ITS Field Operational Test
Final Evaluation Report

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LIST OF ACRONYMS

AAMVA	American Association of Motor Vehicle Administrators
APL	John Hopkins University Applied Physics Laboratory
ASTM	American Society of Testing and Materials
BAH	Booz•Allen & Hamilton, Inc.
CDLIS	Commercial Driver License Information System
CTRE	Iowa State University Center for Transportation Research and Education
CVISN	Commercial Vehicle Information Systems and Networks
DMV	Division of Motor Vehicles
EDI	Electronic Data Interchange
EFT	Electronic Funds Transfer
FEIN	Federal Employer Identification Number
FHWA	Federal Highway Administration
FOT	Field Operational Test
GUI	Graphical User Interface
HVUT	Heavy Vehicle Use Tax
ICC	Illinois Commerce Commission
IDOR	Illinois Department of Revenue
IDOT	Illinois Department of Transportation
IFTA	International Fuel Tax Agreement
IRP	International Registration Plan
ISOS	Illinois Secretary of State
ITS	Intelligent Transportation Systems
JAD	Joint Application Development
KSDOT	Kansas Department of Transportation
KSDOR	Kansas Department of Revenue

LAN	Local Area Network

LIST OF ACRONYMS (Continued)

MEOSS	Midwest Electronic One-Stop Shopping
MnDOT	Minnesota Department of Transportation
MnDPS	Minnesota Department of Public Safety
MODED	Missouri Department of Economic Development
MODOR	Missouri Department of Revenue
MODOT	Missouri Department of Transportation
MOHRC	Missouri Highway Reciprocity Commission
MOMCRS	Missouri Department of Economic Development, Department of Motor Carrier and Railroad Safety
NDOR	Nebraska Department of Roads
O&M	Operations and Maintenance
OS/OW	Oversize/Overweight
PC	Personal Computer
POE	Port of Entry
RDMS	Real-time Database Management System
RSIS	RS Information Systems, Inc.
SDDOT	South Dakota Department of Transportation
SDHP	South Dakota Highway Patrol
SDPUC	South Dakota Public Utilities Commission
SSRS	Single Rate Registration System
UNI	Unified Network Interface
VAN	Value-Added Network
VISTA	Vehicle Information System for Tax Apportionment
WHI	Western Highway Institute
WisDOT	Wisconsin Department of Transportation
WWW	World Wide Web

Executive Summary

The Midwest Electronic One-Stop Shopping (MEOSS) Field Operational Test (FOT) was conceived to evaluate the application of computer technology to the administrative processes associated with obtaining the credentials and permits necessary for commercial vehicles to legally operate on U.S. roadways. The basic concept was that by automating the submission, processing, and receiving of credential applications, motor carriers and state agencies could realize improvements in efficiency and reductions in costs associated with the credentialing process.

Agencies from seven Midwestern states entered into a partnership with the Federal Highway Administration (FHWA) to cooperatively develop and test such a system. The partnership also included AAMVAnet (technical services organization affiliated with American Association of Motor Vehicle Administrators (AAMVA)), and the effort was managed by the Iowa State University Center for Transportation Research and Education (CTRE). Begun in 1994, the project resulted in the deployment and testing of a Personal Computer (PC) based application in the May through October 1997 timeframe.

The resulting computer application was distributed to 16 carriers, and a total of 14 state agencies for use in conducting credential and permit transactions. Applicants could apply for International Registration Plan (IRP), International Fuel Tax Agreement (IFTA), and Single State Registration System (SSRS) credentials and permits, and certain Oversize/Overweight (OS/OW) permits. Users could also file IFTA quarterly reports. All users, government, and motor carrier representatives, were trained in the use of the system, and users manuals were provided.

Due to a number of complicating factors, the final product that was delivered to users was far different than that which was originally envisioned. Partially as a result of changes in communications protocols, the system development process was protracted, and the funding and time necessary to complete the product was insufficient to accommodate the required changes while preserving the initial concept.

Carrier and agency personnel experienced problems with the software from the start. Many had difficulty getting their systems up and running, and representatives form the software developer, RS Information Systems (RSIS), visited user sites to assist in set-up. After having the opportunity to review the functionality of the system, users were asked to conduct credential and permit transactions, and offer input to the evaluation of the system.

Due primarily to the perceived system inadequacies, carrier and agency representatives used the system very sparingly. In fact, during the eight-month (May – December 1997) testing phase, fewer than 30 transactions were attempted by all participants, combined. Nonetheless, the level of use did afford users the opportunity to develop impressions regarding the MEOSS system, and the one-stop concept in general.

The system was not used to a degree sufficient to ascertain whether any benefits were offered by its use. However, based on responses to interviews and surveys, users indicated that the MEOSS system did not offer them any detectable benefit. In fact, some felt the system actually resulted in the degradation of some of their activities. All participants preferred to continue using their current systems, rather than switch to MEOSS.

In spite of this, and the fact that users felt the MEOSS system had significant shortcomings, there was still a great deal of support for the concept. Nearly all participants were confident that electronic one-stop shopping systems would become widely deployed, and that they would be interested in using them to conduct their credentialing activities.

While the MEOSS FOT did not result in the deployment of one-stop shopping in the partner states, it is still considered to be a significant success. By definition, FOTs are a means of bridging the gap between the laboratory and actual implementation. They are a means to identify and develop solutions to the operational challenges associated with the practical implementation of technology. Given that definition, MEOSS was quite successful. As a result, a number of significant lessons were learned.

For instance, it is exceedingly difficult to design a single software application capable of meeting the needs of a diverse set of users like the agencies and carriers involved in this FOT. The reconciliation of disparate needs requires exhaustive research and intensive Joint Application Development (JAD) activities, and in spite of these efforts, a final solution that meets the needs of all users may remain elusive. In any event, these are time-consuming, labor-intensive activities that are easy to underestimate, and difficult to coordinate.

Another lesson stems from the need to consider the current systems and processes when developing such a system. Carriers and agencies alike have invested significant time and funding installing, customizing and populating the systems they now use. The significance of these investments must be considered when developing an application intended to acquire, process and store the types of data that are traditionally handled with these legacy systems. Participants in the MEOSS

FOT were adamant about the need for any new system to be effectively interoperable with existing systems.

Perhaps the most significant lesson, however, is that the application of new technology to existing processes is likely to limit success. Most agencies and many carriers have already implemented some form of automation, either in the form of mainframe computers or PCs. As such, those processes which they currently feel can be automated without risking a breakdown in their ability to meet their responsibilities, have already been automated to some degree. Hence, the true opportunity for substantial, sustainable improvements in efficiency must come from a combination of technology implementation and process reengineering.

In the sections that follow are the results of the evaluation conducted by Booz·Allen & Hamilton, Inc. (BAH) and North Carolina A&T State University (NCA&T). The activities undertaken, and the results obtained are offered in detail, along with the lessons learned.

Background

Purpose and Scope of the Test

The MEOSS operational test was initially proposed as a means to allow commercial vehicles to proceed uninterrupted across multiple states, obtaining the necessary credentials and permits along the way. As the effort progressed, the primary focus became that of the application modern technology to enhance the efficiency of the current commercial motor vehicle administrative processes of applying for and obtaining credentials and permits, and managing fuel tax administration. Through the use of specifically designed computer software, and electronic communications, it was anticipated that the burden these administrative requirements place on motor carriers and state agencies could be lessened by reducing the amount of time and labor expended completing paperwork and awaiting action.

Software designed specifically for the FOT was intended to help ease administrative burdens placed on motor carriers and state agencies by automating portions of the process, and reducing the time required to obtain the desired credential through the use of Electronic Data Interchange (EDI). Using MEOSS, motor carriers could complete applications for credentials and permits using a PC/Windows based software application, then file them with the state electronically via modem. State agencies could then access the application electronically, review the information, and transmit an approval or rejection back to the carrier. MEOSS, thereby, was intended to reduce the credential cycle time by eliminating the need to mail or hand carry applications and credentials. The system had the potential to further decrease the cycle time by providing a validation feature aimed at reducing the likelihood motor carriers would submit an incomplete or incorrect application.

Representatives from thirteen motor carriers, two commercial leasing companies, one motor carrier association, and various agencies from the states of Minnesota, Wisconsin, Illinois, Missouri, Kansas, Nebraska, and South Dakota, participated in the test. Using MEOSS, a motor carrier could apply for IRP, IFTA, and SSRS credentials and permits, and OS/OW permits.

Motor carrier authority is a prerequisite for doing business as a motor carrier, and is administered through a base-state program called SSRS. Vehicle registration for interstate carriers is administered under IRP, which is also a base-state program. The base-state fuel tax program is administered under IFTA. Finally, OS/OW permits are obtained by application to each of the states within which each OS/OW load will travel. The level of participation of each of the MEOSS states in this operational test is provided in Appendix A.

The purpose of this evaluation was to provide state agency and motor carrier decision makers some insights into the potential benefits they may realize through the use of a one-stop shopping system for motor carrier credentials. The intent was that this evaluation would provide the data necessary to assess the impacts, or potential impacts, on carrier and state agency productivity, to assess the user acceptance, deployability and performance of such a system, and to document the institutional issues, and any resolutions, encountered during the operational test.

A Detailed Evaluation Plan was formulated to describe the physical process by which the evaluator attempted to gather and analyze the necessary data. It provided the goals and objectives of the evaluation, and the measures by which they would be addressed. It specified the individual data elements to be collected, and the analysis techniques to be used. It defined the specific tasks to be accomplished, assigned roles and responsibilities to the test participants, and delineated the schedule and resource requirements for the completion of the evaluation.

The data needed to address each of the test objectives was to be gathered through a cooperative effort between the evaluator, the project partners, representatives from the participating state agencies, and the motor carrier volunteers recruited to participate in the operational test. A combination of research, manually and automatically recorded data, and surveys and interviews was to serve as the mechanism for the collection of the necessary information.

History

The MEOSS Operational Test was selected for funding by the FHWA in April 1994, and a project kickoff meeting was held in June 1994. The Iowa State University CTRE managed the project. The remaining partners consisted of a collection of public and private organizations. AAMVAnet, an organization that provides technical services to the American Association of Motor Vehicle Administrators, was tasked with system development. The Western Highway Institute (WHI) was assigned the role of recruiting and interfacing with motor carrier participants. NCA&T was brought under contract to perform the evaluation. The public partners consisted of the FHWA, and the following state agencies:

- Illinois Department of Transportation (IDOT)
- Illinois Commerce Commission (ICC)
- Iowa Department of Transportation (Advisory Only)
- Kansas Department of Transportation (KSDOT)
- Kansas Department of Revenue (KSDOR)
- Minnesota Department of Transportation (MnDOT)
- Minnesota Department of Public Safety (MnDPS)

- Missouri Department of Transportation (MODOT)
- Missouri Department of Revenue (MODOR)
- Missouri Department of Economic Development, Department of Motor Carrier and Railroad Safety (MOMCRS)
- Nebraska Department of Revenue
- Nebraska Department of Roads (NDOR)
- South Dakota Department of Transportation (SDDOT)
- South Dakota Highway Patrol (SDHP)
- Wisconsin Department of Transportation (WisDOT)

Technical work on the project began with AAMVAnet conducting interviews with state agency representatives. These interviews were aimed at identifying the processes used to issue credentials in each of the partner states, establishing agency user preferences for system functionality, and identifying institutional barriers to system implementation. At the conclusion of this phase of work, AAMVAnet delivered a Scope Document that described current processes, and, with input from carriers, made recommendations as to what functionality should be included in the final system. This document was delivered in May of 1995. After presenting the Scope Document to the project steering committee, AAMVAnet was given authorization to proceed with the development of a detailed System Requirements Document. Completed in November 1995, and issued in May 1996, this document contained a complete conceptual model of all current partner state credentialing processes, and proposed MEOSS processes.

The original system concept called for carriers and agencies to conduct the electronic one-stop functions using PCs at each end of the process. It also planned for the installation of kiosks in locations easily accessible to truckers, such as truck stops. The system was initially targeted to smaller carriers, since they typically have a higher demand for trip permits and temporary credentials.

