them in mutual cooperation.

I will be extremely happy if this speech in my 20-months old English can contribute even in a small way to that understanding and cooperation.

THE NORTH DAKOTA RAIL LINES REACTED
BY EXPANDING THEIR CAPACITY

Robert Kottke¹

Thank you for inviting me here today. When Bob Tosterud called and asked that I appear on the program as part of the wrap-up session under the heading of "North Dakota Reacts," little did I realize that the North Dakota Rail Lines would need to evaluate certain comments and react in a somewhat defensive manner. First of all, let me say that my talk will be divided into two parts. Part I will deal with certain comments that were made about the North Dakota transportation system during this forum and in Part II, I'll try to get back to my prepared text. Since I have only fifteen minutes to speak with you, my comments will have to be short and to the point. So here goes Part I.

I just can't believe that so few people have so little faith in the North Dakota Rail Lines. My first reaction to some of the comments was one of anger. Then it changed to disappointment and finally to concern. Maybe, in the final analysis, concern should have come first. But let's look at anger, disappointment and concern in that order.

Why anger? Because I believe we did respond to your demand for rail transportation in 1973. The Soo's grain tonnage from North Dakota increased 71 percent in 1973 over 1972. We have never handled more grain from this state in our history. Name one other industry that could virtually tool-up over night to increase its out-put by that amount. Naturally, we would have much preferred to have that figure doubled or even tripled by providing the North Dakota elevators with more cars because more business means more dollars to us also, and let's face it, that's what we are in business for.

Then I turned to disappointment. A 71 percent increase in tonnage handled means something to me. Very few people seemed to acknowledge the fact the rail lines virtually handled two years' crop in one year. These are very exciting times for those of us in the grain

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transportation business. We are not looking for accolades. But we are looking for support. Certainly, we can do better. Everyone strives to reach that apple blossom at the top of the tree because it is the best. With the help of the grain industry, we can reach it. But it will take the cooperation of everyone concerned. In my opinion, the American rail transportation system is the best in the world and it will get better. We have met and will continue to meet any challenge that is given to us, not only with the grain industry but with other industries as well. Your potash -- your nitrogen -- your fertilizer -- your fuel and more are all parts of the national economy. And we are meeting that challenge also. Not always in a way that is acceptable to all. But nevertheless, our goal is to meet and, yes, surpass your requirements.

Finally, I arrived at an area of concern. A better and more efficient rail transportation system is going to cost dollars. Just like in the trucking industry, our costs of operations have escalated tremendously. On the one hand we talk about a better rail system, while in the same breath we talk about lower prices for that transportation. All in the face of a rapidly increasing national economy. If the rail industry is to innovate and expand, we will need dollars to do it with. I am not here today to tell you that there are no better ways for us to move your grain. We've come a long way from the steam locomotive that moved a carload of grain a mere 100 miles per day. But, we still have a long way to go. We can and will provide North Dakota with a transportation network to market its grain that is second to none. As was pointed out, there are other factors in the marketing of grain that are beyond the control of the railroads. I can only assure you that we will try to do the best job we possibly can, but, we need your help.

I agree that transportation charges play an important part in marketing your grain, but who had ever heard of over five dollar a bushel wheat until 1973. In December, 1971, the North Dakota railroads reduced their wheat rates substantially. In spite of several general freight rate increases since that time, your transportation bill to the Twin Cities and Head of the Lakes was over three million dollars less in 1973 than it would have been had the rates prior to that reduction remained in effect without any increases added. And those are just Soo Line figures. That money would have built 150 jumbo covered hopper cars or upgraded several miles of track. End of Part I, and now in Part II I'd like to get a bit into the factors that enabled the Soo to double our capacity to move grain from country points in just a short span of two years.

By understanding how we accomplished this achievement, you can better understand some of the things we are going to have to do in the future to sustain the high tonnage we will be expected to move from the country; and at the same time, give you some of the factors that extend beyond the country to movements from terminals to points all over the nation.

Basically, Soo Line was able to increase its origination of grain tonnage from country elevators because of three factors:

- (1) Rate making policy, particularly involving strict rules on wheat rates from the country.
- (2) Operating procedures which enable better utilization of freight cars and train service.
- (3) Capital investment in new equipment.

When the reduced rates on wheat were first offered in 1971, it literally had to be tagged a gamble on our part. At that time, no one foresaw the tremendous export sales and domestic demand that would be experienced a short year later. But it was evident at that time from the railroad's point of view, that car utilization had to be improved. No one, especially a person like myself who must determine transportation rates on agricultural products that will meet the need and produce a profit for our company, likes to reduce rates. But we did. And in exchange for it, Soo asked for changes in the way cars were being used, including changes in loading and unloading times. The result was excellent and I would hesitate to look back over the past two years and think we would have had to move the tremendous amounts of wheat that we did under the old and more cumbersome rate structure where delays were incurred in cars, yard congestion was high, and diversions often made at the last minute.

It is obvious to anyone that the lion's share of the credit for the ability to move grain over the past two years has to be tied to the rules that accompany the reduced wheat rates. Wheat is the largest commodity we move and we could not have doubled our tonnage over this period without the increased car utilization those rules provided.

"Changes in operating procedures," is a big broad phrase we often use to express our ability to efficiently

handle business. It encompasses nearly every phase of management of a railroad, from moving cars to seeing they are properly annotated on the records through our computer. Most importantly, all the departments charged with the responsibility for moving the grain worked in full cooperation to get the job done. They put emphasis on such things as:

- * Improvement in the distribution of cars, with an eye to seeing that every customer got a fair share. Cars were in short supply almost constantly as is the case today, but by spreading the fleet around and distributing an equitable share of cars to each point, we were able to keep them moving faster.

- * Improvement in the use of our own as well as foreign line cars. During the past two years we made quite effective use of Canadian cars on shipments moving west. By doing so, we were able to captivate cars of Soo ownership for use on line between country and terminal points. By having control of your own cars they can move faster because there are no restraints on their use. Then too, we used the unit grain train extensively from terminals to points across the country. It is one way of keeping the terminals open to handle the flow from the country and insuring the best possible control of cars when they go off line. One of the discouraging points about sending a car off line during a peak demand period is that its effective utilization drops as delays are incurred at ports as well as in getting the car back to the country or terminal.

- * Providing greater flexibility in arranging service schedules to meet demand as well as scheduling extra trains to handle the increases in business and for returning empties back to the country.

- * Capital investment in new freight cars has been heavy during the past two years. We have also invested large sums of money in locomotives and other improvements to track and facilities. Rate making plays an important part in capital investment because we must be able to constantly generate a flow of funds to be able to invest money in new equipment and modernize the railroad. The Soo has put some 700 new 100-ton hoppers to work since 1971. Most importantly, we have over the past few years greatly increased our new rail relays necessary because of the heavier loads generated from bigger cars.

Those are a few factors which enabled us to more than double our output of country grain over the past two years. But what of the future price you are going to pay to move your product and the ability of the Soo Line to move it fast and efficiently?

