

*A LOGISTICS SUPPORT PROGRAM FOR RURAL
ECONOMIC DEVELOPMENT*

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Disclaimer

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INTRODUCTION

The economic base of North Dakota is narrow and dominated by production agriculture and natural resource extraction. North Dakota's manufacturing industry is small by comparison to other states and is dispersed throughout the state. Many individuals and organizations in North Dakota recognize the need to broaden the economic base by expanding manufacturing and processing sectors to strengthen the economy. However, compared to metropolitan centers, North Dakota lacks a critical mass of transportation and logistics activities for professionals to interact and enhance their skills. Additionally, the number of transportation and logistics professionals in North Dakota is relatively small.

Many businesses, especially small entrepreneurial organizations, are unaware of the importance of managing transportation and logistics issues, and lack the resources to analyze their logistics functions. This is disconcerting given the necessity of superior transportation and logistics management for competitive access to markets created by North Dakota's "rurality." Examples of these logistic and transportation management areas include Just-in-Time delivery relationships, inventory considerations for both buyers and suppliers, plant location implications, and warehouse location and operation considerations.

OBJECTIVE

The objective of this project was to develop a program that provides short-term analyses and education in an effort to enhance the viability of rural manufacturing and processing firms through a better understanding of transportation and logistics management by organizations in North Dakota.

RURAL LOGISTICS PROGRAM COMPONENTS

In response to the lack of logistics professionals and information about the importance of logistics and transportation management, a rural logistics and transportation program was developed. The program is based strictly on customer driven research, analysis, and education that directly benefit businesses and individuals in North Dakota. The program focused on the following four main areas:

- # **Analysis** — short-term logistics and transportation analysis.
- # **Outreach** — development of a logistics roundtable.
- # **Education** — development of an undergraduate course in logistics and transportation management and an internship program benefiting students and businesses in North Dakota.
- # **Research** — long-term research in logistics and transportation management including new site location, expansion, alternative transportation practices, alternative logistics strategies, and alternative buyer-supplier relationships.

To accomplish our goals and to promote the program, more than 20 firms from across North Dakota were visited by the logistics team for their input and guidance regarding the program. The response was positive. All of the firms reinforced the common held belief that effective logistics and transportation management is important to the survival of North Dakota businesses. These firms also stated overwhelmingly that logistics is an under-managed function in their firms and recognized the need for a logistics and transportation management program at the university level given the limited capacity to employ professionals in the field.

Analysis

Approximately 60 percent of the effort was devoted to conducting short term transportation and logistics feasibility studies for existing fledgling firms. This activity was coordinated in part with the North Dakota Department of Economic Development and Finance and the Greater North Dakota Association. A wide range of projects were examined for firms in North Dakota. Table 1 lists the firms and type of work performed.

Table 1. Firms and Work Type Performed for Short Term Analysis¹

Firm	Analysis Conducted
Minot Area Development Corporation, Minot, ND	Assessed the dry van capacity in Minot North Dakota for a potential new firm in the area.
Aviko Corporation, Jamestown, ND	Conducted a logistical analysis comparing truck, rail, and storage costs for frozen vegetables in the export market.
Heart of the Valley Cooperative, Portland, ND	Compared truck versus rail costs for shipping dry edible beans from North Dakota to the Pacific Northwest.
Dakota Gasification Plant, Bismarck, ND and Denver, CO	Developed truck and rail rate estimates for the shipment of dry ammonium sulfate.
North Dakota Department of Economic Development and Finance, Bismarck, ND	Provided information on containerized freight movements through North Dakota and assisted in developing a plan for aiding individuals or firms who may enter a market using containerized freight.
Prairie Organics, Larimore, ND	Provided information on containerized freight shipments of organic grain.

¹All analyses were conducted under confidentiality agreements in which all of the data and final results were the sole property of the client.

Outreach

Approximately 20 percent of the effort was devoted to education within the industry. This was accomplished through Council of Logistics Management (CLM) roundtable meetings and workshops with interested transportation and logistics officials from North Dakota businesses. CLM is an organization of professionals dedicated to the advancement of logistics management whose annual conference draws over 5,000 participants. Roundtable meetings are held monthly in larger cities covering a wide range of logistics, distribution, and transportation issues.

The goal of this effort was to facilitate the development of a North Dakota CLM Roundtable chapter and involve as many people as possible. To accomplish this objective, the Interactive Video Network (IVN) was used to broadcast the first meeting across the state on March 7, 1996. (Advertisement shown in the Appendix section.) The live site was in Fargo, while remote sites were located in Dickinson, Bismarck, Minot, Grand Forks, and Jamestown. In all, 30 people participated across the state for the first meeting.

