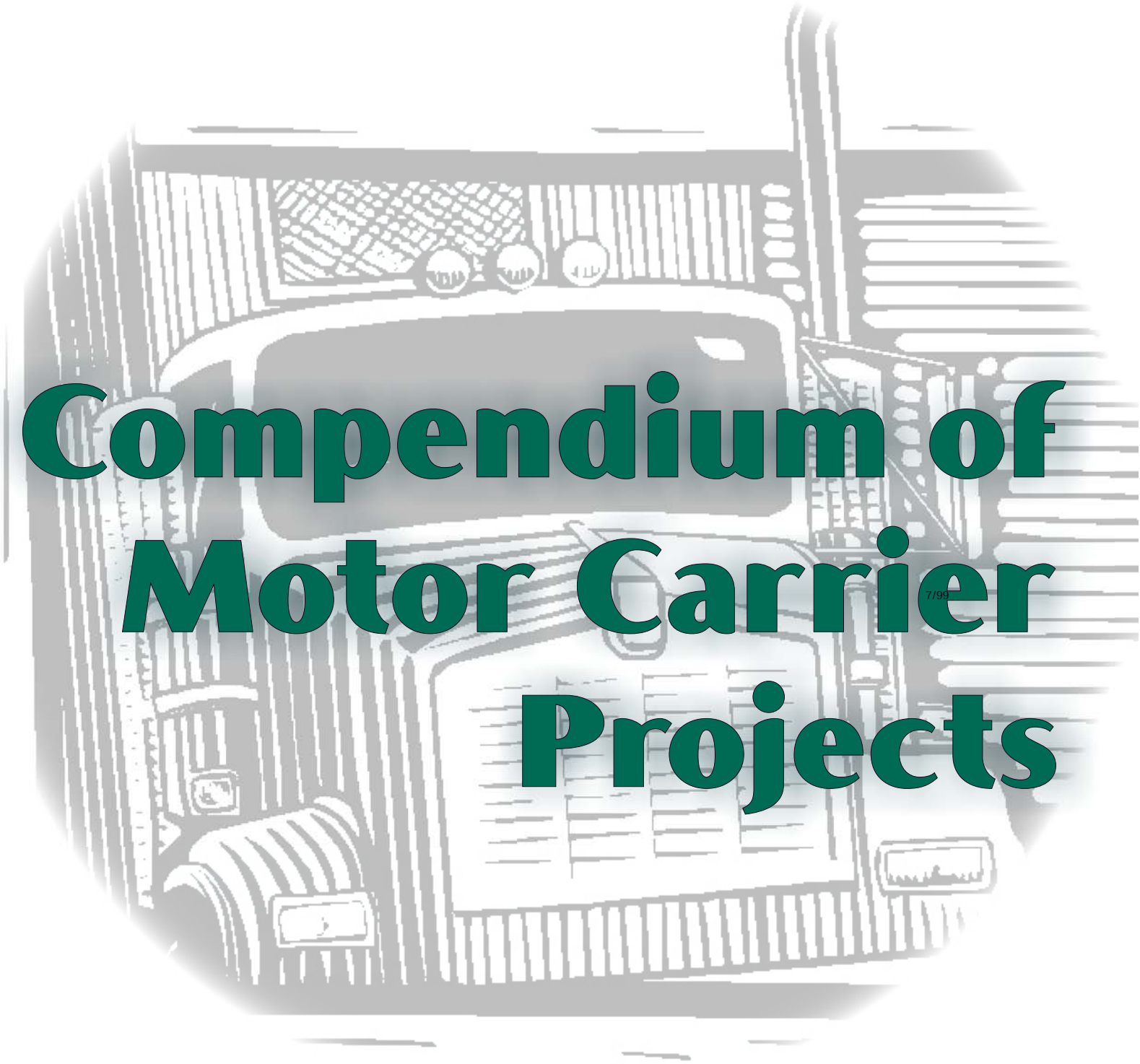

Compendium of Motor Carrier Projects

7/99

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Aspen Driver Vehicle Inspection Software - Second Generation Enhancement and Development of a Unified Carrier Safety Algorithm for Use in the ISS

Project Investigators: Brenda Lantz, Douglas Benson, Field Systems Group
Project Status: in progress

Aspen is a computer software package that is used to assist State and Federal law enforcement agencies in the safety inspection of commercial vehicles. *Aspen is* part of a developing National safety information system that monitors safety performance of the Nation's motor carrier industry. The *Aspen Driver / Vehicle Inspection Software* includes several inter-related programs such as *Aspen, Avalanche,* the Inspection Selection System (ISS), and access to the Commercial Driver License Information System (CDLIS). This system was developed by the Federal Highway Administration's (FHWA) Field Systems Group (FSG) with several partners and contractors including the Upper Great Plains Transportation Institute (UGPTI). The second generation system has now reached production and will soon replace the older first generation system.

Integrating SafeStat into the Roadside Inspection Selection System for Commercial Vehicles

Project Investigator: Brenda Lantz
Project Status: in progress

As the roadside Inspection Selection System (ISS) has undergone development, another related project has also been evolving. This project involves the creation of a SafeStat score to identify unsafe carriers and encourage them to improve their safety performance or have their registration privileges revoked.

