

***MARKET DOMINANCE DETERMINATIONS AND THE
USE OF PRODUCT AND GEOGRAPHIC COMPETITION:
A VERIFIED STATEMENT BEFORE THE
SURFACE TRANSPORTATION BOARD***

John D. Bitzan
Denver D. Tolliver

July 1998

ABSTRACT

On April 29, 1998, the Surface Transportation Board (STB) opened a proceeding to consider elimination of the consideration of geographic and product competition from its market dominance guidelines for rail rates. This publication includes the Verified Statement of John Bitzan and Denver Tolliver in this proceeding.¹

Before a rate can be challenged under the maximum reasonable rate guidelines established by Ex Parte 347, it must first be determined that the STB has jurisdiction over the movements in question. Currently, the STB considers four factors in its determination of market dominance: intramodal competition, competition between railroads at the same general location; intermodal competition, competition between railroads and other modes; geographic competition, competition between railroads able to supply the same product to a destination, but originating at different sources, or competition between railroads able to ship an originating product to different destinations; and product competition, competition between railroads at different locations in shipping substitute products.

Because of the large burdens placed on shippers from responding to railroad statements of geographic and product competition in market dominance proceedings, and because of the potential inconsistency of burdensome market dominance guidelines with the STB's recent efforts to make rate challenges more accessible to small shippers, the STB has opened this proceeding. In our Verified Statement, we argue that geographic and product competition should be eliminated

¹The verified statement of Bitzan and Tolliver was submitted with the filing by the North Dakota Public Service Commission, the North Dakota Wheat Commission, and the North Dakota Grain Dealers Association.

from consideration in market dominance proceedings. Reasons for eliminating geographic and product competition include: (1) their consideration places an unnecessary burden on small shippers, (2) their consideration is contrary to the purpose of market dominance proceedings, (3) they are difficult to quantify, (4) their consideration is redundant given that revenue-cost ratios are already considered, (5) their use may lead to erroneous inferences about price competition, (6) the existence of geographic and product competition are empirical issues, and (7) exclusion of geographic and product competition from the market dominance phase does not preclude their use in rate reasonableness proceedings. Since most of the problems also apply to using intermodal and intramodal competition in determining market dominance, we believe that the revenue to variable cost ratio should be the sole determinant of market dominance.

TABLE OF CONTENTS

INTRODUCTION	1
STATEMENT	2
Consideration of Geographic and Product Competition in the Market Dominance Phase Places a Large Burden on the Small Shipper and is Contrary to the STB's Goal of Creating an Even Playing Field for Small Shippers.	3
The Purpose of a Market Dominance Proceeding Implies the Need for Simplified Decision Criteria.	4
Geographic and Product Competition are Difficult to Quantify and Frequently are Based on Judgement Rather than Data.	5
Evidentiary Statements Regarding Geographic, Product, Intramodal, and/or Intermodal Competition Do Not Provide Additional Information Beyond that Already Provided by Revenue-Cost Ratios.	6
The Use of Multiple Related Criteria May Lead to Erroneous Inferences about Price Competition Due to Simultaneity of Price and Market Share.	8
The Effectiveness of Geographic, Product, and Intramodal Competition are not Theoretical Issues, but Empirical Issues — It is Difficult to Predict the Pricing Behavior Resulting from Oligopoly Rivalry.	9
Determinants of Oligopoly Price	10
Price Competition between Railroad Firms with the Same Costs	11
Price Competition between Railroad Firms with Different but Similar Costs	11
The Role of Multiple Market Competition in Determining Oligopoly Pricing Behavior	11
Increases in the Number of Firms in an Oligopoly Setting do not Necessarily Mean Decreases in Price.	13
Summary of why Geographic, Product, and Intramodal Competition are not Theoretical Issues, but Empirical Issues	14
The Market Dominance Phase is only a Preliminary Stage, and the Exclusion of Geographic and Product Competition from this Phase does not Preclude Their Use in the Rate Reasonableness Stage.	14
CONCLUSION	16
APPENDIX A: Example of Potential Tacit Collusion in an Oligopoly Setting	17
APPENDIX B: Vitae of Bitzan And Tolliver	20

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

EX PARTE NO. 627

**MARKET DOMINANCE DETERMINATIONS
– PRODUCT AND GEOGRAPHIC COMPETITION**

VERIFIED STATEMENT

OF

JOHN D. BITZAN AND DENVER D. TOLLIVER

INTRODUCTION

John Bitzan is a research economist at the Upper Great Plains Transportation Institute at North Dakota State University. He holds a Ph.D. in economics, with specializations in industrial organization and labor economics, from the University of Wisconsin-Milwaukee and has completed a postdoctoral fellowship at Northwestern University. Bitzan has more than eight years of research experience in areas such as railroad cost and industry structure, railroad pricing, and railroad operations and efficiency. He has presented testimony before the Surface Transportation Board on previous occasions. Bitzan's educational and research qualifications are detailed in the appendix.