The kiosks were to be furnished by AT&T, who decided to discontinue participation in the test. With the elimination of the kiosks came a shift in focus toward larger carriers, and the introduction of the concept of interfacing with their legacy systems. At this point in the project, the decision to pursue a PC-based platform was already well entrenched. During the presentation of the System Requirements Document, a question was raised regarding the ability of the proposed system to interface with state legacy systems. Specifically, users expressed concern over the costs and workload associated with the need to maintain independent systems and databases. As a means to address these concerns, AAMVAnet offered to provide users with a modified AAMVAnet Unified Network Interface (UNI), which would allow direct input into their legacy systems, all of which currently used UNI.

However, during this portion of the design process, the FHWA indicated that the resulting system would have to comply with X12 data transfer protocols, which had been chosen as the near term standard for EDI transactions in Intelligent Transportation Systems (ITS). This decision required a significant departure from the current MEOSS development plan, necessitating the use of an open protocol, as opposed to the proprietary protocol inherent in the original design.

In the ensuing months, a number of changes occurred within AAMVAnet. The AAMVA Board of Directors had been conducting an operational review, and had concluded that, because AAMVA is a non-profit organization, it should not compete with private industry, and AAMVAnet should withdraw from software development. To address AAMVAnet's withdrawal as software developer, FHWA enlisted the support of RSIS, a firm under contract to FHWA to perform similar work for one of the Commercial Vehicle Information Systems and Networks (CVISN) prototype states. The decision to bring on RSIS was made for three main reasons–their ongoing work developing a similar system, the availability of funding, and the assurance that the resulting system would be consistent with the emerging EDI standards being developed under the CVISN program.

With help from RSIS and the Johns Hopkins University Applied Physics Laboratory (APL), AAMVAnet continued to work to develop the System Implementation Specification. This specification document, which was completed in August 1996, included process implementation charts, provided data requirements and flows, and incorporated a data dictionary. At this point, the system design called for a central processing site to process and route applications and responses between carriers and states, and EDS, Inc. was enlisted to provide that capability. This approach, which was incorporated to provide carriers the ability to submit a single request for over-dimensional permits for a multi-state trip, was abandoned when it was determined that it could not be accomplished within an acceptable time frame.

Software development personnel at RSIS began developing the product in the fall of 1996, with a target delivery date of March 1997. A test version of the software was presented at a March meeting of project partners and several of the carriers recruited for the test. Despite having reservations regarding the limited capabilities of the product presented, each of the participants agreed to attempt to use the system, provided some fundamental shortcomings were addressed.

In May 1997, RSIS began delivery of the system software. The software was provided to users to install on PCs designated for use on the MEOSS test. During the same time frame, RSIS conducted system training sessions in each of the participating states. The training was open to all prospective state agency and motor carrier users. At the conclusion of training, each user was encouraged to use the software to conduct actual transactions. Actual system use was scheduled to

continue through October 1997. Additional information regarding the project history is provided in the Project Manager's report provided in Appendix B.

System Description

Software Application
The final system made available to users consisted of a software package designed to operate in a Microsoft Windows 95 or NT environment. The product itself was developed around an SQL database, and incorporated a Graphical User Interface (GUI) developed using PowerBuilder development software. Incoming and outgoing message sets were constructed to be consistent with TS285, TS286, and TS997 draft EDI transaction standards, which are currently undergoing American Society of Testing and Materials (ASTM) review. The software was constructed to accommodate the input of information at either a carrier or state agency location, and communication between locations using a direct, PC-to-PC modem connection.

Operational Concept - Motor Carrier
The operational concept was straightforward. Upon initializing the software application, a carrier user was presented with a choice of credential application types (i.e., IRP, IFTA, SSRS, and OS/OW). After selecting the credential type and subtype (i.e., initial, temporary, supplement, etc.), the user was provided with a set of data entry screens containing data fields to be completed with information regarding the carrier, vehicles requiring credentials, and operating characteristics. The data entry sequence was user-defined, and drop-down menus were provided for fields where commonly used entries are available. Fields could be populated either through direct data entry, or from information stored in the system database during earlier data entry. There was no provision for the import of data from external systems.

When the applicant had completed the data entry process, and prior to the forwarding of the application, a data validation function was performed. This validation function examined the data entered on a given application, and alerted the applicant to errors or omissions. An individual application could not be forwarded until all required data fields were populated, and the validation function was performed automatically by the system prior to the forwarding of all applications. It should be noted here that state requirements regarding the submission of supplemental documentation (e.g., vehicle titles, proof of payment of heavy vehicle use tax, etc.) were not waived during the test, and in fact, these documents were required to be forwarded to the state prior to approval of any credential.

Upon completion of data entry and validation, the applicant forwarded the credential request to the appropriate state agency using a direct-dial modem connection. The user selected the recipient from a list entered either during the software development process, or added by them at a later date. The applicant was provided an acknowledgment from the system once the data exchange had occurred.

Once the application was approved or rejected by the issuing agency, the applicant received notification of the status of the application. In most cases, this notification did not represent an actual credential or permit. With the exception of the SDHP, which intended to allow the output of the application process to be used as a legal over-dimensional permit, the applicant was required to wait for the delivery of actual paper credentials and permits before a given vehicle was considered legal to operate.

Operational Concept – State Agency

Upon receipt of a credential request from an applicant, state agency users could access application information, review the data entered by the applicant, and provide an electronic response regarding the status of the application. All review was completed manually by stepping through the data screens provided, which were similar to the screens provided to the applicant. Once the review process was complete, the reviewing agency would process and forward the credential or permit in accordance with standard procedures.

Evaluation Approach

The evaluation of this test was conducted through the cooperative efforts of BAH and Dr. Mary Lind of NCA&T. Dr. Lind provided critical support during the evaluation planning and data collection phases of the evaluation. Evaluation management duties, and the analysis and reporting of the results were the responsibility of Mr. Paul Belella of Booz·Allen. Mr. Belella was tasked to support the evaluation under the terms of an existing contract with the FHWA, due largely to the extremely limited budget provided to NCA&T for evaluation activities.

As stated earlier, the primary purpose of the evaluation was to provide prospective system users with insight into the potential benefits of electronic one-stop shopping. In order to fully address the ability of the MEOSS system to provide these benefits, and evaluation framework was established that addressed six goal areas:

- Goal 1 – Assess System Productivity Impacts
- Goal 2 – Assess User Acceptance
- Goal 3 – Assess System Deployability
- Goal 4 – Document Institutional Issues

- Goal 5 – Assess System Performance
- Goal 6 – Assess System Accessibility

Goal 1 – Assess System Productivity Impacts

The purpose for this portion of the evaluation was to assess the changes in productivity motor carriers and state agencies may realize through the use of the MEOSS system. It was expected that, by measuring the time savings that resulted from the use of the system, and querying the users as to the ability of the system to effectively guide them through the process, sufficient insights could be gained to enable conclusions to be drawn regarding the MEOSS productivity effects. The productivity impacts were to be assessed according to the objectives and measures described in Exhibit 2-1.

Exhibit 2-1 Productivity Objectives and Measures

Objectives	Measures
1.1 Assess improvements in the consistency of the credential administrative process with MEOSS	**M1.1.1** Reduction in required state / motor carrier interaction due to inconsistent / incorrect input data
1.2 Assess the uniformity of the credential administrative process with MEOSS	**M1.2.1** No significant variation in approved credentials based on similar input from varying input sources
1.3 Compare the application-to-issuance cycle times of MEOSS to the current system	**M1.3.1** Reduction in cycle time using MEOSS versus present system
1.4 Assess carrier productivity improvements due to the use of MEOSS	**M1.4.1** Reduction in credential application preparation time using MEOSS versus present system **M1.4.2** Reduction in required state / motor carrier interaction due to inconsistent / incorrect input data
1.5 Assess state agency productivity improvements due to the use of MEOSS	**M1.5.1** Reduction in credential application review time using MEOSS versus present system **M1.5.2** Reduction in required state / motor carrier interaction due to inconsistent / incorrect input data

Goal 2 – Assess User Acceptance

The goal of this portion of the evaluation was to assess the extent to which the MEOSS system satisfied the requirements and suited the preferences of its users. Structured surveys and interviews with motor carrier and state agency personnel

responsible for credential administration were used to collect the information necessary to address the objectives and measures provided in Exhibit 2-2.

Exhibit 2-2 User Acceptance Objectives and Measures

Objectives	Measures
2.1 Assess ease of use of MEOSS as compared to the present system	**M2.1.1** Satisfactory ease of use based on motor carrier responses **M2.1.2** Satisfactory ease of use based on state agency responses
2.2 Assess motor carrier acceptance of MEOSS	**M2.2.1** Preference of MEOSS system over present system based on user responses **M2.2.2** Indication that benefits are provided based on user responses
2.3 Assess state agency acceptance of MEOSS	**M2.3.1** Preference of MEOSS system over present system based on user responses **M2.3.2** Indication that benefits are provided based on user responses

Goal 3 – Assess System Deployability

The goal of this portion of the evaluation was to assess the degree to which the MEOSS system provided a viable platform for full deployment of a multi-state electronic one-stop credential system, and to estimate the capital and operating costs carriers and state agencies can expect to encounter in accessing and using such a system. Data gathered through interviews with carrier, state agency, project management, and system developer personnel were used to address the objectives and measures provided in Exhibit 2-3.

Exhibit 2-3 System Deployability Objectives and Measures

Objectives	Measures
3.1 Determine the minimum configuration requirements for carrier access to and use of MEOSS	**M3.1.1** Documentation of carrier configuration requirements
3.2 Determine the minimum configuration requirements for state agency access to and use of MEOSS	**M3.2.1** Documentation of state agency configuration requirements
3.3 Estimate the capital costs for	**M3.3.1** Documentation of operational test capital

carrier access to and use of MEOSS on a deployed basis	costs incurred to provide carrier access to and use of MEOSS **M3.3.2** Estimate of carrier deployment capital costs (i.e., equipment, training, software, enrollment)

Exhibit 2-3 System Deployability Objectives and Measures (Cont'd)

Objectives	Measures
3.4 Estimate the operating costs for carrier access to and use of MEOSS on a deployed basis	**M3.4.1** Documentation of operational test operating costs incurred to provide carrier access to and use of MEOSS **M3.4.2** Estimate of carrier deployment operating costs (i.e., hardware/software maintenance, network maintenance, network access/transaction fees)
3.5 Estimate the capital costs for state agency access to and use of MEOSS on a deployed basis	**M3.5.1** Documentation of operational test capital costs incurred to provide state agency access to and use of MEOSS **M3.5.2** Estimate of state agency deployment capital costs (i.e., equipment, training, software, enrollment)
3.6 Estimate the operating costs for state agency access to and use of MEOSS on a deployed basis	**M3.6.1** Documentation of operational test operating costs incurred to provide state agency access to and use of MEOSS **M3.6.2** Estimate of state agency deployment operating costs (i.e., hardware/software maintenance, network maintenance, network access/transaction fees)
3.7 Document the motor carrier and state agency training efforts during the test	**M3.7.1** Documentation of the actual training, including training materials, provided to the participants
3.8 Estimate motor carrier and state agency training requirements for deployment	**M3.8.1** Comparison of actual training provided to training needed based on user responses
3.9 Assess motor carrier position on deployment of MEOSS	**M3.9.1** Indications of motor carrier support for deployment of MEOSS based on user responses
3.10 Assess state agency position on deployment of MEOSS	**M3.10.1** Indications of state agency support for deployment of MEOSS based on user responses

Goal 4 – Document Institutional Issues

The purpose for this portion of the evaluation was to document the institutional issues that arose during the formation of the project team and the development and operation of the MEOSS system. It was also intended to provide some insights into the potential impact these issues, and the solutions employed during the operational test, may have on the deployment of such a system. Interviews with participants and research of records were used to address the objectives and measures provided in Exhibit 2-4.

Exhibit 2-4 Institutional Issues Objectives and Measures

Objectives		Measures	
4.1	Document institutional issues and solutions encountered during the operational test	**M4.1.1**	Documentation of operational test institutional issues and solutions
4.2	Assess potential impacts of institutional issues and solutions on MEOSS deployment	**M4.2.1**	Comparison of institutional solutions utilized during operational test to those required for full MEOSS deployment

Goal 5 – Assess System Performance

The primary purpose for this portion of the evaluation was to assess the degree to which the MEOSS system met the performance needs of its users. A combination of user surveys and interviews were used to characterize the degree to which users' system compatibility and capacity requirements were met. The objectives and measures are provided in Exhibit 2-5.