A number of things are certain: More cars, more new rail, and better operating procedures are going to be needed. While we have made great strides in car utilization, we have by no means reached optimum usage from each car. And more cars and new rails are going to require even greater capital investment. Like everyone else in business, costs have escalated and parts are in extremely tight demand. We are already experiencing problems in getting wheels and axles with which to build or repair existing cars. And the time between ordering and delivery of a new car is now over a year because of backlogs in the production process. We have an additional 200 hoppers currently on order but delivery won't be made for some time.

The outgrowth of this need, of course, is higher prices. I would be very remiss if I were to tell you today that your transportation price will not increase. Besides the plant improvements I mentioned earlier, we face higher cost for labor and diesel oil. General rate increases have become increasingly more frequent because of the modern day economy. But what do you have without those increases? I believe the Upper Midwest, and North Dakota in particular, is indeed fortunate to have a very healthy rail system. Without the capital to invest in that system, we certainly would not have been able to move the volume of grain that we did.

Finally, the Soo Line extends a big "thank you" to the people of North Dakota for their efforts in cooperating with the rules and operating procedures that were set up in an effort to move your grain as efficiently as possible. We realize that transporting goods to market is a cooperative venture and one that will continue to be. So, it goes without saying, that we cannot expect to surpass 1973's record without your continued help, and we want to break that record this year!

THE RAILROADS WILL MEET THE CHALLENGE

Ralph O. Avery¹

"It was the best of times, it was the worst of times. We have never had it so good, and we have never had it so bad": a quotation from a soon-to-be published book of selected short stories entitled, "The Autobiography of a Twin Cities Car Distributor." "The Profitless Boom": a headline of an article about the rail industry in Business Week Magazine. "When you never had it so good, or parted with it so fast": inflation. Put them together, that's "The New Era."

On March 2, 1970, the Chicago, Burlington and Quincy, the Great Northern, the Northern Pacific and the Spokane, Portland and Seattle Railways were merged to form a new company with combined trackage of 25,000 miles serving 19 states and 2 Canadian provinces. That's Burlington Northern. Agriculture was, and is, the number one source of revenue for the new company. One of the first projects of the new company was to develop plans to increase its share of the total transportation market for agricultural products and to improve the profitability of this segment of its traffic. Equipment acquisition, based on projected transportation demand and equipment utilization through car control and service changes compatible with changing marketing patterns were important considerations. Our program was progressing fairly well, not without problems, of course, through 1971 and the first half of 1972. And then it happened. Since August, 1972, many of us have come to understand the frustrations of the famous gentleman in the alligator-infested swamp. There have been several occasions in the past eighteen months when I fervently hoped for the opportunity to retrieve some predictions and recommendations made to top management in 1970 and 1971 based on information obtained, for the most part, in the perusal of publications and papers prepared by government agencies and agricultural trade associations and interviews and discussions with many of you and your association's representatives.

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However, I doubt that anyone here today could have stood here in July, 1972, and predicted that in less than two years U.S. agricultural exports would more than double to \$20 billion which we are expecting this fiscal year; that Asia would surpass Western Europe as a market for U.S. agriculture; that the Soviet Union and the Peoples Republic of China each would buy more than \$1 billion worth of U.S. farm products; that planting restrictions would be replaced by freedom to plant to the fences; that an Israeli-Arab confrontation would result in carloads of grain standing idle at Atlantic, Pacific and Gulf Ports because vessels did not arrive or were laying at anchor in Puget Sound, the Columbia River or Galveston Bay because of a shortage of bunker fuel. If you could have predicted these things in July, 1972, it is certainly my misfortune that I missed you.

All of these things came to pass, and there were others just as notable. Records were broken in every segment of agri-business. The nation's railroads responded by handling the largest volume of grain in history, and handled it on short notice. Most of this grain had been produced and stored over a period of years and there were no prophets around to tell us that a drought in Australia, the Soviet Union, South Africa, the Peoples Republic of China and the nearly non-existent monsoon season in India would require this vast amount of grain be moved in not twelve months, but eight months. And this insatiable demand for transportation erupted at a time when the nation's carriers were in sad financial and physical shape due for the most part to the benign neglect of Congress.

During the last 25 years federal, state and local governments have pumped just about \$350 billion into highways, waterways and air transportation and during those 25 years the nation's railroads were left to fend for themselves.

Back in 1970 the nation's rail industry studied the increases in traffic the railroads could reasonably expect in the decade ahead and what it would take in capital improvements to prepare the industry to handle it. The result was a recommendation that the railroads plan to invest an average of \$3.3 billion a year for eleven years. From 1961 through 1970 the industry managed to scrape up an annual average of slightly in excess of \$1.3 billion for equipment, plant and track. But in the last three years, 1971 through 1973, we have spent less, an average of just about \$1.2 billion. Looking at it another way, the United States railroad industry in the last four years, from 1970 through 1973, fell nearly \$8 billion behind its own capital improvement goals. We thought we should have spent close to \$13 billion. We actually were able to spend about \$5 billion.

Operating revenues last year were up more than 9 percent to a record high of \$14.8 billion according to the AAR. Yet operating expenses rose so much and so quickly that net operating income went up only 2 percent. The picture is not very bright when you consider dollars instead of percentages. The industry's \$1.3 billion increase in revenues last year brought only an additional \$18.2 million to net income. Thus, the industry's rate of return on net investment in transportation property increased from a shade under 3.1 percent to a shade over 3.1 percent.

Let's turn for a moment from the national scene to the local scene and specifically Burlington Northern.

In the five-year period, 1970 through 1974, Burlington Northern has spent or committed \$792 million to consolidating or improving our entire 25,000-mile railroad, plant, tracks and car fleet. Presently we own 29,535 grain boxes and 14,373 covered hoppers. 3,489 of these covered hoppers have been acquired since merger in 1970. In addition, we have reconstructed 650 at a total cost of \$60.5 million. We will add another 425 before the end of 1974, which will bring total expenditure for covered hoppers to \$69.4 million since 1970. In addition, we have 297 converted refrigerators and 925 stock cars in grain service. It must be apparent that we are committed heavily to the transportation of grain. Shortly after we placed an order for 1,000 covered hopper cars at a cost of \$18 million for delivery in 1973, the government announced export controls on soybeans and soybean products. We were somewhat shaken, particularly since there arose a clamor for a ban on the export of other grains. The acquisition of a grain-carrying fleet of this magnitude cannot be justified unless our exports remain at a high and stable level. We are optimistic. We believe that while there may be a moderating of the tight supply-demand situation, a return to "normal," in the context of the situation existing before the world trade upheaval, is beyond the realm of possibility. World agriculture has been changing for years. The events of the past two years have only dramatized the fundamental and far-reaching changes that have been masked by a condition of surplus in the major producing countries. There are permanent changes that lie behind the upsurge in agricultural exports and they point to a strong future for U.S. agriculture. We are, indeed, in a new era.

If rail transportation is to keep pace with the demand for transportation in the new era, changes will have to be made in the transportation and distribution system. Elevators in North Dakota cannot be adequately

served under a system which requires 30 to 35 days to load a car at an elevator in central North Dakota, unload it at an Atlantic or Gulf Port and return the empty for reloading in North Dakota.