Denver Tolliver is a research scientist and adjunct professor of civil engineering at North Dakota State University. He holds a Ph.D. in Environmental Planning from Virginia Tech and has 18 years of experience in transportation research, education, and consulting. During his career, Tolliver has filed 20 verified statements with the ICC or STB (appendix).

For reasons discussed in this statement, we urge the Board not to consider geographic and product competition as potential market dominance criteria in future proceedings. Furthermore, it should no longer consider intramodal competition as a potential market dominance indicator. Instead, the Board should primarily rely on the revenue-to-variable cost percentage, which reflects the presence or absence of **effective** competition for a movement.

STATEMENT

In this statement, we address the desirability of including geographic and product competition in the determination of market dominance. We conclude that geographic and product competition should not be considered in market dominance proceedings, for the following reasons:

- Consideration of geographic and product competition in the market dominance phase places a large burden on the small shipper and is contrary to the STB's goal of creating an even playing field for small shippers
- The purpose of a market dominance proceeding implies the need for simplified decision criteria
- Geographic and product competition are difficult to quantify and frequently are based on judgement rather than data
- Consideration of geographic and product competition is redundant for determining market dominance, as they do not provide additional information beyond that which is provided by revenue-cost ratios
- The use of multiple related criteria may lead to erroneous inferences about price competition due to simultaneity of price and market share
- The effectiveness of geographic and product competition are not theoretical issues, but empirical issues, suggesting that the theoretical arguments as to why effective competition is realized in a market are not useful
- The market dominance phase of a rate case is only a preliminary stage, and the exclusion of geographic and product competition from this phase does not preclude their use in the rate reasonableness stage

Most of these arguments also apply consideration of intramodal and intermodal competition in market dominance proceedings. Therefore, we believe that the exclusion of intramodal and intermodal competition from this stage of a rate inquiry would be beneficial, as well.

The remainder of the statement explains each of the reasons for the elimination of geographic and product competition from the market dominance phase of rate consideration.

Consideration of Geographic and Product Competition in the Market Dominance Phase Places a Large Burden on the Small Shipper and is Contrary to the STB's Goal of Creating an Even Playing Field for Small Shippers.

Recently the Surface Transportation Board adopted simplified guidelines for non-coal rail rates, in order to provide small shippers with a reasonable means of challenging rates. In adopting the procedures, the STB correctly recognized that small shippers do not have the resources necessary to pursue lengthy and data intensive rail rate cases. The use of geographic and product competition in the market dominance phase of a rate case is contrary to the STB's efforts to reduce the burden of such proceedings on small shippers with limited resources.

Although the burden of proof for geographic and product competition is on the railroad, shippers feel compelled to respond to railroad statements and are required to respond to railroad discovery. Because small shippers do not possess the same market information and resources as large railroads, the cost of acquiring the necessary information to respond to railroad statements regarding these types of competition is much higher for small shippers than the cost to the railroad of identifying potential geographic and product competition. Thus, the use of geographic and product competition in the market dominance phase of a rate case may inhibit small shippers from pursuing a complaint.

The consideration of geographic, product, intramodal, and intermodal competition in a market dominance proceeding creates a paradox for the small shipper. Given the **simplified** small shipper rate reasonableness guidelines adopted by the Board, it is possible for a small shipper to expend more time and money in a market dominance proceeding than in the rate reasonableness phase of a case. This is an illogical and contradictory outcome given the intent of the small shipper

guidelines and the limited purpose of a market dominance proceeding—which is simply to determine whether the Board has jurisdiction to review the reasonableness of a rate.

The Purpose of a Market Dominance Proceeding Implies the Need for Simplified Decision Criteria.

The only purpose of a market dominance proceeding is to determine whether the Board has jurisdiction over the rate in question. A finding of market dominance has no impact in the reasonableness phase of a rate complaint. U.S.C. 49 § 10707 clearly states that “a finding of market dominance does not establish a presumption that the proposed rate exceeds a reasonable maximum.”

Decision criteria should reflect parsimony in cases where multiple variables essentially measure the same effects. The minimal number of essential decision variables or criteria should be used to provide information relevant to the decision.

Given the limited and clearly-defined purpose of a market dominance inquiry, the use of geographic and product competition is not necessary and goes against the purpose of the entire market dominance phase. If most of the evidence is going to be placed on the table at the market dominance stage, the need to proceed with a rate reasonableness hearing is diminished. Also, as discussed later, consideration of geographic and product competition could result in misleading inferences about the effectiveness of market pricing constraints.

Geographic and Product Competition are Difficult to Quantify and Frequently are Based on Judgement Rather than Data.

Criteria such as the R/VC percentage and market share are easy to quantify and interpret. In contrast, the presence and intensity of geographic and product competition are difficult to quantify. Frequently the Board must sift through and evaluate judgmental and conflicting statements by expert witnesses. Isolating the effects of geographic and product competition from among a vast pool of market forces is a daunting task.

