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South Dakota ITS/CVO Business Plan

Study SD97-10
Final Business Plan

prepared by

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16. Abstract

This report defines an ITS/CVO program for the State of South Dakota. It is a Business Plan to guide the deployment of Intelligent Transportation Systems (ITS) technology for improving commercial vehicle operations (CVO) in South Dakota.

This ITS/CVO Business Plan includes a description of the current CVO environment in South Dakota; a mission, guiding principles, goals, and objectives for the state ITS/CVO program; a coordinated program of ITS/CVO projects that address state and motor carrier goals; and an organization and management framework for accomplishing the ITS/CVO program.

The Business Plan was developed by Cambridge Systematics in close collaboration with the South Dakota ITS/CVO Technical Panel.

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Table of Contents

Executive Summary ES-1
Recommendations ES-8

1.0 Introduction 1-1
1.1 Background to ITS/CVO and Business Plan Development 1-2

2.0 Overview of the Business Planning Process 2-1
2.1 Organization 2-1
2.2 Research Plan 2-2

3.0 Current CVO Environment 3-1
3.1 Current CVO Program 3-1
3.2 Trucking and Economic Characteristics 3-9
3.3 Issues Affecting CVO 3-14
3.4 Opportunities to Apply ITS Technology 3-16

4.0 Strategic Direction for ITS/CVO Activities 4-1
4.1 Mission Statement 4-1
4.2 Guiding Principles 4-1
4.3 Goals and Objectives 4-2

5.0 Program Summary 5-1
5.1 Business Plan Structure 5-1
5.2 Project Descriptions 5-5
5.3 Assessment of Projects 5-27

6.0 Organization and Management Approach 6-1
6.1 Lead Agencies 6-1
6.2 Schedule of Projects 6-3
6.3 Costs and Funding 6-9
6.4 Recommendations 6-13

Appendix A
Technical Panel

Appendix B
Documents

Appendix C
Linkages

Appendix D
Interviews

List of Figures

ES.1 Project Costs and Funding Sources ES-7

1.1 Commercial Vehicle Operations 1-3

1.2 Problem Addressed by CVISN 1-5

1.3 CVISN System Design 1-6

2.1 Process for Developing the South Dakota ITS/CVO Business Plan 2-3

3.1 Commercial Vehicle Operations in South Dakota 3-2

3.2 South Dakota Trucks by Major Use 3-11

3.3 Commodity Shipments Originating in South Dakota Ranked by Value 3-12

3.4 Commodity Shipments Originating in South Dakota Ranked by Weight 3-13

5.1 Recommended Projects by Strategic Goals and Objectives 5-2

5.2 Recommended Projects by National Program Areas 5-4

5.3 Benefits and Costs Worksheet 5-29

6.1 Schedule of Projects 6-4

6.2 Project Costs and Funding Sources 6-10

Executive Summary

This report presents the recommendations of the business planning effort by the state's commercial vehicle operations (CVO) regulatory agencies and motor carrier industry to guide the deployment of Intelligent Transportation Systems (ITS) technology for improving CVO regulation and operations in the state of South Dakota. This effort and this report were produced under the auspices of the South Dakota Department of Transportation's Office of Research that convened a Technical Panel of state, federal, and motor carrier representatives for the express purpose of directing the development of an ITS/CVO Business Plan for the state.

The purpose of the business planning effort was to:

- Describe the current CVO environment;
- Develop a strategic direction for ITS/CVO activities in the state;
- Propose a coordinated program of ITS/CVO projects that address state and motor carrier needs and goals;
- Define an organization and management framework for accomplishing the ITS/CVO projects; and
- Develop materials that will communicate the findings of the Business Plan to government officials and the motor carrier industry and secure support for the ITS/CVO program and its component projects.

This report includes the first four elements of the business planning effort. The fifth element, the presentation materials, are produced separately.

Commercial vehicles are the primary freight movers in the nation and in South Dakota. Trucks move over 80 percent of the state's commodities, and two-thirds of its communities rely solely on trucking to deliver their goods. Safe and efficient motor carrier operations are essential to the future economic growth and competitiveness of South Dakota; contribute significant revenue to the state budget; and are major factors in highway safety.

Rising costs, limited resources, and increased competition are general challenges facing both motor carriers and the state agencies responsible for regulating them. Agencies have fixed or declining funding and staff levels with which to ensure safe and financially responsible motor carrier operations. In an environment of serious funding constraints, agencies and programs must compete for scarce resources. For motor carriers, operating as efficiently as possible, with minimal delays from regulatory activities, is essential to remain competitive.

ITS technology is being applied in CVO programs throughout the country to improve regulatory activities and carrier operations. It includes advanced and emerging technologies in fields such as information processing, communications, and electronics. ITS/CVO goals are to streamline administrative procedures and improve the safety and productivity of trucking.

The goal of the state agencies and industry representatives in the business planning effort was to develop and coordinate projects that apply ITS technology and lead to more efficient, cost-effective, and safer motor carrier operations. The approach that was followed to produce the ITS/CVO Business Plan was based on:

- Participation of a broad cross-section of motor carriers and agencies;
- Recommending projects that have a good chance to succeed, address immediate needs of agencies and carriers, are likely to generate benefits for both the state and industry, and serve long-term goals; and
- Consideration of the national ITS/CVO program to ensure that the state's Business Plan will leverage opportunities presented on a national level, and to allow for compatibility with the development of national ITS/CVO standards while providing technologies and solutions that are most appropriate for South Dakota.

The Business Plan approach was inclusive and user-oriented and consisted of:

- Interviews and meetings with the Business Plan Technical Panel;
- Interviews with other stakeholders, including managers and operations staff from state agencies, and motor carriers and bus operators; and
- Review of relevant literature, including national directives; state and regional institutional issues studies; ITS/CVO business plans from other states; and regional ITS/CVO plans.

South Dakota is a participant in a number of ITS/CVO projects. These projects range from providing up-to-date weather information to all motorists via cellular phone, the Internet, and electronic mail; to exploring the capability of motor carriers to use personal computers to send forms to state agencies and receive credentials back. Increasingly, the state has opportunities to participate in ITS/CVO projects that enable its agencies and motor carriers to further explore new ways of doing business. Current examples of projects are the PRISM project and the CVISN initiative.

The PRISM (Performance Registration and Information System Management) project was entitled by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. It was established to demonstrate a system to link the registration of a commercial vehicle with the carrier's safety performance. Five states developed and tested the concept, and the project was effective in improving carrier attitudes toward safety, and the overall safety of their operations. The project is now expanding to additional states. South Dakota has been invited to participate.

The CVISN (Commercial Vehicle Information Systems and Networks) initiative is the major ITS/CVO project in the nation, and it will strongly influence the character of all other ITS/CVO projects and programs for years to come. The CVISN Model Deployment began in 1996 with awards to eight states to develop specific ITS/CVO capabilities such as electronic transactions between carriers and the state and establishing links among different state agencies so these agencies can exchange data electronically. The CVISN initiative will be funding additional states each year starting in 1998. Funding is competitively awarded, and states must participate in a defined process in order to become eligible. The goal of the project is for states, the Federal Government, and motor carriers to be able to electronically exchange information amongst one another. For example, in South Dakota, the Highway Patrol would be able to receive information from the Public Utilities Commission on the insurance status of carriers and this would enable officers to better enforce regulations; and, as another example, carriers and agencies would be able to conduct business back and forth by computers, reducing paperwork and also time.

Current participation in projects and new opportunities raise a number of questions that are answered in the ITS/CVO Business Plan: Should current projects be continued? What new projects should be considered? What is the value to the state of these projects? What is the value to industry of participation in projects? The state does not have the resources to say yes to everything. It needs a framework to provide direction and guidance for its ITS/CVO activities. The Business Plan provides this framework and will form the basis for an effective state CVO program.

Some agencies in South Dakota have significantly reduced staff in recent years, increasing workloads for existing staff. ITS/CVO projects have been introduced in states precisely because the technologies and services that are developed offer solutions to agencies that are trying to find ways to "make ends meet," that is, regulate the commercial vehicle industry and provide customer services at the same time that staffs are smaller and budgets are not increasing. Operational tests conducted in many states of various new technologies and services, actual deployments of certain systems such as those enabling "prequalified" trucks to bypass weigh stations, and institutional issues studies on state and regional levels, have shown that there are significant time and cost savings to be gained from the well-thought out application of ITS technologies to the regulatory procedures of state agencies. These savings accrue to both state and industry.

Only very recently have efforts been made to quantitatively assess the benefits to be gained from ITS/CVO technologies and services. The lack of significant numbers of fully functional and operating systems applying these technologies and providing these services still hinders definitive conclusions. However, the study conducted in 1996 by the American Trucking Associations (ATA) Foundation to explore the impact of ITS technology on regulatory compliance costs for motor carriers calculated positive benefit/cost ratios for the two services that are most frequently planned for state programs, automated administrative processes and electronic clearance. Automated administrative processes replace the manual review and processing of carrier registration, license, and permit applications, and enable computer (i.e., paperless) transactions between motor carriers and agencies. Electronic clearance is the screening of commercial vehicles for size and weight, safety, and credentials compliance at highway speeds to enable compliant vehicles to bypass a weigh station.

The National Governors' Association published a study in December 1997 to assess the budget implications on states of adopting ITS/CVO services, in other words, looking at benefits and costs to state agencies instead of motor carriers. Although the findings could not be reviewed in time for publication of the Business Plan, preliminary results of draft reports indicated that electronic credentialing (essentially equivalent to automated administrative processes in the ATA Foundation study) would produce substantial benefits relative to costs. Benefits include time that is saved reviewing applications, key-entering data, and issuing credentials; and costs saved in paper and mailing. These benefits are expected to accrue to states in spite of relatively large costs to develop capabilities and systems that support electronic transactions. Benefits from electronic screening appeared to be somewhat less certain, largely because of the considerable cost of developing the infrastructure and incorporating the various technologies. The benefits to be gained from applying ITS technology depend on a number of factors, some of which are, for states, number of registered motor carriers, motor carrier participation rates, existing capabilities, and workloads and existing staff; for motor carriers, size of fleets and operating characteristics of various kinds.

The literature reveals, nonetheless, that ITS/CVO technologies and the improvements in regulatory procedures that generally come with technology applications, offer states the best potential solutions to the problem of maintaining regulatory oversight in a context of fixed or declining resources.

South Dakota will benefit most from projects that address current problems and respond to the specific needs of motor carriers and individual agencies or several agencies; that all relevant agencies and the motor carrier industry agree should be implemented; and that will be developed and deployed in a coordinated manner.

Problems and needs from both state and motor carrier perspectives were identified during several steps of the business planning process. Motor carriers expressed the following problems:

- Too much time is spent trying to comply with regulations; they cited delays at weigh stations and application and issuance procedures;
- Too much paperwork is involved in obtaining credentials and fulfilling other compliance requirements;
- Highway safety needs to be improved, and enforcement officers could spend more time on inspections and use available technologies to help improve safety; and
- Carriers need more information about regulations.

State personnel expressed these needs:

- Agencies should share information so they do not duplicate efforts, and motor carriers would not have to provide the same information to multiple agencies;

- Agencies should automate many of their processes and procedures to save time and improve accuracy; many said that automation would help offset the reductions in staff; and

- Agencies should provide more information of all kinds to carriers.

A strategic direction was defined for ITS/CVO activities with goals and objectives. The strategic goals are:

- Improve the safety and efficiency of CVO;

- Increase the efficiency of the state CVO regulatory processes;

- Safely utilize the capacity of the state's transportation system while preserving its integrity; and

- Provide better service to industry.

These goals and objectives will accomplish the vision of South Dakota's ITS/CVO program. This vision was developed by the Technical Panel to describe what is hoped to be the end result of projects undertaken in the program:

- Enhance safe and efficient movement of commercial goods and passengers through the application of technologies, improved business practices, as well as interagency and industry cooperation.

Problems and needs identified by motor carriers and state personnel were refined according to the goals and objectives that were agreed upon by the Technical Panel, and developed into project concepts.

The projects in the Business Plan are recommended for implementation by the year 2000, although several of them will not be completed by 2000. The plan includes 12 projects that were recommended on the basis of a number of factors, including:

- Addressing immediate needs of state agencies and motor carriers;
- Addressing strategic goals and objectives as defined by the Technical Panel;
- Providing benefits to state agencies and carriers alike;
- Presenting minimal technical and institutional risks;
- Having identified funding, or good potential of being funded; and
- Adhering to the principles and objectives of the CVISN initiative.

Costs to develop the projects are estimated to total approximately $2,960,000 (Figure ES.1). It is anticipated that federal funding will account for 47 percent, or $1,393,000; and that state funding will account for 53 percent, or $1,567,000. In order to decrease the state burden, additional federal funds and private funds will be sought for these projects. The Business Plan describes a number of potential sources.

The recommended projects are described in detail in the report. They contribute to a targeted, coordinated, and well-balanced program of ITS/CVO activities that respond to motor carrier, individual state agency, and state CVO needs. In addition, these activities enhance the national CVISN infrastructure.

A summary of the ITS/CVO program is as follows:

1. The program emphasizes enforcement and safety. Projects in the Business Plan stress the importance of carrier, vehicle, and driver safety. ITS technologies such as automated inspection software and automatic vehicle identification will help enforcement officers perform more safety inspections, and perform safety inspections on vehicles that are at risk of endangering public safety. Development of a system to link vehicle registration to safety performance (the PRISM project) will help ensure that a carrier is operating safely. An automated system for issuing and managing permits for oversize and overweight loads will mean that enforcement personnel who now perform administrative functions can spend more time enforcing commercial vehicle regulations. Safety information also will enter state and national networks and databases more reliably and quickly, thus enhancing enforcement efforts both in South Dakota and elsewhere.

2. The program encourages the automation of regulatory processes and procedures, and the associated changes in the way the state and motor carriers do business. Automation of manual, paper-based procedures is likely to have a large and almost immediate impact on productivity, which is needed in agencies that have seen recent cutbacks. Installation of a new information system for vehicle registration and fuel taxes will not only improve the efficiency of existing processing procedures, but also will enable carriers to obtain registrations in an entirely new way – by personal computer or the Internet. In the future, carriers may be able to obtain all necessary registrations and permits through a single source in the state after data linkages are established between all credentialing agencies. Other projects call for the automation of routing and issuing permits for oversize and overweight vehicles; of entering inspection, citation, and accident data; and of weighing trucks while they are in motion. All of these projects are expected to result in significant time savings that can accrue to carriers as well as to state agencies.

3. The program enhances outreach to motor carriers. Two projects in the Business Plan specifically address the need for carriers to obtain more information from state agencies. Compliance may benefit significantly from carriers receiving new regulatory information, and customer service certainly will be improved. In addition, because carrier interest in and support of ITS/CVO programs are generally lukewarm, outreach and communication must be important elements in ITS/CVO efforts. Projects that respond to needs identified by motor carriers help strengthen lines of communication, the amount of buy-in from carriers to the ITS/CVO program, and aid the expansion of the program.

Figure ES.1 Project Costs and Funding Sources

Projects	Development Cost	Potential Funding Sources			
		PRISM	CVISN	Other Federal	State
1. Proactive information dissemination	$ 30,000				$ 30,000
2. CVO database architecture	150,000		75,000		75,000
3. Automated routing and permitting	653,000				653,000
4. Roadside data transfer	93,000			74,000	19,000
5. Two-dimensional (2-D) bar coding	52,000	43,000			9,000
6. Automated inspection, citation, and accident reporting	113,000	93,000			20,000
7. Linking registration to safety performance	343,000	283,000			60,000
8. Information helpline	30,000				30,000
9. Automatic vehicle identification (AVI)	96,000	80,000			16,000
10. Safety data access	250,000		125,000		125,000
11. Electronic credentialing	1,000,000*		500,000		500,000
12. Weigh-in-motion	150,000			120,000	30,000
Total	**$2,960,000**	**$499,000**	**$700,000**	**$194,000**	**$1,567,000**

* This cost is expected to be significantly reduced as a result of implementation of the previously identified projects.

Recommendations

Based on the work conducted to produce an ITS/CVO Business Plan for South Dakota, the following recommendations are presented for consideration by the South Dakota DOT Research Review Board:

1. It is recommended that the South Dakota ITS/CVO Business Plan be approved for implementation. Throughout the country, ITS technology is being applied in CVO programs to produce more efficient and more cost-effective CVO regulation, and more efficient, cost-effective, and safer motor carrier operations. The projects included in the plan will target and coordinate the state's investments in ITS technology in order to conserve resources and apply those technologies that will be most beneficial to the operations of state agencies and motor carriers in South Dakota.

2. It is recommended that a Steering Committee be established to direct the South Dakota ITS/CVO program, make policy and funding decisions related to the program and individual projects, and coordinate the scheduling of projects through the lead agency assigned to each project. It is recommended that the committee comprise members of the Technical Panel that was convened to direct the development of the Business Plan.

3. It is recommended that the established Steering Committee develop an outreach, education, and training program that will help promote the ITS/CVO program and Business Plan to motor carriers. It is recommended that this program include the following elements:

   - **Motor Carrier Recruitment** – A specified number of carriers will be recruited for participation in ITS/CVO projects at the appropriate times. The Steering Committee, which includes two motor carriers and a representative from the South Dakota Trucking Association, will determine optimum carrier characteristics, and will recruit and maintain the participation of carriers for the duration of the projects.

   - **Industry Communications** – A comprehensive marketing and communications plan for disseminating information to South Dakota motor carriers will be developed. Communications tools may include broadcast fax notices, an initial ITS/CVO program brochure, quarterly newsletters, and training kits.

   - **Motor Carrier Training** – Carriers that are selected to participate in ITS/CVO projects will require additional program education and training. A training program to educate owners and managers about projects and their potential impacts will be developed. The Steering Committee will coordinate training sessions with the South Dakota Trucking Association.

   - **ITS/CVO Showcase** – A showcase of technologies and services will be developed at the end of the first year of the ITS/CVO program. This will communicate

accomplishments to the motor carrier industry and aid in expansion of the program. Printed materials, audiovisual presentations, and hardware and software demonstrations will be featured.

4. It is recommended that the established Steering Committee refine project concepts and develop and issue requests for proposals (RFPs). Projects are scheduled to start immediately upon approval of the Business Plan. Project concepts in the Business Plan must be refined in order to draft preliminary work plans. If the Steering Committee and project lead agencies decide that consultants will be involved in project work, RFPs must be developed and issued, and criteria for making selections must be determined.

5. It is recommended that the established Steering Committee monitor closely the process by which the FHWA will award the next round of CVISN funding, and direct efforts toward securing CVISN funding. CVISN Deployment Incentive Funding is discretionary and competitive, and states that wish to be awarded funding must actively pursue it. In addition to completing defined steps, states must demonstrate institutional and technical capabilities which mitigate the risks associated with deploying new technologies and services. Therefore, it was recommended that project refinement and RFP development be started immediately so that projects can begin and institutional arrangements and collaboration can be forged. The advantages of securing CVISN funding are the size of the awards and the flexibility of what are regarded as eligible uses. A disadvantage is the need for states to provide an equal match, which can be daunting given the size of the awards. In recommending that the state pursue funding, it is noted that the Business Plan is built upon the expectation that necessary funding will be provided for projects. Only if all projects are implemented will the state and its motor carriers realize maximum benefits.

6. It is recommended that the Business Plan be updated in January 2000. It is likely that technologies, policies, and funding sources will have changed since the inception of the plan. At that time, the Steering Committee will convene to discuss the status of the ITS/CVO program and component projects; status of funds; new sources of funding; refinement of projects implemented in the months just before January 2000; new projects; and affirmation or modification of the strategic direction for ITS/CVO activities in the state.

1.0 Introduction

Freight transport plays a paramount role in the economic well-being of South Dakota. Trucks move over 80 percent of the state's commodities, and two-thirds of its communities rely solely on trucking to deliver their goods. Safe and efficient motor carrier operations are essential to the future economic growth and competitiveness of South Dakota. Safe and efficient operations are the responsibility of both the state regulatory agencies and the motor carrier industry.[1]

Rising costs, limited resources, and increased competition are general challenges facing both regulatory agencies and industry. Agencies have fixed or declining funding and staff levels with which to ensure safe and financially responsible motor carrier operations. In an environment of serious funding constraints, agencies and programs must compete for scarce resources. For motor carriers, operating as efficiently as possible, with minimal delays from regulatory activities, is essential to remain competitive.

Intelligent Transportation Systems (ITS) technology is being applied in commercial vehicle operations (CVO) programs throughout the country to improve CVO regulation and operations. It includes advanced and emerging technologies in fields such as information processing, communications, and electronics. ITS/CVO goals are to streamline administrative procedures and improve the safety and productivity of trucking. In South Dakota, state agencies and industry representatives are working together to develop, coordinate, and implement ITS projects that will lead to more efficient, more cost-effective, and safer motor carrier operations.

This ITS/CVO Business Plan is the result of the effort by the state's regulatory agencies and motor carrier industry to guide the deployment of ITS technology for improving CVO in the state. It provides a description of the current CVO environment in South Dakota, a strategic direction for ITS/CVO activities in the state, projects recommended for deployment, and the organization and management approach for implementing the projects.

This report is organized as follows:

- Section 1.0 provides a background to ITS/CVO and Business Plan development;
- Section 2.0 provides an overview of the business planning process;
- Section 3.0 describes the current CVO environment;
- Section 4.0 identifies the strategic direction of South Dakota's ITS/CVO program;

[1] In this report, generally motor carrier includes a motor carrier of goods and a motor carrier of passengers.

- Section 5.0 summarizes the state's ITS/CVO program; and
- Section 6.0 explains the organization and management approach to the program.

1.1 Background to ITS/CVO and Business Plan Development

CVO Functions

Commercial vehicle operations comprise about three dozen areas of interaction involving public agencies and motor carriers. These interactions include vehicle registration, fuel tax reporting and collection, oversize and overweight permitting, driver and vehicle inspections, weighings, and hazardous materials routing. CVO activities can be grouped into four broad functions, as follows (see Figure 1.1):

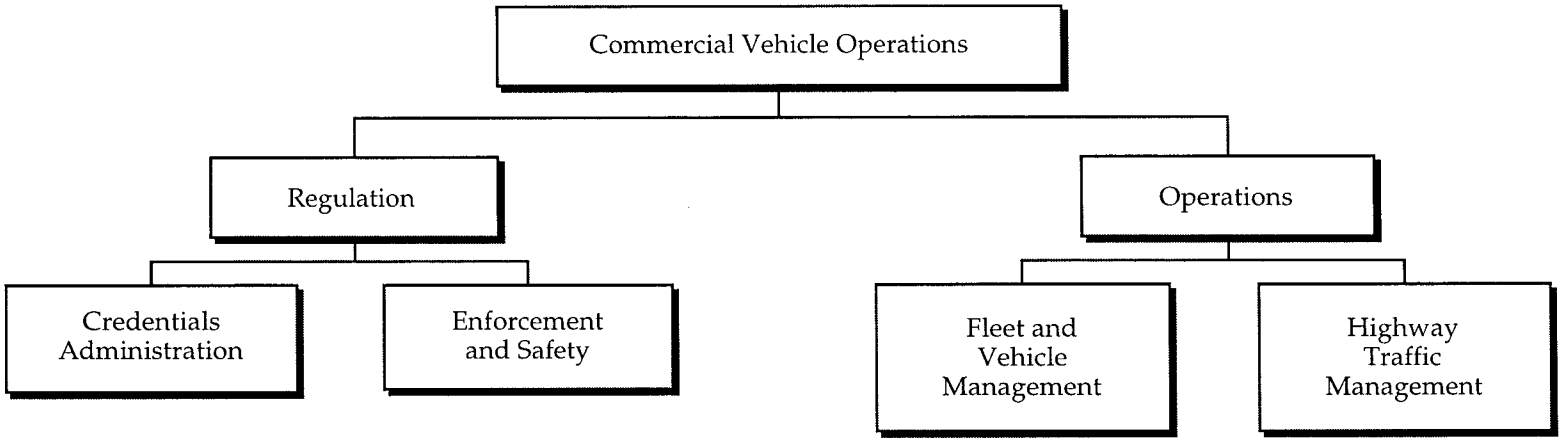
- **Regulation – Credentials Administration** – This includes procedures and systems for managing motor carrier regulations, such as the processes for accepting and reviewing applications, issuing credentials, auditing, and reporting.
- **Regulation – Enforcement and Safety** – This includes procedures and systems for verifying credentials, checking vehicle size and weight, and assuring the safety of drivers and vehicles.
- **Operations – Fleet and Vehicle Management** – This includes activities such as routing and dispatching, communications between driver and dispatcher, maintenance, and regulatory compliance.
- **Operations – Highway Traffic Management** – This includes activities such as travel advisory services, incident management, routing restrictions, and other activities that affect the movement of commercial vehicles.