You should with justification ask why does it take so long to make the trip. If you do, it is probably because you consider Duluth-Superior and Minneapolis-St. Paul as the destination of your grain. In 1970, and even in 1971, you would be correct, at least for the initial destination. However, since August, 1972, when supply and demand came together with a bang, Gackle has been going to Galveston, Hebron to Houston, Casselton to Corpus Christi, Bismarck to Baton Rouge, New Leipzig to New Orleans and on and on along the Gulf and Atlantic Coast. The market is not Duluth, Minnesota or Chicago. These trade centers only reflect the real markets of Algeria and Zanzibar and when Mother Nature, political philosophy and a new affluence converge, the question is not where and when, it is there and then. Transportation assumes a role of immediacy. Some statistics support what some of us know and some of you think happened. In 1972, 77,446 carloads of grain were unloaded at Houston, Texas; in 1973, unloads at Houston reached 177,024. In Corpus Christi in 1972 carloads were 10,823 and in 1973, 43,171. These ports do not have the storage capacity that you are familiar with in the Duluth and Minneapolis terminals. They are tide-water "put-through" elevators and when there is a missed connection due to a disagreement on the London Mercantile Exchange or the cooks union, the delay of a 30,000 ton freighter means that 300 cars badly needed in Scranton, Scobey or Selfridge sit and sit and sit. And no amount of pontification, breast beating or hand wringing will do anything about it. An aspirin and water or a scotch and soda is probably the better alternative.

Well, where do we go from here. What can we expect in the area of demand for transportation in the farm sector, and what are we going to do about it. Given normal conditions throughout the grain producing regions of the world, there are very few countries that can become self-sufficient. Increased population and increased consumption among the developing nations is as factual as death and taxes. Despite the birth control efforts of scores of organizations, dozens of governments, Channel 2, and my wife, we are adding 75 to 80 million people to the world's population every year and it is compound growth. It took from the period of the cave man to 1830 to put one billion people on earth; it took another 100 years to add a billion

more. Thirty years after that in 1950, the world population was 3 billion and in 1975, next year, it should reach 4 billion. These billions are becoming more prosperous. Consumption of grains in the poorer countries, where grain consumed as grain is the principal diet, per capita consumption is about 400 pounds per year. In the developed countries where meat is not a dietary luxury, it is around 1,200 pounds per year. But in the United States and Canada, where beef is a way of life, per capita consumption of grain products is about 2,000 pounds per year and only 155 pounds of that is consumed as grain. Does this tell you anything about the future demand for grain and grain products. It tells me something about the future demand for grain and grain products' transportation. This, and an acute awareness of the sad financial shape of the rail industry, tells, unless someone gets off the dime, it will be "the worst of times." That "someone" is your Representative in Washington. It is my Representative in Washington. It is all those Representatives in Washington who bemoan the fact that the nation's rail service is deteriorating, but have done nothing about it. There is a vehicle before Congress at present that with some amendments can assist in the restoration of the United States railroads to its once dominant role in transportation and permit it to keep pace with agriculture as a member of that affluent society.

GRAIN TRANSPORTATION AND THE COUNTRY ELEVATOR

Roger Bourn¹

It is a pleasure to be here today and present some of my views regarding this meeting and perhaps offer to you some ideas regarding grain transportation and it's relation to the country elevator during the recent transportation crunch and in the days that lie ahead. While it's going to be hard to believe after I make some of these statements, I want to emphasize that country elevators and I are not anti-railroad. Country elevators, in my opinion, have already received many of the major disadvantages from the lack of transportation. Most country elevator managers have found themselves with large inventories that were bought under firm purchase contracts from farmers with relating hedges or to-arrive sales with locked-in margins. Now, during this period of margin erosion, due to increased carrying costs through inflated interest, labor and facility cost, our Public Service Commission and the ICC (see I'm going to take on the whole world) have chosen to allow increased tariff rates to railroads ignoring the existing purchase inventories held by these country elevators. In addition, elevators have been forced to bid for available, uncontrolled independent trucking. Speaking at our luncheon yesterday, Dr. Ottoson suggested the bidding for railroad cars. In my estimation this would only increase our disadvantage at a time when such elevators should be granted incentives for the retention of inventories to better maintain transportation efficiency and purchasing from the farm. Receivers or purchasers, in my opinion, should share equal responsibility when we have increased tariffs that affect existing inventories.

Let's face it, the typical country elevator simply doesn't have or has not had enough expertise. Our personnel has not been expert enough and we haven't had enough influence to avoid actions that I consider inconsiderate or irresponsible. Now, I'm not opposed to railroad

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profits, in fact I've previously testified to the effect that I encouraged higher tariffs, however, certainly not at the country elevator's expense. It's been my observation that tariff decreases are followed by lower country bids shortly thereafter. It's the country that pays the bill on inventories when we have tariff increases. The lowering of bids should, of course, result in no loss but actually a profit when tariffs are lowered. However, I've also observed that this has very rarely been the case during high purchase or high inventory periods. Commission firms who complain vehemently about railroad tariff increases that affect their inventories raise their rates also. I am not saying that these increases are not justified and that the railroads don't require increased income to cover increased cost, however, I do say that such increases are untimely when they involve existing large inventories and hedges. While all of this is going on, it places a great deal of the responsibility, the burden, and the cost on the country elevator. This in all likelihood, will continue to be a burden or responsibility for which the elevator manager must plan.

Excessive truck discounts by terminals to discourage truck shipments are irresponsible when they relate not to additional cost but to the lack of railroad equipment. I'm sure there's not an elevator manager in here that hasn't been critical of the excessive truck discounts.

It is not my intention to castigate the railroads, the commission firms, or the terminal people. Rather, I would hope that my comments are considered as constructive criticism and that elevator people will take it in the inclination in which they are intended.

Now there have been many mistakes made by country shippers that did predicate to the lack of transportation and, I think, we should accept our responsibility too. Realizing the need for transportation as a tool for merchandising, we should work with our railroads, with our barge people, and with our export points rather than consider them as opposing forces. I recall a tariff meeting in St. Paul, Minnesota, in October, 1971, at which country shippers, including myself, joined millers, exporters and others in requesting reduced rail rates. Later, country elevator people testified with others at a House Subcommittee meeting in Fargo regarding the lack of rail equipment. Obviously, this points out that we would like reduced rates and better service. However, this is quite a bit to ask for, in that studies indicate that railroads return only 3 percent on investments.

Perhaps greater efficiency is needed. Following this series of events, the Burlington Northern and the Soo Line did introduce emergency tariffs on which our rates are now based. These rates were reduced so that they would be more competitive with truck transportation in North Dakota. The result of these reduced tariffs was the elimination of many trucking operations. It was also a period of reduction of rail equipment on North Dakota lines. In our area, on the Milwaukee Railroad, we didn't really feel the effect as much. That is, we didn't have the extensive trucking operations that were apparently found along the Burlington Northern and Soo Line. Yet, we did have some trucking casualties on the Milwaukee.