A statistical analysis of the intensity of geographic and product competition would require disaggregate shipment and rate data from several markets and several time periods. Shippers are at a disadvantage because they do not have ready access to information about the shipment frequencies and rates of potential substitutes, or information about rates on movements from competing supply regions. It is especially difficult for a small shipper to rebut a large railroad's detailed evidentiary statement and expert witnesses. Finally, while geographic and product competition are possible in theory, accurate measurement of the effects is nearly impossible given the many market and environmental forces that affect railroad rates.

The key decision information needed in a market dominance case is whether geographic and product competition constitute *effective* constraints on railroad pricing. It is extremely difficult for the Board to ascertain this information from judgmental, conflicting statements or from statistical analysis based on poor data.

Evidentiary Statements Regarding Geographic, Product, Intramodal, and/or Intermodal Competition Do Not Provide Additional Information Beyond that Already Provided by Revenue-Cost Ratios.

In Ex Parte No. 320 (Sub-No. 2), the Interstate Commerce Commission states: “Effective competition from other carriers or modes of transportation, for the traffic to which a rate applies means that, if a carrier raises the rate for such traffic, then some or all of that traffic will be lost to other carriers or modes.” This suggests that the ultimate determination of effective competition, and therefore market dominance, should rest on the pricing behavior of railroads. Since reliable estimates of price-cost margins already are available for the railroad industry, additional theoretical information on the degree of competition is redundant and irrelevant. Theoretical arguments should not take the place of solid evidence regarding the presence or absence of market dominance.

A R/VC percentage of 180 already is used in rate regulation. U.S.C. 49 § 10707 requires that the Board, in making a market dominance determination, “shall find that the rail carrier establishing the challenged rate does not have market dominance over the transportation to which the rate applies if such rail carrier proves that the rate charged results in a revenue-variable cost percentage for such transportation that is less than 180 percent.” The Board uses the same R/VC percentage when computing the Revenue Short-Fall Allocation Method (RSAM) ratio, a potential indicator in small shipper rate reasonableness cases. In this instance, a R/VC percentage of 180 is used as a threshold that separates captive and competitive traffic.

As Table 1 shows, the current cost markup ratios for most railroads are less than 1.5. Therefore, a rate that results in a R/VC percentage of 180 not only recovers variable cost, but a percentage allocation of common and fixed cost and a return on investment equal to the current cost of

capital, plus some element of surplus profit. Assuming URCS long-run variable cost estimates are proxies for marginal cost, a rate which yields a R/VC percentage of 180 is substantially above marginal cost. Thus, by definition, the movement is not subject to effective price competition.

Table 1. Constant Cost Markup Ratios for Class I Carriers in 1996

Railroad	URCS 1996 Constant Cost Markup Ratio
BNSF	1.3858
Conrail	1.4118
CSX	1.3912
IC	1.5149
KCS	1.4938
NS	1.4265
Soo Line	1.4568
SP	1.3563
UP	1.3324

The Use of Multiple Related Criteria May Lead to Erroneous Inferences about Price Competition Due to Simultaneity of Price and Market Share.

Frequently, competition for a given rail movement is assessed by examining market share. A market share analysis may include examinations of intramodal, intermodal, and geographic and product competition. Geographic and product competition can be thought of as variants of intramodal competition. In the case of intramodal competition, railroad firms are competing in the same general location to transport a given commodity to market, while in the case of geographic and product competition they are competing at different locations to transport a similar commodity to market. In essence, geographic and product competition represent railroads competing over broader markets.

Supposedly, a market share analysis shows whether a railroad dominates a particular market, however it is defined. One problem with this type of analysis is that the behavior of the railroad (e.g.,

the way it prices) affects market share. If a railroad attempts to increase its market share by undercutting a competitor, the resulting increase in market share apparently would show an increase in market dominance. In contrast, the market shares of competitors in a collusive arrangement would be lower, although competition is not effective. Any attempt to imply causality from market share to pricing is tenuous, at best.

The Effectiveness of Geographic, Product, and Intramodal Competition are not Theoretical Issues, but Empirical Issues — It is Difficult to Predict the Pricing Behavior Resulting from Oligopoly Rivalry.

Economic theory does not provide a unique prediction about the way that price will vary with different levels of market concentration in an oligopoly setting. Predictions vary based on: 1) whether firms are competing in quantity, price, or some other variable; 2) the degree to which firms value future profits in relation to current profits; 3) the relative cost structures of the firms; 4) the timing of firm decisions; and 5) a variety of other factors. Moreover, since market concentration not only influences firm behavior, but is influenced by firm behavior, one cannot use simple correlations between price and concentration to show a causal relationship.

Because of the wide array of predictions derived from oligopoly models regarding the pricing behavior of firms, railroad market concentration cannot be used to infer railroad price. Thus, the usefulness of railroad market concentration in making an assessment of market dominance is extremely limited. This section of the statement shows the wide variety of pricing implications derived from an oligopoly model where firms compete in price and highlights the plausibility of implicit collusion as a likely outcome. As noted earlier, an examination of the

relationship between market concentration and pricing is equally applicable to geographic, product, and intramodal competition.