The speaker for the first meeting was Gary Ridenhower, director of Logistics and Supply Chain Management for the 3M Corporation in St. Paul, Minn. Ridenhower spoke for two hours about the value of logistics to 3M and its application to North Dakota businesses. His presentation received positive feedback. At the end of the presentation, questions were fielded from each site. Given the long distances many people would have needed to travel to attend the meeting, IVN was an effective method of delivering the presentation.

A second roundtable meeting was held May 9, 1996, with approximately 25 attendees. (advertisement shown in the Appendix section.) The speaker for this meeting was Michael Del Bovo, vice president of sales and marketing for Dart Logistics in Eagen, Minn. The meeting was

broadcast to Bismarck using the TEL8 satellite broadcast system. Del Bovo spoke about the use of third party logistics providers and their role to firms in North Dakota. Basically, third party logistics providers are contractors for transportation and inventory services. Del Bovo spoke about their new role in the transportation industry and also provided insight into the future of the transportation industry. Once again, there was an opportunity at the end of the presentation for attendees to ask questions of Del Bovo.

Education

Approximately 10 percent of the effort was devoted to development of a new undergraduate transportation and logistics management course instructed within the agricultural economics department at NDSU. The class was successful with five undergraduate students and one graduate student enrolled in the course. Four of the students were agricultural economics majors, one was an industrial engineering student, and one was an economics student from Moorhead State University. The class was listed as an elective for agricultural economics majors and as a technical elective for industrial engineering majors. (Copy of the syllabus is shown in Appendix A.) Of the five undergraduate students in the class, three have entered graduate school and are focusing their programs on logistics management. Additionally, students were exposed to logistics and transportation education through attendance of two CLM meetings in the Twin Cities.

An important component of the educational program is developing internships for undergraduate and graduate students to provide “hands on” experience in the logistics management field. Three companies in North Dakota expressed interest in receiving an intern for

one semester of work. Unfortunately, all of the students in the new logistics class were graduating seniors or graduate students and were not eligible for internships. The internship program has great potential, as shown by the level of interest by firms in the region. This focus area will be pursued more heavily in the next year of the program.

Research

Scholarly research was conducted in transportation and logistics management for publication and addition to the current knowledge base. Three projects were developed in this area and supervised by the logistics research staff. The first project, "*The Effect of Preferred Supplier Programs and TQM on Logistical and Procurement Policies,*" was conducted by Cynthia Miller as part of her master's thesis. The objective of this study was to explain the effects of close versus adversarial industrial buyer-supplier relationships on logistical and procurement policies and costs. In the study, a two-firm economic order quantity (EOQ) model was developed that minimized total costs of inspection, inventory, and quality based on joint buyer and supplier costs. (Miller, 1995)

The second project, "*Supply Chain Management: Assessing Costs and Linkages in the Wheat Value Chain,*" was completed by Matt Titus. The objective of this study was to compare firm-level strategic decision information with integrated supply chain data for grain elevators, flour mills, and bakeries. The term "supply chain" refers to all component firms within a particular industry. For example, the wheat products supply chain consists of farmers, elevators, mills, and bakeries. In this study a model was developed to first, evaluate the information

requirements for coordinating the wheat supply chain, and second, evaluate the costs of supply chain strategies. (Titus, 1996)

The third project, "*Inventory Practices of Flour Milling Firms*," was completed by Jason Barber. The objective of this research was to determine how current logistics trends affect inventory policies within the flour milling industry. Specifically, the results of this research benchmarked current inventory management practices and important trends within flour milling. A mail survey of flour mills in the United States was used to collect data for this study. (Barber, 1996)

Several more research projects will be conducted in this area. One involves the relationships of buyer and suppliers in rural areas. The objective of this project is to assess and determine the logistical and transportation practices of small and rural suppliers in the plains and Midwest region. Its goal is to find out what the minimum logistical capabilities of firms in the rural areas are required in order to be suppliers to the larger "leading edge" firms.

REFERENCES

- Barber, Jason T. and Frank J. Dooley. *Inventory Practices of Flour Milling Firms*. Mountain Plains Consortium Report No. 96-62A. North Dakota State University, Fargo. June 1996.
- Miller, Cynthia L. and Frank J. Dooley. *The Effect of Preferred Supplier Programs and TQM on Logistical and Procurement Policies*. Mountain Plains Consortium Report No. 95-47. North Dakota State University, Fargo. June 1995.
- Titus, Matthew J. *Supply Chain Management: Assessing Costs and Linkages in the Wheat Value Chain*. Mountain Plains Consortium Report No. 96-61. North Dakota State University, Fargo. May 1996.