Although SafeStat was designed to prioritize carriers for review and ISS was designed to prioritize for roadside inspection, it would be beneficial if the two programs could work together on a greater level than they do currently. Thus, this project involved integrating the two systems together

The initial testing of the resulting system, ISS-2, indicates that it is just as effective as the original ISS in identifying unsafe carriers for roadside inspection, as well as those with insufficient data. It is anticipated that ISS-2 will be fully implemented and ISS-1 will be phased out.

Evaluation of the Potential for Developing Meaningful Career Paths for OTR Drivers

Project Investigators: Gene Griffin, Lynn KaInbach, Julie Rodriguez
Project Status: in progress

Driver turnover for over-the-road (OTR) truckload carriers is exceedingly high in both an absolute sense and when compared to other industries. Such a high turnover rate has several negative impacts on the firm as well as the industry and society. The firm incurs increased costs and reduced performance. For the industry, impacts of driver turnover are probably more subtle but nonetheless significant. Truckload carriers compete with other modes of transportation and different forms of motor carrier transport; e.g., rail and intermodal.

Although there does not seem to be total agreement on the causes, it is probably fair to say that the issue is very complex in nature. What is known is that job satisfaction has a

significant influence on turnover. Job satisfaction is closely related to an employee *thinking of quitting* and their *intention to search* for a new job. Both of these actions are correlated with turnover.[1]

The general objective of this study is to evaluate the perceived desire by drivers for a career path and the challenges for implementing a system which would fulfill the needs for such a career path. This evaluation will be conducted by considering existing operating conditions of the truckload industry as well as assumed hypothetical conditions that may be necessary to develop such a system. This work will be conducted within the context of accepted understanding of career path as identified in the discipline of industrial/organizational psychology. A brief description of the characteristics of an ideal generic career path will be developed from a literature review. This will provide the context for conducting the remainder of the study.

State Motor Carrier Safety Plan Pilot Project

Project Investigators: Gene Griffin, Julie Rodriguez, Brenda Lantz, Ayman Smadi
Project Status: completed

The UGPTI participated in the Region *8 State Motor Carrier Safety Plan Pilot Program* by assisting the participating states of Colorado, Montana, and Utah. This assistance took place throughout the entire duration of the project from conceptualization of the plan through evaluation. The UGPTI added value to the process by assisting the participating Region 8 states in:

(1) Problem identification
(2) Formulation of targeted actions addressing the problem
(3) Identification and selection of performance measures in assessing the degree of problem mitigation achieved
(4) Interim and final evaluation of program efficacy
(5) Comparative evaluation among the states

Educational and Technical Assistance to CMV Drivers and Motor Carriers

Project Investigator. Ayman Smadi
Project Status. DP-127, December 1998

The focus of the ETA Peer Exchange is to identify ETA activities benefitting commercial motor vehicle drivers, motor carriers, and the enforcement community. Technical assistance and training to the drivers and industry is aimed at achieving voluntary compliance and may be the most cost-effective strategy to reduce crashes and improve highway safety. The peer exchange will identify best ETA practices in the following areas:

(1) State, Industry and OMC innovative outreach and training programs
(2) Outreach opportunities during roadside enforcement contacts and compliance reviews,

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[1]Frank J. Landy, *Psychology of Work Behavior,* Fourth Edition, Brook/Cole Publishing Company, Pacific Grove, CA, 1989, P. 478.

(3) Informational material (e.g., brochures, handouts, manuals, pamphlets, fact sheets)
(4) New and innovative technologies used to provide training deliver information (e.g., Internet)
(5) Partnerships and coordination among State, Federal and Industry
(6) Outreach programs targeted at shippers or transportation brokers.

The Utah Department of Transportation is the host state agency for the peer exchange which was kicked off in April 1997. The peer exchange team includes representatives from the states of Alabama, Connecticut, California, Minnesota, Iowa, Nevada, New Mexico, Tennessee, and Utah. The team also includes two representatives from the trucking industry, a representative from the Commercial Vehicle Safety Alliance, and four representatives from the FHWA-OMC headquarter and field staff. The final report for the peer exchange was finalized in December 1998 and is also available on the internet — **www.cmv-eta.org**. The internet site also provides helpful informations and links to federal, state, and private informational sites.

An Evaluation of Commercial Vehicle Drivers' and Roadside Safety Inspectors' Opinions Regarding the MCSAP, the Roadside Inspection Process, and Motor Carrier Safety
Project Investigator: Brenda M. Lantz
Project Status: DP-125, September 1998

The UGPTI has evaluated and analyzed the opinions of commercial vehicle drivers and safety inspectors regarding the MCSAP. Roadside safety inspectors and commercial vehicle drivers were identified nationwide to form the study's sample frame. A separate survey instrument has been developed, in cooperation with the OMC, and used to question a representative sample from each of these groups on their perceptions of the MCSAP and motor carrier safety.