Determinants of Oligopoly Price

The well-known “Folk Theorem” asserts that in repeated interaction between oligopoly firms, any price above marginal cost and less than or equal to the monopoly price is an equilibrium, as long as firms do not discount the future too heavily. In order to understand the reason why any of these prices can be an equilibrium, some background in oligopoly price competition is necessary.

Under certain assumptions, such as perfect information and zero capacity constraints, if identical oligopoly firms simultaneously compete in price for only one period, they will each set price equal to marginal cost. This is the case because each firm knows that its rival can capture the entire market by setting a price slightly lower than that firm’s price. The only price at which rivals cannot undercut to capture the entire market is at marginal cost. This result is known as the Bertrand Paradox. In an infinitely repeated interaction, however, firms can observe the actions of rivals in previous periods and know that their actions in each period will affect the actions of rivals in future periods. In this case, collusive behavior is often the best strategy for rival oligopoly firms, because any attempts at undercutting rivals to realize a short-term gain will likely lead to long-term price competition. Frequently, the costs of long-run price competition outweigh the short-term benefits of a price reduction by any firm.

Price Competition between Railroad Firms with the Same Costs

While there are many possible equilibria in an infinite repetition of price competition, implicit collusion appears to be the most likely outcome when the cost structures of oligopoly firms are the same. This is the case because firms realize: (1) the long-term consequences of attempting to extract a short-term gain at the expense of rivals and (2) that the optimal coordination solution from each firm's perspective is to charge the monopoly price. Thus, although explicit coordination does not take place, firms are able to implicitly collude by charging the monopoly price.

Price Competition between Railroad Firms with Different but Similar Costs

When the costs of firms are different, but cost structure is similar, coordination still is a likely outcome. Markham (1985) identifies five properties of industries where collusive price leadership is most likely to occur. These are: "(a) the industry is tightly oligopolistic, (b) sellers' products are close substitutes, (c) cost curves are similar, (d) there are barriers to entry of new rivals, (e) demand for the industry's output is relatively inelastic."² All of these characteristics apply to the U.S. railroad industry, suggesting the plausibility of implicit collusion.

The Role of Multiple Market Competition in Determining Oligopoly Pricing Behavior

Another characteristic associated with the railroad industry, which suggests tacit collusion is a likely outcome, is the presence of the same railroad competitors in multiple markets. An example will show how competition in multiple markets can make tacit collusion more likely.

²From Scherer, F.M. and David Ross, *Industrial Market Structure and Economic Performance*, 3 ed. Boston: Houghton Mifflin Company, 1990, p. 249.

Suppose that the BNSF in competition with the UP/SP decides to decrease its rates in hauling wheat from Kansas to the West Coast. While it may gain an advantage in this market, the UP/SP is likely to retaliate in other markets by lowering the price of transporting Nebraska wheat and corn to various markets, Illinois corn to various markets, Texas wheat to various markets, Iowa corn to various markets, and other commodities. Knowing the UP/SP's potential reaction creates an incentive for the BNSF to maintain the collusive price in markets where it competes with the UP/SP. Likewise, this knowledge acts as an incentive for UP/SP to maintain a collusive price in such markets.

Interestingly, the incentive for railroads to maintain a collusive price when they are competing in multiple markets can serve as a conflicting theoretical argument to the effectiveness of geographic and product competition. In the example highlighted above, the theoretical argument for geographic competition would suggest that the price of BNSF in shipping wheat to the west coast from Kansas should be limited, since the receiver on the west coast could purchase a similar wheat from Texas, which is served by the UP/SP. However, the presence of BNSF and UP/SP in both markets also raises the possibility of an incentive to collude.

Since both arguments are theoretically sound, the resolution about which effect will dominate is an empirical matter and will likely differ on a case-by-case basis. This suggests that the only means to examine whether market dominance exists is the revenue/cost ratio. If geographic and product competition are "effective" the lack of market dominance will show up in this ratio, while if they are outweighed by some tacit collusive effect of multiple market competition the revenue/cost ratio will reflect a lack of "effective" competition.

Increases in the Number of Firms in an Oligopoly Setting do not Necessarily Mean Decreases in Price.

When oligopoly firms compete in price, the likelihood that firms can collude in an oligopoly setting decreases with increases in the number of firms, but collusion is still quite plausible. In an infinitely repeated interaction between oligopoly firms competing in price, there are three ways that an increase in the number of firms can reduce price. These are: (1) as the number of firms in an oligopoly rivalry increases, the profit per firm from splitting the monopoly profit decreases, decreasing the cost of being punished for not cooperating with other firms and increasing the benefit of cheating, (2) the focal point for a coordinated price is less obvious, and (3) monitoring cheating is more difficult.

