

**AGRICULTURAL TRANSPORTATION ISSUES  
AND RESEARCH NEEDS, A GEOGRAPHICAL  
AND INSTITUTIONAL PERSPECTIVE**

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Introduction

The purpose of this paper is to identify transportation issues and research needs from a geographical and institutional perspective. This is no small task. Indeed, whether transportation issues and research needs can be identified with complete success is doubtful because of the current nature of transportation. Transportation is currently in a state of flux because of such factors as uncertain energy prices and supplies, changing regulatory policy of the federal government, and changing user fee policies. This makes it difficult to identify issues and needs because of the resulting complexity and fast paced dynamic changes which are taking place in today's transportation industries and infrastructure. However, this should not deter or inhibit the effort of trying to identify issues and research needs, indeed it makes the process all that more important. For if research is to be fruitful and of benefit to mankind it must focus on the relevant. If it doesn't the long term future of research will surely be questionable.

I would like to cover four areas of emphasis as suggested by the title which are as follows:

- The Upper Great Plains Transportation Institute, its creation, governance, purpose and a comparison with other transportation research institutes.

- Future transportation issues in the United States as well as the world.
- Research needs from a geographical or regional perspective.
- Research needs from an institutional perspective.

However, before I cover these points I would like to take this time to pontificate a bit about transportation and its role in our socio-political-economic system at the risk of being too basic for such an audience as this.

The most important aspect of transportation to our socioeconomic system on a state, regional, country or world basis is freight transportation of goods and commodities, not personal or people transportation. This is a simplistic concept, however given the level of research funding for the two different areas of transportation I believe that it bears repeating over and over again. Without a demand for freight transportation there is little or no need for personal transportation.

The reason for this is of course trade; without transportation trade cannot occur and without trade the concepts of comparative advantage and relative efficiency would vanish from economic thought. It is not just the physical properties of transportation that provide place, and to some extent, time utility that are important to trade. Equally important is the cost of that transportation, for trade can only occur if the cost of transport is less than the comparative advantage in the cost of production of a good or commodity. (This does not take into account trade barriers and shortages). Thus transportation is the achilles heel of trade and therefore the economic well-being of all the world. If trade does not exist, personal transportation needs would be limited to the region of self-sufficiency and even travel within this area would be limited in such a primitive economy.

I would also like to take a minute to talk about transportation as a discipline or alternatively when it is not a discipline. Some think of transportation as a discipline standing by itself or at least think of it in terms of being a multi-disciplinary or inter-disciplinary subject area. This is appropriate in some cases but transportation can also be thought of as a subset of marketing. Marketing is a broad area which is concerned with provision time, form, possession and space utility. Transportation provides spatial utility and is at least related to time utility. In a more applied sense agricultural marketing involves several activities including country merchandising, cash sales, futures markets, hedging, storage, domestic and export sales, and of course a number of transportation activities which ties these activities together. When considering transportation research concerning the movement of agricultural commodities I think it is appropriate to think of transportation as a subset of marketing, at the same time realizing that transportation is a multidisciplinary animal. It is important to bear in mind the importance of freight transportation to our economy and the integral aspect of transportation in marketing when one considers future research needs and issues in transportation.

#### Upper Great Plains Transportation Institute

The Upper Great Plains Transportation Institute was created by an act of the North Dakota Legislature in 1967 and has been in existence for sixteen years. Thus it is relatively new and young when compared to some other transportation institutes. The Institute is an integral part of North Dakota State University and as such it is ultimately responsible to the administration of the University. Our enabling legislation states that the "Institute shall be administered by and in conjunction with North Dakota State University."

The funding of the Institute comes from a unique combination of sources including state general fund money (54%), Wheat Commission (18%), and other sources including federal funds, highway department, departments of agriculture, etc. The funding of the UGPTI is unique in that a large percentage of its funding is hard money and an additional twenty percent is in the form of block grants from promotional commodity groups.

The purpose of the Transportation Institute is also rather unique among other institutes as well in that the primary objective is to conduct transportation research which facilitates a wider knowledge and understanding of transportation factors which affect the marketing of state and regional products. Thus the Institute confines its research primarily to the area of marketing of agricultural commodities because of the rural and agrarian nature of North Dakota and the Upper Great Plains.