During this past winter, many buyers have indicated to me that a large percent of the grain is originated by truck. Trucks have multiplied considerably in the past two years and the disappearance of railroad cars, particularly through the winter months when we lack navigation, has forced country grain into this method of delivery. Much of this trucked grain has been discounted as much as 45 cents per bushel when it was delivered. I have sold trucks for December and January delivery to firms who have been unable to accept delivery simply because they had no room, and as a consequence, I've had to resell this trucked wheat during the same period and accept discounts as much as 21 cents per bushel. In order to avoid further discounts, I've even exchanged hedges. However, as a country shipper, I've received no advantage or premium or interest for the fact that they did not receive shipment of grain.

Now, to digress a little more and to present some thoughts that to me at least, are pertinent. As mentioned, I am a manager and have been for many years and I believe in this existing system of originating grain through our country elevators and merchandising it into domestic and export markets. In addition, I believe in the total value of our grain exchanges throughout the country in which we engage in honest, open auction type markets. Perhaps the markets are manipulated -- no system is perfect. I feel that the country elevator system should represent the marketing agent through which producers can continue to most orderly and most profitably merchandise his commodities. If this is true, will we consider the country elevator with the farmer as the primary storage agencies that will maintain inventory reserves and market our grain? If this is to result, a great deal of planning and operating expertise must relate to facilities. In reference to single car shippers and the concern of the ICC, I think that if you look back

historically any kind of a subsidy program only supports non-profit business for an indefinite period of time. Consequently, you aren't going to be able to plan on somebody else picking up the bill, rather you're going to have to make your own profits. If the single car shipper can't survive, he's going to have to plan and expand. Innovation, as described by Webster, is "introduction of new ideas" and to be innovative is to be creative. Innovation has obviously resulted in the country during the past two years as a result of the transportation crunch. That is, country people have been forced to find better methods of marketing, newer methods of financing and continued methods of maintaining reserves profitably which they have never before been required to do. As a consequence, the planning of the country elevator manager must not be based on handling previously stored reserves of a number of years under government loan on our farms and bin sites and in our country elevators and terminals, but on crop programs. Transportation programming is going to have to be carefully oriented to your area grain gathering capacity, and annual crop conditions are going to have to be evaluated and inventory retentions planned and profitably financed. The country elevator manager is going to have to have a better understanding of rail tariffs, a knowledge of multiple car tariff advantages, and the ability to correspond as a grain gatherer with a knowledge of quality and quantity in given areas. The country elevator manager is going to have to have a greater understanding of varied markets which surround us in the east, west, north and south. Certainly we've depended on our commission firms and our domestic and export buyers, and we shall continue to do so. However, in my opinion, if we're going to require a greater management sophistication and the ability to better evaluate information gathered from these sources and exercise independent judgement for greater profit and a greater ability to compete with other direct marketing agencies, then we may continue to arise to the challenge in our areas.

Now, some of our grain has been shipped during this past year by rail and some by truck. Yet, being located on the Milwaukee and, although everyone has been short transportation in our area within the western division of the Milwaukee, we have, I think, received enough transportation so that all elevator operators have had the biggest dollar and unit volume in recent history. Although everyone has been critical of transportation, we sometimes fail to realize the tremendous strain that has been placed on our transportation facilities during

the period because of escalated government inventory reductions. The consequent results have probably been more successful than our attitudes would sometimes indicate. However, many country elevators are looking closer toward greater control of transportation with their own operating ability as it would relate to their own facilities located on the right-of-way.

How self-contained should a country elevator be? How much of your own transportation should you control whether it be by truck or by railroad car lease? Our first serious budgeting in capital investment projections began some seven years ago when we initiated monthly financial programming into our company and introduced annual detailed budgeting and incorporated a five year capital investment program. During that time we carefully planned each of our working departments and attempted to forecast or project stable well-financed growth. As a result of this planning three years ago we began the construction of a new concrete elevator, remodeled an existing elevator into a certified seed plant and expanded our existing feed manufacturing plant. Prior to this, we had developed less investments in our shopping center area, our petroleum area and our farm and home area. We did not ignore the need for expanded and replacement rolling stock. During this period, there was no anticipation, of course, of an intended Russian wheat sale and there was a great deal of grain in storage on the farm and in government bins. However, even then we experienced transportation shortages. We spent a great deal of time considering transportation and its affiliation with our expanded ability to originate grain. We attempted to know better, work closer and develop a greater understanding with the Milwaukee railroad people and tried to keep them informed of our expansion program and make them realize the need for continued transportation to meet the required volume increases to sustain increased expenses as a result of our expansion program. It was our intention to become as self-contained as economically possible in transportation. However, it is simply unreasonable to assume the attitude of complete self-sufficiency in transportation enabling you to originate and ship three million bushels of grain. More realistically, major investments should be related to a percentage of the total and one must be aggressively cognizant of the need to originate other means of transportation, be it truck, rail or boat. When I say other, I mean other than self-contained in the operation. Part

of our construction program included expanded spur trackage that would enable us to spot an increased number of cars for loading. Additional intentions included semi-trucks which would give us the ability to control at least 20 percent of our grain shipments. These trucks would also give us the ability to deliver ingredients into our feed mill on a backhaul from the east. Finally, we conceived the inclusion of our own leased rail cars. Our construction is now complete within the elevator and the feed mill complex. As we were fortunate in completing most of this prior to the large Russian wheat movement, we have utilized our concrete elevator and our transportation facilities with the exception of the leased cars, through two harvests and have moved a great deal of stored grain.

Our semi's, although not profitable, have enabled us to move a great deal of grain that otherwise would not have been possible to move. Also, we have been able to move this grain by truck in a manner that has generally avoided most of the primary discounts on trucked grain because we could plan and anticipate the amount of movement that we would have by truck and sell it far enough in advance to avoid most major discounts. In addition, because we run our own trucks, this movement was accomplished without using the escalated trucking rates that have been affected by many independent truckers. In effect, our trucking rates could be considered obsolete but we're still not running at a loss. After having gone into these semi's, we soon found that they couldn't be self-sufficient or self-supporting unless we had our own shop. We now operate a complete shop with three mechanics and, while we didn't really intend to save a great deal of money or promote profits, we have excluded a great deal of down time by avoiding having trucks in Minneapolis, Fargo, or Bismarck and forcing drivers that want to come home to get hotel rooms. We get in and out a lot quicker.

We hesitated for some time to undertake leased rail cars because of the possible liability incurred in constant monthly lease costs when cars could be sitting at points of embargo which would increase our transportation costs immeasurably. We delayed contracting for these cars until such a time that we felt the major crunch was past and a more even flow of grain movement could better be anticipated. Our transportation program is intended to be a self-controlled portion of our operation and contribute to our general future forecasting to better normalize grain origination and transportation methods for us now, as well as in the future; it is not and was not intended as an unplanned panic program to

relieve the present transportation situation.