However, the last two ways that an increased number of firms can reduce price are not very applicable to the U.S. railroad industry. First, the focal point for a coordinated price often is obvious due to the long pricing traditions in the industry. Certain firms have been the leaders in the past and continue to be the leaders. Moreover, the costs of the various firms are well known by those inside and outside the rail industry. Second, monitoring is not difficult, particularly for agricultural products, due to the public availability of tariff rail prices, special service programs, and the reporting requirements for agricultural contract rail rates.

This leaves us with one reason why railroads may reduce prices with an increased number of firms — the reduced incentive to cooperate due to a lower per period profit from cooperation and a higher gain to cheating. However, it can be shown that as long as the discount factor that firms apply to future profits exceeds $1-1/n$ (where n is the number of firms), then collusion is sustainable. In the case of three railroads, this means that the discount factor must exceed $2/3$. For

the discount factor to be less than $2/3$, railroads would have to apply a discount *rate* of more than 40 percent.³

Summary of why Geographic, Product, and Intramodal Competition are not Theoretical Issues, but Empirical Issues

This section has highlighted the indeterminacy of oligopoly theory in pricing behavior, by showing that there are an infinite number of possible outcomes from oligopoly rivalry. The section also showed the plausibility of a collusive outcome and the potential for oligopoly firms to charge the monopoly price.

Because the theoretical arguments do not provide clear implications for the effects of market concentration on pricing, the use of such arguments in market dominance proceedings does not appear useful. In terms of railroad market dominance guidelines, intramodal, geographic, and product competition can all be thought of as arguments affecting market concentration. Because the ultimate measure of the effectiveness of competition is already present — the revenue/cost ratio — and because such additional measures attempt to determine the degree of pricing power owned by railroads, they add nothing to the determinance of market dominance.

The Market Dominance Phase is only a Preliminary Stage, and the Exclusion of Geographic and Product Competition from this Phase does not Preclude Their Use in the Rate Reasonableness Stage.

It is important to recognize that the elimination of geographic and product competition from the market dominance phase does not preclude their use in the rate reasonableness stage. It is

³The discount factor is defined as $\delta=e^{-r}$

perfectly legitimate to include this type of evidence in the rate reasonableness stage. However, this evidence is not necessary to determine whether the STB has jurisdiction over a particular rate.

CONCLUSION

In summary, we believe that geographic and product competition should not be considered in market dominance proceedings. The reasons for this belief are: (1) their consideration places an unnecessary burden on small shippers, (2) their consideration is contrary to the purpose of market dominance proceedings, (3) they are difficult to quantify, (4) their consideration is redundant given that revenue-cost ratios are already considered, (5) their use may lead to erroneous inferences about price competition, (6) the existence of geographic and product competition are empirical issues, and (7) exclusion of geographic and product competition from the market dominance phase does not preclude their use in rate reasonableness proceedings.

To facilitate the simplest possible method for determining market dominance, we recommend the exclusive use of the revenue-to-variable cost ratio. Most of the problems with using geographic and product competition as determinants of market dominance also apply to intermodal and intramodal competition. Thus, given the fact that a rate generating a revenue-to-variable cost ratio below 1.8 cannot be challenged, a rate generating a R/VC of 1.8 or higher should be subject to challenge without the introduction of complex factors such as geographic, product, intermodal, and intramodal competition.

APPENDIX A

EXAMPLE OF POTENTIAL TACIT COLLUSION IN AN OLIGOPOLY SETTING

An example of two railroads competing in price in a given market (intramodal competition) will show why potential collusion is possible.

Example of Price Competition between Two Similar Railroad Firms

Suppose that railroad A and railroad B compete in the same market, with identical cost structures. Each firm would like to maximize the present discounted value of profits, as follows:

$$\sum_{t=0}^{\infty} d^t p^i(p_{it}, p_{jt}), \text{ where } d = e^{-r} \text{ is a discount factor and } r \text{ is the rate of interest}$$

With the same cost structure for each firm, an obvious focal point⁴ for profit maximization would be to charge the monopoly price, as in a collusive agreement. Suppose each firm plays a trigger strategy, where it charges the monopoly price as long as its rival does in the previous period, but charges a price equal to marginal cost into the infinite future once its rival attempts to charge a lower price. Further, assume that each firm knows the other's strategy and that it knows that the other knows its strategy, ad infinitum. Although each firm may be able to gain in the short-run by undercutting the rival's price, it knows that the long-run benefits of doing so are probably outweighed by the long-run costs. Each duopoly firm compares the benefit of undercutting its rival to the cost, as follows:

Firm A knows that if it cooperates by charging the monopoly price for infinity, Firm B will also cooperate, and A will realize a profit of:

⁴A focal point is a combination of strategies by the rival firms that stand apart from the rest as "obvious" solutions. They often occur due to symmetry or optimality and are necessary to choose a solution from the wide array available according to the Folk Theorem.

$$\frac{p^M}{2}(1 + d + d^2 + d^3 + \dots)$$

However, if Firm A undercuts Firm B by ϵ , it will realize a profit of nearly:

p^M for one period, but then zero for all future periods.

If $\frac{p^M}{2}(1 + d + d^2 + d^3 + \dots) > p^M$ then the firm will cooperate infinitely.