Many of these activities represent interactions between public agencies and individual motor carriers, such as vehicle registration and overweight permitting. Some activities, such as the exchange of apportioned registration fees among states, are exclusive to the public sector. Activities related to fleet and vehicle management remain in the domain of the private sector.

National ITS/CVO Program

The national ITS/CVO program encompasses dozens of projects covering multiple functions. The objectives of the program are to improve highway safety, streamline the administration of credentials, reduce congestion costs for motor carriers, and ensure regulatory compliance by and equitable treatment of motor carriers. Projects involve

Figure 1.1 Commercial Vehicle Operations



- Account Processing
- Credentials Issuance
- Reporting
- Tax Collection
- Auditing

- Driver and Vehicle Safety Assurance
- Size and Weight Inspection
- Credentials Verification

- Routing and Dispatching
- Communications
- Onboard Safety Monitoring
- Record Keeping
- Maintenance

- Travel Advisory Services
- Incident Management
- Routing Restrictions

individual states, consortia of states, the Federal Government, individual motor carriers, and industry associations. They fall into four broad areas:

- **Safety Assurance** – Programs and services designed to assure the safety of commercial drivers, vehicles, and cargo. These include automated inspections and safety information systems.

- **Credentials Administration** – Programs and services designed to improve the procedures and systems for managing motor carrier regulation. These include electronic application and issuance of credentials and automated tax filing.

- **Electronic Screening** – Programs and services designed to facilitate the verification of size, weight, and credential information. These include automated weight and credentials screening at weigh stations.

- **Carrier Operations** – Programs and services designed to reduce congestion and manage the flow of commercial vehicle traffic. These include traveler information systems and hazardous incident response.

The Commercial Vehicle Information Systems and Networks (CVISN) initiative is developing a technical infrastructure to link projects and information systems. The CVISN will enable the interchange of information electronically among public agencies, motor carriers, and third-party service providers through the use of common standards and commercially available communications systems. It will provide a fully integrated collection of commercial vehicle information systems operated by the states, the Federal Highway Administration (FHWA), carriers, and other stakeholders.

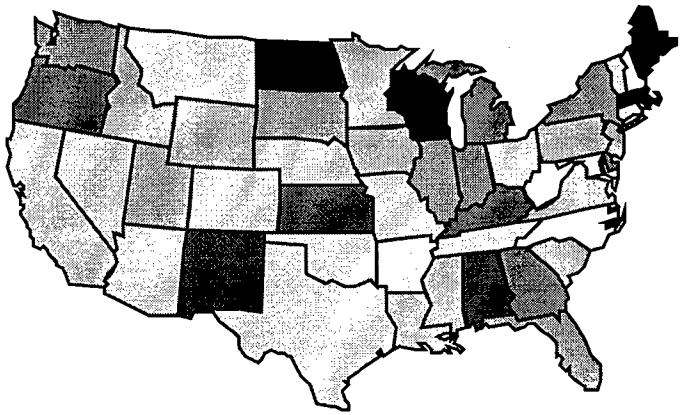
The basic problem addressed by the CVISN is the inability of state agencies to share CVO data with other agencies in the same state and in other states (see Figure 1.2). An essential element of the CVISN is promoting the development of common standards for exchanging information, such as electronic data interchange (EDI) standards. States selected as the first CVISN pilot states are adapting their existing information systems to enable computer to computer exchanges of data, and new systems that are developed will allow electronic data sharing.

At the national level, new systems are being developed that will exchange data with state systems; these systems include credentials clearinghouses to improve multistate transactions. A high-level view of the state, federal, and industry information systems comprising the CVISN is shown in Figure 1.3. Communications networks, such as AAMVAnet and value-added networks (VANs), provide the lines of communication between state and motor carrier, state and core system, etc.

The ITS/CVO Mainstreaming initiative is developing an organizational infrastructure to support ITS/CVO deployment. Through Mainstreaming, plans, policies, and projects are developed at three levels: state, regional, and national. The infrastructure comprises state and regional working groups and the development of state ITS/CVO business plans and regional coordination plans.

Figure 1.2 Problem Addressed by CVISN

How to Connect the Islands of Technology (Information Systems and Networks) Supporting CVO?



Roads were built to allow traffic flow within and between states.

Information systems were built primarily to allow information to flow within a state agency, resulting in difficulties in responding to external requests for information sharing.

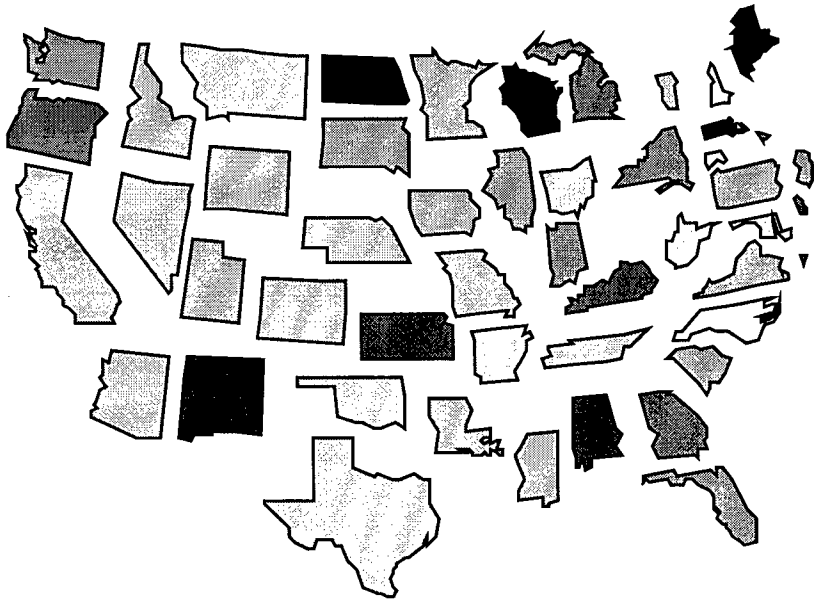
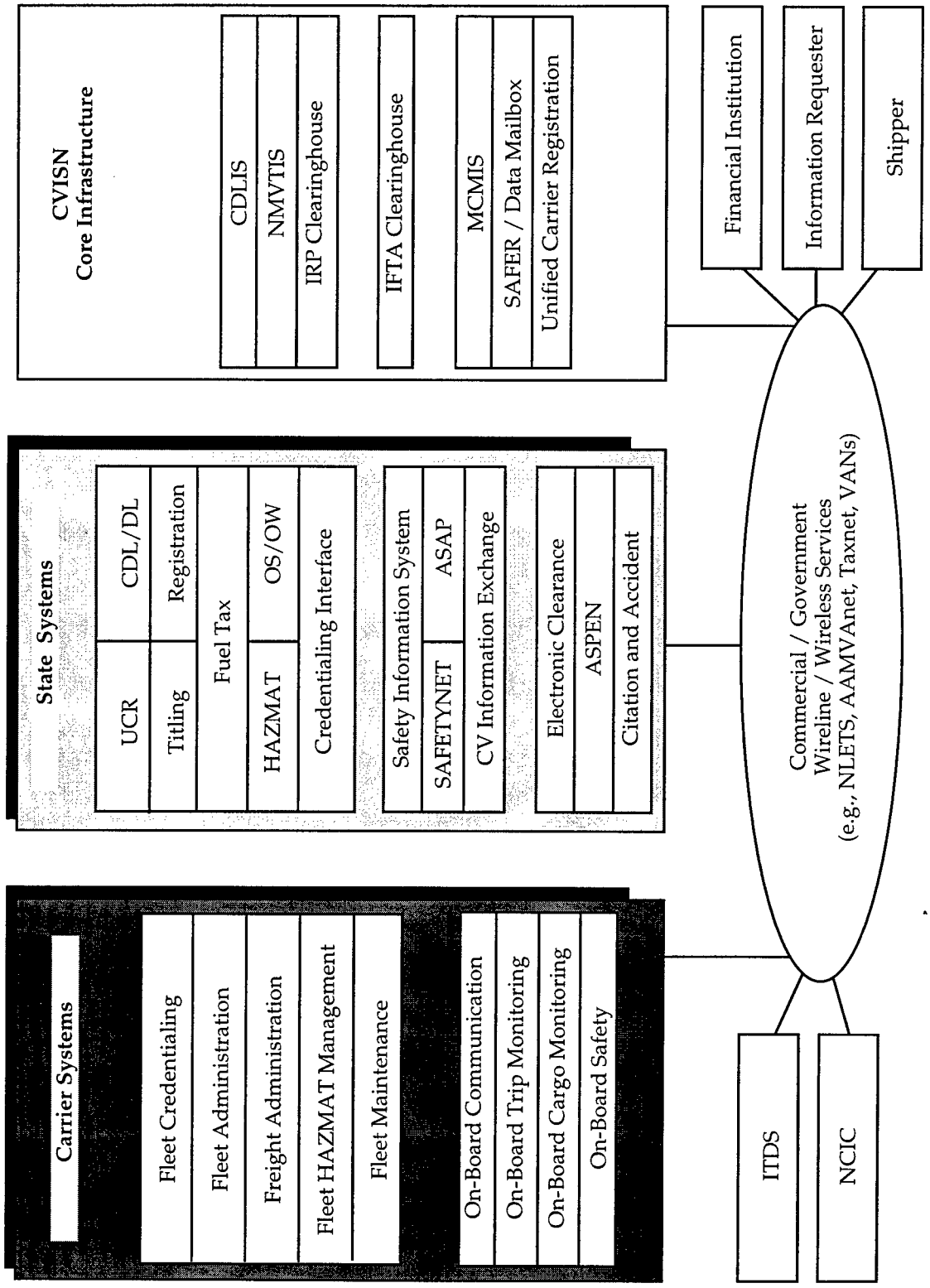


Figure 1.3 CVISN System Design



South Dakota Background

To date, South Dakota has participated in four major ITS projects. The Dakotas' ITS/CVO Institutional Issues Study completed in 1996 documented barriers to implementing ITS/CVO technology. The study does not offer solutions. The Advanced Traveler Information System, also a joint North Dakota and South Dakota project, is a test to provide road and weather information to travelers; weather is communicated to travelers via cellular phone on selected routes in the two states, electronic mail, and Internet access. Federal funding for the project will continue at least through 1998. The project's partners are hopeful that the system will subsequently become self-sustaining. The Midwest Electronic One-Stop Shopping Operational Test, which included seven states and ran through mid-1997, was developed to give motor carriers the capability of obtaining credentials from multiple states through electronic application to their base state. Although this capability was tested in some of the states, it was not tested in South Dakota as none of the pilot carriers submitted applications through the test system.

Presently, South Dakota is participating in a fourth ITS project, ITS/CVO Mainstreaming. The objective of the Mainstreaming initiative is to organize and manage ITS/CVO deployment at the state, regional, and national levels. The development of a state ITS/CVO business plan is a Mainstreaming activity. At the regional level, South Dakota is a member of the Midwest Mainstreaming Consortium. Along with Missouri, Nebraska, and Kansas, it contributes to the development of a Midwest regional coordination plan for multistate ITS/CVO projects.

Other projects that the state is currently exploring offer new opportunities for South Dakota to apply ITS technology to CVO. These projects include an automated routing and permitting system for oversize and overweight vehicles, and the Performance Registration and Information System Management (PRISM, formerly the Commercial Vehicle Information System, or CVIS), a system that ties vehicle registration to carrier safety.

These efforts have not been coordinated in a comprehensive plan or considered within an integrated framework. Moreover, other project needs are yet to be identified. A major requirement of South Dakota's ITS/CVO Business Plan is that it targets and coordinates the state's investments in ITS technology in order to conserve resources and provide benefits to state agencies and the motor carrier industry. ITS/CVO deployment in a coordinated manner also ensures that "balkanized" regulatory programs, where regulatory responsibility is shared among numerous agencies, are not replaced by equally uncoordinated ITS/CVO programs. Although the Business Plan emphasizes the application of ITS technology, it may include both the application of ITS as well as non-technical solutions to CVO issues, such as process improvements.

2.0 Overview of the Business Planning Process

2.1 Organization

The Department of Transportation (DOT) is the lead agency in the development of the Business Plan. Within the DOT, the Office of Research is responsible for organizing and driving Business Plan development. It formed a Technical Panel of managers from the full range of state agencies with CVO responsibilities to act as the project steering committee. The motor carrier industry is represented by the state trucking association as well as by individual carriers. The FHWA also sits on the Technical Panel. The participation of the FHWA helps ensure that the state Business Plan is consistent with the national ITS/CVO program. The composition of the Panel is as follows:

- Department of Transportation;
- Department of Revenue;
- Department of Commerce and Regulation;
- Highway Patrol;
- Public Utilities Commission;
- Department of Environment and Natural Resources;
- Department of Agriculture;
- Bureau of Information and Telecommunications;
- Unified Judicial System;
- Federal Highway Administration;
- South Dakota Trucking Association; and
- Motor carrier industry.

The primary responsibilities of the Technical Panel are to:

- Review and approve the work plan;
- Develop a strategic direction, including a mission statement, guiding principles, goals, and objectives for the ITS/CVO program;

- Designate government and industry personnel to participate in the development of the Business Plan;
- Provide input and guidance to the development of the Business Plan; and
- Review and approve the products of work tasks.

Cambridge Systematics, Inc. of Cambridge, Massachusetts was hired by the South Dakota DOT to assist in the four-month development of the Business Plan. Financial support for consultant services was provided by Mainstreaming funds provided by the FHWA and state matching funds from the DOT.

2.2 Research Plan

This section explains how the ITS/CVO Business Plan was developed. The tasks involved in the business planning process are depicted in Figure 2.1, and explained below.

The Technical Panel was convened by the South Dakota DOT, Office of Research, for the purpose of developing an ITS/CVO Business Plan. The Technical Panel developed the original request for proposal, defined the project's objectives and tasks, and evaluated the submitted proposal. Panel members guided the work of Cambridge Systematics and provided critical input and direction. Representation from all government agencies involved in CVO, as well as industry representation, provided diverse perspectives and broad support for the final Business Plan. A complete list of Technical Panel members is included in Appendix A.

Task 1. Present Work Plan and Conduct Strategic Overview Session with Technical Panel

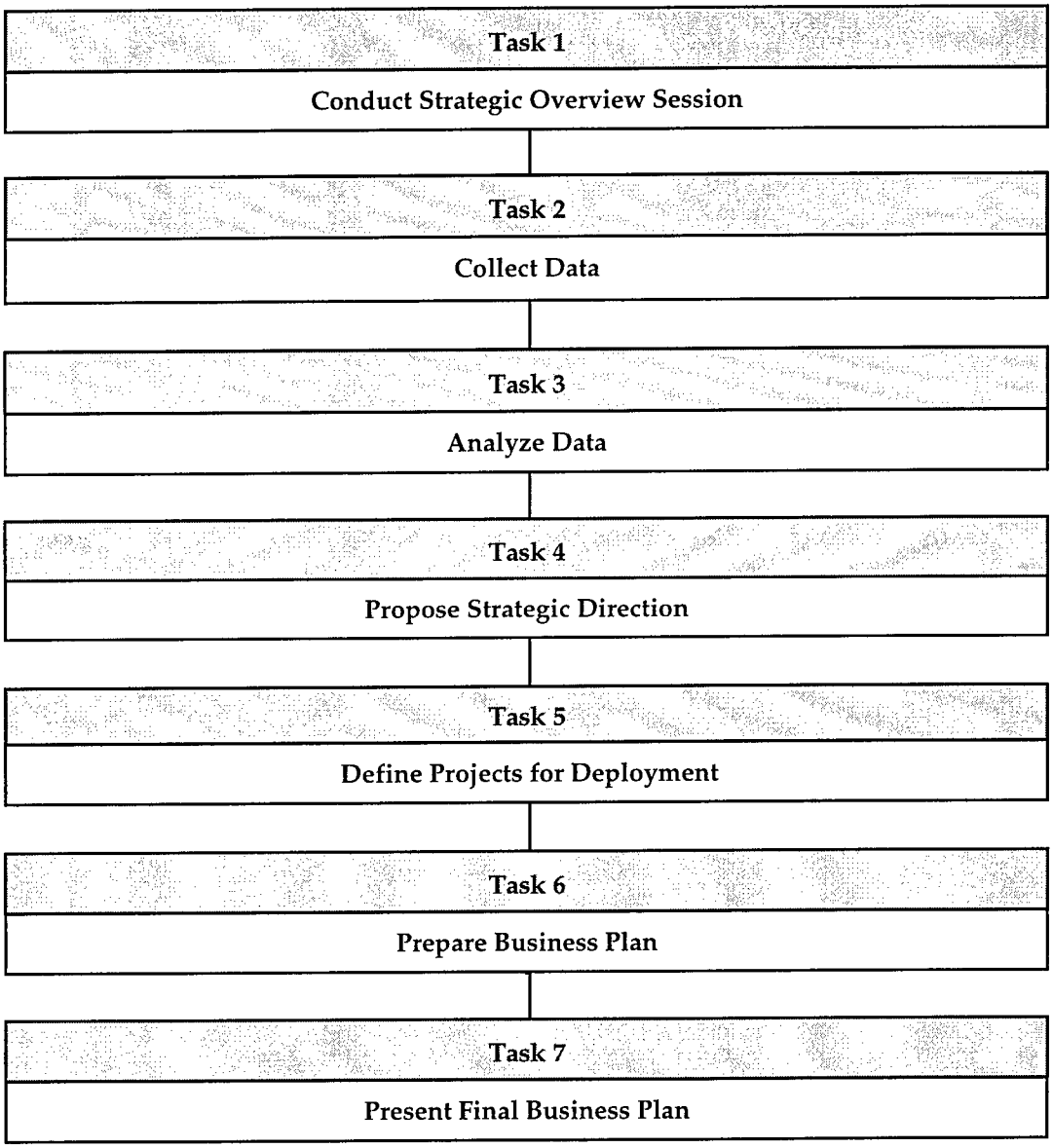
The purposes of this task were to present the final work plan to the Technical Panel and to initiate discussion about the direction of South Dakota's ITS/CVO program.

The initial work plan was modeled after the FHWA Guidelines for State ITS/CVO Business Plans and adapted to best suit South Dakota's CVO environment. The Technical Panel reviewed the work plan and suggested modifications. The revisions were made and the work plan was refined and finalized. The work plan was presented to the Technical Panel at the kickoff meeting held in mid-September 1997.

To help draft the strategic direction for the Business Plan, Technical Panel members were asked to provide suggestions and perspectives at the kickoff meeting. The comments were recorded on a large board so that everyone had the opportunity to review them and provide additional feedback.

Membership on the Technical Panel expanded as a result of the September meeting. DOT's Office of Research asked the Unified Judicial System, Department of Agriculture,

Figure 2.1 Process for Developing the South Dakota ITS/CVO Business Plan



and Department of Environment and Natural Resources to send representatives to the first meeting; these individuals provided the Technical Panel with valuable perspectives on CVO. As a result, these representatives were asked to formally join the Technical Panel in overseeing the development of the Business Plan.

During this trip, preliminary interviews were conducted with members of the Technical Panel in order to:

- Begin collecting background information on CVO in South Dakota, including registration, fuel tax, and safety enforcement;
- Gather impressions on areas for improvement in CVO agency procedures;
- Gather impressions on existing and potential ITS/CVO applications; and
- Request suggestions for stakeholder interviews to be held later in the project.

The product of this task was an approved work plan.

Task 2. Collect Data

The purpose of this task was to ensure sufficient knowledge of the CVO environment in South Dakota, the region, and the nation. The data collection task identified processes, procedures, responsibilities, problems, barriers, needs, and opportunities; it included the following steps:

- A review of business plans and relevant literature at the state, regional, and national levels in CVO, ITS, and other transportation areas;
- Quantitative data gathering;
- A Technical Panel workshop; and
- Interviews with state and federal agencies, trucking firms, bus companies, and other stakeholders.

Literature Review

The purpose of the literature review was to identify best practices among ITS/CVO projects and programs regionally and nationally, become familiar with national and regional initiatives for coordinating South Dakota's projects, and develop strategies for South Dakota's ITS/CVO Business Plan, including project development, management, implementation, and funding. A complete list of the literature reviewed for the Business Plan is found in Appendix B; the documents are grouped into South Dakota and federal/other literature.

Quantitative Data

The purpose of quantitative data collection was to assess the benefits and costs associated with the administration, regulation, and operation of commercial vehicle activities in South Dakota and to characterize agency functions. State agencies were asked to provide statistical information in three areas: state industry characteristics, state agency administrative processes, and safety and credentials enforcement. Questions focused on the following:

- State industry characteristics:
  - Motor carriers and vehicles;
  - Motor coach companies; and
  - Truck accidents.
- State agency administrative processes:
  - Registration and permit applications;
  - Methods of submitting applications; and
  - Revenues generated.
- Safety and credentials enforcement :
  - Vehicle weighings;
  - Vehicle inspections; and
  - Violations.

The questions were posed to three agencies:

- Highway Patrol,
- Department of Commerce, and
- Department of Revenue.

Workshop

The purpose of the workshop was threefold: to review the strategic direction, identify the CVO needs and opportunities, and begin defining projects for inclusion in the Business Plan. The primary focus was for the Technical Panel to identify the technical and non-technical needs that they perceived in the state, and the opportunities they perceived to improve agency practices, introduce technologies, and build stakeholder relationships.

The day-long workshop began by reviewing the strategic direction. The consultants drafted a strategic direction, including mission statement, guiding principles, goals and objectives, and provided it to the Technical Panel prior to the meeting day to allow for meaningful review and response. As a result, members gave thoughtful feedback and specific suggestions for changes and additions to the strategic direction. Modifications were discussed, consensus was achieved, and a revised version of the strategic direction based on the morning's consultation was distributed that afternoon to the Technical Panel members.

The second part of the workshop addressed the perceived needs and opportunities for ITS/CVO applications in South Dakota. Diagrams were drafted at the meeting identifying the electronic linkages that currently exist between the CVO databases of the agencies, and the linkages that are desired. Tables summarizing the results of this exercise are included in Appendix C.

The third part of the workshop addressed the projects that the Technical Panel showed strong interest in pursuing. This project list subsequently was expanded and reviewed by the Technical Panel at the meeting that was held in Task 6.

Interviews

The purpose of the stakeholder interviews was to gather a broad perspective from diverse private and public sector interests to address institutional barriers among stakeholders, technical preferences among ITS/CVO applications, and changes in existing CVO business practices.

The list of interviewees was developed in consultation with the Technical Panel. Ideas for interviewees were gathered from Technical Panel members during the preliminary Technical Panel interviews at the beginning of the project in September. Their suggestions included public sector staff representing both management and operations, and motor carriers and bus operators known to the Technical Panel for their willingness to discuss regulatory conditions and issues, or for their unique perspectives which would benefit the business planning process.

In addition, a strong attempt was made to include a cross section of motor carriers, as well as interstate bus operators. Motor carrier representation that was desired included:

- Intrastate and interstate carriers;
- Private and for-hire carriers;
- Large and small carriers;
- Time-sensitive and less time-sensitive freight carriers;
- Agricultural and non-agricultural carriers;
- Truck association and non-truck association representatives; and
- Hazardous materials (hazmat) and non-hazmat carriers.

Commercial vehicle operators received a letter by fax and/or by mail explaining the business planning process. They were then contacted by telephone to see if they were willing to be interviewed and to respond to questions. The carriers and bus operators that agreed were contacted by DOT's Office of Research to schedule a time for the interview.

In-person interviews were held in South Dakota in most cases, however travel constraints required a limited number of telephone interviews. Decisions to conduct telephone interviews in lieu of in-person interviews were made in consultation with DOT's Office of Research. The final list of individuals interviewed is included in Appendix D.