Exhibit 2-5 Performance Objectives and Measures

Objectives		Measures	
5.1	Assess the compatibility of the MEOSS system with existing business practices	**M5.1.1**	Degree to which the information acquired and forwarded through the MEOSS system was adequate to process the credentials
		M5.1.2	Indications that the MEOSS system is compatible with user operations, based on user responses
		M5.1.3	Proportion of all commercial vehicle transaction types which can be processed through the MEOSS system
5.2	Assess the capacity of the MEOSS system	**M5.2.1**	Potential degradation in application to issuance cycle times with increasing volume of credential applications submitted

Goal 6 – Assess System Accessibility
The primary purpose for this portion of the evaluation was to assess the degree to which the MEOSS system met the accessibility expectations of its users. A combination of user surveys and interviews were used to characterize the degree to which users' requirements were met. The objectives and measures are provided in Exhibit 2-6.

Exhibit 2-6 Accessibility Objectives and Measures

Objectives		Measures	
6.1	Determine the perceived improvements in the accessibility of the information and tools needed to process credentials using MEOSS	**M6.1.1**	Perceived improvement in the accessibility of the information and tools needed to process credentials using MEOSS versus present system
6.2	Assess the availability of the MEOSS system from the motor carrier perspective	**M6.2.1**	Percentage of instances in which the MEOSS system was available at the time desired by users

Key Assumptions

The success of this evaluation was dependent on several factors involving the expected levels of effort and timing of activities on the part of its participants. During the evaluation planning phase, a number of assumptions were made regarding the availability of the information that would be required to conduct a comprehensive evaluation. More specifically, these assumptions were made about each participant's ability and willingness to assist in the collection of the data necessary to perform the analyses cited above.

The first assumption was that participating carrier and agency personnel would be willing and able to document the data elements requested by the evaluator. Essentially, this consisted of completing survey forms and transaction tracking sheets, and submitting to interviews by the evaluator. This assumption proved partially accurate. All the test participants were willing to submit to interviews. However, some difficulty was experienced in getting responses to surveys, and a relatively small proportion of the participants completed transaction tracking sheets.

Another assumption was that participants would be thorough, complete, and forthright in completing all data collection instruments, and in answering interview

questions, and that the Project Manager would proactively participate in the data collection process by ensuring test participants completed and returned the instruments, and participated in interviews. While it is impossible to be certain, the evaluator saw no indication that any participants were less than forthright in their responses to questions. The truthfulness of answers was encouraged by reiterating to each interviewee that the source of the answers provided would not be divulged. The level of completeness of the surveys and tracking sheets that were actually returned appeared to be acceptable. The Project Management Team offered support by encouraging participants to support the evaluation.

A third assumption stated that participating carriers and agencies would conduct actual transactions with the MEOSS system. In addition, it was assumed that the seasonal nature of some of the transactions (e.g., IRP, IFTA and SSRS renewals, OS/OW trip permits, etc.), along with a data collection period of limited duration, would likely require that a number of unofficial transactions be conducted to bolster the data set. Due primarily to an end product that fell short of users' expectations regarding functionality, very few transactions, real or simulated, were attempted.

The final assumption was that the system would be operational within the data collection period. This, in fact, was the case in most of the locations. However, many users, after experiencing difficulties during the set-up of the software, simply chose not to use the system.

In the end, the data that was actually collected consisted largely of baseline characteristics, and user perceptions about MEOSS based on little or no system use. Nonetheless, some useful information was collected, as described in the latter sections of this report.

Key Limitations

During the planning phase, a number of test and evaluation limitations were identified that were likely to inhibit a purely objective and statistically satisfactory evaluation of the MEOSS system. The following limitations were proven true over the course of the evaluation.

The first limitation was based upon the fact that participating carriers were carefully screened and recruited for participation in a manner that severely limits any generalizations about the overall carrier industry. For example, carriers were screened for financial responsibility, interviewed about their willingness to participate, selectively asked to volunteer, and trained and coached in the use of the system.

The second limitation was based upon the limited number of transactions that were generated during the operational test, and the heterogeneity of results due to the diversity of the carriers and state agencies involved. In effect, this precludes the performance of a statistical analysis with a high level of confidence.

Finally, and perhaps most importantly, practically all of the data provided by the participants consisted of estimates and opinions. As a result, care must be taken in interpreting the results, so as not to assume too high a level of numerical accuracy.

Evaluation Activities

During the evaluation planning process, it was decided that a before and after approach would best suit the accomplishment of the evaluation goals and objectives stated above. The original approach was to consist first of the collection and comparison of numerical data regarding transaction cycle times with and without the MEOSS system. The intent was to allow for the assessment of the productivity benefits afforded by the system. The original approach also called for the collection of subjective, user perception data that would allow for the comparison of the utility and ease-of-use of current system to that of MEOSS. In the sections that follow, the proposed approach for each goal area are discussed, along with the activities actually undertaken for the evaluation.

System Productivity Impacts

The primary unit of analysis for time savings is the credential cycle, which is defined as the sum of activities commencing with the start of application preparation, and terminating upon delivery of the requested credential. Within that cycle, it was anticipated that the MEOSS system would affect the credentialing process by reducing the time and / or labor required at one or more of six discrete points: (1) information retrieval, (2) credential application preparation, (3) application delivery, (4) state / carrier corrective / clarification action, (5) application review and approval, and (6) credential delivery. It was hypothesized that the MEOSS system would uniformly issue credentials, regardless of point of application, while simultaneously reducing the administrative burden by reducing the time required to complete one or more of these six discrete tasks. It was further hypothesized that reductions in the amount of time and labor necessary to complete the entire cycle would prove beneficial, especially with regard to the more time sensitive credentials such as trip permits.

The time and effort required to complete each of these tasks, both before and after MEOSS implementation, was to be recorded through a combination of quantitative and qualitative data. Baseline cycle time data was to be gathered using logs, or "tracking sheets," to be completed by both state agency and motor carrier personnel. These tracking sheets asked the credentialing personnel to provide information

regarding the amount of time required to perform portions of the transaction, and dates and times of transmittal and receipt. A sample tracking sheet is provided in Appendix C. Once the MEOSS system was implemented, these same data points were to be gathered using a combination of automatically and semi-automatically collected system data captured by the credentialing software in the MEOSS system. Because time and funding constraints placed on the operational test precluded the prolonged use of the system, it was anticipated that some of the credentialing activity would take the form of simulated, or "unofficial," transactions. The degree to which this technique was to be employed was to be based on the number of actual transactions completed during the data collection period.

At the completion of data collection, this data was to be analyzed to assess whether any significant difference existed between the pre- and post-MEOSS implementation task and cycle times. Data was to be aggregated to the extent possible, given the diverse nature of the internal operations of the carriers and state agencies participating in the test. It was anticipated that the results would be stratified based on a number of factors, such as carrier size, carrier and state level of automation pre-MEOSS, and credential type.

It was expected that, for a given credential type, the credentials issued using the MEOSS system would prove to be more uniform, regardless of the carrier requesting the credential, than is the case with the current credentialing system. A high level of uniformity would be characterized by the consistent assessment of terms and fees, regardless of point of origin or destination. During this evaluation, credential uniformity was to be assessed by reviewing and comparing the inputs and results from a number of similar transactions involving different carriers and each agency. The resulting analysis, while largely qualitative, would provide a useful indicator of the ability of the MEOSS system to support uniform credential administration.

In actuality, a number of eventualities conspired to prevent the conduct of the analysis as planned. The most significant of these was the lack of use of the MEOSS system by both the carriers and the agencies involved in the test. For the duration of the six-month data collection period, which came at the end of December 1997, participant responses indicated that fewer than 20 transactions were completed–all in the State of Minnesota. During that same period, combined estimates provided by the carriers during interviews conducted at the end of the data collection period indicated they attempted to use the system 185-190 times. Similar estimates by state participants indicate 300-350 attempts to use the system. Specific information regarding the activities attempted or completed during these attempts was not gathered. While it is not entirely clear why so many attempts resulted in so few transactions, most respondents expressed frustration regarding the inability of the system to meet their specific needs and expectations. Most had difficulty getting the system up and running, and few appeared satisfied with its functionality. It should

be noted that a number of the state respondents indicated that their system usage attempts included simply checking to see if any applications had been submitted for their review.

As a result, the sparse nature of the post-implementation data set precludes the meaningful assessment of productivity impacts. Despite this result, a significant amount of information regarding the current conditions was gathered from both the tracking sheets, and from participant interviews. These findings are discussed in the Current Conditions section of this report.

User Acceptance

For the purposes of this evaluation, user acceptance was characterized as the ability of the MEOSS system to meet the functionality and user friendliness demands of credentialing personnel, measured in terms of ease of use, and stated preference.

Using a combination of questionnaires and interviews, this portion of the evaluation was designed to provide the data necessary to support conclusions regarding the likelihood that motor carrier and state agency users would accept the MEOSS system, and would prefer its use over the current processes. Questionnaires were distributed once prior to the implementation of the MEOSS system, and once after the system had been placed into service. These questionnaires, examples of which are provided in Appendix C, were intended to gain information about a number of issues, which are discussed in subsequent sections of this report. In addition, structured interviews were conducted with the test participants. These interviews were primarily intended as a means to both clarify questionnaire answers, and to gain further insight into the responses provided.

By definition, information obtained through questionnaires and interviews is qualitative in nature. While the results of this data collection and analysis are sometimes characterized numerically, it is important to note that they are based solely on the perceptions of the system users, and are highly dependent on the features and level of functionality offered by the MEOSS system during the test period.

Where the format of the data allows, responses to questions were aggregated and are presented in tabular and graphical format later in this report. Anecdotal responses were reviewed and, where possible, condensed to aid in the analysis of the tabular and graphical data. Where possible, the results provided in this report are presented in a stratified format similar to that which was envisioned for the productivity analysis.

System Deployability

System deployability can be characterized as the ability of the MEOSS system to meet functionality requirements at a reasonable cost, measured in terms of those costs associated with installation of hardware and software, access to the system, operations, maintenance, and training. Also important to this assessment is the support for MEOSS deployment on the part of the users. The bulk of this portion of the evaluation consists of the documentation of actual costs incurred during the operational test, and the extrapolation of these figures to likely deployment costs.

These costs are based upon the minimum technical requirements for access to and use of the MEOSS system. The technical requirements were determined through research into the minimum specifications for hardware and software the motor carrier and state agency users must have in order to use the MEOSS software applications and access the communications necessary to conduct business. Findings from the system performance and accessibility portions of the evaluation were also to be drawn upon to verify the adequacy of these specifications.

Data regarding the expenditure of resources required for system implementation were to be segregated by type into four categories: (1) computer hardware, (2) software, (3) training, and (4) operations and maintenance (O&M). For the purposes of this evaluation, the costs associated with the conduct of the operational test were not pertinent. Using data regarding the minimum technical and requirements for the use of the MEOSS system, a market cost summary was developed to illustrate the minimum, average, and range of expenses, by expenditure category, carriers and state agencies could expect to incur in implementing a system like MEOSS.

This effort presented a challenge in that the actual costs incurred during the development, deployment, and operation of the MEOSS system within the context of the operational test were not necessarily representative of those which a carrier or state agency would actually encounter under full deployment of such a system. In addition, the experimental nature of the software, and the convoluted development process, contribute to the difficulty in assigning an implementation cost for the software. Furthermore, the limited system use experienced during the test severely limits any conclusions regarding projected O&M costs. Throughout the analysis, the context within which this information was gathered was fully considered.

The assessment of user training was addressed through questions asked during the participant interview process. These questions sought user feedback on the usefulness and adequacy of the training. This information, in conjunction with the cost information collected from the Project Manager, was used to estimate the training requirements that would be necessary under full deployment of a MEOSS-type system.

Finally, the assessment of carrier and state agency users' positions regarding full deployment was addressed based on responses to interview questions.

Institutional Issues

Institutional issues play a vital role in the evolution from concept to deployment of any One-Stop system. Institutional issues include the functional, operational, legislative and statutory demands and constraints within which the system must operate. Putting in place a functional system that aims to address the needs and limitations of a number of jurisdictions and user groups invariably requires the cooperative efforts of those involved.

While the specific issues encountered, and the solutions developed to address them, vary quite substantially depending upon the agencies and individuals involved, in many cases, there exists an underlying commonality between the participants that lends itself well to the sharing of experiences. Hence, there is a great deal of value to be gained by documenting and passing along these experiences, particularly in those instances where the solutions were unusual or innovative.