In addition to a complete report detailing the results from each survey individually and in comparison to each other, results from this study were compared and contrasted with those from a previous study of state administrators and motor carrier management. Notable differences were identified.

North Dakota Motor Carrier Directory

This directory contains a listing of motor carriers operating in North Dakota. The information contained in the directory was gathered by survey from the individual firms, and includes the amount and type of equipment, type and scope of operation, as well as the primary cargo carried. A separate listing of grain haulers is also provided. The most recent directory available is for 1998.

Less-Than-Truckload in the Northern Mountain-Plains States
Project Investigators: Mark Berwick, John Bitzan, Julie Rodriguez, Gene Griffin
Project Status: MPC 97-82, September 1997

This study examined LTL carriers in the Mountain-Plains region of North Dakota, South Dakota, Montana, and Wyoming. Many rural communities rely on the LTL industry for freight movements in and out of the region. The level of LTL service in the Mountain-Plains region is unknown in a post-regulated environment. The study determined that all sizes of carriers are performing LTL service in the Mountain-Plains region. The level of service is undetermined, but it is clear that many companies are performing both TL and LTL services in the region. The level of technology is clearly more advanced in larger companies and larger carriers are likely to adopt all types of technology available. ITS/CVO is not used extensively in the region, but the majority of carriers thought that it will become more prevalent and does add efficiency to the industry.

Truck Costs for Owner/Operators
Project Investigator. Mark D. Berwick, Frank Dooley
Project Status. MPC 97-81, September 1997

Differences that exist among truck configurations, trip and product characteristics, and input prices influence costs for individual owner/operators. Obtaining cost estimates for individual motor carrier movements is difficult. The increasing need for on-time quality delivery of products makes it imperative for all users of owner/operators to understand their costs. Sustainability for the independent trucker may reduce search costs for users of owner/operators and, at the same time, increase customer service by repeatedly using the same trucker. Economic developers need truck cost estimates to compare transportation modes and accurately estimate transportation costs. Owner/operators and users of owner/operators need truck cost information to benchmark performance against competitors and industry standards. The truck costing model developed in this study can be used by shippers and owner/operators as a negotiating tool to arrive at shipping rates. A spreadsheet simulation model was developed to estimate truck costs for different truck configurations, trailer types, and trip movements.

Peer Exchange on Hours-of-Service Compliance
Project Investigator: Ayman Smadi
Project Status: DP-120, September 1997

This project involved a peer review of selected state practices of enforcing hours of service compliance of commercial vehicle drivers. Federal safety regulations restrict a commercial vehicle driver's daily on-duty time to 15 hours, which includes a maximum of 10 hours driving, followed by a minimum eight hours off-duty. In addition, no more than 70 hours of on-duty time may be worked in any given eight-day period and drivers are required to keep log books.

It is believed that a peer review of state practices of enforcing these hours of service regulations will greatly help to improve motor carrier safety. The review identified best practices related to roadside enforcement, new technologies (Intelligent Transportation Systems), data

analysis, training, program management, and industry outreach. This information will be shared with other states and will enhance communications among motor carrier safety agencies.

The Effects of Optimism and Willingness to Trust on Work-Related Attitudes and Behaviors: An Application to the Commercial Vehicle Industry
Project Investigators: Lynn R. KaInbach, Brenda M Lantz
Project Status: MPC 97-75, July 1997

This project helped determine whether certain individual differences among commercial truck drivers influenced work-related behaviors and attitudes. Results of this study are expected to provide the carrier with evidence to support hypotheses about greater performance-related outcomes of drivers who are grouped on particular personality and attitudinal factors. More specifically, the goals are: (1) to determine whether individual differences such as optimism and trust can predict turnover, job satisfaction, and other work-related behaviors of new drivers and (2) to investigate potential changes in these individual characteristics up to the first six months with a national commercial trucking company.

An Assessment of the MCSAP's Research and Development Efforts
Project Investigators: Brenda M Lantz, Jason T Barber
Project Status: DP-117, August 1997

In this project, the UGPTI assessed the effectiveness of the research and development component of the Motor Carrier Safety Assistance Program (MCSAP). This assessment was conducted in two parts. Phase I focused on how effective the results of projects conducted since 1991 using MCSAP funds were, and how well these results were disseminated. In Phase II, a plan for effectively disseminating future research results was developed.

Performance-Based Systems for MCSAP Programs
Project Investigators: Gene Griffln, Brenda Lantz, Julie Rodriguez, Ayman Smadi
Project Status: SP-136, July 1997

Under the Motor Carrier Safety Assistance Program (MCSAP), the Federal Highway Administration's Office of Motor Carriers (OMC) has been working with the states to develop comprehensive Commercial Vehicle Safety Plans (CVSPs). These plans include driver and vehicle inspections, compliance reviews, traffic enforcement, industry education, public outreach, and other commercial vehicle safety activities. The OMC is working with the states to encourage and assist them to adopt a performance-based approach in the implementation of the state MCSAP. The overarching goal of this effort is to improve commercial motor vehicle safety.