Innovations in transportation will come and go. I think the real innovative shipper is a manager who plans very carefully and the company who has the ability to use the presently available and practical forms of transportation. Currently grain movement by pipeline, by air or by other innovative means can be anticipated and should be watched very closely by all of us who are concerned with transporting agricultural commodities. However, while better utilization of existing transportation isn't the newest idea, it is not a bad idea if you are able to make it available to your firm. Producers will become increasingly productive and efficient, exporters will upgrade facilities and marketing methods, railroads will improve techniques, and expansion and improvement are musts for the country elevator. However, unplanned, random expansion could very well result in the wrong facilities at the wrong time without a payout to profit or the maintenance of sufficient capital funds, leaving it useless and underfinanced. Will you improve, or will you not be alive in 1975 or in 1985?

TRUCK TRANSPORTATION IN NORTH DAKOTA

Earl Northrop¹

I would like to say at the outset that I'm possibly the greatest collector of state and federal taxes that you people in this room will get to meet today. I'm going to tell a little bit of a story and then I would like to sum up what I think we need in transportation.

I suppose all of you in this room have heard the story of the good news and the bad news. Well, there was a man who was in a car accident and his right arm was severely injured. After he was healed up and everything, it seemed the arm was shorter. It caused him undue embarrassment because he had to have his sleeve sewed so that it looked like the other one. Well, it seemed in time he went to the doctor and he sat down and the doctor said, "Well, I have good news and I've got bad." He said, "Well, I've had a bad day, I'd sure like to have the good news first." He said, "What is it, Doctor?" The Doctor replied, "The good news sir is that your previously injured arm has grown an inch and a half." He said, "Wonderful! Now tell me, what is the bad news?" The Doctor said, "The bad news is that we found a malignancy." I think this is something we've found in our trucking industry.

I would like to start with the good news. I've been in the trucking industry for 25 years, in free enterprise business for 27 years, I've raised a family, I have a home, and I have gotten no outright subsidy from anyone other than from my own hard work. I think everybody in this room today realizes that we need the railroads, the airlines, the barges, the ships, and that we're living in a time when no more can be done right now until laws are changed for the promotion of transportation. We are living in an era today that no man has ever experienced in regard to the movement of product around our planet.

¹Earl Northrop is Owner, Northrop Dispatch, West Fargo, North Dakota.

Now for the bad news. I think possibly the bad news is that we've picked up a bureaucracy. I am prorated in 13 states to haul livestock, grain, and exempt commodity products. My drivers must carry 62 separate cards that are inspected at every state line. If they don't have the right colored card, they are fined. There's been a new law put into effect, where if you're caught speeding and if you don't have money for the bond, you go immediately to jail. A speeder has now become a criminal. I don't think this is what any of us want. There is basically no uniformity in the states that I travel: weight, lengths, bridge limits, height, width; the height and width, I think, are possibly the most standard, 13 feet 6 inches high and 8 feet wide. The next problem we have is rising costs. As you know, fuel has jumped almost double. I don't know where it is going to stop. I don't know whether it will stop at 60 cents or 70 cents per gallon. Roger Bourn from Scranton mentioned that they had their own shop. I suppose they have their own fuel. I suppose everytime he buys fuel it almost amazes him how much it costs.

Another thing you must all take a look at are the new laws of the U.S. Department of Transportation. The new regulations of the DOT are being made in Washington, and as Forney Rankin mentioned, by people who don't really understand what our problems are out here in North Dakota. I think this is where some of our problems are.

Now I would like to go on and say what I think we need in transportation, or what North Dakota and the Midwest needs. It has come to the point now where everybody in this room must really care. I think we, in the transportation industry, have cared for a long time; the railroads, the trucklines, the barges. But now it's up to all of you to care. I think the trucking industry needs more length, higher gross weights, and additional and new types of equipment so that we might better serve you. Another thing that is so very important is utilization, not only of equipment, but of time. There are 24 hours in a day, six working days in a week, yielding a possible 144 working hours in a week. How do you expect to move your grain when your terminals are open only 40 hours a week? It's almost an impossibility to be open 25 percent of the time and expect to receive and load grain. You are paying your freight rates to me so that I can pay license fees, insurance and taxes whose costs are based on a seven day week. Why can't we use it? There is an energy shortage, yet my trucks have sat in Duluth or some terminal for 24 hours taking 3 gallons an hour to idle. I've seen as many as 500 to 600 of them

sit there for 24 hours and idle. We have to do something about this. Maybe the terminals are full, but I think if we could utilize time and stay open 24 hours a day at certain times, then we could move much more product, and it would be much more economical for me. I've been in the trucking business for 27 years, and not once in this whole time have I ever had the experience of utilizing a piece of equipment 80 percent of the time. I think this is very important to everybody sitting in this room. I can buy a tractor that costs \$30,000, and I can buy a trailer that costs \$15,000 but I only get to use it half the time. What are you going to do? We haul cattle to public markets, which are open 24 hours a day, and one night last fall I came home late at night about 2:30 a.m. and I hadn't been anyplace else. My wife said to me, "Did you have a good day?" I said, "Yes, I guess." She said, "What do you mean?" "Well," I said, "I just figured up before I came home that we're moving 1,112 head of cattle tonight over 15,000 miles and all of the trucks will be back by tomorrow." That's what can be done by utilization. From Fargo to St. Paul is 500 miles and a nice 10 hour run to the terminals. Why not make two trips a day instead of one a day? We ran a little test at the new sunflower plant in Duluth last fall where we kept fresh men on the trucks and they'd run down and come immediately back. You know in five days running to Duluth, and I'll say we ran hard, we delivered 12 loads in five days. Now we're delivering two loads in four days. Enough of that.

Another thing that we should talk about is rates. This is a great big subject and I hate to get into it, but the number one question is rates compared to what? This is like somebody asking me, "How's your wife, Earl?" I said, "Compared to what, how she was when she was 25 or how she is now?" This is like rates. I've trucked cattle out of West Fargo since 1947 and I've had to raise rates during that time. Another point, I haul a cow that weighs 1,000 pounds, and I insure her mortality and her crippling while she is on my truck for \$5.50. In comparison, if I get on Northwest Airlines and fly down to Minneapolis and fly back it costs \$40 and I only wage 700 pounds. My point is that it is difficult to compare rates. Can you compare the rate on wheat with the rate on a product that is packaged? I don't think the rate has very much to do with what we want to get done. I think the most important thing that we can do at this Forum is to solve our problem of movement, and I think we're great enough in this country that the competition will take care of the rate without us worrying about it.

I would like to leave you with one thing: I've been in the trucking business, I've enjoyed it, and if you want me, you call me collect, and if I can make a buck I'll be there!

TRANSPORTATION PROBLEMS AND NEEDS
AS VIEWED BY A STATE SENATOR - FARMER

The Honorable Ernest Pyle¹

Politicians are at a rather low ebb at these times, so I would prefer to say that I'm a farmer rather than a politician. As you know there have been about 25 speeches in this Forum up to this point, each one given by a specialist in his field. My specialty is farming and I love it. I guess my secondary vocation is politics and I'm not as enthused about that as I used to be. However, the assignment given to me by Dale Anderson, was to discuss comments made by various speakers in other sections of the program plus some of my own ideas. Can you imagine a man of Dale Anderson's capabilities asking a politician to make comments about 25 speeches; I've seen politicians spend 20 minutes answering one question and rest assured that's not going to happen here.