There are at least thirty-two transportation research institutes and centers in the United States and Canada and at least twenty-six research institutes and centers which have a large or small transportation effort. All but eight of these are affiliated with universities. These research centers conduct a broad range of transportation research activities in areas such as mass transit, planning, urban, highway, air and rail safety, aeronautics, pedestrian and bicycle behavior, highway and bridge construction, logistics, policy issues, cost-benefit analysis, energy, and law. The bulk of transportation research seems to focus on personal transportation and the transportation infrastructure, rather than the relationship and role that transportation plays in marketing. One other research body which conducts research in transportation relating to the marketing of agricultural commodities is the Center for Transportation Studies at the University of Manitoba.

The research conducted at the Institute must be nonadversary in nature. This may sound simple enough but in the past it was not always that easy, given the regulatory framework within which rail and truck transportation functioned. Essentially the regulation of transportation was conducted in an adversary quasi-judicial manner prior to the passage of the Staggers Rail Act of 1980. Much of the research conducted at the Institute prior to 1980 was submitted as technical evidence in such quasi-judicial adversary proceedings. As such the Institute was considered in some quarters as being adversary in nature when indeed it wasn't. With the change in the regulatory framework this is not nearly the problem that it once was.

Although the problem of adversary versus non-adversary has diminished significantly there still remains the problem of advocacy. Ideally research projects should not be designed based on advocacy positions because of the potential problems which can arise, namely lack of objectivity. However, when designing a research program which addresses problem areas in transportation many projects are implicitly and sometimes explicitly advocacy in nature, supporting positions such as rate equity, user fee allocation, and market penetration. It must be stressed that great care must be taken that research conducted in such an atmosphere will be as objective as possible. If not conducted objectively a research institute simply becomes an organization through which to funnel money to support the positions of those providing the funding.

#### Future Transportation Issues

What are the future transportation issues is a question that warrants considerable thought. I am not sure that society is capable of identifying future issues since it requires a great deal of foresight,

which seems to be noticeably lacking in the human race, to predict what points of debate or controversy will exist in the future. However, there are existing issues whose impact will be felt in the future that are worthy of discussion.

The most fundamental transportation issue today is not the role that transportation shall have in our economy, but rather how that role shall be achieved. I believe that it is accepted fundamentally that freight transportation and some personal transportation is the facilitator of commerce. Freight transportation in and of itself provides no utility such as the consumption of a bottle of beer, however it does make the consumption of that bottle of beer possible. The great debate in the past twenty years, formally initiated by President Kennedy's message to Congress on transportation in 1962, has been how can transportation's role in our economy be best achieved. Essentially the question boils down to two ends of a broad spectrum of possibilities:

- (1) Should transportation function in a free market economy motivated by profit as co-equals with other industries totally unfettered by Government or;
- (2) Shall transportation be regulated by government to decide issues of equity, service and discrimination, and/or ownership of infrastructure.

It appears that we as a country are moving or have moved from somewhere in one half of the spectrum favoring government monitoring and intervention to the other half of the spectrum which relies on the free market economy and the forces of competition to provide adequate transportation to meet the needs of society. This movement was in large measure due to the failure of the Interstate Commerce Commission to appropriately (in my perception) regulate the truck and rail transportation industries.

The rail industry was in economically tough shape until recently, characterized by low rates of return on investment, deferred maintenance, bankruptcy of major class I railroads and poor service. I personally question if this was due entirely to federal regulation. A historical observation of the physical productivity per dollar of wages paid in railroad industries suggests at least some other problems.

The regulated trucking industry on the other hand was probably the product of overzealous protection characterized by franchises which became valuable pieces of property and institutionally restricted entry. This is a bit hard to rationalize from an economic point of view when one considers the ease of entry, the public right-of-way, and technological ease of operation associated with the trucking industry. This of course contrasts significantly with the rail industry. It should be noted that the impetus for this shift in policy came in large part from the economics profession and as such should hold a unique interest for us.

The issue yet to be resolved is whether transportation will best serve the remaining sectors of our economy in a less regulated environment. I doubt that a single answer or generalization will adequately address this issue because of the difference in economic characteristics of the different modes. In my opinion the trucking industry can function in a near totally deregulated environment, with some reservation and concern about LTL freight. I am not nearly as confident about the railroad industry. It is at the very least a unique time for observation and study of the various transportation industries by economists.