Interview guides for state agencies and for industry representatives were developed based on interviews conducted by the consultants for other states' ITS/CVO business plans, as well as the specific needs and goals of South Dakota.

State agency representatives were asked to identify their agency's role in the regulation of CVO in South Dakota, processes required to carry out their agency's functions, impressions of CVO in the state, ITS technologies used and preferred by their agency, and changes they desired (both technical and non-technical) for South Dakota's ITS/CVO program.

Industry representatives were asked about their company's fleet and operations, impressions of CVO credentials administration and enforcement in South Dakota, knowledge of ITS technologies, problems they had experienced, and changes they desired.

Informal interviews were held with the heads of commercial vehicle enforcement in two adjacent states, Minnesota and Wyoming. The purpose was to identify possible joint projects or other collaborations. The two persons interviewed are listed in Appendix D.

All the data collected in Task 2 were used in the following task.

Task 3. Analyze Data

The purpose of Task 3 was to analyze the information collected and identify best practices, strategies, and program components for the ITS/CVO Business Plan.

Data analysis techniques included literature review, benefit/cost analysis, mapping and diagramming, and stakeholder interviews.

Literature Review

The highlights of the South Dakota literature are incorporated into Sections 1.0 and 3.0 of this report.

The remaining literature consists of national, regional, state, and project-specific documentation (see Appendix B). Key documents include the National ITS/CVO Program Plan; business plans from Minnesota, Nebraska, and Oregon; and project-specific descriptions (e.g., PRISM). The information was used to help guide South Dakota's ITS/CVO strategy by planning for compatibility with ITS/CVO initiatives undertaken at the federal level, identifying successful technology applications and management approaches, and validating South Dakota's program emphasis and direction.

The National ITS/CVO Program Plan was used as a reference in drafting the elements of the strategic direction (e.g., mission statement), outlining project categories (i.e., safety assurance, credentials administration, electronic screening, and carrier operations), and providing background on national projects and initiatives. State business plans suggested technologies for adoption, new business practices, organizational structuring, and partnership opportunities. In addition, the business plans helped to confirm that South

Dakota's strategic direction was consistent with other states that had completed business plans.

Business plans completed in other states contributed the following strategies and best practices that were assimilated into South Dakota's business planning effort[1]:

- Form a working committee of state CVO agency managers plus representatives from the Office of Motor Carriers of the FHWA and the motor carrier industry to implement the business plan and develop and direct a state CVO program;
- Develop new methods of providing information to carriers, and new educational materials targeted at specific market segments;
- Bias the ITS/CVO program towards immediate deployment of proven technologies;
- Reengineer regulatory processes before applying automation;
- Linking databases should be a high-priority element in a CVO program;
- Automating processes such as oversize and overweight permitting has high potential to increase agency efficiency; and
- Targeting enforcement efforts on carriers with a history of safety problems reduces the risk of preventable accidents.

Although a first draft of the Midwest Mainstreaming Consortium Regional Coordination Plan was made available in mid-December 1997, no concrete plans for regional projects were included. A "Midwest Mainstreaming Resolution Concerning Electronic Screening Compatibility and Interoperability" earlier had been distributed to consortium members, and a final resolution likely will encompass guiding principles for ITS/CVO activities in the region. The final regional plan will be submitted to the FHWA in May 1998.

Quantitative Data

One of the needs expressed by the Technical Panel at the beginning of the business planning project was an analysis of the benefits and costs of investing resources in ITS/CVO technologies to improve CVO regulation and operations in South Dakota. The scope of the work to develop the ITS/CVO Business Plan did not allow a full benefit and cost analysis, therefore the consultants proposed to use for this purpose the results of the National Governors' Association (NGA) benefit/cost study of state administrative processes. It was expected that the study results would be available during development of the Business Plan.

[1] The content or intent of most of these ideas was mirrored by needs expressed in stakeholder interviews in South Dakota, and therefore the ideas are similar to some South Dakota projects.

However, the NGA study was not available for review until December. At that time, the consultants were able only to review the material and not apply it to South Dakota. The study consists of a spreadsheet for calculating benefits and costs and a guidance document for states using the spreadsheet. Review of the spreadsheet produced the following preliminary findings:

- The spreadsheet format allows a state to input data. Inputs include number of staff by credential and enforcement area; salary range of staff and percentage of time spent on CVO activities; revenues generated by each area; number and type of weigh station facilities; number of applications processed by credential area; and types of projects the state wants to implement (e.g., electronic screening, electronic credentialing, etc.).

- Using multipliers, the spreadsheet calculates anticipated costs to implement electronic screening, electronic credentialing, etc., presented as a range of costs; and anticipated benefits in dollars derived from the implementations, also presented in a range format.

- The spreadsheet apparently will not allow the calculation of costs and benefits for projects that are defined specifically, such as the CVISN; rather, it enables calculations for broadly defined areas such as electronic screening and electronic credentialing.

Use of the NGA spreadsheet may provide benefit and cost numbers for broad ITS/CVO program areas, but it became clear as business planning progressed that the Technical Panel was interested in having benefit and cost data on the project level in order to help prioritize individual projects. In the absence of conducting a full analysis of benefits and costs for projects, a method was developed that classified projects according to relative scales of benefits and costs (see Section 5.3).

Diagrams

The electronic linkages between state agencies were developed at the workshop in Task 2 and are included in Appendix C. Among the many desired linkages, it is important to note the frequency at which electronic linkages to the Highway Patrol is desired. As the Highway Patrol receives more current, accurate, and complete data, its enforcement efforts have the potential to become more targeted and efficient, thereby helping to improve safety in South Dakota.

Interviews

Industry and state agency representatives who were interviewed expressed CVO needs related to regulatory procedures and technology preferences. The following needs were identified, with the number of people who expressed the need in parentheses:

Motor Carriers

- Adopt uniform regulations among states (6);
- Change procedures for obtaining oversize/overweight permits (4);

- Use technology to aid enforcement (weigh-in-motion and sensing equipment were mentioned) (4);
- Conduct more random roadside inspections (3);
- Develop a central source of regulatory information (3);
- Require less paperwork (3);
- Better train enforcement personnel on specialized regulations (3);
- Conduct more enforcement in general (2);
- Conduct tougher speeding enforcement (1); and
- Enable electronic funds transfer (1).

State Agencies

- Share information among agencies (insurance information was specifically mentioned five times) (8);
- Provide more information and education to motor carriers (6);
- Coordinate hazardous waste functions among state and local agencies (3);
- Institute performance-based enforcement (2);
- Enable one-stop shopping for credentials (2);
- Develop automated safety reporting (2);
- Focus on size and weight enforcement (2);
- Develop automated oversize/overweight routing (1);
- Use license plate readers (1);
- Enable electronic funds transfer (1); and
- Consolidate CVO regulatory functions in one agency (1).

Summary of Needs

Motor carriers that were interviewed identified three problem areas at the roadside: the process of obtaining oversize and overweight (OS/OW) permits, delays at weigh stations, and safety. Generally, carriers want to be able to call ahead for overweight permits (as is allowed for oversize vehicles) because it will save time and be much more convenient. Weigh station stops are frustrating when trucks are empty; carriers do not like being weighed when they are not carrying a load. Carriers also are unhappy that all trucks must stop at weigh stations when sensing technologies exist that will automatically weigh trucks and identify them, too. Being of legal weight and having credentials in order, compliant vehicles should be able to bypass the scale facility. Carriers are concerned about safety; several stated that enforcement officers should conduct more roadside inspections, and two others said more enforcement in general should be performed. The

major deskside problem identified was too much paperwork required by state agencies. Carriers that expressed this opinion said they would do electronic transactions.

Agency personnel strongly voiced the need for agencies to share information electronically. They also expressed interest in instituting performance-based or targeted enforcement and one-stop shopping for credentials, both of which depend upon establishing electronic linkages among databases. Automation is also the heart of most of the other needs expressed by agency personnel. These needs include automated safety reporting and automated OS/OW routing. Many agency representatives stated that automating existing manual procedures will offset the reductions in staff experienced by some agencies in recent years that have resulted in increased workloads for remaining staff.

Notably, both carriers and agencies frequently expressed the need to provide the industry with more information and education of all kinds, but especially about renewal dates for registrations and licenses, regulatory requirements, and specialized areas such as hazardous materials transportation.

The issue expressed by carriers most frequently was the lack of uniformity of regulatory policy across states, especially with respect to size and weight regulations. Inconsistent size and weight regulations make it difficult for carriers moving OS/OW loads to operate efficiently because they may be required to make changes in axle configuration and spacing as they travel through multiple states. While one state alone cannot expect to effect changes that bring all states to uniformity, organizations such as the national (and international) Commercial Vehicle Safety Alliance and the regional OS/OW permitting groups serve to bring uniformity issues to the forefront where they are discussed and may be resolved.

The needs expressed in the interviews were used to help define projects for deployment as will be seen in Section 5.0 of this document.

Interviews with Neighboring States

Informal discussions were held with the heads of commercial vehicle enforcement (CVE) activities in two neighboring states, Wyoming and Minnesota, to identify possible joint projects or other collaborations. Both CVE officials expressed interest in coordinating enforcement operations along Interstate 90. Wyoming has a port of entry (POE) at Sundance, near the South Dakota border. Wyoming's CVE chief said exchanging information electronically between Sundance and Tilford, the South Dakota POE, could eliminate the need to weigh vehicles and check credentials in both states. Weight, registration, fuel tax, and other information could be verified at one POE and the verification transmitted to the other state's POE, eliminating the required stop in the second state.

Minnesota's CVE chief said Minnesota and South Dakota have not discussed collaborative weigh station operations largely because of the distance between the scales. In Minnesota, the Worthington scale is about 50 miles from the South Dakota border and presents a question of verifying legal weight in the second state. However, two opportunities were mentioned. One, Minnesota owns a rest area on the South Dakota side of the border, and performing joint "saturation" (vehicle and credentials checks) would be a good joint effort. Two, Minnesota's 10-year capital construction plan calls for a new scale

facility at Manley closer to the border, possibly around 2002. This could be an excellent opportunity to discuss joint operations.

The products of Task 3 were the identification and evaluation of strategies used to overcome technical and institutional barriers to ITS/CVO deployment, best practices among CVO programs, and promising program components for South Dakota.

Task 4. Propose Strategic Direction

The purpose of this task was to propose a strategic direction for South Dakota's ITS/CVO program and document the current CVO environment.

Strategic Direction

The strategic direction proposed in this report was developed in five parts over the first three months of the Business Plan's development:

- The strategic overview session conducted with the Technical Panel provided information for a preliminary strategic direction. A strategic direction consists of a mission statement, or the overall, long-range intention of the state ITS/CVO program; guiding principles, which are the underlying assumptions that guide the development of the Business Plan; goals, which are the broad achievements toward which the program is directed; and objectives, specific components of the goals. During the session, Panel members were asked to describe their expectations for the Business Plan, concerns they have about current procedures and practices, and their vision of CVO in South Dakota.

- A preliminary strategic direction was prepared by the consultants. It encompassed the Technical Panel's priorities that were introduced at the strategic overview session. Conceptually, the draft mission statement, goals, and objectives reflected the priorities of the Technical Panel, and incorporated the major ideas of the national ITS/CVO program.

- The Technical Panel reviewed the strategic direction during the workshop in Task 2. The members added some ideas and generally refined the statements.

- The revised strategic direction was sent to members of the Technical Panel, who were not present at the workshop, for their review.

- A final refinement was made to the strategic direction at the Technical Panel meeting in Task 6. The final version of the mission statement, guiding principles, goals, and objectives is included in Section 4.0 of this document.

Current CVO Environment

A clear understanding of the current CVO program was necessary to identify problems in current CVO procedures and opportunities to apply ITS technology to address the

problems. The research conducted in Task 2 to describe the current CVO program included the following:

- The in-person interviews conducted with managers and operational-level personnel in the South Dakota regulatory agencies; agencies such as the Unified Judicial System that provides judicial support and the Bureau of Information and Telecommunications that provides technical and computer support to the regulatory agencies; and the FHWA, provided detailed information on the CVO responsibilities of each organization and the processes used to administer and enforce motor carrier regulations.

- The workshop conducted with members of the Technical Panel provided information on the regulatory programs of each agency. The workshop also explored information sharing and communication linkages among the state agencies and with multistate and national information systems.

- Agencies provided materials and documentation relating to their functions and processes. The materials include applications and other forms, manuals, handbooks, maps, charts, lists, notices, and reports.

- Agencies provided quantitative data that relate to CVO activities in the state. Data include numbers of registered carriers and vehicles, numbers of applications for credentials and permits, methods of submittal and percentage breakdown, revenue generated by credential processes, numbers of commercial vehicles weighed and inspected, number of citations issued, and numbers of employees by classification.

Trucking and economic characteristics of South Dakota include a profile of the motor carrier industry and information on the movement of commodities in the state. These descriptions were primarily based on the review and analysis of data from the U.S. Department of Commerce, Bureau of the Census, 1993 Commodity Flow Survey. Some data were extracted from the report produced by the South Dakota Trucking Association and the Western Highway Institute entitled *The Trucking Industry in South Dakota Annual Report to the Governor, 1996.*

Issues that affect CVO and opportunities to apply ITS technology were developed from the following sources:

- Strategic overview session with the Technical Panel;

- Interviews with state and federal agencies, trucking firms, bus companies, and other stakeholders;

- Review of the literature including other states' and regions' business plans and the National ITS/CVO Program Plan; and

- Technical Panel workshop.

The product of Task 4 was a Technical Memorandum dated November 1997.

Task 5. Define Projects for Deployment

The purpose of this task was to identify and describe ITS/CVO projects for development, testing, and deployment in South Dakota.

Projects were identified based on the information gathered and conclusions reached from all preceding tasks. Consideration was given to the existing CVO environment in South Dakota, the Technical Panel's outlook on South Dakota's future, as well as the national program and regional activities.

The product of this task was a list of ITS/CVO projects appropriate for coordinated implementation in the state. Project definitions include the purpose of the project; desired outcomes; technical approach; organization and management; schedule; expected products and estimated costs; and potential funding sources. The Technical Panel considered the list of potential projects for deployment at the meeting in Task 6.

Projects were ordered for implementation based on several factors, including benefits and cost, risks, synergy among projects, and availability of funding.

The full project descriptions are included in Section 5.2 of this document.

Task 6. Prepare Business Plan

The purpose of this task was to define an ITS/CVO program suitable for implementation in South Dakota, documented in a structured format.

The Business Plan summarizes the business planning process, current CVO environment, strategic direction, ITS/CVO projects and program, and organization and management approach.

The products of this task include:

- **An Overview of the Business Plan** – An overview of the Business Plan was presented to the Technical Panel in early December 1997. At this meeting, the strategic direction was approved. Projects were described to the Technical Panel which provided suggestions for refining the projects.

- **The Draft Business Plan** – The draft plan was submitted to the Technical Panel on December 23, 1997. It was reviewed by the Technical Panel which provided requests for revision to the consultants.

- **An Executive Summary of the Final Business Plan.**

- **The Final ITS/CVO Business Plan** – The draft plan was revised according to the comments received from the Technical Panel, and after careful discussion of points with the lead agency, the Office of Research of the DOT. The final ITS/CVO Business Plan was submitted in January 1998.

Task 7. Present Business Plan

The purpose of this task was to communicate to key South Dakota stakeholders, in presentation form, a summary of South Dakota's ITS/CVO program.

The task included presentations of the final ITS/CVO Business Plan in late January 1998; presentations were made to the South Dakota DOT Research Review Board and key decision-makers from the public and private sectors.

3.0 Current CVO Environment

This section describes the current CVO program in South Dakota, trucking and economic characteristics, issues affecting CVO, and opportunities to apply ITS technology.

3.1 Current CVO Program

Responsibility for the regulation of commercial vehicle operations in South Dakota is spread among numerous agencies and the FHWA (see Figure 3.1). The following section describes the CVO responsibilities of each agency.

Department of Transportation

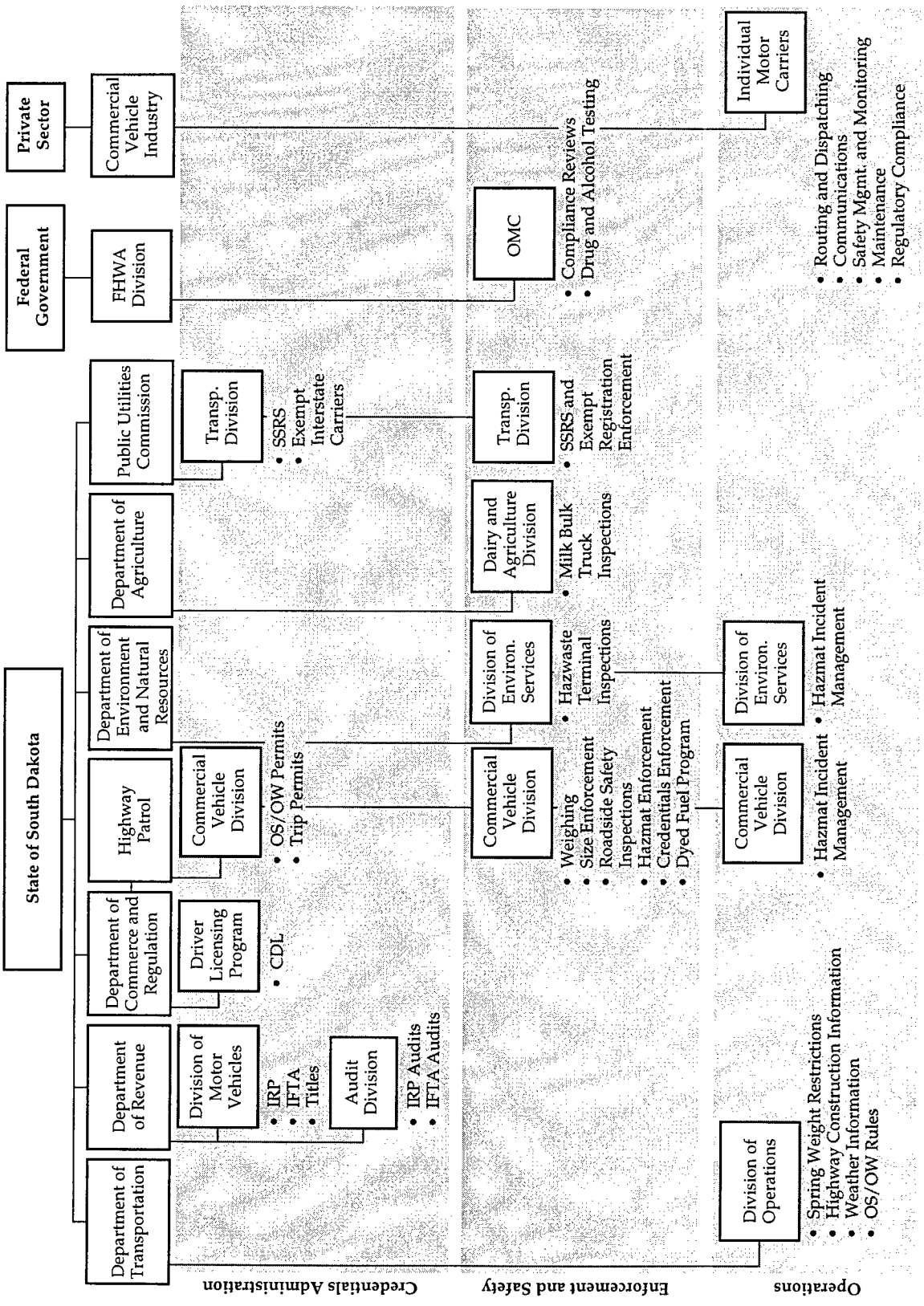
The DOT is primarily responsible for dissemination of information to the commercial vehicle industry, and determining oversize and overweight administrative rules. The DOT, Office of Research, as mentioned previously, is the lead agency in the development of South Dakota's ITS/CVO Business Plan.

Information Dissemination – The Division of Operations within the DOT disseminates critical information to the commercial vehicle industry. This includes maps showing the month's highway construction activity, weather information, a map identifying the state bridge weight limits, and the South Dakota Motor Carrier Handbook. The Handbook explains when a special permit is required, where the permit can be purchased, and how much it costs; it is distributed at the ports of entry (POEs) and Highway Patrol District Four (Commercial Vehicle Division) headquarters. The division also determines spring weight restrictions and distributes this information to the motor carrier industry. All of these efforts take place at the Division of Operations office in Pierre.

OS/OW Rules – Oversize and overweight (OS/OW) permitting rules are established by the Division of Operations in consultation with the Highway Patrol and industry groups. The Transportation Commission and the Legislative Rules Committee have final approval of rules changes.

If a truck exceeds specified size, load, or weight requirements, then the motor carrier must obtain an OS/OW permit. Permits are issued on a per-trip basis and are obtained from the Highway Patrol. Weight loads must be calculated by the division for large loads traveling on less frequented routes. Last year 31,276 single-trip OS/OW permits were issued in the state. This type of permit is not required for motor coach operators because their size does not vary and loads do not exceed the established standards. Size and weight regulations are included in the South Dakota Motor Carrier Handbook.

Figure 3.1 Commercial Vehicle Operations in South Dakota



South Dakota is currently not participating in a regional OS/OW permitting agreement. These regional groups enable motor carriers moving OS/OW vehicles to obtain one permit for travel in all participating states. Generally, travel is restricted to predetermined routes and vehicles fall within predetermined size and weight limits.

Department of Revenue

The Division of Motor Vehicles (DMV) in the Department of Revenue administers the International Registration Plan, the International Fuel Tax Agreement, and vehicle titles.

IRP – South Dakota is a member of the International Registration Plan (IRP). The IRP is a base state program which provides apportioned registration for interstate carriers. Under this program, a motor carrier can register its vehicles in a single state and travel in other states without additional registrations. The base state collects and distributes registration fees to other states based on the miles traveled by the carrier's vehicles in each state. Individual states determine their fee schedule according to vehicle characteristics, including weight, model year, and value.

The DMV processed IRP requests for approximately 1,900 carriers and 10,000 vehicles in 1996. Approximately 85 percent of applications were received by fax or mail. An additional 15 percent were brought in by a carrier representative. IRP applications are processed nightly in batches on an AS400 mainframe computer located in Sioux Falls. The software was developed by consultants for the DMV. Data are manually keyed into the IRP system by DMV staff. Cab cards are issued from the AS400 computer and mailed to the carrier.

Registration trip permits are issued by the Highway Patrol and can be purchased at POEs.

IFTA – South Dakota is a member of the International Fuel Tax Agreement (IFTA). The IFTA program is also a base state agreement; one license is valid in all states. In addition to having an annual license, motor carriers are required to complete a quarterly tax form which fulfills the fuel tax reporting requirements for all states through which the motor carrier has traveled.

The DMV processed IFTA applications for 2,600 carriers and issued 17,000 IFTA decals in 1996. Approximately 85 percent of requests for fuel tax licenses arrive by fax or mail. Fifteen (15) percent are brought in by person. Application and tax return data are manually keyed, and processed on the state's mainframe computer. The IFTA license is printed at the Data Center of the Bureau of Information and Telecommunications. The IFTA license is returned to the DMV office and mailed to the carrier.

Fuel tax trip permits are issued by the Highway Patrol and can be purchased at POEs.

The DMV has been accepting quarterly tax filings electronically. Permitting services are filing returns for some 250–300 motor carriers using a bulletin board system (BBS).

Audits – IRP and IFTA audits are conducted by the Audit Division of the Department of Revenue.

Vehicle Title and Registration – Vehicle title demonstrates proof of ownership by a motor carrier. Titles are administered by the DMV. They are required documentation for applying for the IRP. The DMV maintains the title and registration database on the state's mainframe computer. The database includes both passenger and commercial vehicles.

New software developed by TML allows dealers to input new vehicle and vehicle transfers information directly into the titles database. At present, this is a pilot project in its early stages and currently can only be used for passenger vehicles.

Department of Commerce and Regulation

The Driver Licensing Program is responsible for driver licenses and the driver improvement functions. It is part of the Department of Commerce and Regulation (DCR).