During this evaluation, information regarding the institutional issues encountered, and the resolutions reached, was collected using a combination of the documentation provided by the Project Manager, and interviews with project participants.

Based on the issues encountered during this operational test, the possible impacts on a deployed system were postulated by transposing the issues to a context that more closely reflects that which would exist in full deployment. For instance, issues that were resolved through temporary agreements, which would only remain in effect for the operational test period, were reexamined with an eye towards understanding the likelihood such an arrangement represents a viable long-term solution.

System Performance

The system performance portion of the evaluation was intended to assess the degree to which the MEOSS system was technically capable to support the needs of its intended users. For the purposes of this evaluation, these capabilities were compatibility and capacity. *Compatibility* is defined as the ability of the system to accommodate the procedures, processes and constraints that constitute the mode of operations of the individual user organizations. This is reflected in the certainty with which the system ensured all information required to process a credential request was obtained and forwarded to the appropriate responding agency, and the certainty with which the integrity of the data transmitted between locations was maintained. *Capacity*, simply put, is defined as the ability of the system to deal with increasing transaction volumes.

The system compatibility with user operations was assessed through user responses to the questionnaires and interviews administered after system implementation. Baseline data was gathered using the aforementioned tracking sheets, and during user interviews. Post-implementation data was to be gathered using a combination of automatically and semi-automatically collected system data. However, due to the lack of system use, the primary source of post-implementation data was user interviews.

The ability of the system to handle a large volume of requests simultaneously was to be assessed using data collected by the system. To accomplish this, the evaluator planned to review the transaction records provided in system data records for periods of highest activity. For analysis, transaction date/time stamp data were to be reviewed for indications as to the effect transaction loading has on system performance. Once again, limited system use precluded the completion of this evaluation activity.

System Accessibility

The system accessibility portion of the evaluation was intended to assess the degree to which the information and tools necessary to support credential administration, and the MEOSS system itself, were sufficiently accessible to support the needs of the intended users. This was to be assessed through user perceptions regarding the accessibility of tools and information required to perform their work tasks, and the overall system availability, which refers to the portion of time that the system is accessible and functional, as compared to current methods.

It was anticipated that the MEOSS system would afford its users a greater level of accessibility to the information and tools necessary to perform credentialing activities. Since the system dispensed with the need for printed application forms, and had the capability to perform error checking, for example, it had the potential to simplify operator tasks by centralizing information and functionality. The ability of the MEOSS system to demonstrate improved accessibility was qualitatively assessed by analyzing user responses to questionnaire and interview questions.

System availability is a complex issue. In one respect, it can reflect the technical ability of the system to remain operational for extended periods of time. In another respect, it may reflect the degree to which business may be transacted outside of the normal operating hours of either the carrier or the state agency. Data for this analysis was to be collected using automatically and semi-automatically collected system data, and interviews with system users. For the purposes of this evaluation, a sufficient amount of data to perform a statistically valid assessment was not

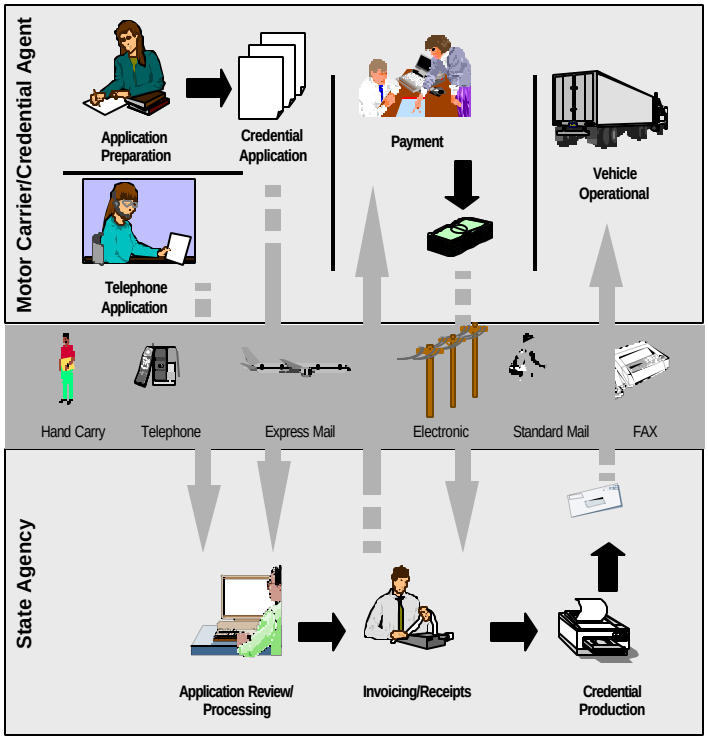
collected. However, the anecdotal information regarding individual attempts at using the system that collected during the post-implementation interviews provides some useful information with respect to overall system availability, as it compares to current methods.

Current Conditions

The basic premise upon which the electronic one-stop shopping concept is based argues that the current methods employed in credential administration fall short of the ideal. More specifically, it is argued that the processes and procedures that must be executed for a carrier to legally operate in a given state are cumbersome and expensive. This portion of the report examines the current conditions in the Midwest One-Stop partner states, from the perspective of those individuals tasked with negotiating the various credential and permit transactions. It discusses the participants' perceptions of the work involved in completing these transactions, and their opinions regarding the processes and procedures used. The findings that follow are organized to first address the overall process, then the state responses, and, finally, the carrier responses.

The Credentialing Process

Aside from differences regarding which agency is responsible for which credentials, the volumes of credentials processed within each state, and the relative levels of automation, the processes for applying for and processing credentials and permits are quite similar among the participating states. Applicants gather the required information, and provide it to the appropriate issuing agency, either in writing or, in some cases, over the telephone. Representatives within the given agency review the information provided by applicants, communicate necessary changes or errors to the applicants, generate an invoice and, upon receipt of payment, produce and distribute the requested credentials or permits. The basic process is depicted in Exhibit 3-1.



Typical Credentialing Process **Exhibit 3-1**

Reviewing this process, three characteristics become immediately obvious: the number of steps in the process, the number of information exchange mechanisms, and the prevalence of paper. A look at the number of steps in the process reveals that, for some credentials, information and / or

documentation is exchanged as many as eight times. The worst case scenario, an IRP renewal, begins with the state sending the carrier a computer printout detailing registration information from the previous year. Carrier personnel review and update the information, and return it to the state. State agency personnel then review the information, and enter it into their system. Any errors or omissions in the carrier's submission are either corrected through interaction between the state and carrier, or a rejection is sent to the carrier. Once approval has been granted, the state generates and forwards an invoice. The carrier then must arrange for payment, either from a standing account, using a company check, or some other means. Once payment has been received by the state, a credential is produced, and returned to the carrier.

Carrier to state and state to carrier information exchange modes include hand carrying / in-person transactions, telephone, standard mail, express mail, fax, and, occasionally, electronic data. The mode used is dictated by the type of credential or permit requested, the administrative rules of the issuing agency, and the preference of the carrier.

With the exception of a few permits, such as self-issue trip permits, the completion of this process often involves the exchange and storage of a substantial amount of paper records. Carrier fleet, mileage, and ownership information makes up the bulk of the data that fill these records. In addition to the thousands of paper-based applications handled annually, carriers and agencies must acquire and maintain physical records of such items as a carrier's proof of insurance, proof of payment of Heavy Vehicle Use Tax (HVUT), original vehicle titles, and documents containing original signatures. In addition, invoices and payments often come in paper form.

The challenges in completing this basic process most often stem from a complex assortment of institutional arrangements, statutory requirements, and administrative rules. The result is a process heavily encumbered with multi-step, paper-based transactions. When these transactions are viewed within the context of the thousands of transactions conducted annually in each state, the labor involved and errors inherent in completing the process are formidable.

State Agencies

Illinois

The duties associated with commercial vehicle credentialing and permitting in Illinois are divided among four agencies. Operating authority, SSRS, and financial responsibility are the responsibility of the Illinois Commerce Commission (ICC). Registration for IRP falls under the purview of the Illinois Secretary of State (ISOS). The Illinois Department of Revenue (IDOR) administers the IFTA fuel tax apportionment, and IDOT is responsible for the issuance of over-dimensional

permits. These agencies are organizationally isolated, and are housed in four separate locations in Springfield, Illinois. A table summarizing credentialing in Illinois is presented in Exhibit 3-2.

	IRP	IFTA	SSRS	OS/OW
Agency	Secretary of State	Department of Revenue	Commerce Commission	Department of Transportation
Annual Volume	75,000	78,000	18,000	247,000
Process Automation	Low	Low	Moderate	Moderate
Overall Automation	High	High	High	Moderate

State Profile – Illinois **Exhibit 3-2**

Among the Midwest One-Stop partner states, Illinois is home to the largest number of Commercial Vehicles (CV). In a given year, CV registration transactions exceed 75,000. It is estimated that, in 1997, approximately 1,800-2,000 carriers registered in Illinois for the first time–this is in addition to the 12,500 renewal requests processed for the same period. Over the same period, the ISOS processed between 18,000 and 22,000 applications for supplements, and 42,000 requests for temporary credentials. Of these transactions, approximately half are conducted through a third party remittance agent, thirty percent are conducted through standard mail, and the remaining twenty percent represent walk-in customers.

The ISOS Commercial and Farm Truck Division, which handles all CV registration, is highly automated, a necessity for processing the credential volumes cited above. However, many of the tasks associated with application process remain manual. The division utilizes a combination of networked PCs, and a mainframe with terminals for each of its 35 staff. They are currently using a homegrown database, into which all registration data is entered manually by in-house staff. Recently, the division examined the use of the Lockheed VISTA (Vehicle Information System for Tax Apportionment), and found it unsuitable for their needs. Applicants can pay for their credentials with a company check, cash, commercial check, or credit card. While most pay by company check, a small portion of the carrier population has adopted the use of an Electronic Funds Transfer (EFT) process with the ISOS.

Illinois also sees a substantial amount of over-dimensional CV activity. In 1997 alone, IDOT processed some 247,000 applications for over-dimensional permits. Of these, approximately ninety-five percent were single trip permits, and ten percent were super loads. More than ninety percent of all standard permit transactions are conducted over the telephone, and all super load requests are submitted by fax. The entire permitting staff has access to the mainframe used to store permit records and assign permit numbers to individual transactions. Data gathered from applicants over the phone are entered into the system manually at one of the terminals connected to the mainframe. At the conclusion of each transaction, the permit writer

provides the assigned permit number to the applicant. The agency has invested in PCs, which are networked to the mainframe, and are used primarily for processing super load requests. The predominant payment method, used by approximately ninety percent of applicants, is via escrow and bonded accounts. The walk-in customers usually pay by company check.

The ICC representative estimates that approximately 10,000-11,000 renewal requests are processed on an annual basis. Of these requests, some 3,500 are for interstate carriers. In addition, approximately 7,000 requests for supplements are processed annually. Approximately eighty percent of SSRS activity is conducted via mail, with the remaining twenty percent divided between fax and electronic mail. The level of automation at ICC, which employs a PC network, is considered high. The agency currently uses a homegrown application that has been adopted for use in a number of other states. Applicants can pay by cash, check or credit card.

The IDOR is tasked with administration of the IFTA program in Illinois. On a yearly basis, the IDOR estimates it processes 75 initial, 8,000 renewal, and 40,000 additional decal requests. These figures indicate that it must also process over 30,000 IFTA quarterly reports. Somewhere in excess of eighty-five percent of the annual transaction volume is conducted through the mail, with the remaining fifteen percent conducted with walk-in customers. While the agency is highly automated, the credentialing processes are largely manual. Currently, IDOR has a network of PC's, and is undergoing the implementation of a Polk system to automate their processes further. Applicants must submit cash or a check at the time of application.

Kansas

The duties associated with most credentialing and permitting in the State of Kansas are accomplished through the combined efforts of the KSDOT and the KSDOR. These include all IRP, most IFTA and all OS/OW transactions. Kansas has what can be characterized as a partial one-stop shop. Applicants can apply for and obtain most of their credentials and permits at a single location. An overview of credentialing in Kansas is shown in Exhibit 3-3.