We have seen the railroads criticized many times during the Forum; we've heard the railroads commended a few times; and we've heard from people who have new ideas in transportation and aren't afraid to put their money where their mouth is. Sometimes when things don't go as we figure they should, we think all is bad. With the amount of grain that has been moved from this state, as well as other states in the whole country, in the last year and a half, someone must have been doing their work right. It goes without saying that many people made thousands of dollars because they couldn't move their grain exactly when they wanted to. I had some grain that I wish I wouldn't have been able to deliver as soon as I did. I thought the presentation made by the trucking industry was very good; Mr. Rankin from the American Trucking Association made a fine presentation. Earl Northrop, a good friend of mine, always does a good job. I told Earl this morning that I had written my speech and I knew I followed him, so I hoped he did a good job. I

¹Ernest Pyle is the Senator, 22nd District, State of North Dakota and owner and operator of a diversified farm near Casselton, North Dakota.

assure you, I think he did. I'm real sympathetic toward the truck industry, especially the grain haulers. There's an absolute need for grain truckers and I certainly hope that they will be able to compete with the railroads, we need them both. As a politician, if there is one criticism of the trucking industry that I can mention, it would be that they don't have the political organization or political punch that the railroads have or at least seem to have. Mark my word, when there is legislation pending, either for or against railroads, they are there. Another observation I could make regarding grain haulers is that in many cases they are independent businessmen with maybe only one or two trucks, with all of their money and maybe part of the bank's money, tied up in that one venture. With the exception of people like Earl Northrop, most of the time these grain haulers are too busy with keeping the trucks on the road to be able to sit at meetings where their own welfare is at stake. In contrast, I have attended committee hearings, rate hearings, etc., where two or three railroads may each have two or three representatives, plus two or three lawyers to look after their interests. As a result, the railroads usually get what they want. I wasn't going to spank the railroads anymore in this session but I think what I have said is true and it does bother me.

At this Forum we've also heard exciting things about new methods of transporting grain by pipeline and by barge, which of course would be new for our area and apparently is a long way off.

I have talked mostly as a politician so far. I would like to make a few comments as a farmer. For as long as I can remember, we have heard so much about having more railroad cars. If we had as many railroad cars as we all thought we needed at one time or another during the year, perhaps we would have more confusion than we have now. I have one thought that has been going through my mind ever since my son and I spent almost \$50,000 for three new tandem trucks to haul sugar beets for two or three weeks a year: Maybe we could put 500 bushels on one of those trucks and haul it to market. Perhaps though, with the cost of gas and three or four miles per gallon for those trucks, it wouldn't work. Maybe it could be a small factor in determining future grain rates, I don't know.

In closing, let me say that I don't think our grain transportation dilemma in North Dakota is impossible to solve. A lot of bins on farms will be empty by harvest time which should give more flexibility of decisions.

Also, with people like Dale Anderson, Bob Tosterud and their staffs working for all of us, it has to get better. The next time the appropriations for the Upper Great Plains Transportation Institute comes up in the Legislature, why don't some of you people give Dale and Bob some support by coming to Bismarck and appearing at committee hearings in favor of what they are doing for North Dakota agriculture. Remember, agriculture pays most of the bills in North Dakota.

A PRODUCER LOOKS AT OUR NUMBER ONE PROBLEM
"TRANSPORTATION"

Norman Weckerly¹

Good afternoon, I'm happy to be with you today in Bismarck addressing a subject which, in a real sense, is of great interest to all of us here.

The agricultural producer has a genuine interest in transportation from both sides of his operation. Nearly all the inputs, with exception of land and labor, which go into the making of our crops must be transported from some distant point of origin. These inputs, fertilizer, fuel, equipment, herbicides, pesticides, twine and wire, and parts for equipment now come from all places of the globe. A strong, viable transportation system is a necessity to assure the producer the availability of the inputs, on time, to enable him to produce maximum crops needed now in these times of commodity shortages.

Looking on the other side of our operation we need these same transportation services to transport the commodities we raise to the consumers. Timely delivery is a very important part of our marketing structure. Some of us can remember very vividly the problems we have had in the past year filling contracts to deliver grain to Minneapolis, or Duluth, because of the transportation not being available. Many of us as farmers were unable to sell grains because warehousemen could not move grain fast enough out of their elevators due to the shortage of available transportation. Penalties were incurred because of late delivery, thousands of dollars of carrying charges were incurred by country elevators and producers because of the inability of our transportation system to get the job done.

I sometimes think that many of us would rather ignore the problems and challenges of the grain transportation system than to face them. There really is very

¹Norman Weckerly is a grain producer, Goodrich, North Dakota; country elevator owner and operator, Hurdsfield, North Dakota; and Commissioner, North Dakota State Wheat Commission.

little glamour left for transportation today. Certainly the days of railroad building in the U.S. hold a spot in history as our country was being settled. Also the history of barge canals and riverboats opening up new territory seems very exciting. We must marvel at the magnificent system of highways we have built in the last two decades, and the advent of the large diesel trucks which have been developed to complete our surface transportation system. But we seem to take all these things for granted today, and we become irritated when a big truck gets in our way on the busy highway. We complain that the railroad is late on schedule, that they have no cars, and that the ones they do have are not cleaned or coppered.

The long-standing joke among grain shippers is that we open the boxcar door to clean and copper the car and step inside and find ourselves standing between the rails. Many of us find ourselves complaining so much that we do not find time to objectively criticize and try to find workable solutions to the many problems we face.

Most of us here in the country, as producers and grain dealers, like to think of the transportation problem as one of not enough railroad cars. We also react very quickly when we hear of embargoes and unloading elevators at the Lakes, West Coast or the Gulf. "Why don't they do something about it?" It would be just great if there were someone who had all the answers, but I am afraid that the answer of doing something will be slow and uncertain.

There is an expression that applies so appropriately to the progress that is being experienced in the farming business today. When you hear someone say that the only thing constant in our day and age is change, it's easier to understand some of the tremendous strides being made in agriculture today.

We here in the country, I am sure, will be called upon to make many more changes to facilitate the economic and physical strains put upon our transportation system. We producers do find it frustrating that the present management of transportation systems, and the established grain trade seem to firmly resist changes which seem inevitable, instead of providing constructive leadership in these areas. If the grain-train principle, which we hear

so much about, is a more efficient method of moving large volumes of grain, then why do we not have forthcoming a rate proposal which would give us the incentive to handle grain by this method.

When we as producers think of changes we must make to meet the challenge of this period, we must look cautiously at the social and economic impact they will have on our rural economy today. I think that we, as producers in the Upper Great Plains, have adapted quite well to the changes in our rural economy the last 25 years. In fact, I feel that farmers have adapted much more to the changes that have come than most other segments of the economy. It never ceases to amaze me the numbers of people who are afraid of change. I feel that we must accept change as a challenge and also as an opportunity.

If we are expected to press for revitalization of our transportation system, then we must be assured that there is going to be a continuation of present government policy of full agricultural production, with emphasis upon exporting enough to maintain reasonable prices to producers. If we are going to properly service the domestic and international trade, then we must be willing to accept change here in the country which will allow the transportation system to economically move the huge amounts of agricultural commodities which we will raise.