The role of the UGPTI in this project is to serve as a resource of information and expertise for state and federal personnel that are implementing the new performance-based system. A workbook and training sessions has been developed by the UGPTI . These materials help in defining the concepts and terminology used by OMC in the performance-based system.

The Roadside Inspection Selection System (ISS) for Commercial Vehicles
Project Investigators: Brenda M Lantz, Michael W Blevins, Thomas J. Hillegass
Project Status: DP-116, March 1997

The Inspection Selection System (ISS) was developed in response to a 1995 Congressional mandate calling for the use of prior carrier safety data to guide the selection of vehicles and drivers for roadside inspections. It was designed at the Upper Great Plains Transportation Institute, in cooperation with a ten-state Roadside Technology Technical Working Group and the Federal Highway Administration's Office of Motor Carriers (OMC). The OMC's Field Systems Group managed the overall project and completed the ISS software development. The ISS is designed to help better distribute roadside inspections among motor carriers, and target those with prior poor safety performance.

Results from the testing of the system show that there is a significantly higher out-of-service rate when ISS recommends the inspection versus when it does not. Clearly, the ISS will help to target relatively unsafe carriers (as well as those for which there is insufficient data) and reduce the inspection burden on proven safe carriers. This means more efficient use of scarce resources by focusing on less safe vehicles/drivers. It is anticipated that in the future, the ISS will be used to screen transponder-equipped vehicles at mainline speeds.

Commercial Vehicle Driver Associate Family Issues Assessment
Project Investigators: Melinda J. Hill, Nancy W Hudson, Brenda M Lantz, Gene C Griffin
Project Status: DP-115, March 1997

This project examined the dissatisfaction of truck drivers associated with issues relating to the family. This dissatisfaction is seen as one major reason for high turnover rates in the trucking industry. The study determines the nature of the trucking family environment through questions asked of both the driver and their spouse/partner. Questions address work concerns, family concerns, decision-making, informational needs, communication, and leisure time. In addition, respondents were asked for tips they might give a new driver and his/her family about handling personal and family issues while the driver is away from home. This information will then be used to help determine programs of intervention and support useful for trucking companies.

User-Centered Systems Analysis of the North Dakota Intermodal Management System
Project Investigator: Douglas E Benson
Project Status: DP-114, February 1997

This paper presents the results of a user-centered systems analysis of a proposed software system, The North Dakota Intermodal Management System. The study surveyed and evaluated several object-oriented analysis methods to select the one that best supports user centered development. This examination determined that Jacobson's Use Case Driven Approach best meets that criterion.

Dakotas' ITS-CVO Institutional Issues Study
Project Investigators: Ayman Smadi, Julene Rodriguez
Project Status: DP-113, November 1996

The purpose of this project was to investigate institutional issues and barriers to implementing Intelligent Transportation Systems for Commercial Vehicle Operations (ITS-CVO) in North Dakota and South Dakota. The study team facilitated dialogue among users (motor carriers) and public agencies which administer, regulate, or enforce motor carrier operations. Outputs included recommendations for changes to procedures, rules, and regulations to enhance motor carrier operations.

A review of states' regulations and administrative procedures was also included. A steering committee of representatives from state agencies and motor carriers in the two states provided insight on critical regulation and operational issues in the two states, and potential technological solutions.

Highway Regulatory Guidelines for Farm Equipment Operators
Project Investigators. Ayman Smadi, Mike Saewert, Kevin Andres, Brenda Lantz
Project Status: Completed October 1995

This guidebook was developed at the Upper Great Plains Transportation Institute (UGPTI) as a result of a cooperative agreement with the Transportation Marketing Division of the U.S. Department of Agriculture (USDA). The agreement provided funding to UGPTI to compile relevant federal and state regulations pertaining to operations of farm equipment in a single easy way to use reference.

The guidebook is divided into three regulatory sections which cover operator, vehicle, and hazardous materials requirements, in addition to a directory of state agencies. The information in the guidebook was compiled from federal and state regulations. State vehicle size and weight legal limits and allowable exemptions were collected through a survey of state permitting agencies and are included in the chapter on Vehicle Guidelines.

Perceptions of the MCSAP: Motor Carrier Management and State Administrators
Project Investigators. Gene Griffin, Brenda Lantz, Matthew Titus
Project Status: DP-108, October 1995

This project identified the perceptions of the Motor Carrier Safety Assistance Program (MCSAP) by those who administer the program and by those whom the program applies to. Questions were asked of these two groups concerning roadside inspections, safety/compliance reviews, objectiveness/fairness of inspectors, safety, funding, and Intelligent Transportation Systems for Commercial Vehicle Operations (ITS-CVO) concepts.

Analyzing and comparing answers to these questions revealed suggestions for methods of gaining support for the MCSAP by client groups to increase its effectiveness and improve motor carrier safety.

Motor Carrier Industry Perceptions of IFTA and IRP
Project Investigators: Gene Griffin, Brenda Lantz, Julie Rodriguez, Matt Titus
Project Status: MPC 95-45, March 1995

This study examined the problems arising from the lack of uniformity in state laws and regulations concerning motor carriers. It also assessed the effectiveness and progress of the programs, such as the International Fuel Tax Agreement (IFTA) and the International Registration Plan (IRP), which have been set up to alleviate these problems.