Because Interstates 70 and 35 nearly bisect Kansas in both latitude and longitude, respectively, a substantial portion of the nation's carrier fleets pass through the State on a regular basis. However, the number of carriers that choose to base operations

	IRP	IFTA	SSRS	OS/OW
Agency	Department of Revenue	Department of Revenue	N/A	Department of Transportation
Annual Volume	12,800	200	N/A	70,000
Process Automation	Low	Low	N/A	Moderate
Overall Automation	High	High	N/A	High

State Profile – Kansas **Exhibit 3-3**

in Kansas is small, relative to many of the other Midwest One-Stop States. An estimated total of 2800 IRP renewals are processed in a given year, along with approximately 10,000 supplements. In addition, the state processes around 200 IFTA transactions per year. An estimated 95 percent of the 70,000 or so OS/OW permits issued in a given year are for single trips.

The internal application processes for IRP and IFTA remain predominantly manual. Kansas has been successful at applying some automation to its processes. For instance, a portion of its approved credentials and permits are forwarded to carriers automatically through a fax server. Like many of the states in the Midwest, a portion of the OS/OW permits are issued through a third party. On the whole, the respondents indicated they felt the level of automation varied depending upon the credential, but that the overall level was moderate to high. They felt the permitting process was highly automated. The group currently uses PCs linked to an IBM mainframe. Payment can be made either from an escrow account, or using a credit card through a commercial checking service.

Minnesota

The State of Minnesota is home to what can be considered the closest thing to a true one-stop shop among the Midwest partner states. Nearly all the administrative duties associated with credentialing and permitting are conducted under one roof. Representatives from the MnDOT and the MnDPS are co-located in a Truck Center in Mendota Heights, Minnesota. All IRP, IFTA SSRS and OS/OW credentials and permits are issued from this location. A brief synopsis of Minnesota credentialing activity is provided in Exhibit 3-4.

	IRP	IFTA	SSRS	OS/OW
Agency	Department of Public Safety	Department of Public Safety	Department of Transportation	Department of Transportation
Annual Volume	19,400	8,000	1400	160,000
Process Automation	Moderate	Moderate	Moderate	Moderate
Overall Automation	High	High	Moderate	High

State Profile – Minnesota **Exhibit 3-4**

The review of applications and issuance of credentials and permits associated with IRP and IFTA are the purview of the Prorate Section within MnDPS. A total of approximately 4,000 IRP accounts and 5,400 IFTA accounts are managed on an annual basis. Total annual credential volume is as follows: for IRP, approximately 800 initial applications, 4,900 renewals, 10,000 supplements, and 4,100 temporaries; for IFTA, approximately 600 initial applications, 3,400 renewals, and 4,000 trip permits. Approximately 30 percent of applications are submitted through Deputy Registrar offices around the state. The remaining applications come from walk-in customers (30 percent), through the mail (25 percent), or by fax (15 percent). Applicants are invoiced, and may pay using a

company check, or by cash or money order. The processing of applications is somewhat automated–fees are calculated automatically, and credentials are produced using a database. Registration is conducted using VISTA via an IBM AS400. Fuel tax administration is conducted using a local database on a PC local area network.

The issuance of over-dimensional permits is the responsibility of the Transportation Permits, Road Information, and Emergency Operations section within MnDOT. Over the course of a year, approximately 120,000 annual and 40,000 trip permits are issued. Most applications are faxed in, and some carriers are allowed to self-issue permits after phoning in the request. Very few are mailed in or delivered in person. Most permits are paid for through bond accounts, while some are paid by credit card via a check writing service. Since 1990, MnDOT has been using an in-house system to automate portions of the review process. Using a PC network and Route Builder software, permit agents evaluate the proposed route, and perform basic error checking. Overall automation is considered high.

The MnDOT Office of Motor Carrier Services manages operating authority. Estimates place the annual demand at 1,300 renewals, while approximately 100 supplement transactions are conducted over the same period. Most applicants (ninety percent) choose to mail in their applications, while the rest deliver them in person. Approximately eighty percent of the credentials are mailed back to the applicant, and ten percent are sent by fax. Applicants can pay by credit card or company check. The levels of automation for the credential process and overall are considered moderate.

Missouri

Among the Midwest One-Stop partner states, Missouri is second only to Illinois in the number of apportioned CV registrations. The Missouri Highway Reciprocity Commission (MOHRC) within MODOR processes an estimated 31,700 requests for IRP credentials annually. Of those transactions, approximately 5,600 are renewals and 20,000 are supplements. The Commission issues around 500 temporary IRP credentials in the course of a year. Because the MOHRC also processes IFTA transactions, it is considered by its staff to be a one-stop shop. Annual demand for renewals is estimated at 5,000, and approximately 20,000 IFTA quarterly reports are processed over a twelve-month period. A profile of credentialing in Missouri is provided in Exhibit 3-5.

	IRP	IFTA	SSRS	OS/OW
Agency	Department of Revenue	Department of Revenue	Department of Economic Development	Department of Transportation
Annual Volume	31,700	25,000	4,000	154,000
Process Automation	Low	Low	Low	Low
Overall Automation	High	High	Moderate	Moderate

State Profile – Missouri **Exhibit 3-5**

Within MOHRC, the application review process is almost entirely manual, and approximately eighty percent of all applications are received through standard mail. The remaining twenty percent are hand carried into the MOHRC. Overall automation within MOHRC is considered high, where PCs linked to an IBM 3270 mainframe are used.

The MOMCRS is responsible for the administration of SSRS credentials in Missouri. Of the estimated 4,000 transactions conducted annually, approximately 1,700 are renewals, and 2,200 are supplements. The application review process is manual. Seventy to seventy-five percent of applications are received through standard mail, and approximately twenty percent are faxed into MOMCRS. The remainder are walk-in transactions. The overall automation level is moderate. The MOMCRS division staff use PCs linked to a Local Area Network (LAN) and to a mainframe.

The MOMCRS of MODOT is the issuing authority for over-dimensional permits. Approximately 154,000 OS/OW permits are issued in a given year, of which 150,000 are for single trips. On the order of ninety-five percent of applications are faxed in, and all applications are reviewed manually. Automation of this process is limited to the use of a fax server to forward permits to applicants. Approximately ninety percent of applicants pay for permits using escrow accounts. Overall agency automation is considered low to moderate, though staff have access to PCs linked to a LAN and a mainframe.

Nebraska

The State of Nebraska boasts what might be termed as a near-one-stop shop for credentials and permits. Carriers can obtain all necessary IRP, IFTA, and SSRS credentials and permits, and certain OS/OW permits from the Motor Carrier Services Division of the Department of Motor Vehicles (DMV). Credentialing activity in the State of Nebraska is profiled in Exhibit 3-6.

	IRP	IFTA	SSRS	OS/OW
Agency	Department of Motor Vehicles	Department of Motor Vehicles	Department of Motor Vehicles	Department of Motor Vehicles/ Department of Roads
Annual Volume	10,000	3,500	3,000	DMV – 17,000 DOR – 76,730
Process Automation	Moderate	Moderate	Moderate	DMV – Moderate DOR – Low
Overall Automation	High	High	High	DMV – High DOR - Low

Over the course of a year, the DMV processes approximately 10,000 IRP transactions, 3,500 IFTA credentials, 3,000 SSRS applications, and 17,000 requests for over-dimensional permits. Approximately

seventy-five percent of these transactions are conducted through standard mail, while the rest are walk-in applications. The application review process is manual, but the fee and apportionment calculations and credential production processes are automated. Overall DMV automation is moderate to high, with staff using PCs and/or terminals connected to the DMV mainframe, and to a state mainframe. Over-dimensional permits administered by NDOR in the last year totaled 76,730, including 21,500 super load permits, 41,669 annual permits, and 13,471 single-trip permits. Approximately ninety-five percent of the applications were received by fax. The remaining five percent were walk-in requests. All permits are paid for through escrow accounts. With the exception of the accounting function, all portions of the permitting process within NDOR are manual. Overall, the level of automation within NDOR is considered low, with staff using a mainframe and a few PCs.

South Dakota

Two agencies responsible for issuing credentials and permits in the State of South Dakota participated in this effort. The duties of these agencies are illustrated in the table in Exhibit 3-7.

The SDHP, in addition to its customary enforcement duties, issues over 31,000 OS/OW permits in a given year. These transactions can be conducted via fax, in person at one of the district offices, over the phone (for self-issuance), or with any SDHP Trooper. Most (eighty-five to ninety percent) transactions are paid for using cash or check, with the remainder paid using credit cards. The only portion of the permitting process that is automated consists of a legal load computer program. None of the credential processes are automated. The overall level of automation within SDHP is moderate. Computers include PCs networked to all state Ports Of Entry (POEs) and district offices.

	IRP	IFTA	SSRS	OS/OW
Agency	N/A	N/A	Public Utilities Commission	Highway Patrol
Annual Volume	N/A	N/A	1800	31,000
Process Automation	N/A	N/A	Low	Moderate
Overall Automation	N/A	N/A	Low	Moderate

State Profile – South Dakota **Exhibit 3-7**

The other South Dakota credentialing agency participating in this test was the South Dakota Public Utilities Commission (SDPUC). The SDPUC's responsibility is the administration of SSRS, for which approximately 1,800 transactions are completed in a given year. Of those transactions, approximately 300 are initial requests, 1,000 are renewal applications, and 500 are supplements. Most applications are received via

standard mail. Guaranteed funds must be provided at the time of application. The review process is manual, but receipts and credentials are computer-generated. The overall level of automation is considered low.

Wisconsin

Within Wisconsin, the Motor Carrier Taxes and Permits Section of WisDOT is responsible for the issuance of over-dimensional permits—the only transaction type for which the State of Wisconsin participated in the MEOSS test. A profile of that agency is provided in Exhibit 3-8.

	IRP	IFTA	SSRS	OS/OW
Agency	N/A	N/A	N/A	Department of Transportation
Annual Volume	N/A	N/A	N/A	57,000-65,000
Process Automation	N/A	N/A	N/A	Low
Overall Automation	N/A	N/A	N/A	Moderate

State Profile – Wisconsin **Exhibit 3-8**

An estimated 57,000 to 65,000 OS/OW permits are issued annually, of which 18,000 to 22,000 are multi-trip, and 39,000 to 43,000 are for single trips. Approximately seventy percent of applications are received via fax, while the remaining thirty percent are handled over the telephone. A small number of customers prefer to hand carry applications. Fees associated with single-trip permits are predominantly collected through an invoicing process, while multi-trip permits are usually paid for with cash or check at the time of application. The review process is almost entirely manual, with agency staff entering request data into a mainframe computer that contains bridge characteristics. The overall level of automation is considered moderate. Staff use PCs connected to a LAN and to a mainframe.

Motor Carriers

The motor carriers with whom states conduct credential transactions mirror the diverse nature of the agencies described above. However, an additional layer of complexity is added simply through the sheer number of carriers currently in business. Due largely to deregulation of the trucking industry, the motor carrier population in the US has increased dramatically since 1980. In addition, the demands of an ever-changing business environment, combined with business conditions that are more favorable in some states, have resulted in carriers changing registration base states. As a result, the volume of credential and permit transactions conducted annually is substantial.

A total of twenty-eight carriers, leasing companies and service providers were recruited during the period of the test. Sixteen of these organizations provided

responses during the interview phase of the evaluation–the source of the bulk of the evaluation data. Among these organizations were two leasing companies, one motor carrier association, one private fleet, two specialized carriers, one franchise, and nine common carriers. Fleet sizes ranged from a low of 44 power units and 250 trailers, to a high of 27,000 power units and 7,000 trailers. Levels of credentialing process automation and overall automation spanned the spectrum from low to high.

Because the analysis of the current conditions could potentially be affected by a number of factors, it was decided that the segmentation of the population of participant carriers would make the analysis more meaningful, and manageable. As a starting point, three different carrier characteristics, referred to as "stratification factors" through the remainder of the report, were chosen. These stratification factors were the carrier size, the base state, and the overall level of automation.

The size of a carrier is a reliable indicator of both the number of credentials and permits obtained annually, and the size of a given application for IRP and IFTA credentials. As a result, it was assumed that the amount of time associated with obtaining credentials, and the level of interaction required between carrier and state representatives to complete a given transaction, as functions of carrier size, might provide some useful insights. This would allow for comparisons across states, and levels of automation. This stratification information is illustrated in Exhibit 3-9.