We cannot be expected to make all these changes overnight, nor can the system change this fast. Thus, the reason why none of us have quick answers.

About three years ago I heard one of our politicians make a speech to a bankers' convention. He outlined a program that the future to good economic income in North Dakota was strictly through livestock operations. Now three short years later we have \$5 wheat and \$38 fat cattle -- just the opposite of his prediction. I merely bring this out that I certainly hope this same thing doesn't happen with the need for transportation.

All of us in the agricultural and transportation community are gearing up for all-out production, and most of us are more than willing to accept the changes which are necessary to make this "new ball game" work.

I am, as: 1) a producer of agricultural commodities; 2) a grain and fertilizer dealer; and 3) an independent trucker, very concerned with our number one problem of transportation. I sincerely hope that we can work together to formulate the "New Ideas For the New Era," and then be able to implement them for the betterment of the people of North Dakota and the entire world.

Question and Answer Session for Panel
"North Dakota Reacts"

Question to Mr. Northrop:

Do you think the truck size and weight laws ought to be increased and what is your reaction to the new speed limit and the fuel crisis?

Answer by Mr. Northrop:

In answer to your first question, I think it is very imperative that we somehow come to a conclusion that we can utilize the interstate system for what it was designed to do. In regard to your second question, I can speak basically for my own trucks which are 320's and a '903 horse Cummins, which are V-8's. We also use 350's, 370's, and I have one 250. The big motor came as a result of a DOT announcement in 1969, which said that we must have enough power to pull a gross weight at a speed of 65 miles per hour and maintain that speed at 60. Most of our trucks today are designed to run between 60 and 65 miles per hour. My trucks have to be run in ninth and eleventh gear, and since the 55 miles per hour speed limit came into effect, I can show you in black and white that my fuel consumption has gone up a half gallon to a gallon. My 903's are hovering right around 3.7 to 4 miles to the gallon; if you let them run around 60 or up there where they can cruise in the top hole, you will find that they will run 4, 4.15, 4.25.

Question to Mr. Kottke:

What causes most of your train derailments?

Answer by Mr. Kottke:

I wish I knew what caused most of our derailments. If we knew the answer to that, I guess we could probably wipe derailments out entirely. Derailments are part of the biggest source of concern on our railroad today. We've had some -- we've had some bad ones -- and they have cost a lot of money. When you pound 60-100 pound rails daily with 100-ton cars, and 100-ton cars are in trains that are averaging 7-10 thousand tons apiece, plus 250,000 ton engines, maybe two or three to a unit, and there are several trains moving over these tracks daily, it's bound to do something. We have had a continuing maintenance program. We try to watch the rail with rail detectors that run over the rail periodically. We just don't know. Most of the derailments we have, as I understand, have been the result of broken rails. We wish we didn't have them, because we certainly hate to pick up \$5 a bushel wheat from the ground; it costs us money.

Question to Mr. Kottke:

Please translate your 200 grain cars and present equipment into a picture of how you will handle record crops expected this fall. What are your plans to cope with an even greater volume?

Answer by Mr. Kottke:

The 200 cars are in addition to the 2,000 we already have. This will put our jumbo car fleet to 2,250, give or take a few now and then when we have wrecks. We would like to put into effect a program that would allocate cars to the country and force faster unloading in the terminals. Now this is what you would want to hear in the country, not what the terminals want to hear. But the way we feel about it is that if we could captivate our fleet and have some percentage of it in a continuous turn-around service between the country and the market, we could handle an even greater record amount of grain from North Dakota, western Minnesota, South Dakota, and Montana. We have a car distribution department working in Minneapolis to try to solve the problem. While they don't always come up with the right answers, we can, and I think we will, be able to handle even greater volumes from North Dakota with better car control.

Question to Mr. Avery:

Can you explain the economics of allowing an elevator manager ten hours to load a car and then have it sit on a spot up to a week before picking it up? This is on the mainline with trains going by every few hours.

Answer by Mr. Avery:

Yes, damn poor. Now, I don't know whether this is a regular occurrence but I certainly hope that the people who are responsible for that don't let it happen all the time, and if it happens only occasionally, I can understand it. I would appreciate it very much if the gentleman who asked the question would see me afterwards. I certainly would like to know where the car is, and I think I can get someone to move it or change the practice. We can do one of two things: we can move the car or move the fellow who is leaving it there.

Question to Mr. Avery:

If you were an elevator manager and nailing your own plywood on a cattle car for grain loading and hear about Burlington Northern developing their extensive holdings, would you be angry?

Answer by Mr. Avery:

The answer is very. However, I thought I did explain the erroneous new release. We are providing approximately one acre in a joint venture, and while it hasn't been settled yet, somebody else will put up the money.

Question to Mr. Avery:

Has the Burlington Northern ever considered selling their holdings and buying hopper cars?

Answer by Mr. Avery:

I told you we bought around 4,000 covered hoppers since 1970. We sell holdings almost monthly, and, if the price is right, we'd sell them weekly. However, it is apparently better to the financial people who figure these things out; I can't even handle my own checkbook, never mind the company's finances. The return for the railroad is apparently greater by keeping the investment rather than by selling it outright. Our return from activities other than transportation last year, by the way, was much greater than the return on transportation activities.

Question to Mr. Avery:

Will you say that North Dakota in 1973 received its share or an equitable share of the Burlington Northern grain fleet?

Answer by Mr. Avery:

Yes, it certainly did. I would like to point out one thing here. Mr. Scoggins, in his prepared remarks yesterday, talked about the movement of grain from North Dakota. He showed a terrific increase in 1973 when he combined the Soo Line and the Burlington Northern, then he showed the traffic increase in 1973 over 1972, taking the Soo Line separately. He also went on to show that the Burlington Northern actually had a decrease. Well, that's correct, because I furnished him the figures. But there is a reason for it, and a lot of you here may know about it. Namely, that in February, March and April of 1972, the Department of Agriculture decided to relocate something between 15 and 20 million bushels of hard red spring wheat that were stored in central and north central North Dakota. Approximately 90 percent of this wheat was in elevators served by Burlington Northern. Therefore, in February, March, and April of 1972 we had the three biggest months in the history of the company and almost as much as we had in August 1972, which set an all time record. So what we were trying to do in 1973

was to break a previous record we made system wide: 358,000 car loads of grain in 1973 and around 307,000 in 1972. During these three months in early 1972, when we were setting records hauling grain out of North Dakota, the Nebraska shippers were not shipping, nor were the Montana shippers, Wyoming or Colorado. In fact, there was no wheat moving except the relocation of the wheat within North Dakota, which went to Texas. You can go back and take a look at the market at the time, it will reflect that nothing was moving. Then, when we got into August 1972, everybody was shipping. We found there were elevators calling in and looking for cars which we didn't know existed, and some of them were pretty articulate. Incidentally, but for the sure brilliance, I have never seen one that could beat a North Dakota elevator manager when he was on the phone.