Commercial Driver License – Drivers of commercial vehicles are required to have a commercial driver license (CDL); it is valid for five years. The Driver Licensing Program is responsible for administering the written and road CDL test, and issuing the CDL itself. It also accepts and reviews applications, conducts eye exams, and issues temporary licenses.

The following vehicles require a CDL:

- Vehicles in excess of 26,000 Gross Vehicle Weight Rating (GVWR);
- Trailers in excess of 10,000 GVWR, if the load and trailer exceed 26,000 GVWR;
- Vehicles designed to carry 16 or more passengers; and
- Vehicles requiring hazardous materials placarding.

A South Dakota CDL is recognized in all states in the country. There are 47,000 CDL drivers licensed in South Dakota. A driver should be in possession of only one CDL; holding CDLs from multiple states is not permitted.

To obtain a CDL, an applicant must take both a written and a driving (or skills) test, and pay a driver license fee. The Class C road tests are administered through the driver exam stations, which are operated under the DCR. Third-party testers, including some large trucking companies, which are trained and monitored by the DCR, administer the remainder of the CDL skill testing. After successful completion of the exam and application, fulfillment of the medical standards, fee payment, and verification of a safe driving history through the Commercial Driver License Information System (CDLIS), a CDL can be issued immediately. The National Law Enforcement Telecommunications System (NLETS) is also available to the DCR to obtain driver information.

The CDLIS is a pointer system that consists of drivers who hold or have held CDLs, and drivers who have been convicted of a moving violation in a commercial vehicle. The state of record holds the status and the driving record of the individual. If a driver changes his or her state of record, the history is transferred to the new state of record via the CDLIS. The Driver Licensing Program and the Highway Patrol access the CDLIS through the state's mainframe computer.

The driver license group based at the DCR headquarters in Pierre responds to questions by telephone concerning driver licenses, lost licenses, and replacements. Approximately 10-15 percent of the calls come from commercial vehicle drivers.

A pilot program of two-dimensional (2-D) bar coding of driver licenses begins in April of 1998. The program is expected to go statewide in June. The advantage of 2-D bar codes is that they carry increased amounts of data compared to conventional linear codes.

Driver Improvement – The DCR notifies commercial drivers when their license is being suspended, disqualified, or revoked. If a driver is convicted for two serious offenses within a three-year timeframe, his or her license will be disqualified. The driver has 10 days to request a hearing after receiving the notification letter; the hearing generally takes place within one or two months.

Department of Environment and Natural Resources

The Department of Environment and Natural Resources (DENR) oversees the regulation of hazardous waste transport and participates in incident management of spills of hazardous materials including hazardous waste, in South Dakota.

Hazardous Materials – South Dakota does not require a state permit to transport hazardous waste or other hazardous materials. The state has adopted the federal regulations governing the transport of hazardous waste, including the inspection of vehicles hauling hazardous waste; the state has no additional regulations.

Hazardous materials are considered regulated substances and are not addressed until a spill occurs. If a hazardous material spill occurs within the state, various agencies could respond depending on the location of the spill. The Highway Patrol and the DENR are among the agencies involved in incident management. Carriers are responsible for clean-up and the associated costs.

In addition, the DENR is following the progress of two strategy and planning systems sponsored by the U.S. Environmental Protection Agency, Office of Solid Waste. The Waste Information Needs (WIN) initiative and the Hazardous Waste Information Needs for Making Environmental Decisions (INFORMED) project support state hazardous waste programs and promote consistent data management.

Department of Agriculture

The Dairy and Agriculture Division of the Department of Agriculture oversees the inspection of milk bulk trucks.

Milk Bulk Truck Inspection – The role of the Department of Agriculture in CVO is limited to milk bulk truck inspection carried out by the Dairy and Agriculture Division.

Public Utilities Commission

The Transportation Division of the Public Utilities Commission (PUC) is responsible for regulating exempt interstate carriers and for administering the Single State Registration System (SSRS).

Operating Authority – The PUC administers the SSRS in which interstate carriers register their Interstate Commerce Commission (ICC) or U.S. DOT operating authority in the state.[1] The PUC is also responsible for issuing operating authority to exempt interstate carriers. (Exempt interstate carriers are interstate carriers that transport commodities that are exempt from economic regulation, formerly administered by the ICC.) There are 826 carriers registered in the SSRS through South Dakota and 3,280 exempt carriers in the state. The SSRS is another base state agreement. The program relieves carriers from having to register their operating authority in other SSRS-participating states. Proof of insurance is required for both SSRS carriers and exempt carriers.

Operating authority for intrastate motor carriers is not required.

Approximately 90 percent of SSRS applications arrive by mail or fax. The remainder come in by person. Applications are manually keyed, processed, and stored in Q&A software on a personal computer. Credentials are automatically issued in the PUC office. The database is maintained and supported by the PUC.

Through the Midwest One-Stop Operational Test it was possible for motor carriers to electronically apply for SSRS credentials to the PUC. However, in South Dakota, the service was not tested by any pilot carriers.

As insurance is required for both exempt and SSRS carriers, the PUC monitors the insurance status of these carriers. In addition, the PUC has the authority to issue citations for registration violations by SSRS and exempt carriers. The PUC e-mails weekly and monthly reports to the Highway Patrol on SSRS suspensions and revocations. It also mails the monthly report to the other 38 states that participate in the SSRS.

Highway Patrol

Administratively, the Highway Patrol is part of the Department of Commerce and Regulation. However, the Commercial Vehicle Division of the Highway Patrol has such wide-reaching responsibilities that for the purposes of this Business Plan, it is treated

[1] Until early 1996, carriers were required to receive interstate operating authority from the ICC and were required to register that authority with most states. In December 1995, Congress passed legislation to terminate the ICC and transfer its remaining powers to the U.S. DOT. The law abolished ICC operating authority. In January 1997, as required by the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), the SSRS was established which obligates carriers to register proof of insurance with a base state. Currently, operating authority is administered by transportation commissions, public utilities commissions, state departments of transportation, and other entities.

separately. Its functions in the area of CVO deal with roadside enforcement, permitting, and hazardous materials incident management. The division has an enforcement staff of 67 who weigh commercial vehicles, perform safety inspections, check credentials, and issue permits. For all personnel except the four POE managers, weighing activities and checking credentials are the dominant functions.

Roadside Enforcement – The Commercial Vehicle Division of the Highway Patrol (hereafter, the Highway Patrol), is responsible for roadside enforcement in the state. Enforcement includes the weighing of vehicles and inspection of drivers, vehicles, hazardous cargo, fuel, and credentials. The credentials that the Highway Patrol inspects include vehicle registration, fuel tax license, SSRS registration, CDL, and logbook hours of service. Vehicle weighings and safety inspections occur at different sites in the state: POEs, mobile enforcement locations, and spot checks along the roads. Last year, 592,123 vehicles were weighed across the state (523,654 at fixed sites; 68,469 at mobile sites).

In 1995, South Dakota became the last state to join the Commercial Vehicle Safety Alliance (CVSA), joining the other states in adopting a common safety inspection standard. South Dakota now has CVSA-trained inspectors to conduct vehicle inspections. Last year, 801,832 vehicles were inspected statewide (683,480 vehicles were inspected at fixed sites; 118,352 vehicles were inspected at mobile sites).

There are five POEs in South Dakota and nine mobile units:

- POEs are located at: Sisseton (I-29 North), North Sioux City (I-29 South), Sioux Falls (I-90 East), Tilford (I-90 West), and Yankton (U.S.-81 at Yankton). All of the POEs operate seven days a week, 24 hours a day, with the exception of Yankton, which operates four days per week, 10 hours a day.

- The nine mobile units operate in teams of two officers. These units are placed in different locations throughout the state on a variable schedule.

The dyed fuel testing program is administered by the DMV and the Highway Patrol. Motor carrier enforcement officers sample fuel from trucks to check for violations of the dyed fuel regulations. Dyed fuel is generally intended for off-road use.

The Highway Patrol, as the state's primary enforcement agency, issues a large number of citations for hours of service and other violations and out-of-service orders. In 1996, 3,218 out-of-service orders and 12,039 CVO citations were issued. The Highway Patrol is also involved in incident response, an operational rather than enforcement activity, including incidents involving hazardous materials spills.

Permits – Special permits are required for motor carriers traveling in South Dakota under certain load or operating conditions. There are 21 permits issued by the Highway Patrol. The most frequently issued permit is the single-trip OS/OW permit; 31,276 were issued in 1996. An additional 27,049 single-trip permits, including fuel tax and registration permits, were issued as well.

Over half of trip permit requests come in by person to the POEs or to Highway Patrol headquarters in Pierre. Close to half of the requests are made over the telephone. The permit applications are completed by hand. The information is then keyed and stored in

a Q&A database. None of the processing is automated. Overweight permits must be obtained in advance of the trip in South Dakota. A trip permit for an overdimensional load or fuel or registration can be obtained at a POE at the time of the trip.

The Highway Patrol's involvement in ITS activities includes the following:

- The Highway Patrol is linked to a number of national information systems and relies on them for information to make enforcement and inspection decisions. Currently, the Highway Patrol uses the Aspen software to upload inspection data on its personal computers to the SAFETYNET. The Highway Patrol is linked to the CDLIS, the National Criminal Investigation Center (NCIC), the NLETS, and the State Wants and Warrants. Access at POEs is by personal computers; access by mobile units is through the state radio.

- The Highway Patrol is in the process of acquiring new laptop computers to improve reporting processes and linkages to information for the mobile enforcement units, and to establish an electronic linkage between the Patrol and the DMV for communicating dyed fuel program violations.

- The Highway Patrol recently submitted a proposal to the FHWA requesting funding through a technology grant for cellular communications. Cellular communications capability for laptop computers would link the mobile units to the POEs and the Highway Patrol headquarters and improve the speed and quality of data communication from the roadside to deskside.

- The Highway Patrol is investigating the possibility of introducing weigh-in-motion (WIM) technology at a new North Sioux City POE.

The Highway Patrol also participated in the Midwest One-Stop Operational Test for OS/OW and fuel and registration permits; however, no electronic permit applications were submitted by any pilot carriers.

Unified Judicial System

The Unified Judicial System (UJS) provides judicial support to the CVO regulatory agencies, which includes interpretation of laws. The agency's responsibilities include handling citations, penalties, and fines incurred by motor carriers and motor coach companies and their employees. It does not have CVO regulatory responsibility.

The Unified Judicial System holds citation information on a mainframe application, the Criminal Justice Information System (CJIS). This system is not yet a statewide system, but some agencies, including the Driver Licensing Program in the DCR, Highway Patrol, and Department of Criminal Investigation (DCI), do have access currently.

Bureau of Information and Telecommunications

The Bureau of Information and Telecommunications (BIT) does not have regulatory responsibilities but is responsible for supporting the state regulatory agencies. The BIT's role is to implement new hardware and software systems, support and network existing state computer systems, and program systems to meet the changing requirements of state agencies. The BIT supports all state agencies mentioned here with the exception of the PUC and the UJS.

South Dakota's communications and information infrastructure is based on a statewide fiber optic network.

FHWA, Office of Motor Carriers

The Office of Motor Carriers (OMC) of the FHWA administers a number of safety- and education-related programs including the federal Drug and Alcohol Program, and conducts safety compliance reviews. The SafeStat prioritization process for compliance reviews focuses on carriers' safety histories and known carrier problems. The reviews are conducted to see how a carrier handles the maintenance of vehicles and complies with safety regulations. During compliance reviews, logbooks, vehicles, and vehicle reports are sampled. The objective of the review is to improve safety and compliance among motor carriers.

The OMC also requires trucking companies to establish drug and alcohol programs. The programs include random drug testing of drivers already with the company, as well as required drug testing for driver applicants.

Among other responsibilities, the OMC administers various grants, handles complaints and works for their resolution, and reviews the state's size and weight plan and commercial vehicle safety plan.

3.2 Trucking and Economic Characteristics

Trucking is the major method of goods movement in the United States and therefore plays an integral role in the nation's transportation system. In 1993, the most recent year for which there exist comprehensive data, trucks carried over $4.6 trillion worth of goods and earned $345 billion in gross freight revenues. These revenues are expected to increase a total of 21 percent in the subsequent decade (1994-2004). During that time the number of trucks on the nation's roads is expected to increase by 14 percent.

Freight Transportation in South Dakota

In 1993, South Dakota produced $10 billion and 25 million tons of shipments. Trucks hauled 80 percent of these commodities by both value and weight. This trucking accounted for 0.2 percent of total U.S. shipments by value and 0.3 percent by weight. Agriculture, the largest user of commercial vehicles in the state, demands 65 percent of South Dakota's trucks (see Figure 3.2). The major goods hauled when ranked by value are food, chemical and farm products (see Figure 3.3); when ranked by weight, the major goods hauled are farm products, nonmetallic minerals, and clay, concrete, glass or stone products (see Figure 3.4). Of these goods 40 percent of the value and 55 percent of the weight of total shipments originating in South Dakota were shipped to destinations within the state.

About 28 percent of the value and about 47 percent of the weight of all shipments were between places less than 50 miles apart. These numbers show that trucking is vital both for the local movement of commodities and for exporting materials and products beyond the state.

The largest portion of these exported goods, roughly a fifth by both value and weight, was shipped to the neighboring states of Minnesota and Iowa. Other important destinations by value were California, Nebraska, and Illinois. Other important destinations by weight were North Dakota, Wyoming, and Michigan.

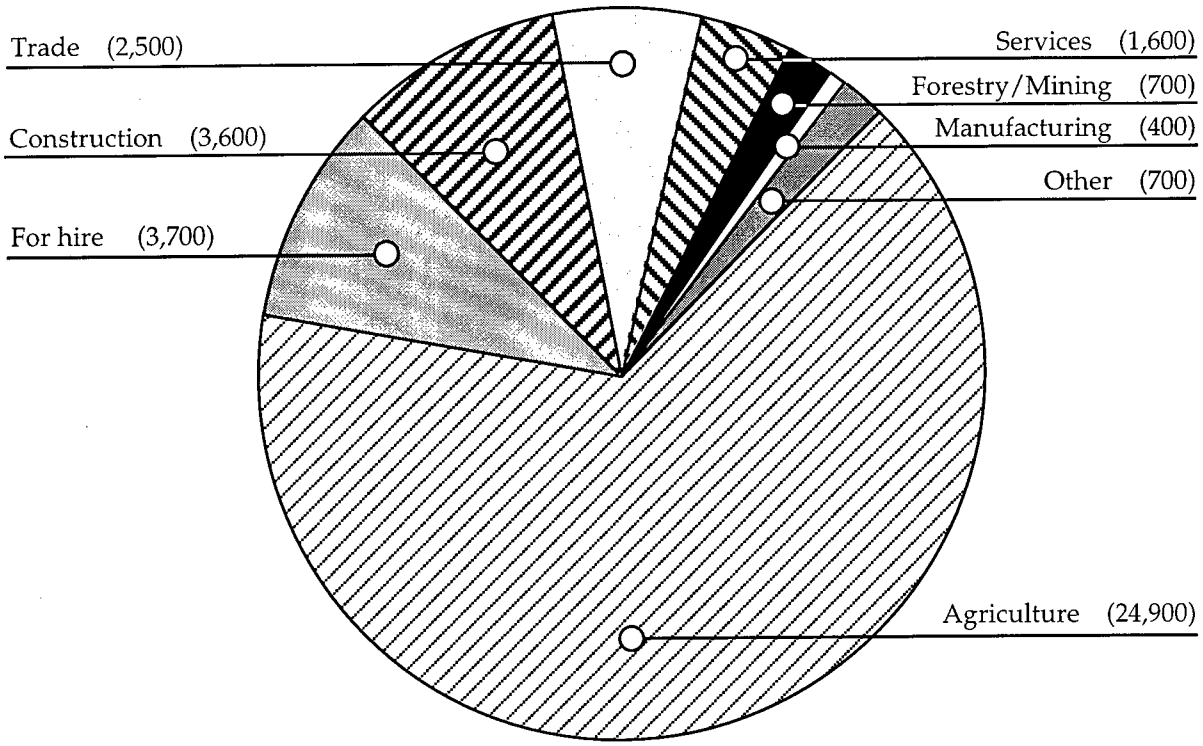
Commercial vehicles bring an additional $6 billion worth of goods into South Dakota from places outside the state. Furthermore, almost $7 billion worth of commodities pass through South Dakota on trucks to other destinations on a yearly basis.

Safety is a major concern regarding commercial vehicle operations because of the size of trucks relative to other motor vehicles and trucks often carry hazardous cargoes. For the five years from 1992 to 1996 inclusive, the percentage of truck involvement in all accidents in South Dakota remained constant at 3.3 percent; however, the percentage of fatal accidents involving trucks was over two to three times as great during those same years. In 1993, trucks in the state were involved in 19 fatalities. The number was 15 fatalities in 1994 and 1995, and 19 fatalities in 1996. Of trucks in South Dakota carrying hazardous materials, there were 20 incidents in 1995 causing only one injury and no deaths. These accidents amounted to about 0.1 percent of the 14,688 such incidents nationwide.

Industry Structure

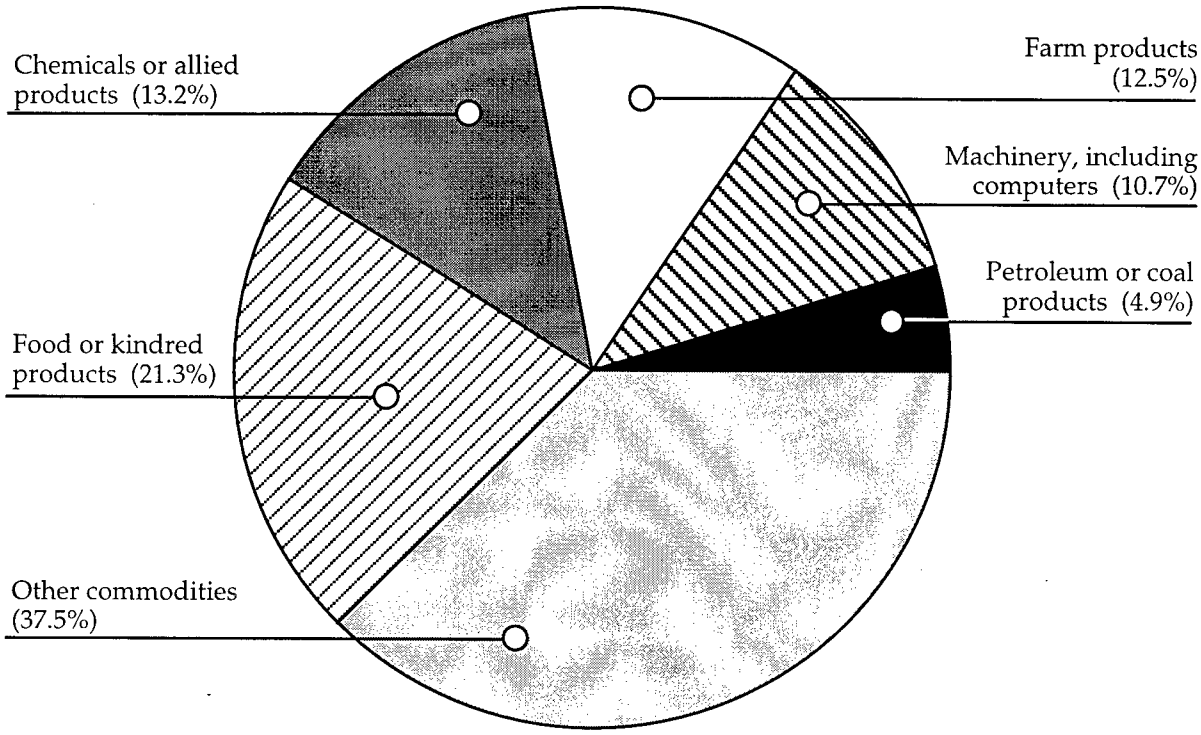
Compared to many states, a small number of interstate motor carriers are based in South Dakota. About 1,900 carriers and 10,000 vehicles are IRP-registered in the state; about 2,600 carriers are IFTA-registered; and 826 carriers register ICC/U.S. DOT operating authority in South Dakota (through the SSRS). In comparison, Minnesota has 5,000 carriers and over 20,000 vehicles for IRP, 3,800 IFTA carriers, and 16,000 carriers with Minnesota-based ICC operating authority. Some 3,280 interstate carriers operating in South Dakota transport commodities that are exempt from economic regulation, formerly administered by the ICC. According to estimates by the PUC, 89 percent of the exempt carriers operate

Figure 3.2 South Dakota Trucks by Major Use



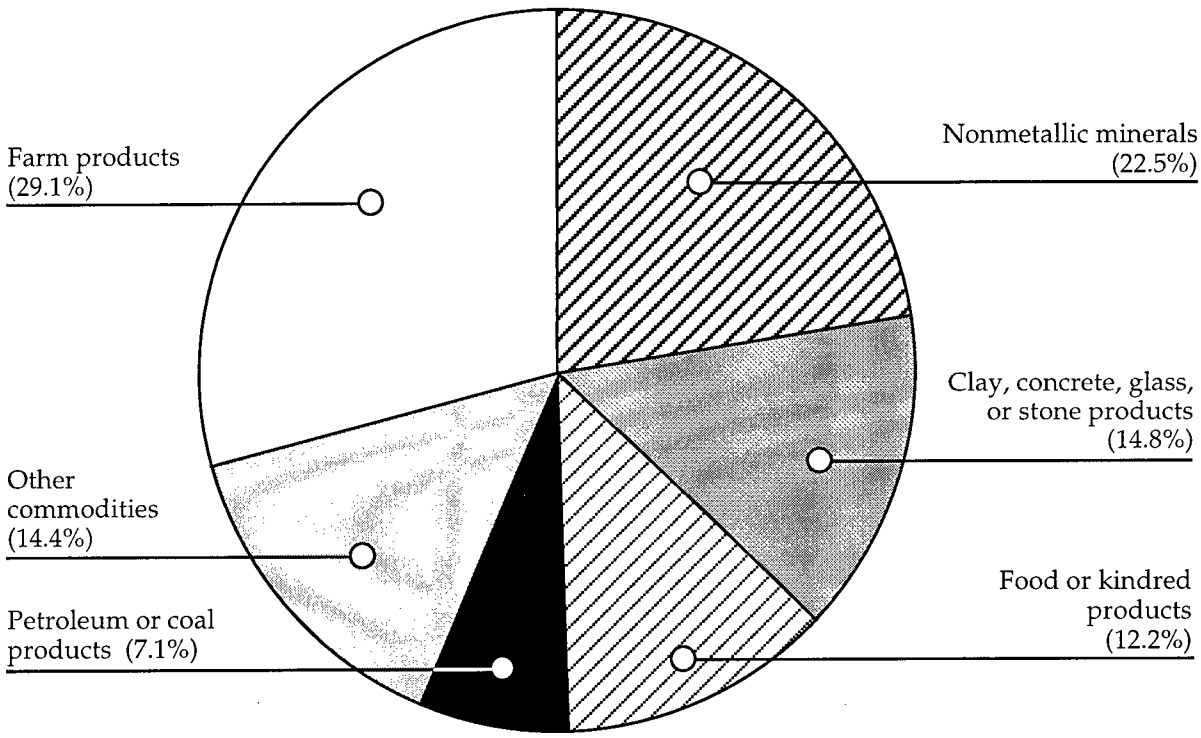
Note: Excludes pick-ups, minivans, panels, and utilities.
Source: U.S. Department of Commerce, *1987 South Dakota Census of Transportation.*

Figure 3.3 Commodity Shipments Originating in South Dakota Ranked by Value



Source: U.S. Department of Commerce, *Bureau of the Census, 1992 Census of Transportation, Communications, and Utilities, 1993 Commodity Flow Survey.*

Figure 3.4 Commodity Shipments Originating in South Dakota Ranked by Weight



Source: U.S. Department of Commerce, *Bureau of the Census, 1992 Census of Transportation, Communications, and Utilities, 1993 Commodity Flow Survey.*

fewer than five vehicles, and 14 percent of SSRS-registered carriers have less than five vehicles.