This implies that the firm will cooperate as long as:

$$(d + d^2 + \dots) > 1$$

$$\Rightarrow \frac{d}{1-d} > 1 \Rightarrow d > \frac{1}{2}$$

Since δ is greater than $\frac{1}{2}$ even when the interest rate is in excess of 60 percent, this is likely. When more than two firms are selling in the oligopoly market, the value placed on δ to ensure cooperation must exceed $(1 - 1/n)$, where n is the number of firms. Thus, while this suggests that increases in the number of firms will decrease the likelihood of collusion, it does not show that increasing firm numbers constitutes effective competition.

APPENDIX B
VITAE OF BITZAN AND TOLLIVER

John Bitzan

2921 29th Ave. Cir. So.
Moorhead, MN 56560
(218) 287-1964

OBJECTIVE

To advance in the field of economic research, by continuing to pursue research that is valuable to industries, government, and academia.

EMPLOYMENT

Transportation Economist **March 1990 - Present**
UPPER GREAT PLAINS TRANSPORTATION INSTITUTE FARGO, ND

In this position, I perform economic research in the area of transportation. I specialize in the areas of transportation industry structure and efficiency, transportation pricing and cost analysis, and the analysis of regulatory policy.

Postdoctoral Fellow **July 1997 - October 1997**
NORTHWESTERN UNIVERSITY EVANSTON, IL

In this position, I worked with Professor Marcus Alexis on an annotated bibliography of the economic approach to learning. I reviewed articles related to Bayesian updating, learning by doing, game theoretic approaches to learning, and experimental economics, and summarized them in a manner that someone not trained in economics would understand.

Instructor **August 1994 - December 1994**
UNIVERSITY OF WISCONSIN-MILWAUKEE MILWAUKEE, WI

In this position, I taught Principles of Macroeconomics. I was responsible for designing the course, choosing the book, preparing and presenting lectures, designing and administering exams, and evaluating the students.

Teaching Assistant **August 1993 - May 1994**
UNIVERSITY OF WISCONSIN-MILWAUKEE MILWAUKEE, WI

In this position, I taught discussion sections, administered exams, and graded exams.

EDUCATION

Ph.D., Economics **August 1993 - August 1997**
UNIVERSITY OF WISCONSIN-MILWAUKEE MILWAUKEE, WI

In completing my Ph.D. course work, I achieved a grade point average of 3.9. My areas of specialization include Industrial Organization and Labor Economics.

M.A. Applied Economics **September 1987 - December 1989**
MARQUETTE UNIVERSITY MILWAUKEE, WI

I achieved a grade point average of 3.5 at Marquette. My area of specialization was in Public Policy Economics.

B.A. Economics **September 1983 - August 1987**
ST. CLOUD STATE UNIVERSITY ST. CLOUD, MN

I had a paper published in a compendium of outstanding papers in economics from Minnesota universities.

SKILLS

- Well-versed in microeconomic theory
- Trained in the latest techniques in econometric modeling
- Able to apply economic theory to industry behavior and performance

- Experienced in the analysis of railroad behavior and efficiency
 - Have extensively studied the effects of regulatory policy on the transport industries
-

PROFESSIONAL ASSOCIATIONS AND AWARDS

- Law and Economics Consulting Group - Affiliate
 - American Economic Association - Member
 - Transportation Research Board, State Rail Committee - Friend of the Committee
 - Agricultural and Rural Transportation Chapter of the Transportation Research Forum, Executive Vice President, 1994-95
 - Transportation Research Forum Student Paper Contest - Honorable Mention, 1997
-

REFEREED PUBLICATIONS

- Bitzan, John D. "The Structure of Railroad Costs and the Benefits/Costs of Mergers," forthcoming in *Research in Transportation Economics*, Vol. 5, 1998.
- Bitzan, John D., Denver D. Tolliver, and Daniel L. Zink. "An Improved Model for Measuring Economies of Size in the Provision of Rural Road Services," *Journal of the Transportation Research Forum*, Volume 33, No. 1, 1993.
- Koo, Won W., Denver D. Tolliver, and John D. Bitzan. "Railroad Pricing in the Captive Market: A Case Study of North Dakota Grain Shipments." *The Logistics and Transportation Review*, March, 1993.
-