Question to Mr. Avery:

Of the 14,300 hopper cars owned by the Burlington Northern, how many of them are in grain service?

Answer by Mr. Avery:

That's difficult to pin down. We like to think, and occasionally we can even get the statistics to prove it, that of the 14,000 between 10,000 and 11,000 are in grain service most of the year. Sometimes we will go more than that, sometimes we will go less.

Question to Mr. Avery:

At the National Grain and Feed Association meeting on the Transportation Improvement Act of 1974, Secretary Barnum stated that the freight car shortage should come to an end. He went on to say that the Transportation Improvement Act of 1974 provides for \$2 billion in federal loans for financing rolling stock, right of way, terminals and rail plant facilities. What effect will this have on country elevators located on branch lines? Will this financing help your railroad phase out undesirable branch lines?

Answer by Mr. Avery:

No, this will not help us phase out undesirable branch lines. With or without the Transportation Improvement Act of 1974, undesirable branch lines will be phased out. While we have no major program for phasing out undesirable branch lines, if somebody moves out on the mainline, and as a result the branches become very low density, then of course, we would take some action.

I would like to take this opportunity to address myself, if I may, to the availability of funds. We think this is good. We support the policy, or at least the intent, of the Transportation Improvement Act. I don't expect the Burlington Northern will send a representative down to Washington immediately with a bag to get money. We are fairly healthy. We are spending huge amounts of money in our plant, but we would like to see some of the marginal roads get some of these guaranteed loans so that they might contribute to the total car supply. We have just better than 50 percent of our cars on line, and you can go down the whole list and find railroads that are marginal which have 1400 to 1500 of our cars, while we have only 150 to 200 of theirs. Now if they can get this money, improve their plant, get locomotives, and get grain boxes, then it will make a contribution to serving you better in North Dakota.

Question to Mr. Avery:

Aren't the railroads lucky the U.S. Government leaves them alone?

Answer by Mr. Avery:

Well, I don't know. But I wish I had bought some stock in some of the paper industries before we merged, as we have gotten to be their number one customer. Probably 60 percent of what we write is because of U.S. Government regulations. We are regulated even more than I am when I am home.

Question to Mr. Avery:

Is it true that wheat rates from North Dakota will go up 6 cents on May 1?

Answer by Mr. Avery:

It is.

Question to Mr. Avery:

What commodity does Burlington Northern haul which contributes more profit than barley or wheat?

Answer by Mr. Avery:

Taking them separately, I think barley is "bullion from the mint at Denver." Wheat, on the other hand, does not give us the return that many other commodities do. You have to take into consideration that profit comes from time, space, and volume and your investment. If you can only turn a car every 35 days, I don't care if the rate is \$1 a bushel you are still going to lose money on it.

Question to Mr. Bourn:

How many semi's do you run and do you do it with a profit or a loss? What is your cost per mile on your truck fleet? Do you have backhauls on the majority of your truck hauls, and how long is your average truck haul?

Answer by Mr. Bourn:

I can't answer some of these questions. Let me say this. In addition to the eight semi's to which I referred, we have a good deal more rolling stock, including tandems within our feed manufacturing department and other trucks, pickups, and units. We maintain on each of these units a cost center. This cost center includes all interest, taxes, driver costs, fuel costs, and so forth. These costs are assigned to a department to which we refer to as transportation, maintenance and service. We have a manager in charge of this department and also a dispatcher.

I may make one comment on our cost per mile. While I don't recall the figures they are very important. The cost per mile varies distinctly from truck to truck.

We have standardized our semi's with the 290 Cummins. We like that engine and we carry a spare engine. We don't do any in-frame overhauls. If we have a truck that has an engine problem, we pull the engine out, stick the rebuilt engine in and do necessary repairs on the floor of the shop.

We do have backhauls. However, we don't solicit backhauls other than those we use within the company. The reason for this is that trucks can be dispatched all over the country and making a profit from our trucks is not our primary interest. No, the trucks are not profitable, but we haven't sustained losses that are important enough to discount their value. We could make them profitable if we ran them at current trucking rates. I get constant pressure from our manager to do just that. We don't, however, want to go that route because we feel it is impractical as far as our operation is concerned.

Question to Mr. Bourn:

I like your concern for the country elevator. Bravo.

Answer by Mr. Bourn:

For that, I thank you. I have always been country elevator.

Question to Senator Pyle:

What are you doing, as a legislator, to help increase the car supply?

Answer by Senator Pyle:

Well, I think most politicians operate on the theory that you should know a little about everything and not much about anything. I don't know if this is a friendly question or if it is someone from my district. I thought the only one here from my district was my wife. At any rate, I am doing absolutely nothing about the car shortage. I am waiting like all you fellows are. I suppose if I am doing anything it would be that I am supporting the Upper Great Plains Transportation Institute. If they can do it, we'll get them.

CONCLUDING REMARKS BY MR. ROBERT REIMERS

I want to thank all of the people who have participated in this program, particularly those who have spent hours and hours going over what they might say to you people when they got here. Whether they were people for the rails or against the rails or if they were people involved in transportation from Washington, D.C., or people who were involved in the export business on the West Coast, or those in Minneapolis, they deserve our thanks.

I suppose I've probably been one of the worse critics of the rails. I make no apologies for that because I guess I'm not going to quit until things look like we think they ought to look like for the people of North Dakota. I want to say this, though. North Dakota farmers and grain dealers have historically looked to the railroads for their transportation. They are still looking in that direction. The railroads, by the same token, owe us, or at least have an obligation, to keep us informed as to how they are going to handle that transportation. They never did that until somebody came along with a competitive mode of transportation. In North Dakota's case it was the truck. When there were finally enough trucks on the road, the rails took a look at them and said, "Fellows, by golly, we have got to change our ways. They are getting to us." And the rails did just that. That's fair enough. What I'm suggesting is that the development of competition in transportation -- in North Dakota's case it was the trucking business -- has been a very healthy thing for North Dakota agriculture. I make no apologies for what I say. I think the rails should have looked down the road; I don't think they did. However, now I think they are, and I think this kind of a seminar is a very good thing. One other point: There is nothing humorous about something new, whether it be barge traffic where you've got snowballs or whether it be a grain pipeline. While we don't believe you are going to do these kinds of things tomorrow or next year -- we don't know whether you are ever going to do them -- but remember, nothing has changed more rapidly than North Dakota's agriculture, and nothing has changed slower than North Dakota's transportation methods, with the exception of the trucking industry. We are entitled to a better deal than that, and I think we are on the right program now; let's just work a little harder at it. The railroads, in my opinion, have come around a long ways; they are out here and they want to work with us. Fellows, we'll do whatever we can and

whatever is humanly possible. The rails are changing, and working hard at it; I just can't help but to say they are a little late, but they are doing it.

In conclusion, there is no sense in belittling the fact that competition is the major motivation for change in any industry. Competition is what makes you sharp. If you don't have any competition, it's really easy to get lazy.

I want to thank each one of you for coming. You're the people that made this thing work, not the guys up here. These are the guys that came here, that put the effort into it, and we thank them from the bottom of our hearts. We thank you more for coming.