Implications of Electronic Clearance for Regulatory Enforcement of Trucking
Project Investigator: Matthew Titus
Project Status: DP-103, October 1994

The transparent borders concept of the Federal Highway Administration's Intelligent Transportation System for Commercial Vehicle Operations (ITS-CVO) program could enhance regulatory efficiency by improving motor carrier compliance while reducing costs of compliance.

In evaluating motor carrier regulations, understanding the structure, conduct, and performance of the industry is necessary. From this analysis, insight into regulatory reform as well as compliance strategies can be gained.

Following the analysis of the industry, this report focuses on the cost of enforcement for motor carriers, a component of compliance cost. Motor carrier regulations are typically enforced concurrently during weight and safety enforcement efforts. To determine the burden, the amount and value of time spent by motor carriers on enforcement activities was estimated. Recognizing that differences among trucking firms exist, burdens were estimated separately for truckload and less-than-truckload carriers. Values were based on labor and opportunity costs. Time requirements were taken from existing literature.

Current weight enforcement efforts cost the industry between $167 and $283 million annually. Further, over 99.4 percent of the burden is borne by compliant carriers. Technologies and enforcement strategies are currently available and should be pursued that would greatly reduce the proportion of compliant vehicles subjected to enforcement.

Complying with current safety enforcement efforts costs the industry between $14 and $25 million annually. Compliant carriers bear over 44 percent of this cost. Analysis of safety data indicates that a statistical relationship exists between out-of-service rates and accident rates. Therefore it is possible to develop a system that would increase the proportion of non-compliant vehicles subjected to inspection relative to compliant vehicles.

Evaluation of the Differences Between Spontaneous and Anticipated Roadside Inspections of Motor Carriers
Project Investigator. Brenda Lantz
Project Status: DP-104, August 1994

The goal of this study was to improve the effectiveness of highway safety inspections of motor carriers. These inspections can be broadly classified as anticipated or spontaneous. Anticipated inspections are defined as those in which the driver is usually aware that there is a high

probability that an inspection will take place. These would normally occur at fixed sites, such as highway weigh stations. Conversely, spontaneous inspections are those in which the driver may be unaware that an inspection will take place. These would usually be conducted at roadside facilities, such as rest areas, check points, or even by a highway patrol or truck regulatory officer on the shoulder of the road.

This project evaluated the differences, if any, between violations found during the two broad classifications of inspections as described above. This was conducted in order to provide the Office of Motor Carriers management staff with the information to improve the roadside inspection procedures and to allocate Motor Carrier Safety Assistance Program funds as efficiently as possible. This should, in turn, result in the maximum removal of unsafe equipment and drivers from service.

The study found very little notable differences between violations found during ("spontaneous" versus "anticipated" inspections which were conducted in 1993 in North Dakota. Considering overall out-of-service rates, the author recommended that fixed sites continue to concentrate on Level I inspections while roadside sites concentrate on Level III, as these are the areas they are each best suited for.

Development of a Predictive Model to Ascertain Probable Safety Ratings for Motor Carrier Firms: A Nationwide Perspective

Project Investigator. Brenda Lantz
Project Status: DP-105, May 1994

In every industry, safety is a top priority. This is particularly true in the trucking industry as evidenced by the increases in roadside inspections and safety reviews conducted each year and new legislation implemented. However, some costs to the industry, and ultimately society, from these requirements may be able to be diminished. Safety reviews, in particular, can be very time consuming. Previous research has shown, however, that many other data items that the Federal Highway Administration collects are highly correlated with the outcome of these reviews. Therefore, this project examines the feasibility of developing a model from this other data to ascertain the probable likelihood of a certain safety rating. This would enable efforts to be concentrated on the motor carrier firms with the least probability of achieving a Satisfactory rating and reduce the need to visit every firm. A preliminary analysis is conducted using only information from North Dakota to get a feel for the data, then a comprehensive analysis is performed utilizing all motor carriers in the database. In addition, reviews of other related research are given.

Driver Job Satisfaction, Turnover and Job Performance: A Conceptual Framework and Empirical Evidence

Project Investigators: Gene Griffin, Julene Rodriguez
Project Status: SP-117, October 1993

The purpose of this paper is two-fold: 1) to develop a conceptual framework which provides a pragmatic justification for being concerned about job satisfaction from a business perspective; and 2) present some empirical evidence resulting from a national study of drivers conducted at the Upper Great Plains Transportation Institute.

Basic Theory of Calculating Costs: Applications to Trucking
Project Investigator. Kenneth Casavant
Project Status: SP-118, September 1993

The basic conceptual theory of costs will be presented in this report, emphasizing definitions of costs as they are applied to business situations. These costs' concepts will then be evaluated relative to differing firm characteristics that have specific impacts on those costs. The report concludes with a brief section on how to determine and evaluate productivity of the resources used in producing service as a firm.