OTHER PUBLICATIONS

- Bitzan, John D. "An Analysis of Housing Price Variation in Milwaukee," Master's Essay, Department of Economics, Marquette University, Milwaukee, 1989.
- Bitzan, John D. *Course Module for Industrial Organization and Its Applications to Transportation*. MPC Report No. 95-49. Mountain Plains Consortium, Fargo, 1995.
- Bitzan, John D. "Professional Basketball: Is There a Competitive Buying Market For Players?" In Frank W. Gery (ed.) *Compendium of Student Papers in Economics by Economics Undergraduates of Minnesota Colleges and Universities*, Vol. 2, No. 1, Minnesota Economic Association, 1988.
- Bitzan, John D. *Railroad Deregulation: Impacts on Rates and Profitability*. UGPTI Staff Paper No. 122. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1994.
- Bitzan, John D. *The Estimation of A Grain Handling Margin For Elevators in Barley Producing States*. UGPTI Staff Paper No. 100. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1990.
- Bitzan, John, Bridget Baldwin, and Kimberly Vachal. *Implications of a North American Grain Marketing System for Prairie Province Transportation and Elevator Systems*. forthcoming USDA Report, United States Department of Agriculture, Washington, D.C., 1997.
- Bitzan, John D., Joel S. Honeyman, Kenneth L. Casavant, and Denver D. Tolliver. *The Impact of Rail Restructuring on Rural and Agricultural America - Case Studies of Rail Abandonment*. forthcoming USDA Report, United States Department of Agriculture, Washington, D.C., 1995.
- Bitzan, John D., Joel S. Honeyman, Kenneth L. Casavant, and Denver D. Tolliver. *The Impact of Rail Restructuring on Rural and Agricultural America - Nationwide Assessment of the Impacts of Rail Restructuring*. forthcoming USDA Report, United States Department of Agriculture, Washington, D.C., 1995.
- Bitzan, John D. and Jill A. Hough. *Guidebook for Rural and Small Urban Transit Systems in the Mountain-Plains Region*. MPC Report No. 94-36, Mountain Plains Consortium, Fargo, 1994.

OTHER PUBLICATIONS

- Bitzan, John D., Brenda K. Linstad, Frank J. Dooley, and Denver D. Tolliver. *The Applicability of Community Impact Analysis to Light-Density Rail Line Analysis in North Dakota*. UGPTI Staff Paper No. 105. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1991.
- Bitzan, John D. and Denver D. Tolliver. *An Analysis of the Efficiency and Effectiveness of Selected Rural Transit Systems in the State of North Dakota*. UGPTI Publication No. 84. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1990.
- Bitzan, John D. and Denver D. Tolliver. *Emerging State Rail Issues: Implications For Rail Planning in North Dakota*. UGPTI Staff Paper No. 101. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1990.
- Bitzan, John D., Denver D. Tolliver, and Leslie M. Bertram. *Covered Hopper Car Supply For Grain: Impacts on the State of North Dakota*. UGPTI Staff Paper No. 102. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1990.
- Bitzan, John D., Denver D. Tolliver, and Wayne Linderman. "An Analysis of the Benefits and Costs of Constructing a Rail Siding at the ProGold Facility in Wahpeton, ND," for the North Dakota Department of Transportation, October, 1995.
- Bitzan, John D., Denver D. Tolliver, and Wayne Linderman. *The Impacts of the Clean Air Act Amendments of 1990 and Changes in Rail Rates on Western Coal*. MPC Report No. 96-59. Mountain Plains Consortium, Fargo, 1996.
- Bitzan, John D., Denver D. Tolliver, and Daniel L. Zink. *Rural Road Financing Strategies - Two New Models Applied to North Dakota Counties*. MPC Report No. 92-13. Mountain Plains Consortium, Fargo, 1992.
- Bitzan, John D. and Kimberly J. Vachal. *Rural Transit Research Needs in the Mountain Plains Region*. MPC Report No. 92-17. Mountain Plains Consortium, Fargo, 1992.
- Norton, Jerry D., John D. Bitzan, and Denver D. Tolliver. *Rail Transportation and U.S. Grain Marketing: The Impact of Railcar Availability on U.S. Grain Markets, and The Cost of Excess Capacity and Rates of Return on Covered Hopper Grain Cars*. forthcoming United States Department of Agriculture report.
- Tolliver, Denver D. and John D. Bitzan. *Northern Plains Barley Railroad Transportation and Marketing Study*. UGPTI Publication No. 89. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1991.
- Tolliver, Denver D. and John D. Bitzan. "Methods for State DOTs to Examine Rail and Truck Cost-Distance Scales." working paper, Upper Great Plains Transportation Institute, Fargo, 1995.
- Tolliver, Denver D., John D. Bitzan, Brian A. Lindamood, and Martha Struthers. *An Analysis of Light-Density Rail Lines in North Dakota*. UGPTI Publication No. 87. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1991.
- Tolliver, Denver D., John D. Bitzan, Brian A. Lindamood, and Martha Struthers. *An Analysis of Light-Density Rail Lines in North Dakota; Appendix A: Individual Line-Segment Trends and Analysis*. UGPTI Publication No. 88. Upper Great Plains Transportation Institute, North Dakota State University, Fargo, 1991.
- Vachal, Kimberly, John Bitzan, and Mike Saewart. *North Dakota Wheat Producer Marketing*. MPC Report No. 96-57. Mountain Plains Consortium, Fargo, 1996.
- Vachal, Kimberly, John Bitzan, and Denver Tolliver. *Transportation as an Input to the North Dakota Agricultural Marketing Process*. MPC Report No. 96-54. Mountain Plains Consortium, Fargo, 1996.