A brief examination of the basic carrier information reveals at least two interesting points. First, very few of the participating organizations have automated their credentialing processes, even those citing higher overall levels of automation. Not surprisingly, none of the small carriers, and nearly half of the medium-sized carriers have done so. Only one carrier, Schneider,

		Base State	Fleet Size		Level of Automation	
			Power Units	Trailers	Credentialing	Overall
Small	Kansas Motor Carrier Assn	KS	70 Accounts		Low	Moderate
	Lakeville Motor Express	MN	44	250	Low	Moderate
	Terminal Consolidation	MO	125	300	Low	Low
	Midwest Specialized	MN	155	247	Low	Moderate
	Seward	NE	200	410	Low	Moderate
Medium	CENEX/Land O Lakes	MN	255	600	Moderate	Moderate
	Overnite Express	MN	310	700	Low	Low
	ATS Specialized	MN	500	1000	Low	Moderate
	OTR Express	KS	532	737	Moderate	High
	Farm Credit Leasing	MN	600	200	Low	Moderate
	PFT Roberson	IL	1150	1400	Moderate	High
	CFI	MO	1800	5400	Moderate	High
Large	Werner Enterprises	NE	5300	13000	Low	High
	United/ Mayflower	MO	9000	9000	Low	Moderate
	Schneider Specialized	WI	12500	25000	High	High
	Rollins Leasing	Multiple	27000	7000	Low	High

MEOSS Carriers by Size **Exhibit 3-9**

indicated it felt its credentialing processes were highly automated. Schneider Specialized is a division of Schneider National, and maintains a fleet of approximately 600 power units and 1,500 trailers. The second observation is that the larger carriers tend to have higher levels of automation overall. This would seem reasonable, in the absence of information to the contrary, given that larger firms are more apt to have the ability to finance both the purchase of high technology systems, and the efforts necessary to implement them.

Next, the carriers were grouped according to the states in which they are based. The rationale for this stratification stems from the assumption that the credentialing and permitting processes are relatively consistent within a given state, regardless of the applicant. This is not to say that every carrier's applications are handled identically; rather, it infers that all carriers choosing to file applications in a certain way (e.g., submit by fax, pay by company check) are likely to encounter similar experiences. The results of the base state stratification are illustrated in Exhibit 3-10.

While nothing significant is immediately apparent in this figure, the results from interviews with carrier representatives provide insight into the impacts that state practices have on the way they perceive the current environment.

	Base State	Fleet Size		Level of Automation	
		Power Units	Trailers	Credentialing	Overall
Lakeville Motor Express	MN	44	250	Low	Moderate
Midwest Specialized	MN	155	247	Low	Low
CENEX/Land O Lakes	MN	255	600	Moderate	Moderate
Overnite Express	MN	310	700	Low	Moderate
ATS Specialized	MN	500	1000	Low	Low
Farm Credit Leasing	MN	600	200	Low	High
PFT Roberson	IL	1150	1400	Moderate	Moderate
Terminal Consolidation	MO	125	300	Low	Low
CFI	MO	1800	5400	Moderate	High
United/ Mayflower	MO	9000	9000	Low	High
Schneider Specialized	WI	12500	25000	High	Moderate
Seward	NE	200	410	Low	Moderate
Werner Enterprises	NE	5300	13000	Low	High
Kansas Motor Carrier Assn	KS	70 Accounts		Low	Moderate
OTR Express	KS	532	737	Moderate	High
Rollins Leasing	Multiple	27000	7000	Low	High

MEOSS Carriers by Base State **Exhibit 3-10**

The final carrier stratification factor was the carriers' levels of automation. This was assumed important for two primary reasons. First, the level of automation can logically be considered an indication of the predisposition of a carrier toward the automation of its internal processes, which include their credentialing activities. The assumption here is that a carrier that has already attempted to automate their internal credentialing process is likely to exhibit lower baseline application

preparation times, and overall cycle times, than those that have not.

Second, the overall level of automation establishes the environment within which a carrier's employees work. It is thereby assumed that a carrier with a higher overall level of automation is more likely to have staff members that are familiar with computers, and their application in day-to-day business operations. With this in mind, it is then logical to assume that employees of highly automated carriers are likely to display a higher comfort level with new computer applications than those at firms with lower levels of automation, all other things being equal.

One very important factor to recognize when analyzing this information is the source of this information. During the data collection process, interviewees were asked to subjectively assess the degree of automation, based solely on their perspective. This presents an obvious source of bias that must be considered in the overall analysis. The evaluator acknowledges the presence and potential impacts of user bias on the findings reported later in this document. The carrier stratification by level of automation is provided in Exhibit 3-11.

	Base State	Fleet Size		Level of Automation	
		Power Units	Trailers	Credentialing	Overall
Midwest Specialized	MN	155	247	Low	Low
Terminal Consolidation	MO	125	300	Low	Low
ATS Specialized	MN	500	1000	Low	Low
Lakeville Motor Express	MN	44	250	Low	Moderate
Overnite Express	MN	310	700	Low	Moderate
Seward	NE	200	410	Low	Moderate
Kansas Motor Carrier Assn	KS	70 Accounts		Low	Moderate
Farm Credit Leasing	MN	600	200	Low	High
Werner Enterprises	NE	5300	13000	Low	High
United/ Mayflower	MO	9000	9000	Low	High
Rollins Leasing	Multiple	27000	7000	Low	High
CENEX/Land O Lakes	MN	255	600	Moderate	Moderate
PFT Roberson	IL	1150	1400	Moderate	Moderate
CFI	MO	1800	5400	Moderate	High
OTR Express	KS	532	737	Moderate	High
Schneider Specialized	WI	12500	25000	High	Moderate

MEOSS Carriers by Level of Automation Exhibit 3-11

The most readily apparent observation from this figure is that with few exceptions, the level of automation of the individual carriers' credentialing processes is generally lower than their overall levels of automation. The one real outlier was Schneider Specialized, which indicated its overall level of automation was moderate. Based on a comparative observation of Schneider's operations, it is the evaluator's opinion that the overall level of automation at Schneider would probably be more accurately described as high.

Another interesting observation is that, while the lowest levels of overall automation were attributed to the smallest organizations, overall automation was not necessarily consistent with carrier size. However, there is a noticeable trend toward larger firms having higher levels of automation.

In the sections that follow, the information described here regarding the current conditions within the state agency and motor carrier organizations is used as a frame of reference for the analysis of the information gathered during the operational test evaluation. As stated earlier, it is hoped that in the absence of sufficient data to draw statistically significant conclusions regarding the viability of the MEOSS system does not overshadow the value of the lessons learned during its development and testing.

Findings

System Use

As a preface to the analysis prescribed in the test plan, test participants were asked to describe the tasks they completed in preparation for the actual use of the MEOSS system, and the extent to which the system was used. This information, along with the demographic data discussed in the previous section of this report, serves to define the context within which the findings that follow must be considered.

State Agencies

As noted earlier, the test population used the MEOSS system very sparingly. Some users indicated numerous unsuccessful attempts were made, but most opted not to exercise the system more than a few times. Across state agencies, participants were not able to consistently estimate the number of times the system was used, or the total amount of time spent using it. Those that offered estimates indicated the number of times it was used ranged from a low of zero (no applications were received), to a high of 125 to 130. About one-third of the agencies indicated the system was used from 10 to 30 times. Few of the agency representatives would offer estimates regarding the total usage time by staff members.

Only the representatives from Minnesota indicated they were able to complete any transactions. In all, state representatives indicated a total of less than 20 transactions were completed across all participating states. Of the sixteen participating agencies (two agencies opted not to use the software at all) responsible for the issuance of credentials and permits, only two successfully completed transactions. The primary reason for the lack of transactions, from the perspective of the state representatives, was the reluctance on the part of carriers to submit applications using the system due to technical problems. Based on the responses provided during interviews, a substantial portion of the system use attempts discussed earlier came in the form of agency representatives attempting to acclimate themselves to its features and use. This would explain the disparity between the numbers of attempted uses and actual transactions.

However, responses from many state representatives also indicated that had carriers submitted applications through MEOSS, the information received at the state would not have been sufficient to fully process the requested credential. Of the fourteen agencies that attempted to use the system, representatives from six indicated the information on the MEOSS application was not sufficient to process, five felt that it was, and three were either unsure, or were not able to receive applications due to technical difficulties. Those agencies responsible for IRP and IFTA tended to notice the most discrepancies between what was required to process a credential, and what MEOSS provided. One particular system shortcoming was its inability to provide a

means for submitting supporting documentation, such as proof of insurance, proof of payment of HVUT, and vehicle titles.

Eleven of the sixteen agencies indicated they were required to alter their current procedures in some way to accommodate the use of the MEOSS system. The primary change came in the form of the need to transcribe information received through MEOSS into agency legacy computer systems. The one notable exception was the South Dakota State Patrol, which intended to use the system data files as records, and printouts provided by the system as legal documents.

Despite the difficulties experienced, the shortcomings identified, and the additional workload associated with using the MEOSS system in addition to continuing the processing of applications using current methods, most agency representatives indicated participation in the operational test did not constitute a burden. Twelve of the sixteen responding groups responded positively regarding their opportunity to participate.

Motor Carriers

As discussed in the previous section, motor carriers largely refrained from using the MEOSS system. Only six of the sixteen carriers indicated using the system 10 or more times, and only one, Farm Credit Leasing, used it more than 20 times. Of the estimated 57 applications collectively submitted by all the carriers, only two carriers indicated they completed transactions using the system, for a total of four transactions combined (the discrepancy between carrier and agency responses regarding the number of transactions was not investigated, since the real significance of these numbers is in the low overall total indicated by both).

Because the data entry forms provided in the software were largely designed to replicate paper application forms, carriers indicated that the only changes to their traditional processes were the entry medium and the method of transmittal to the state. None of the participating carriers were able to make extensive use of the ability of the software to store fleet and company information, primarily due to the very small number of applications submitted.

All carriers opted to designate certain staff members to use the MEOSS system, but none chose to assign dedicated staff. All potential and actual system users were required to continue to process credential and permit applications using current methods, as well. Most respondents indicated participation did not represent an additional burden. One stated that it was, but that it was expected, given the nature of the test. Two felt it was a burden, and others indicated it would have become a burden had more activity been undertaken.

System Productivity Impacts

As stated earlier, the purpose of the productivity impact assessment was to assess the changes in productivity motor carriers and state agencies may realize through the use of the MEOSS system. To address this goal, objectives were developed that addressed key areas relating to productivity:

- Improvements in credentialing process consistency
- Uniformity of the credentialing process using MEOSS
- Reductions in cycle times
- Reductions in labor requirements

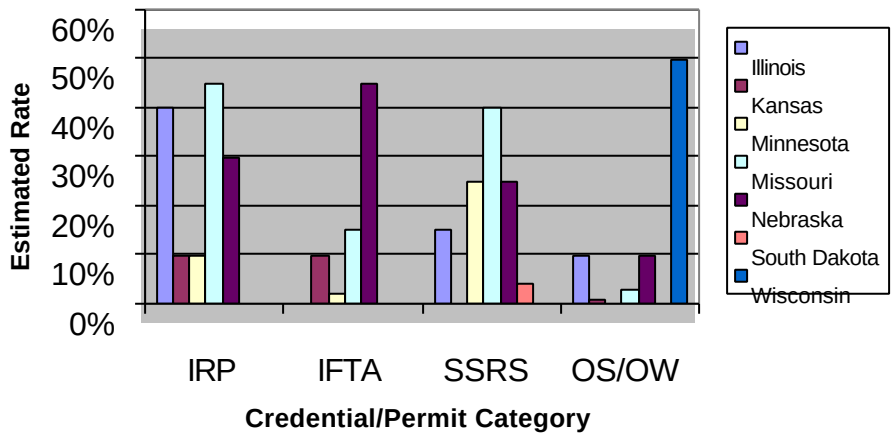
The findings for each objective discussed here are segregated into state agency and motor carrier categories.

Objective 1.1: Assess Improvements in the Consistency of the Credential Administrative Process with MEOSS

The primary measure for assessing the degree to which the MEOSS system improved consistency was the degree to which it reduced the amount of interaction between the applicant and the responsible agency required to correct applications.

State Agencies - Baseline:
Representatives from participating states indicated that between 10 and 45 percent of applications submitted for IRP and IFTA credentials require follow-up using current systems. These figures are somewhat similar for SSRS credentials, with the highest reported follow-up rate of 40 percent. Over-dimensional permits were reported to require the lowest interaction rates overall, with the exception of Wisconsin, which estimated a rate of 50 percent. Estimated interaction rates for each credential or permit category under current systems are illustrated in Exhibit 4-1.