Career Stage, Time Spent on the Road, and Truckload Driver Attitudes
Project Investigators: James McElroy, Julene Rodriguez, Gene Griffin, Paula Morrow, Michael Wilson
Project Status. SP-113, May 1993

The purpose of this study is to examine the relationships between career stage, time spent on the road, and driver work-related attitudes. Three phenomena make the study of truck driver attitudes salient to carriers and shippers.

Opportunities for Career Advancement Found to be Very Important to Truckload Drivers
Project Investigators: Julene Rodriguez, Gene Griffin
Project Status: SP-108, February 1993

This paper examines the results of a 1990 study conducted to determine what contributes and detracts from job satisfaction for drivers as a means of addressing the driver turnover/retention issue. One of the major conclusions of this study was that drivers have an overwhelming desire for some form of a career path and system of advancement.

Analysis of Roadside Inspection Data and Its Relationship to Accident and Safety/Compliance Review Data and Reviews of Previous and Ongoing Research in These Areas
Project Investigator: Brenda Lantz
Project Status: DP-95, January 1993

The main objective of this study was to analyze roadside inspection data and its relationship to safety/compliance review and accident data. Data used for this analysis were provided by the Office of Motor Carriers and included a sample of larger carriers with the most recent inspection information and safety ratings. In addition, summaries of past work in this area and in other related areas is given, as well as reviews of on-going research. The study finds strong support for a relationship between the aforementioned data sets and the findings are compared to the earlier work reviewed.

Piecework: Theory and Applications to the Motor Carrier Industry
Project Investigator. Brenda Lantz
Project Status: SP-107, October 1992

The purpose of this paper is to examine some of the theory and ideas associated with piecework and apply these ideas to the motor carrier industry. The theories discussed are those pertaining to: 1) setting the piece rates; 2) changing the rates; 3) the seeming lack of employee loyalty; 4) the seeming importance of quantity over quality; and 5) equity theory.

Evaluation of the Impact of Changes in the Hours of Service Regulation on Efficiency, Drivers, and Safety
Project Investigators: Gene Griffin, Julene Rodriguez, Brenda Lantz
Project Status: DP-93, October 1992

This study was conducted in an effort to add knowledge to the issue of hours of service rules that regulate commercial truck drivers. Drivers, carriers, and society in general would appear to experience positive net gains from a change in the cumulative hours of service rules from the current 70-in-8 day rule to a 24-hour restart provision. These positive gains would consist of increased driver income, improved scheduling flexibility, a potential for increased time at home, increased economic efficiency, and improved safety, as well as gains in other areas.

Creating a Competitive Advantage Through Partnershipping with Owner-Operators
Project Investigators: Gene Griffin, Julene Rodriguez
Project Status: DP-91, June 1992

Trucking firms who rely on owner-operators to any significant extent will not achieve an advantage in a highly competitive industry if they do not understand their partners. But understanding them is only the first step in creating a competitive advantage. This understanding must be translated into a program of earnest partnershipping in which both the independent contractor and the trucking firm benefit. This study provides information to encourage that first step - understanding owner-operators' concerns, needs, and wants.

Job Satisfaction of U.S. Commercial Drivers
Project Investigators: Gene Griffln, Julene Rodriguez, Brenda Lantz
Project Status: DP-90, June 1992

The 100 percent driver turnover rate common in the truckload segment of the trucking industry is extremely high in an absolute sense and especially high when compared with other industries. Turnover results in additional training costs, safety problems, lost business, increased insurance rates, idle equipment, and a host of other business problems. Turnover is related to overall job attitude; therefore this study looks at factors contributing to job satisfaction and dissatisfaction. Herzberg's "Two-Factor Theory of Job Satisfaction," an industrial psychology theory of motivation in the work place, provided the basis for this study.

This study was designed primarily around company drivers, as a similar study also conducted at the Upper Great Plains Transportation Institute by the same authors, and focused strictly on owner-operators. A total of 13 truckload firms throughout the nation participated in the study. Results are based on responses to a 20-page questionnaire by 3,174 company drivers who drove for the participating firms. Although not random, the sample was intended to be representative of the truckload industry. A similar questionnaire was used to survey truckload carrier managers to find out their perceptions of drivers' attitudes.

Specific findings of the study covered several aspects of the driver's job including the work itself, the working environment, integration into the company, training to be a professional, communication with the company, job expectations, and career advancement. These findings, combined with the analysis of the managers' perceptions of the drivers' opinions, point to the conclusion that the industry is underutilizing its largest and most important resource-drivers. A variety of reasons were cited for disillusionment with the industry and any plan developed by individual trucking firms to retain drivers must be comprehensive and long-range. It is believed that management can use the information provided in this study to improve the job satisfaction of their drivers and, in turn, reduce turnover.

Market Choice, Entry Regulation and Joint Production
Project Investigator. Wesley Wilson
Project Status: SP-81, September 1991

Firms can jointly serve multiple markets in a set and can serve one of several mutually exclusive sets. Firms choose the set and the particular markets of the set in which to produce. Entry regulation influences these decisions by restricting access to some but not all markets. Entry restrictions directly affect the regulated market but also spill over to other markets in the same and different sets of markets.