Commercial vehicles operating exclusively within the state are licensed through the counties at county treasurer's offices. These vehicles do not register in the IRP, IFTA, or SSRS base state programs. About 30,000 in-state commercial license plates are issued yearly. Drivers of commercial vehicles weighing over 26,000 pounds are required to be licensed under the CDL standards.

Fourteen (14) motor coach companies register their FHWA operating authority in South Dakota.

The South Dakota Trucking Association is the local affiliate of The American Trucking Associations. It provides educational services to the trucking industry, including safety-oriented programs, and proposes and supports legislation on behalf of its membership. No motor coach association exists in the state, but some of the state's motor coach companies are members of the American Bus Association.

3.3 Issues Affecting CVO

A number of issues impact the conduct of CVO regulation in South Dakota today and are likely to affect how efficiently projects included in the ITS/CVO program are carried out and the timeliness of implementation. These issues present potential obstacles to the successful implementation of the ITS/CVO Business Plan. The issues are as follows:

- Multiple agencies are involved in the regulation of CVO in South Dakota. Complying with this fragmentary structure is costly and frustrating to motor carriers. Carriers provide the same information to more than one agency, and may have to interact with six different agencies in order to operate. For some carriers, especially newer carriers, obtaining information on requirements may mean calling around until the appropriate agency is reached. For the state, maintaining a number of systems that operate independently, that do not extensively share data with one another, and that in some cases require that carriers provide the same information for different programs, is also costly and clearly not optimally effective. A critical need in implementing the ITS/CVO program is for strong support for the program from all the agencies and the integration and coordination of their work on projects. Having many agencies rather than one or two agencies makes integration and coordination more difficult to achieve.

- Regulatory agencies do not have experience working together on other than an ad hoc basis. Successful implementation of the Business Plan will require commitment of resources on a continuing basis.

- Some agencies have significantly reduced staffing. Large reductions in staff in recent years have caused heavy workloads for existing staff in agencies such as the DMV (Revenue) and the BIT. In the DMV, a staff of about four full-time persons handles IRP and IFTA functions. In the BIT, about two and one-half full-time persons provide

support to all CVO functions. This includes IRP, IFTA, and IRP and IFTA audits; titles; OS/OW permits and trip permits; size, credentials, and hazardous materials enforcement, and inspections; and the dyed fuel program. Heavy workloads impair the ability of these agencies to carry out necessary functions effectively. The pressure to overcome their existing workloads has made it difficult for these agencies to implement new ways of doing business and also to participate in innovative new projects.

- Of special concern is the ability to mobilize information technology expertise to carry out the potentially large amount of network and systems work and preparation of functional requirements for systems. Because of limited resources, the BIT must increase staff to provide services for the ITS/CVO program or significant consultant support must be obtained for ITS/CVO development. For some agencies, contracting for outside help may be very difficult. The UJS has expressed concern about the ability to obtain federal funding to contract with computer consultants to assist with needed changes to the CJIS.

- State's recent participation in a major ITS/CVO project, the Midwest One-Stop Operational Test, yielded no information in South Dakota on how much time is saved or other benefits that accrue to agencies and motor carriers when carriers electronically apply for SSRS and OS/OW, fuel tax, and registration permits. No electronic transactions were submitted by carriers that agreed to participate in the test. As a result, it also is not possible for either the state or industry to leverage the experience to promote electronic credentialing. Although not all carriers and agencies who were interviewed believe electronic credentialing will provide substantial benefits, some consider it to be among the most promising ITS/CVO applications.

- Motor carriers in South Dakota are not extensively using advanced technologies. Typically, carriers in the state have very small operations, and the small carriers are just beginning to use ITS/CVO technology such as mobile communications systems. Nationally, market penetration for mobile communications systems is significant and growing, and demand appears to be relatively independent of fleet size or range of operations. In South Dakota, a few of the larger carriers have deployed satellite tracking systems in their fleets. For the future, many potential ITS/CVO applications in the state will require that motor carriers in some numbers use technology in their interaction with state regulatory agencies. These applications include electronic credentialing, automated fuel tax filing, and electronic screening of vehicles equipped with vehicle-to-roadside communications devices such as transponders.

Perhaps of equal importance as an issue affecting CVO in South Dakota are the outstanding working relationships between the state agencies and motor carriers, among the state agencies, and between the state agencies and the Federal Government. The interest of the public agencies in involving industry in the business planning process; the ability of agencies and industry to communicate their respective problems and needs and to try to resolve problems; and the mutual respect between agency and carrier personnel that the consultants recorded in all the interviews, are an extremely solid basis for implementing the Business Plan and should not be underestimated as positive factors.

3.4 Opportunities to Apply ITS Technology

Opportunities to apply ITS technology to improve the regulation of motor carriers in South Dakota are numerous. The opportunities involve activities related to automating procedures and operations, networking information systems, and changing the way that regulatory agencies and motor carriers do business. Specific opportunities include the following:

- **CVISN** – This initiative is the major CVO project in the country. The national ITS/CVO program along with states, motor carriers, and other stakeholders, is investing in the development of the technical infrastructure that will support the nationwide deployment of ITS/CVO services. The CVISN core infrastructure includes a collection of planned or operational multistate information systems, including the CDLIS; the IRP and IFTA clearinghouses; and the Safety and Fitness Electronic Records (SAFER) system, which will provide a link between existing and planned motor carrier safety information systems. Presently, eight pilot states are enhancing their internal information systems such as interstate registration, intrastate registration, fuel tax, OS/OW, and operating authority; and implementing ITS/CVO services such as electronic screening and electronic credentialing. Within the CVISN framework, carriers will enhance or develop fleet credentialing, administration, and maintenance systems; and adopt onboard communications, trip monitoring, cargo monitoring, and safety systems.

- **PRISM** – The objective of this system is to improve highway safety by linking registration to safety performance so unsafe carriers can be identified and entered into safety improvement programs. South Dakota has presented a proposal to the PRISM steering committee to adopt and implement the PRISM system. At its core, the system would provide the DMV with automated access to information on the safety fitness of a carrier, information based on safety performance data from Highway Patrol and federal inspections and reviews. It is envisioned that other regulatory agencies in the state, including the DCR and the PUC, would also be linked with the PRISM system to ensure that carriers with a history of compliance violations cannot renew their registration.

- **Automated Routing and Permitting** – A system for automating what currently are manual processes has potential for improving safety and efficiency. Computerized routing of oversize and overweight vehicles that accesses information on bridge clearances, road restrictions, and construction activity, can enhance their safe operation. Electronically issuing OS/OW, fuel tax, and registration permits can "free up" considerable time that the Highway Patrol can add to the time it now spends on enforcement. The increased enforcement efforts may generally improve highway safety.

- **Automated Inspection, Citation, and Accident Reporting Software** – The Iowa Department of Transportation is using specially developed software that enables enforcement officers to enter inspection, citation, and accident data electronically. South Dakota is exploring the possibility of installing this software on laptop computers equipped with cellular communications capability. The system could allow the Highway Patrol to reliably upload the data from the roadside to the SAFETYNET

many times a day. Use of the system has the potential to save time, increase accuracy, and produce more timely data for use by the Patrol and other public agencies.

- **Weigh-in-Motion Installation** – A new, ITS-equipped POE facility is being planned north of North Sioux City. The present POE at North Sioux City is frequently plagued by queues of commercial vehicles backing up onto the interstate highway. Technologies such as WIM and automatic vehicle identification (AVI) are being considered for the new facility to process vehicles more quickly and prevent queuing problems. Completion of the facility is anticipated in 2002.

- **Electronic Credentialing** – Electronic credential application and issuance would enable regulatory agencies and motor carriers to conduct business transactions electronically and eliminate much of the paperwork required today as well as shorten the time cycle. It would require development of software and information systems for electronic registration, mileage reporting, and/or tax collection. Additionally, capabilities for the interstate exchange of credential data and reconciliation of fees with other states would be needed for full deployment of this service. Most of the credentials-granting agencies in South Dakota have expressed interest in implementing electronic credentialing with motor carriers. Carriers generally favor the idea.

- **Mainstreaming** – The Mainstreaming initiative emphasizes planning for and deployment of specific ITS/CVO technologies and services, with particular emphasis on the deployment of the CVISN infrastructure. South Dakota's ITS/CVO Business Plan is the first step in achieving these ends. All of the opportunities listed in this section are technologies or services, or functional equivalents, being incorporated into the deployment plans of the present CVISN pilot states. PRISM, in particular, is a convenient entry to many ITS/CVO services.

4.0 Strategic Direction for ITS/CVO Activities

This section explains the vision and direction of South Dakota's ITS/CVO Business Plan. It includes the mission statement, guiding principles, goals, and objectives for ITS/CVO activities in the state.

4.1 Mission Statement

The mission of South Dakota's ITS/CVO program is as follows:

- Enhance safe and efficient movement of commercial goods and passengers through the application of technologies, improved business practices, as well as interagency and industry cooperation.

4.2 Guiding Principles

The projects included in this Business Plan were developed to reflect the following principles:

- Projects should be consistent and compatible with the CVISN architecture and the operational deployment of the CVISN;
- The ITS/CVO program should be a partnership between industry and government agencies;
- Financial investment by industry in ITS/CVO projects should be voluntary;
- Projects should provide benefits to industry;
- Projects should provide benefits to state agencies;
- Projects should strive for consistency, connectivity, and compatibility among agency systems, neighboring state systems, and national initiatives;
- Projects should optimize the collection of revenue due to the state through its regulation of CVO;

- Short-term efforts should be leveraged to serve long-term objectives whenever possible; and
- Motor carrier data should be accessible to those with a genuine need for access to data, while remaining sensitive to privacy concerns.

4.3 Goals and Objectives

The goals and objectives of the state's ITS/CVO program are as follows:

Goal 1: Improve the safety and efficiency of CVO.

- **Objective 1:** Focus inspection and enforcement activities on high-risk carriers.
- **Objective 2:** Educate motor carriers about safe and responsible operations.
- **Objective 3:** Educate the traveling public about sharing roads with commercial vehicles.

Goal 2: Increase the efficiency of the state CVO regulatory processes.

- **Objective 4:** Streamline deskside procedures.
- **Objective 5:** Automate credentialing procedures.
- **Objective 6:** Network systems to ensure the effective exchange of critical information among government agencies and industry.

Goal 3: Safely utilize the capacity of the state's transportation system while preserving its integrity.

- **Objective 7:** Increase the ability to comply with existing regulations.
- **Objective 8:** Optimize safe and efficient movement throughout the state.

Goal 4: Provide better service to industry.

- **Objective 9:** Streamline deskside procedures.
- **Objective 10:** Automate credentialing procedures.
- **Objective 11:** Increase industry involvement through public and private partnerships.
- **Objective 12:** Provide timely weather, construction, and regulatory information.

5.0 Program Summary

This section includes the Business Plan's classification of projects, project descriptions, assessment of projects, and ordering of projects for implementation.

As a result of the business planning process described in this document, 12 ITS/CVO projects were recommended for the state program. Three factors were most important in arriving at these recommendations: the CVISN, strategic goals and objectives, and motor carrier and state agency needs.

South Dakota is committed to developing all of its ITS/CVO projects in accordance with the CVISN architecture and the operational deployment of the CVISN. This is the first guiding principle for the South Dakota ITS/CVO program. Specifically, projects must address the primary objectives of the CVISN: to promote the electronic interchange of information among all CVO stakeholders, and to develop and enhance information systems and networks to support widespread ITS/CVO deployment. In addition, projects must adhere to the CVISN principle of exchanging information through the use of common standards and commercially available communications systems, and the principle of interoperability of transponders and other communication technologies.

Strategic goals and objectives were presented in Section 4.3 of this document. It is essential for projects to address the goals and objectives established for the ITS/CVO program. Each project that was recommended fulfills one or more goals and hence, one or more objectives. At the same time, every goal and every objective is addressed by a project. Figure 5.1 shows the projects and the goals and objectives for each project.

Motor carrier and state agency needs identified from interviews were summarized in Section 2.2. In large part, these needs were the basis for the original project concepts.[1]

These concepts were subsequently refined, strategic goals and objectives for projects were determined, and compatibility with the objectives of the CVISN were ascertained, before projects were recommended for the Business Plan.

[1] A few project concepts were identified in the strategic overview session prior to the interviews. Cellular communication of inspection data from the roadside and bar coded credentials were discussed as projects "about to happen," i.e., a pilot or test project was impending. The PRISM project was discussed as a proposal being very seriously considered by the state CVO agencies.

Figure 5.1 Recommended Projects by Strategic Goals and Objectives

Projects	Goal 1 CVO Safety			Goal 2 Regulatory Efficiency			Goal 3 System Safety and Integrity		Goal 4 Service to Industry			
	Objectives			Objectives			Objectives		Objectives			
	1	2	3	4	5	6	7	8	9	10	11	12
1. Proactive information dissemination		✔	✔				✔				✔	✔
2. CVO database architecture	✔			✔	✔	✔			✔	✔		
3. Automated routing and permitting				✔	✔	✔	✔	✔	✔	✔	✔	
4. Roadside data transfer	✔											
5. 2-D bar coding				✔					✔			
6. Automated inspection, citation, and accident reporting	✔			✔					✔			
7. Linking registration to safety performance	✔			✔	✔	✔			✔	✔		
8. Information helpline		✔					✔					✔
9. AVI	✔							✔				
10. Safety data access	✔					✔						
11. Electronic credentialing				✔	✔	✔			✔	✔	✔	
12. Weigh-in-motion	✔							✔				

5.1 Business Plan Structure

It is helpful to show how South Dakota's projects fit into the national framework. Figure 5.2 shows the projects categorized into one or more of the four areas of the national ITS/CVO program:

1. **Safety Assurance** – projects designed to assure the safety of commercial drivers, vehicles, and cargo.

2. **Credentials Administration** – projects designed to improve the procedures and systems for managing motor carrier regulation.

3. **Electronic Screening** – projects designed to facilitate the verification of size, weight, and credential information.

4. **Carrier Operations** – projects designed to reduce congestion and manage the flow of commercial vehicle traffic.

The figure shows that the focus of the state's ITS/CVO program at the present time is safety assurance followed by credentials administration. Inasmuch as the Business Plan will be updated to reflect new or changed funding sources, technological advances, advancement of specific projects, organizational or policy shifts, and increasing levels of buy-in from public and private stakeholders, the next lineup of projects may show a gradual movement toward electronic screening and carrier operations projects.[2]

Recommended Projects

Following are summary statements of the 12 projects recommended in this plan:

1. **Proactive Information Dissemination** – Information of various kinds and by a number of media is distributed to motor carriers.

2. **CVO Database Architecture** – An architecture for linking CVO regulatory databases will be developed.

3. **Automated Routing and Permitting** – An automated system for routing and permitting oversize and overweight vehicles will be implemented.

4. **Roadside Data Transfer** – Inspection data will be transmitted from the roadside by cellular modems.

[2] In Section 6.0, the consultants recommend that the Business Plan be updated in two years.

Figure 5.2 Recommended Projects by National Program Areas

Projects	Areas			
	Safety Assurance	Credentials Administration	Electronic Screening	Carrier Operations
1. Proactive information dissemination	✔	✔		
2. CVO database architecture	✔	✔	✔	
3. Automated routing and permitting	✔	✔		✔
4. Roadside data transfer	✔			
5. 2-D bar coding		✔		
6. Automated inspection, citation, and accident reporting	✔			
7. Linking registration to safety performance	✔	✔		
8. Information helpline	✔	✔		
9. AVI	✔		✔	✔
10. Safety data access	✔			
11. Electronic credentialing		✔		
12. Weigh-in-motion			✔	✔

1. **Two-Dimensional Bar Coding** – Registration credentials and commercial driver licenses will be bar coded.

2. **Automated Inspection, Citation, and Accident Reporting** – Enforcement officers will electronically enter data at the roadside.

3. **Linking Registration to Safety Performance** – A system for linking the vehicle registration process to safety performance will be implemented.

4. **Information Helpline** – A system for answering motor carrier questions will be developed.

5. **Automatic Vehicle Identification** – Technology for identifying high-risk motor carriers for inspection will be implemented.

6. **Safety Data Access** – Enforcement officers will electronically access data at the roadside.

7. **Electronic Credentialing** – Paperless transaction systems for CVO credentials will be developed.

8. **Weigh-in-Motion** – A system for electronically sorting commercial vehicles at ports of entry will be implemented.

5.2 Project Descriptions

Full descriptions of the 12 recommended projects follow. The project description includes the purpose, intended result, strategic objectives addressed, participating agencies, technical approach, key issues, and resource needs of each project.

Project No. 1. Proactive Information Dissemination

Purpose – Provide various kinds of information to the motor carrier industry.

Outcome – Weather, road condition, and construction information currently is disseminated to motor carriers and other motorists by a number of media. This information helps carriers operate safely and efficiently. Delivery of educational information regarding CVO agency resources, regulatory procedures, and compliance is planned. Carriers that were interviewed in the business planning process indicated that information like this would increase their ability to comply with regulations. In addition, customer service will be enhanced.

Strategic Objectives Addressed – Objectives 2, 3, 7, 11, 12.

Lead Agencies – Department of Transportation, Department of Revenue, Department of Commerce and Regulation, Highway Patrol.

Other Participating Agencies – State and federal CVO regulatory agencies.

Market – Motor carrier industry.

Approach

- State agencies have actively made essential information available and accessible to motor carriers. Information that is critical for safe and efficient operations is provided by the South Dakota DOT Web Page. This includes regional weather reports, winter road conditions, spring load limits, water problems along state highways, and construction activities. Information such as this could be made accessible by cellular telephone and through an information hotline. Planned efforts also include expanding the cellular coverage area to additional sections of western and southern South Dakota. The Highway Patrol Web Page provides regulatory information such as legal size and weight information as well as permit information.

- The South Dakota Trucking Association is publishing in its monthly newsletter articles on new programs, new laws, changes in regulations, safety advice, and other topics. Commonly, articles are written by state or federal personnel.

- In this project, some information will be prepared for general distribution to motor carriers in response to needs expressed in carrier interviews such as an annual calendar of events and a checklist of requirements. The calendar will include dates for renewals of credentials, for filing quarterly fuel tax returns, and other events with dates that annually change. The checklist of requirements will not need to be updated on any regular basis.

- Additionally, a variety of other materials can be developed to meet the needs of the different market segments of the industry in South Dakota.

- New methods of delivering information to carriers will be considered. Among the more ambitious efforts is developing information for electronic kiosks at rest areas and truck stops.

- Proactively disseminating information will be more beneficial to carriers as ITS/CVO projects are implemented. Changes in business practices and roadside procedures will increase needs for explanation and education.

Key Issues

- All agencies must participate to ensure that information is complete and accurate.

- A program of information dissemination must be designed.

- Collaboration with motor carriers on contents of materials and methods of dissemination is needed.

Products – A body of materials that will be distributed and made available to motor carriers on a regular or as-needed basis.

Duration – 12 months.

Estimated Cost of Development – $30,000.

Estimated Annual Operating Costs – $20,000.

Estimated Short-Term Staffing Requirements – Less than one-half FTE (full-time equivalent) total from all CVO agencies will be needed to develop this project.

Estimated Long-Term Staffing Requirements – Less than one-half FTE total from all CVO agencies will be needed to sustain this project.

Funding – $30,000 will likely come from state funds.

Project No. 2. CVO Database Architecture

Purpose – Develop an architecture for linking the various CVO regulatory databases.

Outcome – A plan for linking the CVO databases will be developed in this project. The actual linking of databases will occur incrementally as other ITS/CVO projects are implemented and new systems are installed. Linked databases will result in more efficient and cost-effective administrative processes as agencies share information with one another and motor carriers are not required to provide the same information to multiple agencies. Currently, most of the CVO agencies cannot share information with one another, and agencies often collect the same data from motor carriers. The agency representatives who were interviewed in the business planning process expressed strongly their desire to receive and share data.

Strategic Objectives Addressed – Objectives 1, 4, 5, 6, 9, 10.

Lead Agency – Department of Transportation.

Other Participating Agencies – Bureau of Information and Telecommunications, state CVO regulatory agencies.

Market – State CVO regulatory agencies, motor carrier industry.

Approach

- CVO applications and projects increasingly require capability for electronic interagency data exchange through linkages developed among existing and planned

information systems. Projects such as linking registration to safety performance and automated inspection reporting require database linkages that do not presently exist.

- Roadside to/from deskside, state agency to state agency, state to/from regional/national, and motor carrier to/from state systems potentially are involved.

- Reducing the need for motor carriers to provide the same information to multiple agencies relies heavily on agencies sharing information.

- Feasibility of combining or otherwise changing the structure of state information systems can be examined.

- Implementing a developed architecture will be a long-term project. Initially, a high-level functional design will be produced that depicts the data flows that are desired. Detailed design of the architecture prescribing how systems will be linked will be developed as new systems are installed in the state. Thus, the architecture changes over time.

Key Issues

- Database incompatibilities within South Dakota, with other states, and at the national level will affect the ability to accomplish all desired linkages.

- Software and hardware incompatibilities and variable system performance must be addressed and resolved.

- Changes in technology and evolving data communication standards must be monitored and incorporated into decisions on hardware and software.

- Operational compatibility with the CVISN architecture should be maintained.

Products – CVO database architecture and a cost estimate for linking databases.

Duration – Three months to produce the functional design. Development of the detailed design will proceed incrementally over several years.

Estimated Cost of Development – $150,000 for functional and detailed designs.

Estimated Annual Operating Costs – None.

Estimated Short-Term Staffing Requirements – Less than one-half FTE from the Bureau of Information and Telecommunications (BIT) will be needed to lead functional design work.

Estimated Long-Term Staffing Requirements – Less than one-half FTE from the BIT will be required on an as-needed basis for detailed design work.

Funding – $75,000 potentially will be provided by the CVISN initiative, with the remaining $75,000 to come from state funds.

Project No. 3. Automated Routing and Permitting

Purpose – Implement an automated routing and permitting system for oversize and overweight vehicles.

Outcome – Automated routing and permitting will improve the routing of oversize and overweight (OS/OW) vehicles resulting in safer operations, and improve the management of permit operations resulting in greater agency productivity. It also will enable optional electronic permit applications by motor carriers that will reduce the time needed to apply for permits and enable them to receive permits at convenient locations. Currently, permitting is a manual process. Permit information is recorded by hand, and permit guidelines, highway information, and complex manual procedures are used to approve and verify routes. Routing errors sometimes occur. Staff time required for this process is considerable. The cost/benefit analysis performed for the South Dakota Department of Transportation in 1997 calculated a benefit to cost ratio of 1.58, indicating that an automated routing and permitting system will save the state a considerable amount of money each year, on the order of $111,000. Because the system will provide carriers greater flexibility in applying for and receiving permits, resulting in time savings, it is likely to provide a similarly positive benefit/cost ratio to carriers.

Strategic Objectives Addressed – Objectives 4, 5, 6, 7, 8, 9, 10, 11.

Lead Agencies – Department of Transportation and Highway Patrol.

Other Participating Agencies – Department of Revenue and Bureau of Information and Telecommunications.

Market – Motor carrier industry, Highway Patrol, Department of Transportation, local law enforcement agencies.

Approach

- System will collect all permit information, automatically route OS/OW vehicles by considering pavement, bridge, construction, and temporary highway conditions, and issue a permit. System also will conduct all administrative functions such as account management and receipt of fees.

- Consideration is being given to developing the system at a central site providing all functions, with ports of entry and mobile units accessing the system to enter permit issuance information and issue permits but not having local capability to route vehicles.

- System will issue many classes of permits. Certain permits will require analysis prior to issuance and will not be issued by the system.

- Automated routing will be supported by existing databases in the Roadway Environment System and potentially by the Geographical Information System (GIS) being implemented in the state.

- Motor carriers will be given the option to electronically submit permit information via personal computer modems or the Internet and receive permits by facsimile, the Internet, or local printing.

- The South Dakota DOT Research Review Board has recommended acquisition of an automated routing and permitting system.

Key Issues

- Whether one centralized system or multiple full-service systems will be developed needs to be determined.

- Road conditions are subject to frequent, often unanticipated, changes due to weather, construction, and incidents. This can pose problems to a system which requires very reliable data.

- How to enable carriers to electronically submit and receive permits needs to be determined, including software development or acquisition, hardware requirements, and procedures.