Short Vita of Denver D. Tolliver

Highlights: Denver Tolliver has 18 years of experience in transportation research, education, and consulting. He has published widely in national transportation journals and wrote a textbook on highway impact assessment. During his career, Dr. Tolliver has filed 20 verified statements with the ICC or STB in areas of transportation economics and cost analysis. In addition, he has consulted for the Washington Department of Transportation, the Nebraska Department of Roads, the Oregon DOT, the U.S. Army Corps of Engineers, Washington State University, the Grain Transportation Agency of Canada, the Canadian Grains Council, Canadian National Railroad, Consolidate Papers, Inc., and national agribusiness companies. Dr. Tolliver has worked on several freight transportation plans for North Dakota, Montana, and

OVERVIEW *Employment*

1980 - 1998	North Dakota State University Research Scientist and Adjunct Professor
1979 - 1980	North Dakota Department of Transportation, Rail Planner
1977 - 1979	Research Assistant, Center for Environmental Studies, Virginia Polytechnic Institute
1974 - 1976	Military Service, U.S. Army

Education

Ph.D., Environmental Design and Planning, Virginia Polytechnic Institute, 1989

Masters, Urban and Regional Planning, Virginia Polytechnic Institute, 1979

B.A., Geography, Morehead State University, 1973

CURRENT POSITIONS

- North Dakota State University**
- **Associate Director, Mountain Plains Consortium.** [Administration of University Transportation Centers Program for Federal Region VIII]
 - **Adjunct Professor, Department of Agricultural Economics**
 - **Adjunct Professor, Department of Civil Engineering**
 - **Research Scientist, Upper Great Plains Transportation Institute**
 - **TEL8 Board of Directors** [Administration of interactive video educational and technology transfer network in Federal Region VIII]

RECORD OF PARTICIPATION IN ICC/STB PROCEEDINGS

Ex Parte 375-C Effects of Nationwide Freight Rate Increase on North Dakota Revenue-Cost Ratios (1980).

APB 38550 Revenue-Cost Ratios on Sunflowers (0114940) from North Dakota to the Pacific Northwest (1981).

APB 38551 Revenue-Cost Ratios on Sunflowers (0114940) from North Dakota to Minneapolis-St. Paul, MN (1981).

APB 38552 Revenue-Cost Ratios on Sunflowers (0114940) from North Dakota to Duluth, MN, and Superior WI (1981).

APB 38553 Revenue-Cost Ratios on Wheat (0113710) from North Dakota to the Pacific Northwest (1981).

Revenue-Cost Ratios on Durum (0113720) from North Dakota to the Pacific Northwest (1981).

APB 38554 Revenue-Cost Ratios on Wheat (0113710) from North Dakota to Minneapolis-St. Paul MN (1981).

Revenue-Cost Ratios on Durum (0113720) from North Dakota to Minneapolis-St. Paul, MN (1981).

APB 38555 Revenue-Cost Ratios on Wheat (0113710) from North Dakota to Duluth MN and Superior WI (1981).

Revenue-Cost Ratios on Durum (0113720) from North Dakota to Duluth MN and Superior WI (1981).

APB 38556 Revenue-Cost Ratios on Barley (0113110) from North Dakota to the Pacific Northwest (1981).

APB 38557 Revenue-Cost Ratios on Barley (0113110) from North Dakota to Minneapolis-St. Paul, MN (1981).

APB 38558 Revenue-Cost Ratios on Barley (0113110) from North Dakota to Duluth MN and Superior WI (1981).

AB-6 Sub(No. 104F) Burlington Northern -- Abandonment Between York and Dunseith in Benson, Pierce, and Rolette Counties in North Dakota (1981).

AB-6 Sub(No. 163F) Chicago & Northwestern -- Abandonment Between Oakes and Ellendale in Dickey County North Dakota (1982).

AB-6 Sub(No. 236) Burlington Northern -- Abandonment Between Linton ND and Eureka SD in Emmons, McIntosh, Campbell and McPherson Counties (1983).

Ex Parte 431 Comments on the Adoption and Use of the Uniform Rail Costing System (1983).

Ex Parte 290 (Sub. No. 4) Comments on the Railroad Cost Recovery Procedures Productivity Adjustment (1984).

Ex Parte 402 Matters of Reasonably Expected Costs (1984)⁵

AB-33(Sub No. 62) Union Pacific Railroad Company -- Abandonment Between Tekoa and Fairfield in Whitman and Spokane Counties, Washington (1990).

AB-33(Sub No. 63) Union Pacific Railroad Company -- Abandonment Between Colfax and Tekoa and Thorton and Seltice in Whitman County, Washington (1990).

AB-1 (Sub No. 230) Chicago and Northwestern Transportation Company -- Abandonment Between Norfolk and Chadron, Nebraska (1992).

Ex Parte 347 Sub No. 2 Maximum Reasonable Rate Guidelines for Non-Coal Commodities

⁵ Filed jointly with the North Dakota Public Service Commission.