Another issue facing the railroad industry and rail shippers is the merger of the various rail companies into four to seven large

companies and the resulting potential for balkanization of the country. As with all issues this contention is difficult to prove or disprove. However, the possibility is real enough to provide incentive to monitor the situation closely. Whether smaller regional roads, or product, geographic and intermodal competition will prevent the country from evolving into distinct geographic economic units which cannot be integrated as a result of large rail transportation companies remains to be seen.

Another emerging national issue is the effect of intermodal transportation companies. With the potential elimination of regulation which prevents common ownership of transportation firms of different modes we are experiencing acquisition of trucking and barge firms by railroad companies. Will large intermodal transportation companies which operate several different modes emerge as a result of this possible change in policy and, if so, what will be the consequences. At first glance, it appears that there is a magnificent opportunity for logistical coordination, using the most efficient and appropriate mode for specific transportation needs and the overall potential for improved service along with increased efficiency. No doubt the potential is there. The nagging question is: is there also potential for reduced competition between modes which could result in shippers becoming captive to a horizontally integrated transportation firm? There is a potential for elimination of truck/rail and truck/barge/rail competition with the emergence of such firms.

Cargo preference seems to be a perennial threat to competitive ocean shipping, however, in the past few years it has support from international quarters as well as national interests. The United Nation's Code of Linear Conduct (UNCTAD Code) would apply cargo

reservation policies at the international level which would result in a 40-40-20 split of ocean traffic. Forty percent each for the trading partners participating in the conference and 20 percent of the traffic for third flag operators. In addition to the international movement for cargo reservation there seems to be a greater push for cargo preference legislation at the national level. The cost of cargo reservation would be significant to bulk shippers which would ultimately have a negative impact on the agricultural sector.

Another issue which has particular interest to North Dakota and Montana, with implications for everyone with concern for the grain marketing system, is the influence that rail firms will have on shaping the grain marketing system. Railroads have the power to shape the grain marketing system by manipulation of rate spreads between different types of service. By pricing appropriately, the railroads can and have dictated the lot sizes of buying and selling grain and oilseed. On the surface this would appear to be consistent with sound management practices. However, this is not necessarily the case. Rate spreads have been developed in the past between 26 and 52 car service to the Pacific Northwest much in excess of the efficiencies achieved as the result of the larger shipment. Spreads as large as 24 cents/cwt. existed at times in the past when cost differentials of only a few cents could be identified (six to nine cents). Thus the railroad firm in an effort to encourage subterminal development, was experiencing a paper loss. Such a pricing policy would influence the size of shipment and of course the number of country merchandising facilities. This has immediate implications for public road and bridge conditions and costs, and farm to market truck costs. Longer run concerns about changes in rail pricing policy and competition in country grain merchandising also exist.

A final issue I would like to briefly cover is one of rail contracts and the potential for resulting discrimination. Contracts for rail service were legalized by the Staggers Rail Act and have proliferated in the past two and one-half years since passage. The potential for person discrimination as well as commodity and place discrimination is overwhelming. I believe this is true even in light of the provisions for agricultural contracts in the Staggers Act because of the secrecy of the terms of the contract being maintained by the present Interstate Commerce Commission. Whether such discrimination will take place on a broad scale remains to be seen, but it already has taken place on a limited basis. The impact of such discrimination is also speculative, but the potential negative impact on the grain marketing system should encourage us all to watch and observe carefully and debate the issues when and if they become more clearly defined.

#### Research Needs from a Geographical Perspective

Agricultural commodity transportation research needs from a geographical perspective are conditioned by several different factors which are as follows in no order of significance:

- The modes which serve a region or area.
- Whether the region is a net exporter or importer of agricultural commodities.
- Does the region produce commodities which depend heavily on export markets?
- Alternatively, does the region depend primarily on domestic markets?
- Distance from point of production to export position or domestic market.

- Imbalance of traffic between the region and other regions of the United States.
- Whether processing takes place within the region.

This list of factors is certainly not all inclusive but it does include some of the major factors that condition research needs.

The modes which serve a region certainly dictate research needs because much of the research that is conducted is modal in nature, e.g. the study of the railroad, truck or barge industry. It would be difficult to justify a large expenditure of research dollars on a mode which did not serve the region.