- Adoption of a new technology such as automated routing and permitting represents significant changes in the business practices of state agencies and motor carriers and considerable training of public and private users of the system will be required.

- Existing expertise in routing is localized in one place and may not be transferable to a central site location of the system.

- Existing routing and permitting processes are manual and do not require computer and network support. This kind of support will need to be provided internally and/or externally.

Products – Functional routing and permitting software; automated routing and permitting system.

Duration – 30 months.

Estimated Cost of Development – $653,000. This includes costs of implementation and hardware and an estimated training cost of $20,000.

Estimated Annual Operating Costs – $95,000. This includes costs of system maintenance, annual software license, and hardware maintenance and upgrades.

Estimated Short-Term Staffing Requirements – 1.5 FTE will likely be needed for this project, roughly one-half FTE from the Highway Patrol, one-half FTE from the Department of Transportation (DOT), and one-half FTE from the Bureau of Information and Telecommunications (BIT). The Patrol and the DOT should provide existing staff (each one-half FTE) for responsibilities such as area expertise for system development, planning and implementing changes in business practices, and training staff. System development and networking will likely require one-half FTE from the BIT.

Estimated Long-Term Staffing Requirements – One-half FTE will be needed to provide ongoing internal system support and to collect data required to support the system.

Funding – $653,000 will likely come from state funds.

Project No. 4. Roadside Data Transfer

Purpose – Use cellular modems to enable timely roadside data transfer.

Outcome – Cellular modems have the potential to provide fast and reliable data exchange between the roadside and deskside resulting in improved enforcement of regulations. Cellular modems will be deployed with laptop computers equipped with electronic data entry capability (see Project No. 6). Electronic data entry and cellular transmission will replace the current paper-based reporting process and speed up the process of uploading safety information to the SAFETYNET thereby providing more timely data for use by the Highway Patrol, enforcement agencies in other states, and the FHWA.

Strategic Objectives Addressed – Objective 1.

Lead Agency – Highway Patrol.

Other Participating Agencies – Bureau of Information and Telecommunications and FHWA, Office of Motor Carriers.

Market – Highway Patrol.

Approach

- Laptop computers will be equipped with cellular communications capability for transferring data from the field to the SAFETYNET. Specifically, a conventional (analog) modem is attached to a cellular telephone for cellular transmission. This can be accomplished multiple times in a day.

- Potentially, enforcement officers can transfer data to additional information systems for use by other state agencies and jurisdictions.

Key Issues

- Reliability of data transmission by cellular modems is undetermined.

- Basic cellular coverage is not available in portions of South Dakota, notably in the northwest.

Products – A new means of transferring data from the roadside to deskside systems.

Duration – 21 months.

Estimated Cost of Development – $93,000.

Estimated Annual Operating Costs – $14,000.

Estimated Short-Term Staffing Requirements – No staffing changes.

Estimated Long-Term Staffing Requirements – No staffing changes.

Funding – $74,000 will be provided by a federal technology grant to the Highway Patrol, with the remaining $19,000 to come from state funds.

Project No. 5. Two-Dimensional Bar Coding

Purpose – Use two-dimensional bar codes to provide quick retrieval of vehicle, carrier, and driver information.

Outcome – Use of two-dimensional bar codes will enhance capabilities to store and deliver data. Currently, motor carrier, vehicle, and driver information is obtained from a visual inspection of credentials, and manually recorded on inspection, citation, and accident documents. Locating the information on credentials and recording is time consuming, and recording incorrect information is not uncommon. Barcoded credentials will quickly provide proper carrier, vehicle, and driver information for automatic entry into the appropriate fields of electronic documents (see Project No. 6). Two-dimensional bar codes offer greater data storage capabilities than conventional linear bar codes.

Strategic Objectives Addressed – Objectives 4 and 9.

Lead Agencies – Department of Revenue and Department of Commerce and Regulation.

Other Participating Agencies – Highway Patrol.

Market – State CVO regulatory agencies, local law enforcement agencies, and emergency service providers.

Approach

- Selected information will be translated into a two-dimensional bar code format and printed on a credential or driver license.
- The following data will be bar coded on IRP temporary authority credentials and permanent registration cab cards: registrant, vehicle, credential, and motor carrier information.
- Essential driver data will be bar coded on commercial driver licenses (CDLs) and other driver licenses.

- For CVO regulation, Highway Patrol officers will electronically scan information bar coded on registration credentials and CDLs to properly identify vehicles and drivers and to automatically complete the appropriate fields for inspection, citation, and accident documents. Scanning will be done by bar code readers attached to laptop computers.

- Two-dimensional bar coding of driver licenses begins as a pilot program in the state in April of 1998. The program is expected to be implemented statewide in June 1998. Bar coding of IRP credentials begins in the summer of 1998.

Key Issues

- PRISM-related information potentially will need to be added to the bar codes on registration credentials.

- Because the driver license renewal cycle is five years, it will take five years to completely phase in bar coded driver licenses, and current manual procedures for collecting and recording driver information will coexist with the new technology for that time.

Products – Bar coded registration credentials and CDLs.

Duration – Twelve months to implement bar coded registration credentials; five years to completely implement bar coded driver licenses.

Estimated Cost of Development – $52,000. This includes costs of software to translate data into bar code format and print it on credentials, a personal computer to run the software, a printer, and bar code strips. The cost of bar code readers is in Project No. 6 and is not included here. The cost to bar code driver licenses is treated as an essentially non-CVO expense and is not included here.

Estimated Annual Operating Costs – $6,000.

Estimated Short-Term Staffing Requirements – Less than one-half FTE from existing Department of Revenue staff will be needed to research and apply the bar code technology.

Estimated Long-Term Staffing Requirements – No staffing changes.

Funding – $43,000 will be provided by the PRISM project, with the remaining $9,000 to come from state funds.

Project No. 6. Automated Inspection, Citation, and Accident Reporting

Purpose – Electronically enter inspection, citation, and accident data at the roadside.

Outcome – Inspection, citation, and accident data will be recorded electronically at the roadside and transmitted electronically to the SAFETYNET resulting in reduced time required for inspections, reduced traffic disruptions, greater data accuracy, and faster data transfer. Currently, reports are produced manually in the field, mailed or delivered, and key-entered on deskside personal computers for eventual uploading to the SAFETYNET. This paper-based cycle is slow, and data errors are unavoidable. In Iowa, roadside electronic data entry using software that is proposed for South Dakota greatly reduced the time needed to place inspection and accident data into the SAFETYNET.

Strategic Objectives Addressed – Objectives 1, 4, 9.

Lead Agency – Highway Patrol.

Other Participating Agencies – Department of Revenue; Department of Commerce and Regulation; Department of Transportation; Unified Judicial System; Bureau of Information and Telecommunications; and FHWA Division, Office of Motor Carriers.

Market – Highway Patrol, motor carrier industry.

Approach

- Highway Patrol officers will electronically scan motor vehicle and motor carrier information bar coded on registration credentials and driver information bar coded on CDLs to properly identify vehicles and drivers at the roadside and to automatically complete the appropriate fields for inspection, citation, and accident documents. These documents will have been automated. Scanning will be done by bar code readers attached to laptop computers.

- Other data collected for inspections, citations, and accidents are to be entered on-line at the roadside or during a compliance review. Customized software for electronic data entry capability will be installed on laptop computers. About 75 officers will use this technology.

- Laptop computers will be equipped with cellular communications capability (see Project No. 4). Data will be uploaded from the laptop computers to the SAFETYNET multiple times in a day. From the SAFETYNET data will be uploaded to the Motor Carrier Management Information System (MCMIS) weekly.

- Citation information is envisioned in the longer term of two or more years in the future as being uploaded daily to the Unified Judicial System's (UJS) database of traffic citations, the Criminal Justice Information System (CJIS). Currently, citations written by the Highway Patrol are manually entered into the CJIS.

Key Issues

- Consensus is needed among the Highway Patrol, Accident Records in the Department of Transportation, the UJS, and cities and counties, regarding the automation of citation and accident documents.

- Adoption of electronic data entry at the roadside represents significant changes in the business practices of state agencies that may require training and adjustment time.

- Inasmuch as data will be entered on multiple laptop computers, maintaining data consistency can be challenging. Changes to the SAFETYNET, state accident records, and the CJIS will necessitate timely updating of all instances of the software.

Products – On-line entry of inspection, citation, and accident data.

Duration – 12 months.

Estimated Cost of Development – $113,000.

Estimated Annual Operating Costs – $10,000.

Estimated Short-Term Staffing Requirements – No staffing changes.

Estimated Long-Term Staffing Requirements – A portion of each officer's time will be saved equivalent to one FTE. In addition, deskside data entry time will be reduced.

Funding – $93,000 will be provided by the PRISM project, with the remaining $20,000 to come from state funds.

Project No. 7. Linking Registration to Safety Performance

Purpose – Link motor carrier safety performance and vehicle registration.

Outcome – Unsafe motor carriers will be identified and entered into safety improvement programs resulting in improved motor carrier operations and generally improved highway safety. The current vehicle registration process cannot readily determine the safety fitness of a motor carrier to which a vehicle is assigned. This project, by developing an information system and a process of sanctions or limitations on operations, will help ensure that a carrier is operating safely. Combined with automatic vehicle identification technology, it enables enforcement to target vehicles for inspection. This project is also known as the PRISM project.

Strategic Objectives Addressed – Objectives 1, 4, 5, 6, 9, 10.

Lead Agencies – Department of Revenue and Highway Patrol.

Other Participating Agencies – Bureau of Information and Telecommunications, Department of Commerce and Regulation, and FHWA Division, Office of Motor Carriers.

Market – State and federal CVO regulatory agencies, motor carrier industry.

Approach

- The Office of Motor Carriers of the FHWA Headquarters maintains a target file of at-risk carriers from all states participating in the PRISM project. The target file is downloaded daily to each participating state. At-risk carriers are identified on the basis of safety performance data by the SafeStat algorithm developed in the original Commercial Vehicle Information System project. The SafeStat provides for continuous assessment of carrier safety fitness in the areas of accidents, driver, vehicle, and safety management.

- The Division of Motor Vehicles (DMV) in the Department of Revenue and the Highway Patrol, along with the FHWA Division office, will adopt the Motor Carrier Safety Improvement Process (MCSIP). The MCSIP uses SafeStat results to determine which carriers should be subject to enforcement actions such as warning letters, compliance reviews, or suspension or revocation of registration. Prior to issuing registration credentials to a carrier, the DMV will query the target file, and will not issue the credentials if the carrier has reached the suspension or revocation step in the MCSIP.

- Data collection and data transfer, and the accuracy of this data, are essential to compute and update a carrier's safety status. Information captured by enforcement personnel at the roadside will ultimately be used in the registration process. The Highway Patrol will deploy three technologies to facilitate the collection and transfer of data: 1) laptop computers and software to electronically enter inspection, citation, and accident data (see Project No. 6); 2) two-dimensional bar coding of registration credentials and CDLs for identification at the roadside (see Project No. 5); and 3) cellular modems for transmitting data from the roadside (see Project No. 4).

- The Highway Patrol will identify at-risk vehicles for inspection at weigh stations. Automatic vehicle identification (AVI) technology (see Project No. 9) will be deployed to identify vehicles, followed quickly by a query of the target file to determine if vehicles have invalid credentials or are unsafe.

- Registration is envisioned in the longer term of two or more years to be linked also with fuel tax filings and insurance status to ensure that carriers with a history of compliance violations cannot renew their vehicle registration.

Key Issues

- Legislation is necessary for South Dakota to deny, suspend, or revoke registrations on the basis of motor carrier safety.

- Present IRP registration system requires major enhancements, or a new system will be needed, to accommodate PRISM requirements.

- Present IRP registration process must incorporate the issuance and collection of U.S. DOT numbers.

- PRISM system development and functional requirements, systems, and communications work for the DMV and the Highway Patrol require major resource investments.

While system design and programming work can be assigned to consultants, preparation of functional requirements, planning and implementing changes in business practices, and training and education of staff must be conducted largely by state personnel.

- Various electronic linkages are required among the PRISM system modules; registration, enforcement, and vehicle title information systems; and external systems such as the MCMIS. A CVO database architecture (see Project No. 2) should be developed for these linkages and all linkages planned or desired that involve a CVO database.

- How AVI technology will be linked with the target file for identifying vehicles for inspection needs to be determined.

- When registration of intrastate carriers will be linked with safety performance needs to be determined. Plans for phase two of PRISM deployment, about three to five years away, include the entry of intrastate carriers into the federal Unified Carrier Register. Delaying the addition of intrastate carriers to the PRISM system in South Dakota until that time will avoid the need for the state to fund the effort to calculate safety ratings for instrastate carriers.

- Quantifying the benefits of changes, particularly expressed outcomes such as improved safety, can be difficult and expensive due to data limitations and the lack of conclusive cause and effect relationship between safety fitness as it is measured and assessed and actual public endangerment. However, the PRISM pilot project in five states proved to be effective in improving motor carrier attitudes toward safety, and the safety of their operations. As a result, participation in PRISM was expanded to additional states.

Products – A system for linking the vehicle registration process to safety performance; a process for targeting at-risk or high-risk carriers for inspection; a process for monitoring and improving safety performance.

Duration – 30 months.

Estimated Cost of Development – $343,000. This cost is exclusive of the costs of any other projects.

Estimated Annual Operating Costs – $175,000. This includes $160,000 yearly fee for an IRP system.

Estimated Short-Term Staffing Requirements – Three FTE will likely be needed for this project. This includes 1.5 FTE from the Department of Revenue, one-half FTE from the Highway Patrol, and one FTE from the Bureau of Information and Telecommunications (BIT). From Revenue, one FTE will be a contract employee to enter U.S. DOT numbers for one year. The remaining one-half FTE from Revenue and the one-half FTE from the Patrol should come from existing staff. Responsibilities will include providing area expertise for PRISM system development, planning and implementing changes in business practices, and helping to train staff. System development and networking will likely require one FTE from the BIT.

Estimated Long-Term Staffing Requirements – One-half FTE will be needed to provide ongoing system support and networking.

Funding – $283,000 will be provided by the PRISM project, with the remaining $60,000 to come from state funds.

Project No. 8. Information Helpline

Purpose – Provide motor carriers with a single point of contact in state government for answering questions regarding CVO regulation.

Outcome – Quick delivery of accurate regulatory information will be provided to motor carriers. Within the present organizational framework, agencies tend to own pieces of information. If a question cannot be answered in one agency, the carrier is referred to another agency. This can be frustrating, and there is not a way to ensure that a question is answered. Carriers that were interviewed in the business planning process indicated that a central source of regulatory information will increase their ability to comply with regulations. A helpline will likely reduce multiple calls. In addition, customer service will be improved.

Strategic Objectives Addressed – Objectives 2, 7, 12.

Lead Agencies – Department of Revenue, Department of Commerce and Regulation, Highway Patrol, Public Utilities Commission.

Other Participating Agencies – State and federal CVO regulatory agencies.

Market – Motor carrier industry.

Approach

- Ideally, an information helpline will be staffed by a person extremely knowledgeable about CVO regulation in South Dakota and other states, and about federal regulations. In many instances, a caller will not need to make additional calls.

- Recognizing that state personnel cannot become experts in all aspects of CVO regulation, a combination expert helpline/referral system may be preferred by state agencies. A well-trained person will be able to answer many questions, and will refer questions to other agencies as necessary. In some cases, referral will be required because more than an answer is needed.

- Creation of a 1-800 helpline is envisioned.

- Helpline will be more beneficial to motor carriers as ITS/CVO projects are implemented. Changes in business practices and roadside procedures will increase needs for explanation and education.

Key Issues

- How the helpline will be staffed needs to be determined. A likely scenario is one person at a time answering calls. This person may perform helpline duties in addition to other duties.
- State agencies will have to agree on a staffing plan.
- Considerable education of affected personnel on all aspects of CVO regulation will be needed.
- All agencies must support the helpline.

Products – A new system for quickly answering carrier questions.

Duration – 12 months.

Estimated Cost of Development – $30,000.

Estimated Annual Operating Costs – $100,000.

Estimated Short-Term Staffing Requirement – 1.5 FTE from one agency, or from multiple agencies together, will be needed to staff the helpline.

Estimated Long-Term Staffing Requirement – 1.5 FTE from one agency, or from multiple agencies together, will be needed to staff the helpline.

Funding – $30,000 will likely come from state funds.

Project No. 9. Automatic Vehicle Identification

Purpose – Identify high-risk motor carriers for inspection.

Outcome – Automatic vehicle identification technology (AVI) will enable focused enforcement on high-risk carriers resulting in improved highway safety. AVI is an essential part of linking registration to safety performance (see Project No. 7). It enables enforcement officers to determine both if vehicles are unsafe and if they have valid credentials. Determination of vehicles to be inspected using AVI linked with the target file of at-risk carriers is based on safety performance data that is more comprehensive and current than data used in the present Inspection Selection System, thus potentially removing more unsafe vehicles from the highways. AVI also enables electronic screening.

Strategic Objectives Addressed – Objectives 1 and 8.

Lead Agency – Highway Patrol.

Other Participating Agencies – Department of Revenue, Bureau of Information and Telecommunications, and FHWA Division, Office of Motor Carriers.

Market – Highway Patrol, motor carrier industry.

Approach

- AVI technology will determine the state of registration and plate number for commercial vehicles passing through a weigh station.
- Target file of at-risk carriers is immediately queried to determine if a vehicle is unsafe.
- Target file will provide a response indicating that no inspection is necessary, inspection is desired, or inspection is necessary.
- Response will be part of an overall selection process that determines which carriers are inspected.
- AVI technology also enables identification of vehicles with invalid credentials such as OS/OW permits and operating authority/proof of insurance, and this is desired in the longer term of two or more years in the future. Establishing the data linkages mapped in the CVO database architecture (see Project No. 2) will provide the data needed for electronic credentials verification.
- Longer term ITS/CVO plans (more than two years in the future) include development of full electronic screening capability. Implementation of AVI and weigh-in-motion (WIM) technologies will be followed by the networking of weigh station computers and technologies with credential databases. The ultimate goal, "transparent borders," travel by safe and legal carriers through multiple states or across international borders with no more than a single stop, then will be possible.

Key Issues

- Type of AVI technology needs to be determined. Whether license plate readers, transponders, or other technology are adopted depends on factors that include reliability, especially in harsh weather conditions; cost; and interoperability.
- How AVI technology will be linked with the target file for identifying vehicles for inspection needs to be determined.
- How AVI technology will interface with the selection process at the weigh station needs to be determined.
- Target file must be accessed within three to five seconds of vehicle identification.
- Target file information must be current.

- AVI technology must be compatible and interactive with other technologies in the PRISM project.
- How and if AVI technology will be interfaced with WIM equipment that may exist at the same location needs to be determined.

Products – AVI technology for vehicle inspection selection.

Duration – 12 months.

Estimated Cost of Development – $96,000. General credentials verification and electronic screening are not considered.

Estimated Annual Operating Costs – $10,000.

Estimated Short-Term Staffing Requirements – No staffing changes.

Estimated Long-Term Staffing Requirements – No staffing changes. Electronic screening is not considered.

Funding – $80,000 will be provided by the PRISM project, with the remaining $16,000 to come from state funds.

Project No. 10. Safety Data Access

Purpose – Electronically access safety data at the roadside.

Outcome – Roadside enforcement personnel will use laptop computers to access motor carrier safety and driver license data. Currently, communications in the field are limited. Officers obtain information about carriers and drivers by calling the state radio which has links to numerous information systems. This method of communication is unreliable. An improved method is needed for officers to quickly and reliably access information in order to target inspections on carriers with unknown or poor safety records and to check driver license status. Implementation of this project will complete the two-way communication between the roadside and deskside that will begin with the project to automate inspection, citation, and accident reporting (see Project No. 6) for communication of inspection and other results from the roadside to the deskside. The result will be improved enforcement of regulations and more equitable treatment of motor carriers.

Strategic Objectives Addressed – Objectives 1 and 6.

Lead Agency – Highway Patrol.

Other Participating Agencies – Bureau of Information and Telecommunications and FHWA, Office of Motor Carriers.

Market – Highway Patrol.

Approach

- Roadside personnel will electronically access information from a potentially large number of safety and credentials databases.

- Safety information systems to be accessed include the SAFETYNET and the Commercial Driver License Information System (CDLIS). Presently, the Safety and Fitness Electronic Records (SAFER) system is being developed to provide access from the roadside to systems such as the SAFETYNET, the MCMIS, and the CDLIS. How the SAFER system will work will be solidified by the time South Dakota begins to implement roadside electronic access.

- Credentials access will likely be developed following development of access to safety information systems. Vehicle registration, fuel tax, operating authority/proof of insurance, and OS/OW permit status will be included in the longer term of two or more years in the future.

Key Issues

- Type of enabling technology for deskside to roadside data communication needs to be determined. Reliability and cost will be the primary factors. Reliability of cellular transmission used for roadside data transfer (see Project No. 4) will be pertinent.

- Basic cellular coverage is not available in portions of South Dakota, notably in the northwest.

Products – A new means of obtaining data at the roadside.

Duration – 12 months.

Estimated Cost of Development – $250,000 for safety data access.

Estimated Annual Operating Costs – $25,000.

Estimated Short-Term Staffing Requirements – Less than one-half FTE from the Bureau of Information and Telecommunications will be needed to provide networking.

Estimated Long-Term Staffing Requirements – No staffing changes.

Funding – $125,000 potentially will be provided by the CVISN initiative, with the remaining $125,000 to come from state funds.

Project No. 11. Electronic Credentialing

Purpose – Electronically accept motor carrier applications for credentials, issue credentials, and respond to authorized queries.

Outcome – Government agencies and motor carriers will conduct business transactions electronically, potentially reducing the costs of doing business for both agencies and carriers. Carriers must apply to more than one state agency for the credentials and permits they need in order to operate. Application and issuance processes are often slow, redundant, and they involve much paperwork. Electronic credentialing will reduce the paper transfer, provide quick and assured delivery of credentials, and generally shorten the whole process of applying for, issuing, and receiving credentials. The ATA Foundation in 1996 assessed the potential impacts of electronic transactions on regulatory compliance costs for carriers, and calculated benefit/cost ratios of 19.8 for large fleets (more than 99 units), 4.2 for medium fleets (11-99 units), and 1.0 for small fleets (1-10 units), indicating considerable benefits to medium and large carriers. Preliminary results of the NGA benefit/cost study indicated that state agencies also can expect considerable cost savings from electronic credentialing. Carrier and agency representatives who were interviewed in the business planning process expressed strong interest in electronic transactions.

Strategic Objectives Addressed – Objectives 4, 5, 6, 9, 10, 11.

Lead Agencies – Department of Revenue and Public Utilities Commission.

Other Participating Agencies – Bureau of Information and Telecommunications.

Market – Motor carrier industry, Department of Revenue, Public Utilities Commission.

Approach

- Motor carriers will apply for, pay for, and receive credentials electronically from their office or other locations or through third-party service providers. Carriers also will file fuel tax returns and pay the associated taxes and fees electronically.

- In most cases, the state credentialing agency will initiate electronic transactions in the form of renewal notices sent to carriers. Carriers and service providers will receive transaction messages on personal computers with special software, called Carrier Automated Transaction (CAT) software.

- Carriers will review and electronically correct application data, and submit the application electronically to the agency system. The system will process applications, issue invoices, and issue credentials. Carriers will have transmitted notice of method of payment to the agency system.

- Either optionally or alternatively, carriers will be able to use a Web-based interface rather than a CAT interface to apply for and receive credentials.

Key Issues

- State agencies will need to decide if electronic credentialing will be conducted via a CAT or Web-based interface.

- Specific credentials to be offered electronically need to be determined. Nationwide, credentials that are considered most often are interstate vehicle registration (IRP), fuel taxes (IFTA), operating authority/proof of insurance (SSRS), OS/OW permits, and intrastate registration. In South Dakota, electronic OS/OW permitting already has been decided (see Project No. 3), and plans for a new IRP system include functionality to support electronic transactions but this functionality will not be developed until the longer term of two or more years in the future.

- In the absence of new information systems, electronic credentialing requires enhancements and modifications to existing "legacy" systems, and these changes and their costs often are considerable.