Exhibit 4-1 – Estimated Rate of Interaction Required to Correct Applications Using Current Systems



Upon review of the information shown in Exhibit 4-1, a number of observations can be made. The first is that the interaction rate in Kansas and Minnesota for IRP are roughly one-fourth that of the highest rates, which were reported in Missouri and Illinois. The figures for IFTA also indicate low interaction rates for Kansas and Minnesota, while Nebraska's estimate is largest by nearly a factor of four.
The second observation is that the interaction rate for SSRS is surprisingly high, with three states reporting rates in excess of 25 percent. This is in stark contrast to the contention of most respondents, who claimed SSRS forms were the easiest to complete among all credential types.

The third observation is that the interaction rate for OS/OW permits in Wisconsin is five times that in the next closest states. This is primarily attributable to the fact that approximately 70 percent of OS/OW permit requests are forwarded to the state via fax, and approximately 50 percent of applications require an average of six fax transmittals to complete. The likely explanation for this is that in other participating states, the majority of SO/OW applications are either received via telephone, or applicants are called to resolve application errors, rather than completely by fax. The Wisconsin representative also indicated that applications received by fax tend to be more complex than those taken over the telephone.

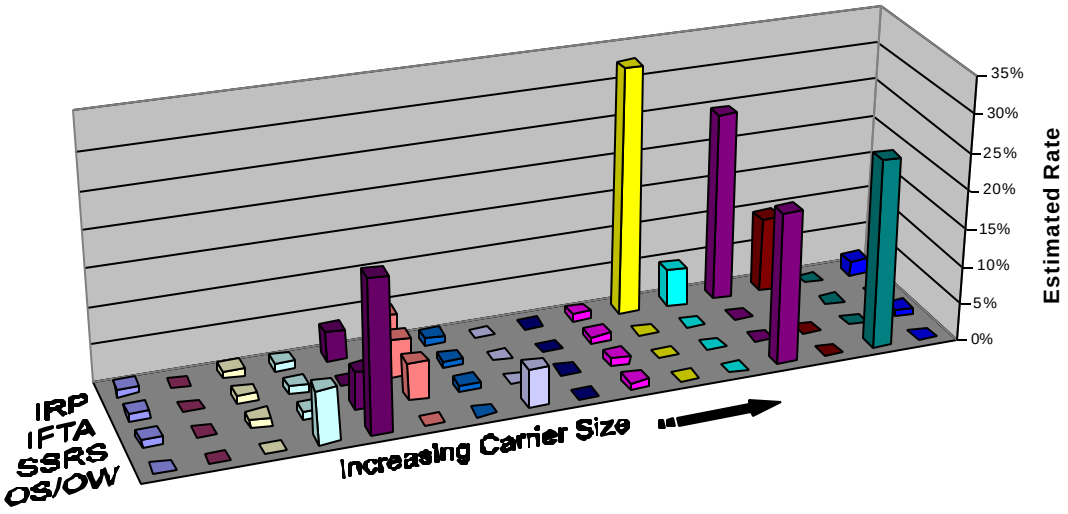
The small number of transactions attempted using the MEOSS system precludes a direct comparison of pre- and post-implementation interaction rates. None of the state agency respondents indicated they had used the system enough to project figures. However, several were confident that based on their limited exposure to the system, and the fact that the introduction of any new system usually results in some initial difficulties, interaction rates would have been higher with MEOSS, at least initially.

Motor Carriers - Baseline:
Motor Carriers indicated interaction rates that fell between 0 and 33 percent. The largest rates were for IRP credentials, followed by over-dimensional permits. Generally, the participating carriers indicated very low interaction rates for IFTA and SSRS transactions. Estimated interaction rates for each credential or permit category are provided in Exhibits 4-2 through 4-4. Exhibit 4-2 shows how the rates are effected by carrier size. Exhibit 4-3 shows the same data, according to base state, and Exhibit 4-4 illustrates the data according to carrier level of automation.

Examining Exhibit 4-2, there does appear to be some size-related trend in the data. While it is not conclusive, there is evidence to suggest that the largest carriers experience the largest rates of interaction. What is important to note is the higher incidence of interaction for IRP and OS/OW. Twelve of the 16 carriers indicated interaction is required at some level for IRP. Additionally, the larger carriers show consistently higher rates. While specific reasons were not obtained during data

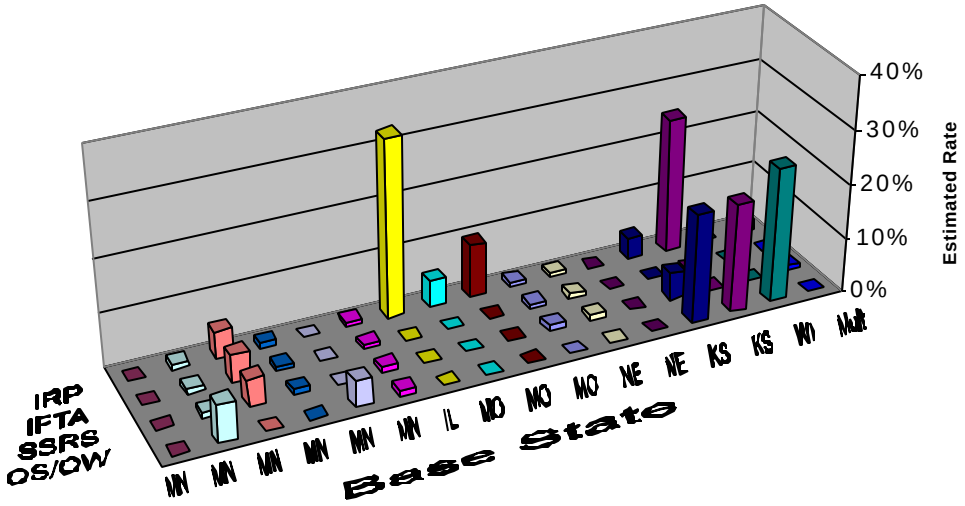
collection, it would seem logical that this may be due to the lengthy, complex applications associated with large numbers of trucks.

Exhibit 4-2 – Motor Carrier Estimated Interaction Rate to Correct Applications – By Carrier Size



Six carriers also indicated the need to interact for OS/OW. The significant observations here are that these are the only carriers participating in the test that apply for over-dimensional permits, and that carrier size isn't an obvious indicator of interaction rate. No obvious trends can be found by examining the rate of interaction required when examining carriers by base state either, as illustrated in Exhibit 4-3.

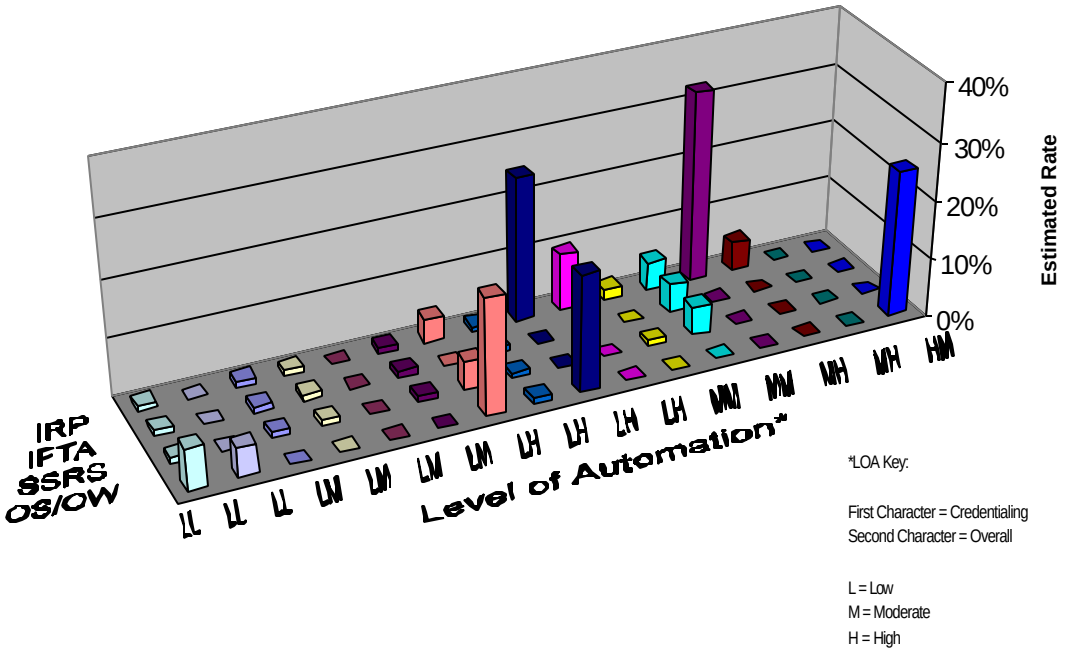
Exhibit 4-3 – Motor Carrier Estimated Interaction Rate to Correct Applications – By Base State



However, carriers based in Illinois, Kansas and Wisconsin reported higher interaction rates than those in other states.

Finally, in Exhibit 4-4, the rate of required interaction is illustrated according to the levels of automation for credentialing and overall operations for each carrier.

Exhibit 4-4 – Motor Carrier Estimated Interaction Rate to Correct Applications – By Level of Automation



Interestingly, those carriers that reported experiencing the lowest rate of interaction tended to also have lower levels of automation for their credentialing operations, and for their overall organizations. Further, those carriers with the highest interaction rates tended to rate their overall level of automation as moderate or high.

Based on the data presented here, conclusions regarding the causal factors for incomplete or inaccurate applications are not possible. However, some inferences can be made. For instance, IFTA and SSRS credential transactions appear to require lower rates of interaction, as evidenced in each of the exhibits. In addition, OS/OW permitting appears to be less cumbersome in states that conduct the bulk of their transactions via telephone, where real-time interaction takes place.

But perhaps the most readily apparent inference is that the carriers that participated in the MEOSS FOT, as a group, are not likely to submit incorrect or incomplete applications. This is not surprising, given the desire of participating states to support the inclusion of "acceptable" carriers in the program. As a result, the bias that this creates is evident in the data provided here.

State Agencies – Post-MEOSS Implementation:

None of the state agency respondents had used the MEOSS system sufficiently to be comfortable offering perceptions regarding how it would have affected the rate of interaction required for incorrect or incomplete applications. So, in the strictest sense, there is no empirical evidence to suggest the rates would have changed. However, the logic used during the development of the software was designed to require the applicant to complete prescribed data fields. In theory, this feature would, at least, potentially reduce the likelihood that an incomplete application would reach the state. This feature did appear to function during use of the software, however, no attempt was made to track its ability to correctly identify the required data elements for each application type, within each state.

Motor Carriers – Post-MEOSS Implementation:
As with the state representatives, none of the carrier respondents had used the MEOSS system sufficiently to be comfortable offering perceptions regarding how it would have affected the rate of interaction required for incorrect or incomplete applications. So, once again, there is no empirical evidence to suggest the rates would have changed.

Aside from the system logic regarding the completion of required data fields, the MEOSS system would also prevent an applicant from filing an illegible application, which also holds the potential to reduce the rate of interaction by some small amount.

Objective	Result
1.1 Assess Improvements in the Consistency of the Credential Administrative Process with MEOSS	Insufficient Data

Objective 1.2: Assess the Uniformity of the Credential Administrative Process with MEOSS

The primary measure for assessing the uniformity of the credential administrative process with the MEOSS system was the variation in approved credentials based on similar input from varying input sources.

Because this objective did not call for a comparative analysis between current systems and MEOSS, baseline data was not collected. Furthermore, since so very few transactions were attempted, meaningful analysis is not possible.

Objective	Result
1.2 Assess the Uniformity of the Credential Administrative Process with MEOSS	Insufficient Data

Objective 1.3: Compare the Application-to-Issuance Cycle Times of MEOSS to the current system.

For the purposes of this analysis, the application-to-issuance cycle time includes all the activities that are conducted beginning with the submission of an application through the delivery of the requested credential. Hence, all review, approval, payment, and delivery processes are encompassed.

State Agencies - Baseline:
Two separate data collection activities were used to gather data for this objective. The first involved the use of credential tracking sheets. These sheets, which were basically routing slips that provided space for applicants and reviewers to provide inputs regarding dates and times for specific events, were to be used by all participating carriers and state agencies during the baseline data collection period. The second activity consisted of interviews with test participants.