An Empirical Examination of Market Access
Project Investigators: Wesley Wilson, Frank Dooley
Project Status. SP-106, June 1991

This report examines the firm decisions to enter markets under conditions of joint production and entry regulation.

Motor Carrier Employees' Compensation Survey
Project Investigators: Julene Rodriguez, Gene Griffin
Project Status: SP-103, 1991

The information contained in this report was gathered in February 1991. The data reported represent policies that were current as of the date of the survey. Several companies were in the process of modifying their compensation policies.

Determinants of Job Satisfaction of Professional Drivers
Project Investigators: Julene Rodriguez, Gene Griffin
Project Status. DP-68, October 1990

This study looks at drivers' opinions about specific areas of their work and how important these areas are to their job satisfaction. Management's perceptions are compared to drivers' opinions. job satisfaction is theoretically linked to driver productivity, turnover, new entrants, and few drivers exiting the industry. In addition, reducing turnover has been shown elsewhere to have positive impacts on safety.

Directory of Regulated Motor Carriers in North Dakota, 1990
Project Investigator: Julene Rodriguez
Project Status. DP-82, January 1990

This is the first time a directory of this type has been published by the Upper Great Plains Transportation Institute. It is being published in an attempt to fill many needs. Shippers can use it to determine what their choices are in the market. The motor carrier industry can use it to track service in the state and identify opportunities. It should also be useful for economic development. New firms would be able to identify sources of transportation for their needs.

The Determinants of Job Satisfaction of Professional Drivers
Project Investigators: Julene Rodriguez, Gene Griffin
Project Status SP-97, November 1989

The motor carrier industry faces a costly problem with driver turnover and a general driver shortage. This paper looks at drivers' opinions about specific areas of their work and how important these areas are to their job satisfaction. Management's perceptions of drivers are also addressed and compared to drivers' opinions.

Backhaul Opportunities for North Dakota Grain Truckers
Project Investigators: Frank Dooley, Leslie Bertram, Wesley Wilson
Project Status. DP-69, April 1989

The overall objective of this report is to assist grain trucking firms manage their backhaul opportunities. The specific objectives of this report are to: 1) identify and define the industry backhaul characteristics of North Dakota grain truckers; 2) determine and describe what methods are being used to obtain backhauls; 3) determine what obstacles prevent firms from obtaining backhauls; and 4) identify the determinants of and estimate the probability for obtaining backhauls from various markets.

Operating Costs and Characteristics of North Dakota Grain Trucking Firms
Project Investigators. Frank Dooley, Leslie Bertram, Wesley Wilson
Project Status: DP-67, August 1988

The specific objectives of the report are to: 1) define and compare industry characteristics of North Dakota grain truckers with previous research; 2) estimate and evaluate the operating costs for motor carrier firms hauling grain in North Dakota; and 3) evaluate changes in grain trucking costs over time.

North Dakota Grain Trucking Directory 1988
Project Investigators: Frank Dooley, Leslie Bertram
Project Status: DP-66, March 1988

This directory was published with two goals in mind. First, it serves as a list to shippers in identifying inter and intrastate grain haulers. Second, it publicizes firms that operate in the grain trucking industry.

Adjusting to a Changing Transportation Regulatory Environment: The Case of Trucking Exempt Commodities
Project Investigators: Wesley Wilson, Gene Griffin, Kenneth Casavant, Daniel Zink
Project Status. SP-83, August 1987

During the late *1970's* and early *1980's* a variety of legislation was passed that affected the transportation industries. Legislated changes, coupled with rising costs and a depressed economy, represented a wide variety of new circumstances facing the grain distribution system, particularly the grain truckers' role in that system. A program was therefore initiated to educate truckers, shippers, and others about this changing economic and regulatory environment. In addition, the program addressed the long run implications of these dynamic forces and the truckers' changing role in the distribution system. The program consisted of management topics presented by economists and attorneys. Specific topics discussed included truck costs, pricing, competitive factors, policy changes, the impact of truck and rail deregulation, the importance of the industry to agriculture, and growth in the industry.

An Analysis of Potential Impacts of Regulatory Reform on the Intrastate Trucking Industry in North Dakota
Project Investigator: Dennis Ming
Project Status: DP-60, October 1986

The main purpose of this study is to analyze the effects of existing federal and state laws and regulations on intrastate trucking operations in North Dakota and analyze the potential impacts of regulatory reform (including varying degrees of regulation).

Intrastate Motor Carrier Regulation/Deregulation
Project Investigator: Dennis Ming
Project Status. SP-68, February 1985

This review of literature on intrastate motor carrier regulatory reform has revealed two basic findings. First, in states where intrastate deregulation has taken place rates have generally declined or have remained constant, and quality of service has not eroded. And second, shippers and receivers generally prefer a deregulated environment while carriers prefer a regulated environment.