- Electronic credentialing provides the most benefits to carriers and agencies when it is in the form of one-stop shopping that enables carriers to obtain multiple credentials through a single point of contact. This scenario depends on the establishment of electronic linkages among agencies. These linkages will be planned in the CVO database architecture (see Project No. 2). However, as the development of automated OS/OW permitting will likely demonstrate, efficiencies can be gained from single agencies implementing electronic credentialing which does not depend on interagency linkages.

- The reengineering of procedures and systems across multiple agencies, development of entirely new functions and systems, and investment in expensive hardware are generally needed to implement full one-stop shopping.

- Adoption of electronic credentialing will require considerable training of state and motor carrier personnel.

- In the absence of a mandate to conduct all business electronically, dual systems, one traditional and paper-based and the other new and electronic, will need to be supported for an indefinite period of time.

- State agencies should determine the interest of a broad spectrum of carriers, and licensing agents, in electronic credentialing, and their ability to do it.

- Electronic transactions must be consistent with national electronic data interchange (EDI) standards.

Products – Paperless transaction systems for one or more CVO credentials.

Duration – 24 months.

Estimated Cost of Development – $1,000,000. This is the rough cost to implement one-stop shopping for three credentials. This cost is expected to be significantly reduced as a result of implementation of the previously identified projects.

Estimated Annual Operating Costs – $100,000.

Estimated Short-Term Staffing Requirements – 1.5 FTE will likely be needed for this project, roughly one FTE from the Bureau of Information and Telecommunications (BIT) to conduct system development and networking, and a total of one-half FTE from existing

staff of the credentialing agencies for responsibilities such as area expertise for system development, planning and implementing changes in business practices, and training staff.

Estimated Long-Term Staffing Requirement – One-half FTE will be needed to provide ongoing internal system support and to collect data required to support the system.

Funding – $500,000 potentially will be provided by the CVISN initiative, with the remaining $500,000 to come from state funds.

Project No. 12. Weigh-in-Motion

Purpose – Implement an electronic sorting system to move commercial vehicles more quickly through ports of entry.

Outcome – Commercial vehicles will be weighed automatically on the approach ramp to a port of entry (POE), and at the discretion of facility personnel, may be allowed to bypass the static weighing process, thereby reducing delays for compliant vehicles. Currently, all vehicles must be weighed on the static scale at a facility. Congestion and the lack of automated equipment can result in a stop of 15 minutes or more, a major burden for drivers with time-sensitive cargo or hours of service constraints. Each minute spent at a POE directly impacts a motor carrier's costs and profitability. Compliant vehicles being required to stop at POEs is an issue that was raised by a number of carriers interviewed in the business planning process. At the North Sioux City POE, congestion frequently spills over into the traveling lanes of the interstate highway, posing a dangerous safety hazard. Installation of weigh-in-motion (WIM) technology will reduce congestion at POEs resulting in improved highway safety. WIM technology also enables electronic screening.

Strategic Objectives Addressed – Objectives 1 and 8.

Lead Agency – Highway Patrol.

Other Participating Agencies – Department of Transportation.

Market – Motor carrier industry, Highway Patrol, Department of Transportation.

Approach

- Medium-speed WIM equipment will be installed off the mainline on the approach ramp to the weigh station.
- Commercial vehicles will be sorted in motion to allow some vehicles to bypass the static weighing process.
- Potentially overweight vehicles will be directed by electronic signing or signaling to the static scale.

- WIM may be installed at a planned POE north of North Sioux City. The existing North Sioux City facility is frequently plagued by queues of commercial vehicles backing up onto the interstate highway. Completion of the new facility is anticipated in 2002.

- Longer term ITS/CVO plans (more than two years in the future) include development of full electronic screening capability. Implementation of WIM and AVI technologies will be followed by the networking of POE computers and technologies with credential databases. The ultimate goal, "transparent borders," travel by safe and legal carriers through multiple states or across international borders with no more than a single stop, then will be possible.

Key Issues

- Planning for additional technologies such as AVI at the same time as WIM can avoid costs of retrofitting infrastructure and communications systems. These technologies are the basis for electronic screening systems.

- Technologies, policies, and preferences can change considerably during a five-year planning horizon.

- Some agency staff resistance and nervousness should be anticipated because of the paradigm shift represented by allowing vehicles to bypass the static scale.

- Multiple commercial vehicles bypassing the static scale and reentering the highway in close proximity to one another may be a traffic hazard.

- Quantifying the benefits of changes, particularly expressed outcomes such as improved safety, can be difficult and expensive due to data limitations and the relatively small number of definable incidents (e.g., "dangerous" queues on the highway) over time. However, concern for the safety of motorists on the highway next to the North Sioux City POE was expressed many times by motor carriers that were interviewed in the business planning process and by several members of the Highway Patrol. Because of this dangerous situation, the state is planning to rebuild the facility in a new location north of the present facility, with possible installation of WIM.

Products – A system for in-motion sorting of commercial vehicles on a ramp in order to allow some vehicles to bypass the static scale.

Duration – Six months to install WIM equipment. Completion of the North Sioux City POE is expected to be in 2002.

Estimated Cost of Development – $150,000 for a basic WIM system. Electronic screening is not considered.

Estimated Annual Operating Costs – $15,000.

Estimated Short-Term Staffing Requirements – No staffing changes during basic WIM installation.

Estimated Long-Term Staffing Requirements – No staffing changes. Electronic screening is not considered.

Funding – $120,000 is expected to come from construction funds provided by the Federal Government, with the remaining $30,000 to come from state funds.

5.3 Assessment of Projects

Although all 12 projects were recommended for the ITS/CVO program, it was necessary to assess each project in order to develop a sequence for implementing them. Projects were assessed according to several factors. These factors were benefits and costs, risks, synergy among projects, and availability of funding.

Benefits and Costs

Costs of developing the projects have been estimated, but quantifying the benefits would have been especially difficult and expensive because of the small amount of operational data available on the technologies and systems recommended in this plan. Outcomes such as improved safety are particularly hard to quantify. A full benefit and cost analysis of the projects was beyond the scope of the study and was not conducted.

To provide stakeholders with an understanding of the relative costs and benefits of individual projects, however, the consultants used an X axis and Y axis format to show how the projects could be classified solely on the basis of relative costs and benefits. The following scales were developed for measuring the costs and benefits of projects:

Costs

- **Low** – Development costs that fall within this category were estimated to be minimal, and are likely to be met with limited resistance by state agencies. Projects in this category are likely to represent development costs from zero to $25,000.

- **Moderate** – Development costs that fall within this category were estimated to be relatively more substantial than low-cost projects and may require special budget requests by the state agencies. The development costs included in this category were estimated to range from $26,000 to $200,000.

- **High** – Development costs that fall within this category are likely to be very substantial. These costs will probably require dedicated budget requests or authorizations by the state. Development costs included in this category were estimated to exceed $200,000.

Benefits

- **Low** – Projects that will have little or no positive impact on administrative efficiency or safety were classified as "low."

- **Moderate** – Projects that will improve the efficiency of deskside regulatory transactions, enhance the productivity of roadside operations, or enhance safety in other ways were categorized as producing moderate benefits. Projects that improve customer service were included in this category.

- **High** – Projects that will have a major positive impact on safety, efficiency, productivity, or customer service were categorized as yielding high benefits.

Figure 5.3 shows the results of plotting the projects according to these scales.

Projects located in quadrant "A" are expected to produce high benefits with low or moderate development costs. Typically, these are projects that will be deployed early. The information helpline and proactive information dissemination projects scored comparatively high in benefits because of anticipated improvements in customer service offered by the two projects. Projects in quadrant "B" also scored high in benefits. Costs to develop these projects, on the other hand, will be high. Quadrant "C" projects are expected to produce moderate benefits with moderate development costs. None of the projects recommended in this plan were located in quadrant "D." A project in this area would require moderate to high development costs, and might produce minimal benefits, therefore it is likely to be the last project deployed, if it is deployed at all.

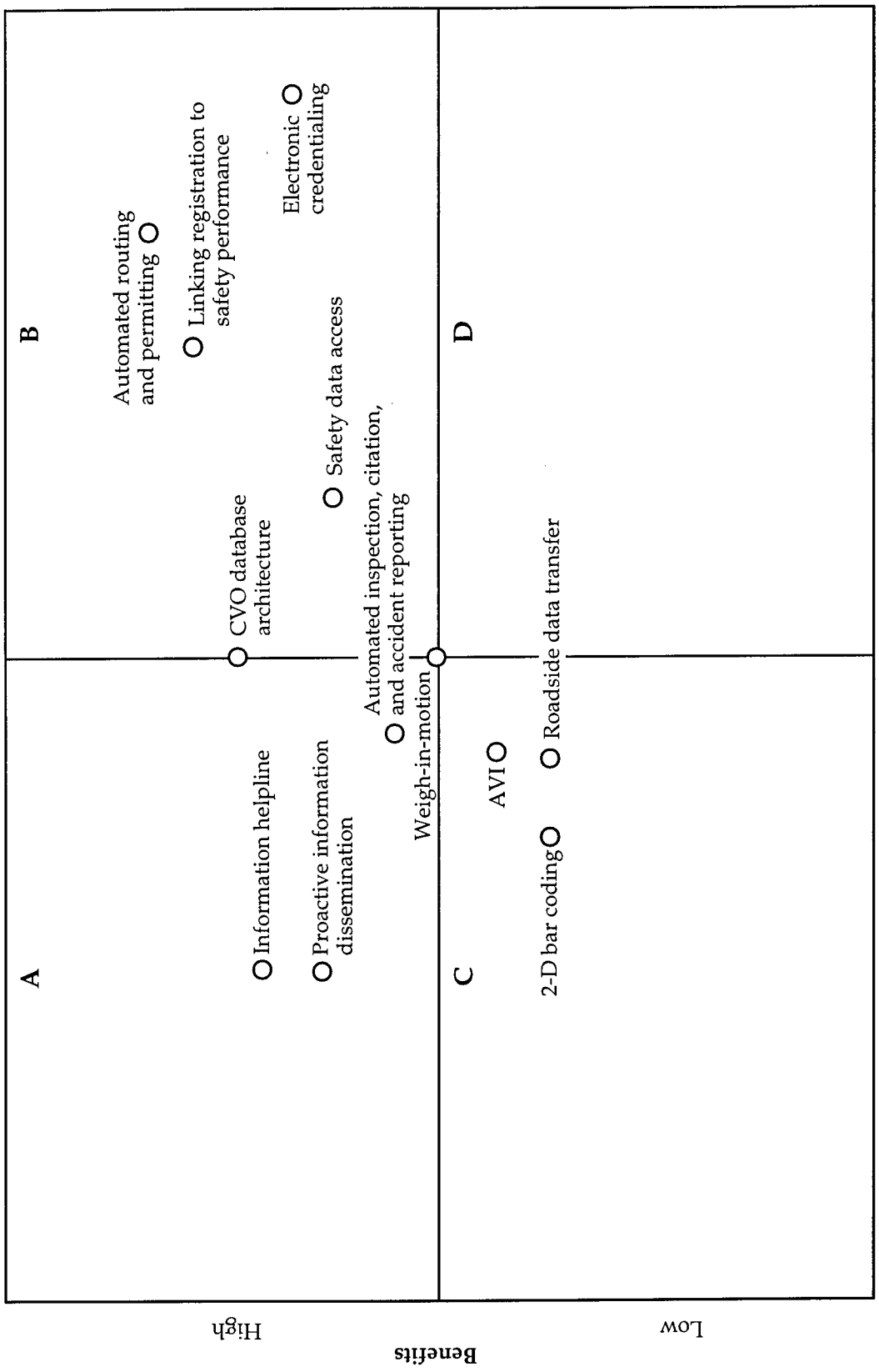
On the basis of this worksheet, generally all of the Business Plan's projects will produce at least moderate benefits to the state, motor carriers, or both. The more differentiating factor is development cost.

Risks

In developing a schedule of projects, consideration was given to the risks associated with implementing a project. Risk assessment is a way of estimating the probability that a project will succeed in achieving its purpose and intended result within reasonable time and budget limits. Assuming a project has sufficient resources, risks can be technical or institutional. For every one of the 12 projects, key issues are listed in the project description. Generally, issues can be considered to be risks. They jeopardize the chance of success of a project.

Risks typically are time-dependent for technology projects because as technology matures, the technical risks become fewer and less threatening. For example, technical risks in deploying the CVISN (such as planning for the development of the intrastate data mailbox or the outfitting of motor carriers with transponders) currently are fairly high as development of some "core" systems and efforts to achieve consensus on communication standards are still evolving, leaving CVISN pilot states at virtual standstills in some areas. The next round of CVISN states will find virtually all core systems and elements, and even standards, operational.

Figure 5.3 Benefits and Costs Worksheet



Therefore, it may be most prudent in a risk-averse environment that most states find themselves in, to implement more mature technologies early on, leaving newer or more developing technologies for later stages of a program.

Synergy Among Projects

Scheduling projects should take into account synergy among projects, that is, individually a project may not have the potential to provide large benefits but combined with one or more related projects, the project (and the group of projects) becomes significantly more important, and perhaps should be implemented early, and implementations of synergistic projects should be coordinated. This is the concept of positive combined action.

As shown in Figure 5.3, the projects involving roadside data transfer, AVI, and two-dimensional bar coding fall in the area of moderate benefits and moderate costs. These projects, plus automated inspection, citation, and accident reporting (also to be called automated inspection reporting), are expected to be components of South Dakota's project to link registration to safety performance (PRISM). The actual benefits to be derived from their combined deployment in the PRISM system are represented by the location of linking registration to safety performance in quadrant "B" – high benefits, and high costs.

As will be shown in Section 6.2 of this document, synergistic projects will likely be implemented at the same time, or sequentially if one or more implementations are needed first. Thus, the development of the PRISM system requirements will be accompanied by the deployment of laptop computers with cellular communications, and installation of AVI technology will follow the development of database linkages and specifications for interfacing AVI and the target file.

Availability of Funding

Availability and timing of funding strongly affect how projects are scheduled. Funding for some South Dakota ITS/CVO initiatives has been definitively identified, notably funding for linking registration to safety performance, two-dimensional bar coding, automated inspection reporting, and AVI, which will be provided by the PRISM project (80 percent) and state funds (20 percent). Funding also has been identified for the road-side data transfer (about 80 percent federal and 20 percent state) and automated routing and permitting (100 percent state) projects. In addition, the cost of installing WIM at the planned POE near North Sioux City may be absorbed in the total cost of building the facility, that is, on an 80-20 federal and state split.

At this time, it appears that the proactive information dissemination and information helpline projects will rely entirely on state funds for development. If South Dakota is awarded CVISN funds in the future, the remaining projects (CVO database architecture, safety data access, and electronic credentialing) potentially will be funded through the CVISN according to a 50-50 federal and state split.

Refer to Figure 6.2 for a listing of project costs and potential funding sources.

Order of Projects

The following factors, that were not ranked, were used to order the projects in terms of sequence of implementation:

- Relative costs and benefits;
- Risks;
- Synergy among projects;
- Available funding;
- Immediate needs of state agencies and motor carriers; and
- Goals and objectives of the state's ITS/CVO program (see Section 4.3).

Based on these factors, the projects were ordered for implementation as follows:

1. Proactive information dissemination
2. CVO database architecture
3. Automated routing and permitting
4. Roadside data transfer
5. Two-dimensional bar coding
6. Automated inspection, citation, and accident reporting
7. Linking registration to safety performance (PRISM)
8. Information helpline
9. Automatic vehicle identification
10. Safety data access
11. Electronic credentialing
12. Weigh-in-motion

Discussion

Proactive information dissemination is listed first because it is a project already underway. Weather, road condition, and construction information currently is disseminated by a number of media, including the DOT Web Page, cellular communication, and an

information hotline. Regulatory information is being presented by the Highway Patrol on its Web Page and by the state trucking association in its monthly newsletter.

The other project that is based on providing information to motor carriers, the *information helpline*, is scheduled to have development initiated around the third quarter of 1998. Both of these projects are very important elements of the state ITS/CVO program. With their low costs and high benefits, these projects fall in the desirable "A" quadrant. There are essentially no technical risks to develop these projects. Synergy between a helpline and information distribution is logical, and one program with a core group of participants from the state agencies, and industry, could organize and direct the activities. A single person, with backup, could be responsible for staffing the helpline and gathering, assembling, and producing educational materials, and could work through the program group to get ideas, information, and other support from the various CVO agencies and the industry.

CVO database architecture should be started very early in the ITS/CVO program to define the linkages that will be needed to support other program efforts. Two systems that are expected to be developed early in the program, automated routing and permitting and linking registration to safety performance, require that certain linkages be defined and established. Development of these two systems will benefit from the advance construction of an architecture. In turn, installation of the new systems will give form to the evolving detailed architecture.

Automated routing and permitting "scores" highest in importance among all the projects. It scores well on the benefits and costs worksheet; functioning systems with automated routing and permitting capabilities exist elsewhere so technical risks are relatively low; and to date at least partial funding has been earmarked (of the estimated $653,000 needed for development, $125,000 was earmarked for the fiscal year ending in July 1998 and $250,000 for the fiscal year ending in July 1999; the remainder probably must also come from state funds). This project has the distinction of addressing immediate needs expressed by both state agency personnel and motor carriers first discussed in the analysis of interviews (Section 2.2). An automated routing and permitting system will essentially replace a big paper system that is cumbersome and inefficient to use and provides no ability to share data efficiently. With the option of electronic applications, carriers will spend less time providing permit data, will be able to receive permits at a convenient location, and will be provided with optimally safe routing.

Safety will be improved in two ways. One, better routing will potentially eliminate accidents in construction zones and crashes of overheight vehicles at bridges. Two, the time-consuming administrative functions performed by POE personnel will largely be taken over by the computerized system, thereby releasing enforcement personnel to focus on safety enforcement. This project also addresses every one of the four goals of the state's ITS/CVO program: improving the safety and efficiency of CVO; increasing the efficiency of the state CVO regulatory procedures; promoting the safe utilization of the transportation system while preserving its integrity; and providing better service to industry.

Among the remaining projects, the *PRISM* project will provide many safety benefits, will begin the electronic linkages for facilitating data sharing in the state and outside the state, and will be an early opportunity to demonstrate the state's intention to implement ITS/CVO systems in a manner that is consistent and compatible with the CVISN. That is,

the state will link databases to facilitate data sharing and adopt common standards for electronic communication. Initially, the PRISM project will link special modules; registration, enforcement, and vehicle title systems; and the MCMIS. Roadside and deskside will further be linked as laptop computers are used to enter inspection and other data. As the basis for multiple internal linkages, the PRISM project ties together the safety assurance and credentials administration areas. Eventually, external linkages will include a link between the PRISM and SAFER systems for SafeStat data. The SAFER is being developed as part of the CVISN to provide safety fitness, roadside inspection history, and accident record information to fixed and mobile enforcement sites.

Three other projects should be combined with the PRISM effort and developed simultaneously with it. These projects actually are integral components of the PRISM project. They are *roadside data transfer, two-dimensional bar coding, and automated inspection reporting.* A fourth synergistic project, *automatic vehicle identification,* will follow at the end of the first year of the program after the preconditions for its use are developed. This will also allow AVI technology to mature.

Some projects cannot be undertaken until other conditions are met. For example, *weigh-in-motion* is presently envisioned for a planned POE that will not be ready until 2002. *Safety data access* and *electronic credentialing* are found in the "B" quadrant; they have high benefits but also high costs. At this time, how the state will fund these projects is uncertain. The best likelihood is funding through the CVISN whereby the Federal Government and the state provide equal matches. In large part because of the uncertainty of being awarded CVISN money and of the schedule of awards, safety data access and electronic credentialing are listed near the bottom of the order of projects.[3] As Section 6.2 of this document will show, the two projects are scheduled to start in September 1999.

[3]CVO database architecture development also may rely on CVISN funding. However, because of its lower total costs, its incremental nature, and its extremely high priority, the uncertainty of CVISN funding is not a factor in scheduling the project.

6.0 Organization and Management Approach

This section covers the roles and responsibilities of public and private sector stakeholders in the state's ITS/CVO program, scheduling of projects, and anticipated funding needs and sources. Recommendations for implementing the Business Plan conclude the section.

6.1 Lead Agencies

In South Dakota the DOT has been designated to lead ITS development and deployment activities. The DOT was the lead agency in the development of the ITS/CVO Business Plan. Although the focus of the office charged with driving the Business Plan development, the Office of Research, is research activities, and projects in the plan are designed for deployment, this office is best positioned to direct the state ITS/CVO program. As the South Dakota member of the Steering Committee of the Midwest Mainstreaming Consortium, the Office of Research has already made a commitment to represent the CVO regulatory agencies in ITS/CVO activities outside the state.

Typically, funding from federal sources is funneled through the state DOT, making the office the logical choice for financial and contracting responsibilities. Finally, the experience of other states has shown that an agency or other unit without substantial credentials or enforcement functions in CVO provides the most objective and focused program leadership because it does not have to deal with both day-to-day operations and "visionary" planning and it likely has less "turf" to defend from change.

The productiveness of the Business Plan Technical Panel suggests that this group be established as the Steering Committee to assist the Office of Research in directing the ITS/CVO program. The Office of Research should also be a member of the Steering Committee. The Committee will be charged with making policy and funding decisions related to the program and its constituent projects.

The Steering Committee will coordinate the scheduling of projects through the lead agency assigned to each project. Project lead agencies will be responsible for project management, status and financial reporting, coordination with participating agencies, other liaison activities, and management of outside consultants. Lead agencies for projects in the Business Plan are as follows:

- Proactive information dissemination – DOT, Revenue, DCR, and Highway Patrol;
- CVO database architecture – DOT;

- Automated routing and permitting – DOT and Highway Patrol;
- Roadside data transfer – Highway Patrol;
- Two-dimensional bar coding – Revenue and DCR;
- Automated inspection, citation, and accident reporting – Highway Patrol;
- Linking registration to safety performance – Revenue and Highway Patrol;
- Information helpline – Revenue, DCR, Highway Patrol, and PUC;
- Automatic vehicle identification – Highway Patrol;
- Safety data access – Highway Patrol;
- Electronic credentialing – Revenue and PUC; and
- Weigh-in-motion – Highway Patrol.

Updating the Business Plan

The consultants recommend that the Business Plan be updated in two years to reflect changing circumstances, the advancement of specific projects, and new information. Changes in technologies, policies, and funding sources are especially critical in creating the need for an updated plan. Information in the plan may be changed, or a stand-alone addendum may be issued.

The Office of Research should convene the Technical Panel (Steering Committee) in January 2000. Discussion should include the following topics:

- Status of the ITS/CVO program;
- Status of individual projects;
- Status of funds available for projects;
- New sources of funding;
- Areas requiring special attention (significant project delays or budget overruns, mid-course corrections needed, etc.);
- Refinement of the electronic credentialing, safety data access, and weigh-in-motion projects;
- New projects for the program, including the incorporation of a detailed electronic screening project;
- Affirmation or modification of the strategic direction for ITS/CVO activities in the state; and
- Process for updating the plan.

Decisions regarding whether to add information to the existing plan or issue an addendum; who will be responsible for developing the update (in-house staff or consultant); and what methodology will be used to gather information on new funding sources, potential projects, and current national and regional ITS/CVO environments, will help define the process for updating the plan.

6.2 Schedule and Milestones

Figure 6.1 shows the schedule for implementing the projects recommended in the Business Plan. The schedule indicates duration, sequence, and estimated dates for starting projects.

The first phase of the ITS/CVO program begins in January 1998 and includes the development of seven projects. The start dates for these projects cluster approximately in the first quarter of 1998, from January to April. Proactive information dissemination, CVO database architecture, automated routing and permitting, and linking registration to safety performance (PRISM), along with three of the synergistic PRISM projects, are scheduled to begin in the first phase. For four of the projects, implementation extends beyond the first two years of the program.