If a region is a net exporter it originates traffic and, if a region is a net importer, it terminates traffic. Although these problems seem, and to some extent are, similar there are transportation differences. The net exporter is looking for the broadest possible range of domestic and export selling possibilities. The net importer is looking for the broadest range of buying opportunities which are limited primarily to domestic sources of supply. Transportation is the key to providing each alternative but it is done in different manners because of the export factor and because importing regions are sometimes served by one major regional railroad such as the Northeast.

Commodities which move into export channels sometimes do so much more expeditiously than those that move into domestic channels. Also, there are no intermediate stops for processing for agricultural exports of bulk grains and oilseeds. The transportation characteristics and need are generally different.

The distance which commodities have to move to domestic or export market determine in large part the transport costs. Thus the more distant producing regions are, the more locationally disadvantages when compared

to closer regions. Transportation becomes a larger portion of the marketing bill for such regions and thus determines the relative amount of research, if not general areas of interest.

The imbalance of traffic has implications for individual mode changes and viability. If there is an imbalance of traffic, rates will tend to be higher and economic viability of modes will tend to be reduced, thus creating certain research needs.

Domestic processing within a region demands special transportation needs as opposed to raw commodity movements. This will also condition research needs.

There are many specific needs, from a geographic point of view, for the Upper Great Plains and West. One of the more important needs is to determine if geographic or product competition, and market competition, will maintain a transportation system which serves shippers in an equitable manner or will it result in captive shippers which find themselves at the mercy of one transportation firm. A related research need is what constitutes a captive shipper and how can that be determined empirically. At present there is not a good application of theory on under what conditions we can identify a captive shipper.

Another research need is how transportation is influencing our agricultural marketing systems. Do changes in rate structures, transit provisions, rate spreads, and service influence our agricultural marketing system? There is no question in my mind that they do and from my perspective the succeeding question is who benefits and/or loses from such changes. Our traditional marketing system will undergo significant changes in the future as a result of transportation, e.g., rates bypassing traditional markets and rate spreads favoring certain types of shippers. It would be useful for several interest groups to understand the significance of such changes.

Another research need from the perspective of the West and Upper Great Plains is how increasing transportation costs have and will impact on the comparative advantage of the regions in producing agricultural commodities. Because of the distance to export and domestic markets, increasing transportation costs will continue to have a negative impact on economic viability. I believe it is necessary not only to be aware of this but to be capable of measuring it. Still another research need is to determine how the grain marketing system will adjust to the increased risk and uncertainty introduced as a result of rail deregulation.

Other research needs in bullet form are as follows:

- Use of the Trucking Exemption by Cooperatives.
- Changing Country Grain Merchandising System.
- Rail Burden Study of Grain Producing Regions and Commodities.
- Changes in Patterns of Grain Movements and Corresponding Export, Port and Domestic Handling Capacity Needs.
- Energy Considerations in Transportation.
- Stability, Costs, and Characteristics of the Exempt Motor Carrier Industry.
- Transportation Needs of Domestic Sunflower Processors and Wholeseed Merchandisers.

#### Transportation Research Needs from an Institutional Perspective

Transportation research from an institutional perspective is guided in part by the sources of funding. If a state, an agency within a state, or a private sector firm provides funding for a research program they will expect problem areas relevant to them to be studied. At the state level the direction in program will be the least directed while at the private, and sometimes, the agency level, the director in research will be quite specific. Funding sources do provide some

direction in the development of a research program, and thus answer partially the question of research needs from an institutional perspective, but they should not dictate with a great degree of specificity the nature of the entire research program. There needs to be a balance between research which is problem solving oriented and pragmatic in nature and research which is conducted for the sake of expanding a body of knowledge, developing baseline information and developing individual expertise.

From the transportation institute perspective a balance must be maintained, for both are necessary if the institute is to remain viable. The more pragmatic problem oriented projects are many times very dependent on the longer term research program motivated by a desire to understand transportation and the role it plays in our economy.

Now that we've taken a look at a somewhat fractured crystal ball I would like to repeat a statement attributed to Paul Samuelson concerning two fundamental laws of economics. They are: economists cannot predict the future with accuracy, and -- neither can anyone else.