APPENDIX

AG ECON 496

LOGISTICS AND TRANSPORTATION MANAGEMENT

3 Credits
Morrill Hall Room 107

MWF 12:30-1:20 pm
Spring Semester 1996

ADVISING FACULTY MEMBER:

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E-mail: titus@badlands.nodak.edu

Office Hours: 9:30-10:20 MWF

COURSE DESCRIPTION:

Logistics is a relatively new term in business today. While many companies have been performing the traditional functions of logistics: transportation, purchasing, inventory, etc., only recently have companies looked at logistics as a managerial function. The challenge has become to coordinate the activities of logistics within traditional management styles. This need for change has broadened the role of logistics to include strategic planning, customer service, materials management planning, TQM, and business re-engineering. The coordination of these activities is the theme of logistics in this course.

GOALS OF THE COURSE:

- 1) To expose the student to the principles of logistics and transportation management
- 2) To illustrate the importance of logistics to the firm.
- 3) To provide the student with the techniques for analyzing, coordinating, and improving the logistical functions of the firm.

INSTRUCTIONAL ORGANIZATION:

Frank Dooley is the advising faculty member of the course. As such, he advised in developing the course outline and reviewed the tests and case studies administered. Dooley has taught a

graduate level logistics course for the past two years in the Department of Agricultural Economics and has 16 years experience in transportation and logistics.

The lecture will be presented in a team approach by Joel Honeyman and Matt Titus, research assistants at the Upper Great Plains Transportation Institute, who have spent the last two years focusing on transportation and logistics. They will lecture individually on the sections of the course in their respective research focus areas.

TEXT: Coyle, John J. Bardi, Edward J. and C. John Langley. *The Management of Business Logistics, 6th ed.* St. Paul, MN: West Publishing Co., 1996.

EVALUATION:

Homework:

There will be a number of (approximately 10) homework assignments throughout the semester from the textbook, as well as supplemental handout problems. These problems will help introduce the student to the principle concepts of logistics. The solutions of the homework will be explained in class after they have been handed in. **LATE HOMEWORK WILL NOT BE ACCEPTED.**

Tests:

There will be two midterms and a comprehensive final, which will consist of multiple choice, essay, and numeric problems.

Case Study Projects:

There will be two case studies assigned throughout the semester. These case studies will focus on evaluating and analyzing logistics from a cross functional setting. Students will work in groups and present the results to the class in the form of a short (10-15 minute presentation). All members of the group should participate equally in the presentation. A typed, double spaced, summary paper with all applicable results, tables, graphs etc. is due the day of the presentation.

<i>Points Breakdown:</i>	Midterms	200 points
	Final Exam	100 points
	Homework	100 points
	Case Studies	<u>100 points</u>
	Total	500 points

<i>Grading:</i>	90-100%	A
	80-89%	B
	70-79%	C
	60-69%	D
	Below 60%	F

HONOR SYSTEM:

All students taking any course in the College of Agriculture are under the “Honor System.” The Honor System is governed by students and operates on the premise that most students are honest and work best when their honesty and the honesty of others is not in question. It functions to prevent cheating, as well as penalize those who are dishonest. It is the responsibility of the student to report any violations of the honor pledge to the instructor, honor commission, or the dean of the College of Agriculture.

Students are required to sign the following:

“Upon my honor, I have neither given nor received aid in writing this examination.”

TENTATIVE COURSE OUTLINE:

Topic:	Text & Materials Covered	Time
<p><i>Introduction to Logistics</i> # What is logistics? # Logistical activities # Logistics role to the firm</p>	Chapters 1, 2	One week
<p><i>Supply Chain Management</i> # The logistics pipeline</p>	Chapters 3	One week
<p><i>Logistics Information Systems</i> # Order processing # EDI</p>	Chapter 5	One week
<p><i>Inventory</i> # Types of inventory # Cost of inventory # Safety Stock # EOQ Model # Lead Time # Just in Time delivery (JIT) # Materials Requirements Planning (MRP)</p>	Chapter 6, 7	Three weeks

Test I

<i>The Transportation System</i>	Chapters 8, 9	Four weeks
# Role of transportation		
# Modes of transportation		
Railroads		
Motor Carriers		
Air & Water Carriers		
# Classification of Carriers		
# Intermodal shipping		
# Carrier negotiation		
# Transportation pricing		
<i>Test II</i>		
<i>Warehousing & Materials Handling</i>	Chapters 10, 11	Two weeks
# Transportation consolidation		
# Supply and product mixing		
# Warehouse layout		
# Materials handling		
<i>Facility Location</i>	Chapter 12	One week
# Warehouse and plant location		
<i>Logistics Quality</i>	Chapter 13	One week
<i>The Logistics Function</i>	Chapter 14	One week
# Role of logistics to the firm		
# Changing traditional organizational structures		
<i>Final Exam</i>		

Note: Any students with disabilities or other special needs, who need different accommodations in this course, are invited to share these concerns or requests with the instructor as soon as possible.



UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
 LOGISTICS PROGRAM
 NORTH DAKOTA STATE UNIVERSITY
 PO BOX 5074, FARGO, ND 58105

Logistics Roundtable Meeting Announcement
 Thursday, March 7, 1996 6:00 - 8:00 PM CST

Topic: Logistics Management: What is it & what does it mean to your company?

Speaker: Gary Ridenhower

Director of Logistics Services, 3M Company. St. Paul, MN

We are pleased to announce the speaker for the first logistics roundtable is Gary Ridenhower, Director of Logistics Services and Supply Chain Management for the 3M Company in St. Paul, MN. Gary is a native of Sentinel Butte, ND and is a graduate of Dickinson State University. He has been with 3M for over 25 years and has a variety of experience in divisions and corporate staff including, most recently, memory technology group logistics manager. He is a member of the Council of Logistics Management and is a frequent speaker at the CLM national meeting and other logistics and supply chain management conferences.

Schedule:	6:00 PM	Welcome: Gene Griffin, Director UGPTI
	6:10 PM	Presentation: Gary Ridenhower
	7:30 PM	Discussion and Questions

It is our goal at the Transportation Institute to make this roundtable meeting accessible to participants across the state. In order to accomplish this, the Interactive Video Network (IVN) will be used to broadcast the meeting across the state. IVN allows for dialogue and interaction with the speaker. The host site will be in Fargo, where the speaker will present. We have selected five remote sites for this meeting: Bismarck, Dickinson, Grand Forks, Jamestown, and Minot. Based on attendance and your feedback, other sites can be added for future meetings. Any comments or suggestions are welcome.

For more information contact Joel Honeyman at 231-9595 or Matt Titus at 231-9594

Registration Policy: RSVP this form by *fax or phone* by March 1: Cost \$10 per person

Fax: (701) 231-1945
 Phone: (701) 231-7767

Payment: Those attending in Fargo may pay at the door.
 For those at remote sites, please mail a check to the Transportation Institute.
 After we receive your RSVP, specific details will be *faxed* to you.

Company or Affiliation _____

Address _____ Phone: _____ Fax: _____

Name(s) of Attendees _____

Site attending (please circle one): Bismarck Dickinson Fargo Grand Forks Jamestown Minot



UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
 LOGISTICS PROGRAM
 NORTH DAKOTA STATE UNIVERSITY
 PO BOX 5074, FARGO, ND 58105

Logistics Roundtable Meeting Announcement
 Thursday, May 9, 1996 6:00 - 8:00 PM CST

*Topic: Perceptions of the Motor Carrier Industry
 and the Use of Third Party Logistics Providers*

Speaker: Mike DelBovo

VP of Sales and Marketing: Dart Logistics, Eagan, Minnesota

Significant changes have occurred in the transportation industry. In the past 5 years, the emerging field of Third Party Logistics has truly taken off. Major warehousing, consulting, and transportation providers have scurried to open new business ventures. Virtually everyone is adding the word "logistics" to their business in response to this change. Third Party providers because of their wide range of services have become the fastest growing segment of the transportation industry and have forced traditional trucking companies to innovate or get out of the business. Third Party Services allow shippers, especially firms like those in North Dakota, to benefit from outsourcing their logistical and distribution functions. These firms can then dedicate limited managerial and financial resources to their core business functions.

During the presentation, Mike will review the major players in the Third Party Market and discuss what is working and what is not. Also, Mike will discuss how the relationships have changed between shippers and carriers and demonstrate these through real life case studies.

Schedule:	6:00 PM	Welcome: Gene Griffin, Director UGPTI
	6:10 PM	Presentation: Mike DelBovo
	7:30 PM	Discussion and Questions

The Interactive Video Network (IVN) will be used to broadcast the meeting across the state. IVN allows for dialogue and interaction with the speaker. The host site will be in Fargo, where the speaker will present. We have selected five remote sites for this meeting: Bismarck, Dickinson, Grand Forks, Jamestown, and Bottineau.

For more information contact Joel Honeyman at 231-9595 or Matt Titus at 231-9594

Registration Policy: RSVP this form by **fax** by May 6: Cost \$10 per person
 NO SHOWS WILL BE BILLED.

Fax: (701) 231-1945 **Payment.** Those attending in Fargo may pay at the door.
 Phone: (701) 231-7767 for those at remote sites, please mail a check to the Transportation Institute.
After we receive your RSVP, specific details will be **faxed** to you.

Company or Affiliation _____

Address _____ Phone: _____ Fax: _____

Name(s) of Attendees _____

Site attending (please circle one): Bismarck Dickinson Fargo Grand Forks Jamestown Bottineau