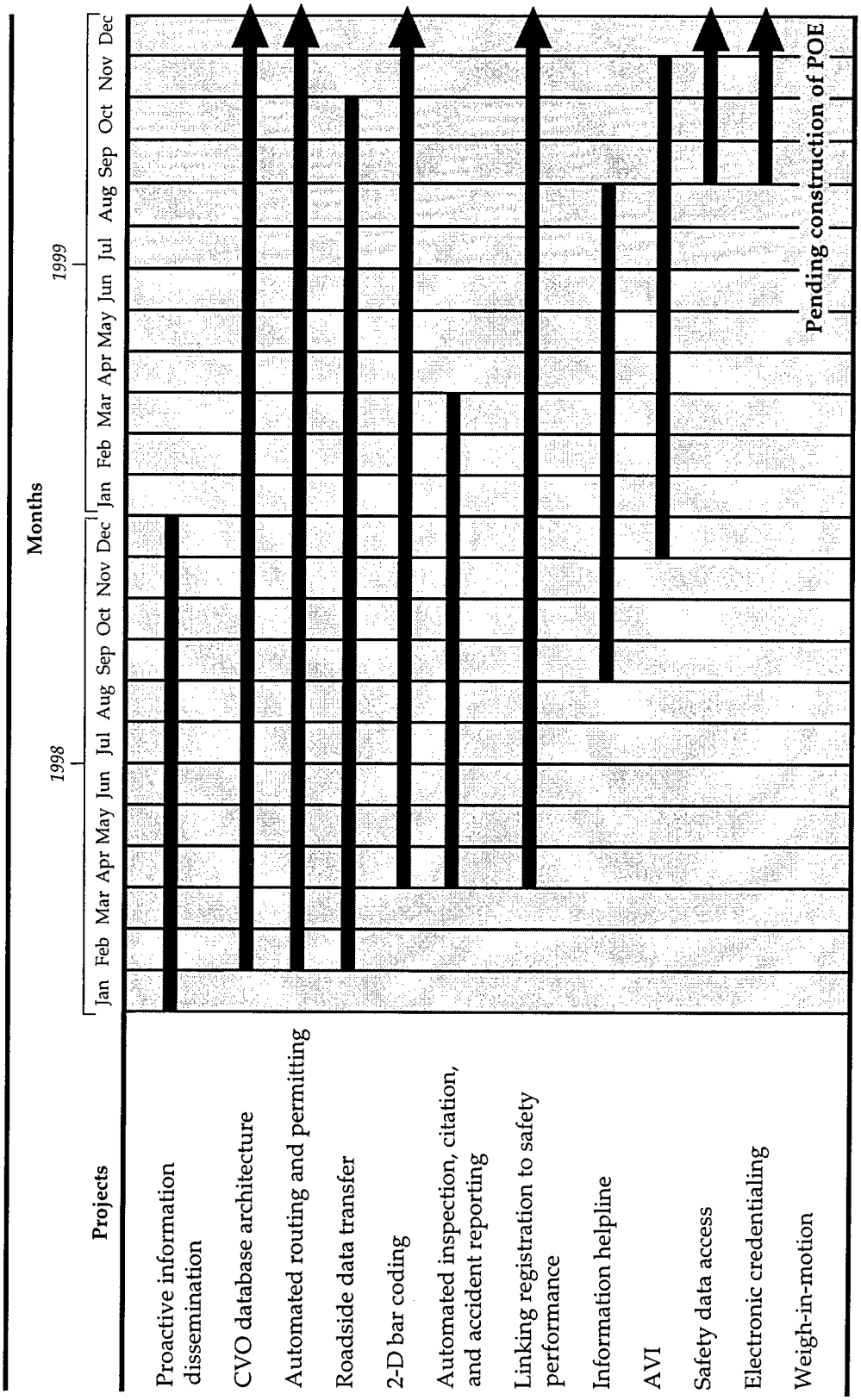
About the fourth quarter of 1998, a second phase of implementation begins with development of the information helpline and installation of AVI technology, in September and December respectively. A third phase includes startup of the safety data access and electronic credentialing projects in September 1999. The installation of WIM equipment is tied to the construction of a new POE with an anticipated completion date in 2002.

Key milestones for projects have been identified as follows:

Project No. 1. Proactive information dissemination

- Develop a program plan that includes deliverables, dates, lead agencies, distribution methods, and an outreach plan.
- Prepare and distribute an annual calendar of events that includes dates for renewing credentials, filing quarterly fuel tax returns, etc.
- Prepare and distribute a checklist of regulatory requirements, i.e., comprehensive list of what is required to operate as a motor carrier in South Dakota.
- Develop functionality for an electronic kiosk that provides information such as a calendar of events, a checklist of regulatory requirements, excerpts from the motor carrier manual, weather, road conditions, and construction activities.

Figure 6.1 Schedule of Projects



Project No. 2. CVO database architecture

- Prepare a high-level functional design.
- Develop a detailed design.
- Update the detailed design and incorporate new systems as necessary.

Project No. 3. Automated routing and permitting

- Develop and issue request for proposals (RFP).
- Contract for and acquire system software.
- Acquire hardware.
- Recruit motor carriers for the pilot testing of the electronic applications capability.
- Develop and install the permitting module, and test its functionality.
- Develop and install the routing module, and test its functionality.
- Conduct an end-to-end test.
- Train participating state personnel and pilot motor carriers.
- Develop a motor carrier education and outreach plan.

Project No. 4. Roadside data transfer

- Acquire hardware.
- Establish cellular connections.
- Train enforcement personnel.

Project No. 5. Two-dimensional bar coding

- Implement the driver license pilot program.
- Implement the driver license statewide program.
- Redesign registration credentials to accommodate bar codes.
- Acquire and run software to translate data into bar code format, and print the bar codes on credentials.

Project No. 6. Automated inspection, citation, and accident reporting

- Acquire software for data entry capability, and customize it.
- Automate inspection, citation, and accident documents.
- Ensure the operability of bar code readers with driver licenses and registration credentials.
- Install software on laptop computers.
- Install cellular modems.
- Establish the capability to upload to the SAFETYNET.
- Conduct an end-to-end test.
- Train enforcement personnel.

Project No. 7. Linking registration to safety performance

- Complete the registration module (includes acquiring IRP system, collecting U.S. DOT numbers, establishing links internally and with MCSIP and MCMIS) and non-automated registration procedures.
- Complete the warning letter module (includes functionality for identifying South Dakota motor carriers to receive warning letters) and non-automated procedures related to warning letters.
- Complete the improvement module (includes functionality for identifying South Dakota motor carriers for compliance reviews) and procedures for conducting compliance reviews as part of the PRISM system.
- Secure legislation for the suspension and revocation of registration on the basis of safety.
- Complete the data quality module (includes annually updating motor carrier information through registration process and testing operability with automated inspection reporting, bar coding, and SAFETYNET upload components) and non-automated data assurance procedures.
- Complete the enforcement query module (includes accessing target file, installing AVI technology, and validating motor carrier identification) and non-automated enforcement procedures.
- Conduct tests of module functionality as appropriate.
- Conduct an end-to-end test.

- Train participating state personnel.
- Educate motor carriers.

Project No. 8. Information helpline

- Develop a program plan that includes goals, a staffing plan, and an outreach plan.
- Train personnel.
- Create a 1-800 helpline.
- Perform outreach.

Project No. 9. Automatic vehicle identification

- Select the type of AVI technology to be used.
- Define specifications and procure the AVI technology.
- Install AVI at three POEs.
- Interface AVI with the target file and other PRISM system components.
- Incorporate AVI into inspection selection processes.
- Conduct a test of functionality.
- Train POE personnel.
- Link AVI with credentials databases including OS/OW, operating authority/proof of insurance, and other credentials as determined.
- Incorporate AVI into an electronic screening system.

Project No. 10. Safety data access

- Select the type of technology to be used.
- Develop on-line information access capability for roadside personnel.
- Train enforcement personnel.
- Establish links with credentials databases as identified including registration, fuel tax, operating authority/proof of insurance, and OS/OW.

Project No. 11. Electronic credentialing

- Determine which credentials may be obtained electronically.
- Procure CAT software or develop Internet functionality
- Develop the functionality to route transactions to the proper agencies.
- Complete the necessary agency-to-agency linkages.
- Complete the necessary external linkages with systems in the CVISN core infrastructure (e.g., national clearinghouses).
- Ensure the functionality of credentialing systems, performing legacy system modifications if necessary.
- Recruit motor carriers for the pilot test.
- Conduct an end-to-end test.
- Train participating state personnel and pilot motor carriers.
- Develop a motor carrier education and outreach plan.

Project No. 12. Weigh-in-motion

- Finalize the site requirements.
- Define specifications and procure WIM and ancillary equipment.
- Install WIM and ancillary equipment.
- Develop the sorting system (includes programming weight threshold for allowing bypass, developing signal system, and programming "override" capability for scale personnel).
- Conduct a system test.
- Educate motor carriers.
- Incorporate WIM into an electronic screening system.

6.3 Costs and Funding

Implementation of the 12 projects in the Business Plan is estimated to total approximately $2,960,000 in development costs. Figure 6.2 lists the development cost of each project and the potential funding sources.

As the figure shows, federal funding through PRISM, the CVISN, and other sources, potentially will provide $1,393,000 for ITS/CVO development in South Dakota, or 47 percent. State funds totaling $1,567,000, or 53 percent, will provide the remainder of development costs.

Although the Business Plan has identified anticipated and potential sources of funding, alternative sources should be actively pursued. In particular, federal and private funds should be sought in order to decrease the considerable state burden. One of the primary responsibilities of the DOT as the lead agency, with help from the Steering Committee, is to secure funds to support the ITS/CVO program.

Federal Sources of Funding

Federal sources of funding include the following:

- CVISN Deployment Incentive Funding;
- Motor Carrier Safety Assistance Program (MCSAP);
- Federal-aid highway programs; and
- Innovative financing.

CVISN Deployment Incentive Funding

The first round of CVISN money was awarded in 1996 to eight pilot states through the CVISN Model Deployment program of the FHWA. Additional states will obtain money through the CVISN Deployment Incentive Funding program. This funding is discretionary and competitively awarded. In total, the Federal Government will spend an anticipated $25 million annually to fund state "ITS/CVISN" projects.

Specifically, states will be expected to use deployment incentive funds to demonstrate CVISN Level 1 capability within a three-year period. Level 1 capability includes an organizational framework of state agencies and motor carriers to direct projects; development of a CVISN system design; implementation of elements of safety information exchange such as electronic inspection software and a connection to the SAFER system; implementation of credentials administration such as IRP and IFTA automated processing and electronic credentialing encompassing about 10 percent of total transaction volume; and electronic screening at one fixed or mobile site.

Figure 6.2 Project Costs and Funding Sources

Projects	Development Cost	Potential Funding Sources			
		PRISM	CVISN	Other Federal	State
1. Proactive information dissemination	$ 30,000				$ 30,000
2. CVO database architecture	150,000		75,000		75,000
3. Automated routing and permitting	653,000				653,000
4. Roadside data transfer	93,000			74,000	19,000
5. Two-dimensional (2-D) bar coding	52,000	43,000			9,000
6. Automated inspection, citation, and accident reporting	113,000	93,000			20,000
7. Linking registration to safety performance	343,000	283,000			60,000
8. Information helpline	30,000				30,000
9. Automatic vehicle identification (AVI)	96,000	80,000			16,000
10. Safety data access	250,000		125,000		125,000
11. Electronic credentialing	1,000,000*		500,000		500,000
12. Weigh-in-motion	150,000			120,000	30,000
Total	**$2,960,000**	**$499,000**	**$700,000**	**$194,000**	**$1,567,000**

* This cost is expected to be significantly reduced as a result of implementation of the previously identified projects.

Although the total cost of a three-year deployment project will vary from state to state depending on the size of the state, scope of its CVO program, and existing capabilities, the average cost per state is estimated at $6 to $8 million, of which the Federal Government and the state each will provide $3 to $4 million.

South Dakota is on the path to Level 1 capability with implementation of the Business Plan. An organizational framework is in place in the form of the Technical Panel/Steering Committee. The Business Plan includes projects for electronic inspection software (Project No. 6); IRP and IFTA automated processing (Project No. 7); electronic credentialing (Project No. 11); and enabling technology for electronic screening (Projects No. 9 and 12).[1]

The overall process for states to obtain deployment incentive funds consists of the following steps:

- Completion of an ITS/CVO Business Plan;
- Participation by state personnel and other stakeholders in two ITS/CVO training courses;
- Participation in a series of CVISN workshops; and
- Completion of a CVISN project plan (completed in one of the workshops) that serves as a proposal to be submitted to the FHWA for deployment incentive funding.

The FHWA will fund selected proposals based on a set of criteria and available funding. Four to seven states will be funded each year starting in fiscal year 1999 to begin the ITS/CVISN deployment projects. In all, 26 to 42 states will receive deployment incentive funds. At present, when the FHWA will initiate the process for states to obtain these funds is unknown.

Other Federal Sources of Funding

The MCSAP is a grant program to assist state enforcement of safety, size, and weight regulations with the goal of reducing commercial vehicle crashes. Funds are granted according to an 80-20 federal and state split. Eligible uses include pen-based and laptop computers, roadside access to safety information systems, and automatic brake testing equipment. The MCSAP is a key funding source for implementing ITS/CVO safety assurance projects, and should be considered as an alternative way to fund or help fund projects such as safety data access.[2]

Federal-aid highway programs include the Surface Transportation Program (STP), the National Highway System (NHS), Interstate Maintenance (IM), State Planning and Research (SPR), and Highway Safety Program (402 Program). In particular, the STP provides 80 percent federal funding for operational improvements on federal-aid

[1] A new, combined IRP and IFTA system is planned by the Department of Revenue.

[2] The potential of this funding in South Dakota is at hand with the state now joining the MCSAP.

highways; highway safety improvements and programs; and highway research, development, and technology transfer. STP funds are potentially applicable to a wide range of ITS/CVO projects such as weigh station upgrades, commercial vehicle traveler information systems, and hazardous materials incident response systems. For South Dakota, STP ("construction") funds are expected to fund WIM installation at a new weigh station.

Innovative financing is a relatively new initiative in the federal highway and transit programs. It can be used to provide or enhance credit, make loans, reduce interest rates, and improve cash flow. Innovative financing has the potential to provide financial flexibility and create additional sources of revenue for states. Examples include phased funding, advance construction, flexible match, and the State Infrastructure Bank (SIB) pilot program.[3]

State and Local Sources of Funding

- Permit fees;
- Operating authority fees;
- Registration fees;
- CDL fees; and
- Motor fuel taxes.[4]

At the state and local levels, issues such as lack of dedicated funding sources for ITS/CVO and competition with other projects and priorities in agencies (e.g., passenger car registration) make obtaining funds difficult. However, cost sharing for federal projects such as Mainstreaming has come from state sources.

Locating funds for development costs clearly is a challenge, but the automated processing systems that will be implemented as part of the state's ITS/CVO program have potential to pay for themselves. Given a reasonable expectation that state agencies will experience cost savings from installing automated systems for administering IRP and OS/OW functions and developing electronic transactions capabilities, the possibility exists that the savings could be "put back into the systems," that is, used to help pay for the annual operating costs of the new systems.[5]

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[3]South Dakota has used advance construction. Basically, the state spent money that must be repaid with the passage of a new federal highway bill. Until a new bill passes, the state must cut construction approximately equal to the amount spent. However, after passage, the state may end up with more money than it planned.

[4]Highway construction funds are derived from motor fuel taxes.

[5]Positive benefit/cost ratios for automating manual processes were mentioned in the project descriptions for automated routing and permitting (Project No. 3) and electronic credentialing (Project No. 11).

Unfortunately, the interviews with motor carriers did not ask carriers if they are willing to pay higher permit, registration, and license fees in order to help fund the development of new ITS/CVO systems and services that have the potential to provide them with time and cost savings. It is generally felt that carriers are willing to help fund mutually beneficial projects, but the amount they are prepared to pay depends on a number of factors including the specific benefits that are expected and the operating characteristics and size of the carrier.

Private Sector Funding

Using private sector funds to help support an ITS/CVO program has until recently been limited to one or two examples. With public/private partnerships now "in vogue," if more conceptually than functionally, and with the increasing participation of the motor carrier industry in state, regional, and national initiatives, states are looking at the private sector to help them develop CVO projects. The main source of private sector funding is public/private partnerships. Examples of successful public/private partnerships include the HELP, Inc. sponsored electronic screening program (PrePass) that is a franchise arrangement; the Missouri fiber optic cable installation, an example of a concession; and the I-95 Fleet Forward Operational Test which uses pooled funds.

The business planning process did not uncover any specific opportunities for public/private ventures, but the interviews that were conducted did not include vendors and other private sector groups that are potential funding sources.

6.4 Recommendations

Based on the work conducted to produce an ITS/CVO Business Plan for South Dakota, the following recommendations are presented for consideration by the South Dakota DOT Research Review Board:

1. It is recommended that the South Dakota ITS/CVO Business Plan be approved for implementation. Throughout the country, ITS technology is being applied in CVO programs to produce more efficient and more cost-effective CVO regulation, and more efficient, cost-effective, and safer motor carrier operations. The projects included in the plan will target and coordinate the state's investments in ITS technology in order to conserve resources and apply those technologies that will be most beneficial to the operations of state agencies and motor carriers in South Dakota.

2. It is recommended that a Steering Committee be established to direct the South Dakota ITS/CVO program, make policy and funding decisions related to the program and individual projects, and coordinate the scheduling of projects through the lead agency assigned to each project. It is recommended that the committee comprise members of the Technical Panel that was convened to direct the development of the Business Plan.

3. It is recommended that the established Steering Committee develop an outreach, education, and training program that will help promote the ITS/CVO program and Business Plan to motor carriers. It is recommended that this program include the following elements:

   - **Motor Carrier Recruitment** – A specified number of carriers will be recruited for participation in ITS/CVO projects at the appropriate times. The Steering Committee, which includes two motor carriers and a representative from the South Dakota Trucking Association, will determine optimum carrier characteristics, and will recruit and maintain the participation of carriers for the duration of the projects.

   - **Industry Communications** – A comprehensive marketing and communications plan for disseminating information to South Dakota motor carriers will be developed. Communications tools may include broadcast fax notices, an initial ITS/CVO program brochure, quarterly newsletters, and training kits.

   - **Motor Carrier Training** – Carriers that are selected to participate in ITS/CVO projects will require additional program education and training. A training program to educate owners and managers about projects and their potential impacts will be developed. The Steering Committee will coordinate training sessions with the South Dakota Trucking Association.

   - **ITS/CVO Showcase** – A showcase of technologies and services will be developed at the end of the first year of the ITS/CVO program. This will communicate accomplishments to the motor carrier industry and aid in expansion of the program. Printed materials, audiovisual presentations, and hardware and software demonstrations will be featured.

4. It is recommended that the established Steering Committee refine project concepts and develop and issue requests for proposals (RFPs). Projects are scheduled to start immediately upon approval of the Business Plan. Project concepts in the Business Plan must be refined in order to draft preliminary work plans. If the Steering Committee and project lead agencies decide that consultants will be involved in project work, RFPs must be developed and issued, and criteria for making selections must be determined.

5. It is recommended that the established Steering Committee monitor closely the process by which the FHWA will award the next round of CVISN funding, and direct efforts toward securing CVISN funding. CVISN Deployment Incentive Funding is discretionary and competitive, and states that wish to be awarded funding must actively pursue it. In addition to completing defined steps, states must demonstrate institutional and technical capabilities which mitigate the risks associated with deploying new technologies and services. Therefore, it was recommended that project refinement and RFP development be started immediately so that projects can begin and institutional arrangements and collaboration can be forged. The advantages of securing CVISN funding are the size of the awards and the flexibility of what are regarded as eligible uses. A disadvantage is the need for states to provide an equal match, which can be daunting given the size of the awards. In recommending that the state pursue funding, it is noted that the Business Plan is built upon the expectation

that necessary funding will be provided for projects. Only if all projects are implemented will the state and its motor carriers realize maximum benefits.

6. It is recommended that the Business Plan be updated in January 2000. It is likely that technologies, policies, and funding sources will have changed since the inception of the plan. At that time, the Steering Committee will convene to discuss the status of the ITS/CVO program and component projects; status of funds; new sources of funding; refinement of projects implemented in the months just before January 2000; new projects; and affirmation or modification of the strategic direction for ITS/CVO activities in the state.

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Appendix B – Documents

South Dakota Literature

1. Bureau of Governmental Affairs, University of North Dakota, Advanced Transportation Weather Information System (ATWIS), Interim Report, July 1997.

2. South Dakota Department of Transportation, Bridge Weight Limits, map, 1995.

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Appendix C – Linkages

SSRS – Operating Authority (Insurance Information) (PUC)

Existing Electronic Linkages	Desired Electronic Linkages
PUC Field Staff	Highway Patrol DENR

Exempt Carriers (Insurance Information) (PUC)

Existing Electronic Linkages	Desired Electronic Linkages
PUC Field Staff	Highway Patrol

Highway Use Receipt – HUR (OS/OW, trip permits) (Highway Patrol)

Existing Electronic Linkages	Desired Electronic Linkages
(information currently maintained on hard copy forms; summary information stored in Q & A)	DOT (Operations and Engineering/Planning) Highway Patrol Dept. of Revenue PUC Carriers

CDL **(Commerce)**

Existing Electronic Linkages	Desired Electronic Linkages
Industry (through DAC)	
Law enforcement agencies	
Dept. of Social Services	
Dept. of Labor	
UJS	
Dept. of Revenue (Title and Registration)	
DOT (Accident Records)	
CDLIS	

Wants and Warrants

Existing Electronic Linkages	Desired Electronic Linkages
CDLIS	PUC
National Law Enforcement Telecommunications System (NLETS) (to CDL and Dept. of Revenue)	
National Crime Investigation Center (NCIC) (to CDL and Dept. of Revenue)	
State Wants and Warrants (Dept. of Criminal Investigation, DCI)	

Combined IRP and IFTA **(Revenue) (Proposed)**

Existing Electronic Linkages	Desired Electronic Linkages
IRP: Title and Registration	Carriers
	Highway Patrol
	Title and Registration

PRISM **(Proposed)**

Existing Electronic Linkages	Desired Electronic Linkages
	IRP
	SAFETYNET
	PUC
	Title and Registration
	Highway Patrol (to UJS and CDL)

2-D Bar Code **(Proposed)**

Existing Electronic Linkages	Desired Electronic Linkages
	Driver Exam Station Applications
	Driver Licenses

Automated Routing and Permitting **(Proposed)**

Existing Electronic Linkages	Desired Electronic Linkages
	IRP
	Title and Registration
	Revenues (Dept. of Revenue)
	PUC
	DOT (Operations and Engineering/Planning)
	Highway Patrol
	Carriers

Appendix D – Interviews

In-Person

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1. David Huft, Department of Transportation
2. Creighton Miller, Department of Transportation
3. Darin Larson, Department of Transportation
4. Richard Hacking, Department of Commerce and Regulation
5. Rory Mennenger, Department of Commerce and Regulation
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7. Sgt. Noel Gabriel, Highway Patrol
8. Rodney Halvorson, Highway Patrol
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11. Carrie Jacobson, Department of Environment and Natural Resources
12. Kim McIntosh, Department of Environment and Natural Resources
13. Maureen Droz, Department of Tourism
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15. Katie Hartford, Public Utilities Commission
16. Jill Smith, Unified Judicial System
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18. Mark Cichos, Bureau of Information and Telecommunications
19. Ron Knecht, Bureau of Information and Telecommunications
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2. Danny Krogh, Safety-Kleen Corporation
3. Dawna Leitzke Osborne, South Dakota Petroleum Marketers Association
4. Jeff Parker, Parker Transfer and Storage
5. Dave Stoterau, Farmland Industries
6. Larry Thury, Midwest Coast Transport
7. Kevin Trager, Jack Rabbit Bus Lines
8. Ernie Wevik, Falls Transport

By Telephone

Industry

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3. Henry Heagley, Heagley Harvesting
4. Leigh Krumbach, Owner/operator
5. Bob Lewis, Jr., Lewis Truck Line
6. Ken Lutz, Universal Transport
7. Wanda Stange, Prorate Services
8. Wayne Worthen, Powder River Transportation (interstate motor coach, Gillette, WY)

Other States

1. Capt. Steve Gerard, Highway Patrol, Wyoming Department of Transportation
2. Maj. Gene Halverson, State Patrol, Minnesota Department of Public Safety