Grain Trucking Directory 1985
Project Investigators. Dennis Ming, Julene Rodriguez
Project Status: DP-58, 1985

This directory was published with two goals in mind. First, it serves as a list to shippers in identifying interstate grain haulers. And second, it publicizes firms that operate in the grain trucking industry.

Commodity Exemptions and Relaxed Market Entry - New Opportunities for Motor Carrier Backhauls
Project Investigators: Marc Johnson, Gene Griffin
Project Status. SP-48, January 1983

This is the seventh of eight papers in the Transportation Deregulation and Agriculture series, John 0. Gerald and Ken L. Casavant, general editors, published by the Western Rural Development Center. The series deals with the nature and potential impacts on agriculture of the Motor Carrier and Staggers Rail Acts of *1980.* These acts, in part, removed federal regulation of the trucking and rail industries.

Truck Weight and Length Limits
Project Investigator. Dennis Ming
Project Status: SP-31, December 1982

This report discusses the maximum vehicle weights and length limits of different truck sizes.

Changing Costs and Characteristics of Operating Motor Carriers: A Case Study of Grain Trucking Firms in North Dakota
Project Investigators: Kenneth Casavant, Wesley Wilson, Gene Griffin
Project Status. SP-24, November 1982

The general purpose of this paper was to evaluate the performance and operating characteristics of the motor carrier industry serving North Dakota.

Costs and Characteristics of Operating Interstate Motor Carriers of Grain in North Dakota
Project Investigators: Gene Griffin, Wesley Wilson, Kenneth Casavant
Project Status: DP-46, September 1982

The general purpose of this study was to evaluate the performance and operating characteristics of the motor carrier industry moving North Dakota grain.

Pilot Study of Motor Carrier Service to Eight Rural North Dakota Communities
Project Investigator: Wesley Wilson
Project Status: DP-41, October 1981

This study was undertaken as a pilot study of motor carrier services provided to eight communities located in North Dakota with populations of 5,000 people or less. The intentions of the study are to provide insight into the level and adequacy of motor carrier service, traffic characteristics of the shipments, as well as the perceptions of business representatives with respect to deregulations.

An Analysis of the Regulated Motor Carrier Industry in North Dakota
Project Investigator: Wesley Wilson
Project Status: DP-40, September 1981

The objectives of this study are to define the regulatory environment of interstate and intrastate motor carriers, to compare the North Dakota intrastate motor carrier industry's financial characteristics to a nationwide industry-norm, and to analyze trends of the North Dakota intrastate motor carrier industry over a 20-year period.

Papers and Proceedings of the Trucking in North Dakota Management Conference
Project Investigators: Kenneth Casavant, John Finsness, Gene Griffin, William Thoms, Wesley Wilson
Project Status. SP-86, August 1981

This paper is a compilation of papers which represents five aspects of North Dakota trucking.

The Motor Carrier Act of 1980: An Analysis of the Changes
Project Investigator. Wesley Wilson
Project Status: SP-13, July 1981

An analysis of the Motor Carrier Act for 1980.

The Exempt Motor Carrier - North Dakota's Dilemma
Project Investigator. Gene Griffin
Project Status. SP-10, February 1981

This paper gives a brief description of the formation of the exempt motor carrier industry and its relationship to railroads, as well as problems in that industry.

The Cost and Operations of Exempt Motor Carriers in North Dakota
Project Investigator: John Cosgriff
Project Status: DP-33, November 1978

The overall objective of the study is to determine and evaluate the structure and cost of operation of that portion of the exempt for-hire motor carrier industry which provides a transportation service for the marketing system of North Dakota grain from country elevators to terminal markets.

Statistical Appendix: Motor Carrier Transportation of Agricultural and Non-Agricultural Products in North Dakota, 1969
Project Investigators: David Nelson, Gregory Binkley, Ronald Nichols
Project Status: DP-21, November 1971

Statistical data for Publications No. 19 and 20.

Motor Carrier Transportation of Non-Agricultural Products in North Dakota, 1969 (Extension of Publication 19)
Project Investigators: Gregory Binkley, David Nelson
Project Status: DP-20, November 1971

The primary purpose of this study is to estimate the volume of non-agricultural commodities transported by motor carrier to, from, and within North Dakota.

Motor Carrier Transportation of Agricultural Products in North Dakota, 1969
Project Investigators: Ronald Nichols, David Nelson
Project Status: DP-19, October 1971

The general purpose of this study is to estimate the volume of agricultural products transported by motor carrier to, from, and within North Dakota.

An Inventory of State Economic Regulation of Agricultural Motor Carriers
Project Investigators: Robert Wales, David Nelson, Charles Bullard
Project Status. DP-11, February 1970

The general objective of this study is to describe the structure of one mode (of transportation), the motor carrier, and to analyze the nature and extent of economic regulation by the states of a particular segment of motor carriers - the for-hire carrier of agricultural commodities.

A Credit Quality Study of the Agricultural Trucking Industry of North Dakota
Project Investigators. James Almond, David Nelson
Project Status. DP-9, July 1969

The general purpose of this study was to determine the ability of the agricultural trucking industry of North Dakota to attract capital, either from private investors or from financial institutions.