A total of 376 tracking sheets were at least partially completed and returned to the evaluator. The table in Exhibit 4-5 provides the number of tracking sheets received, by credential type, during baseline data collection.

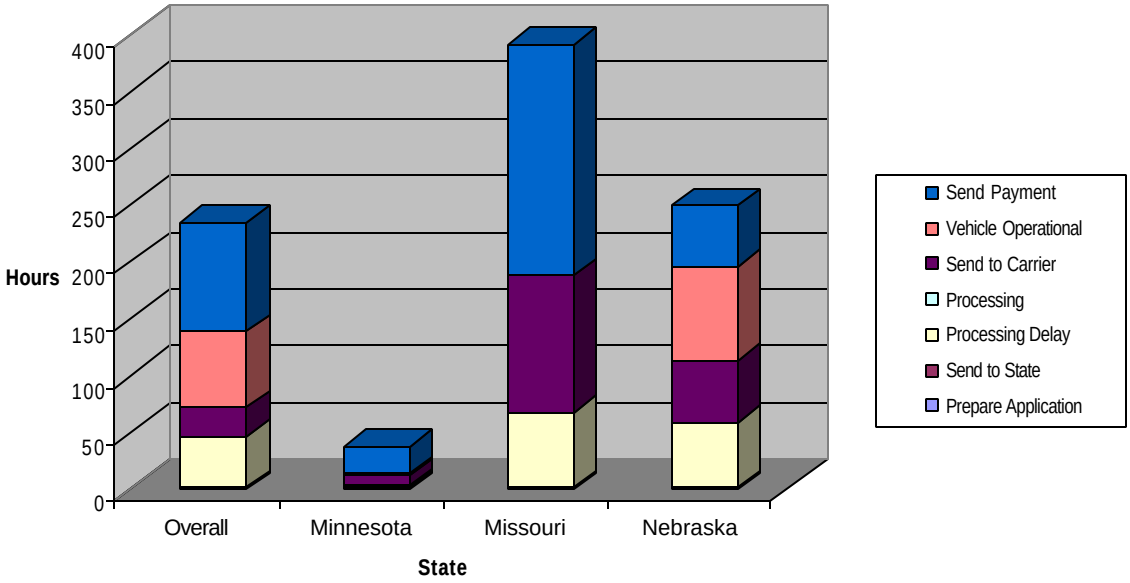
Exhibit 4-5 – Number of Tracking Sheets Received, by Type and by State

Credential Type	Total	State						
		IL	KS	MN	MO	NE	SD	WI
IRP Total	**261**	**0**	**0**	**49**	**20**	**188**	**2**	**0**
IRP Initial	2	0	0	0	0	2	0	0
IRP Supplement	191	0	0	48	20	121	0	0
IRP Temporary	66	0	0	1	0	65	0	0
IRP Trip	2	0	0	0	0	0	2	0
IRP Renewal	0	0	0	0	0	0	0	0
IFTA Total	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
IFTA Initial	0	0	0	0	0	0	0	0
IFTA Supplement	0	0	0	0	0	0	0	0
IFTA Renewal	0	0	0	0	0	0	0	0
IFTA Quarterly Rpt	20	0	0	1	0	18	1	0
SSRS Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SSRS Initial	0	0	0	0	0	0	0	0
SSRS Supplement	0	0	0	0	0	0	0	0
SSRS Renewal	0	0	0	0	0	0	0	0
OS/OW Total	**95**	**0**	**8**	**36**	**0**	**0**	**49**	**0**
OS/OW Multi-Trip	3	0	0	0	0	0	3	0
OS/OW Single Trip	92	0	8	36	0	0	46	0

From the figures in Exhibit 4-5, it is clear that nearly all the tracking sheets received were for IRP supplements and temporary credentials, and OS/OW single trip permits. Minnesota and Nebraska accounted for the bulk of the IRP transactions, and Minnesota and South Dakota accounted for nearly all OS/OW activity. Of those tracking sheets received, very few had actually been completely filled with data. Nonetheless, some trends are noticeable.

The graph in Exhibit 4-6 shows the composite average cycle time, in hours, for IRP supplements for all tracking sheets received, and the individual states of Minnesota, Missouri, and Nebraska.

Exhibit 4-6 – Tracking Sheet Data for IRP Supplements

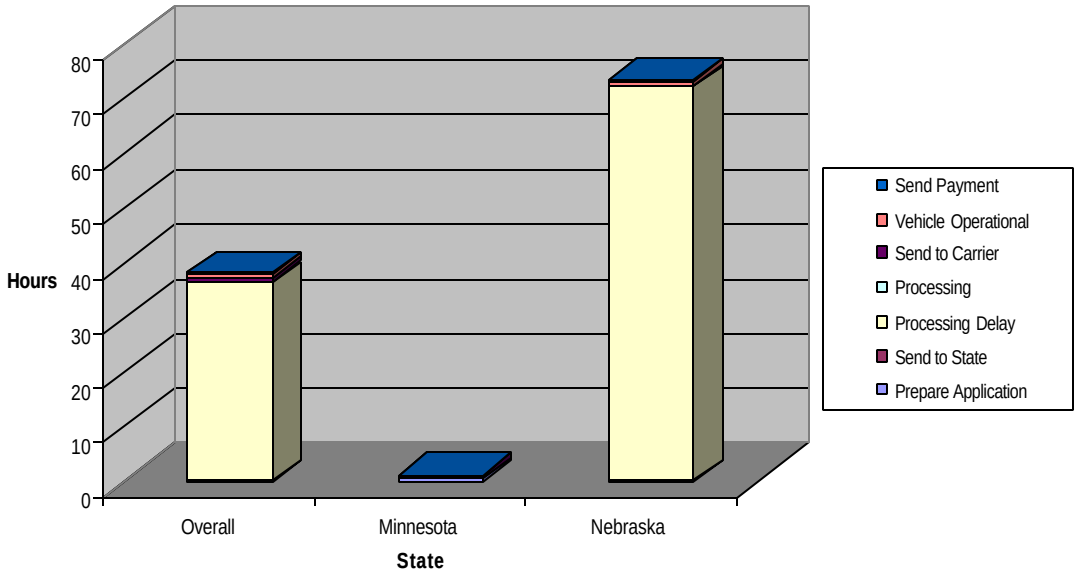


Based on this data, the most obvious observation is how much more quickly Minnesota carriers can get their applications processed. Overall average cycle time for IRP supplements ranged from a low of 25 hours in Minnesota, to a high of approximately 375 hours in Missouri. Another immediately obvious observation is the very short amount of time spent by carriers in preparing applications and forwarding them to the state. This would be consistent with the contention of many of the test participants that supplements are quite easy to complete. Missouri and Nebraska show a significant processing delay—the amount of time passes between when an application is received at the state, and when state employees actually begin processing. Once processing begins, however, they appear to be completed quite quickly.

There are at least two plausible explanations for what is seen in the exhibit. First, Missouri processes more than 50 percent more IRP credentials in a given year than does Minnesota. Second, the vast majority of carriers in Nebraska opt to file for

credentials through standard mail. This conclusion would be consistent with the data, which shows the amount of time that transpires between when the credentials are sent by the state, and when they are received by the carriers to be significantly less in Minnesota than in the other two states.
Cycle time data from tracking sheets for IRP temporary credentials are illustrated in Exhibit 4-7.

Exhibit 4-7 – Tracking Sheet Data for IRP Temporary Credentials



While the difference between the cycle time in the two states appears dramatic, it must be remembered that only one temporary IRP credential was tracked in Minnesota, while 65 were captured in Nebraska. It is safe to say, however, that the processing delay in Nebraska consumes the overwhelming majority of the cycle time in Nebraska.

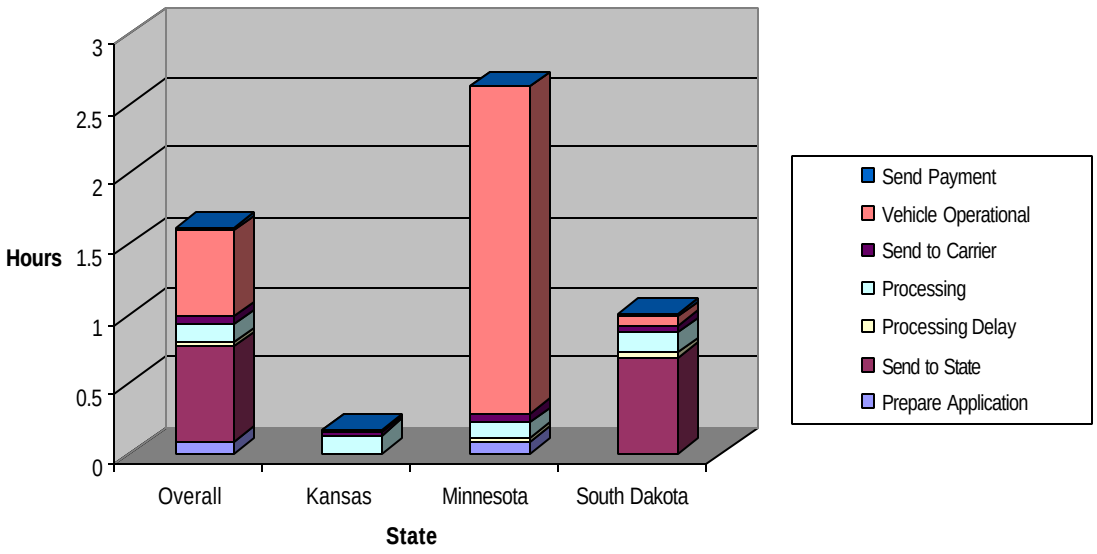
The only IFTA transactions for which tracking sheets were completed were quarterly reports filed by a handful of carriers. Nearly all—18 of 20 received—came from the state of Nebraska. Even those from Nebraska, however, were only partially completed, and each offered an identical amount of time for preparing and processing the reports. As a result, little can be drawn from the data.

The final transaction type for which more than a handful of tracking sheets was obtained was single trip OS/OW permits. The states of Minnesota and South Dakota accounted for nearly all of these tracking sheets. The results are illustrated in Exhibit 4-8.

A quick look at the figure in Exhibit 4-8 shows how much more quickly OS/OW single trip permits are processed than are the IRP supplements or temporaries. The cycle time in Minnesota, which appears significantly longer than in the other states,

is skewed by an outlying data point—one permit transaction was recorded to take 200 hours to complete. Removing this transaction from the data set drops the average to just under 1.4 hours, which is closer to that of South Dakota.
Most dramatic is the relatively short amount of time to complete transactions in Kansas. Although relatively few tracking sheets were received, they appear to consistently reflect a process that takes less than 30 minutes, from start to finish.

Exhibit 4-8 - Tracking Sheet Data for OS/OW Single Trip Permits



While this information is of interest, the low overall total of tracking sheets renders it statistically insignificant. In an effort to provide a more comprehensive picture of current processes, representatives of participating agencies were asked to respond to questions regarding the time requirements for the steps in the process. While the responses received were, of course, subjective estimates, responses were obtained for each of the agencies involved in the test. Unfortunately, because the responses given were often in the form of ranges of time, graphical depiction is difficult. Instead, tabular data is presented here.

The table in Exhibit 4-9 shows the responses received from those agencies responsible for administering all or part of the applications for IRP credentials.

Before attempting to interpret this data, three key issues that apply to all interview response-based analysis must be addressed. First, because state agency representatives provided these responses, application preparation time is not included. Second, a number of respondents were unable or unwilling to provide estimates, either because they were not familiar with the time required, or were not responsible for issuing the credentials listed—these responses are denoted by an "ND" entry, which stands for "Not Determined." Finally, because these responses

represent estimates on the part of the respondents, they must be viewed with that context in mind. Hence, some are certain to be more accurate than others.

Exhibit 4-9 – Estimated Average Cycle Time for IRP – State Agency Interview Responses

State	Estimated Average Application to Issuance Cycle Time				
	Initial	**Supplement**	**Temporary**	**Trip Permit**	**Renewal**
Illinois	1-2 days	ND	ND	ND	Up to 10 days
Kansas	ND	ND	ND	3-5 minutes	ND
Minnesota	1 hr -2 days	1 hr -2 days	30 minutes – 4 hrs	10 minutes - 2 days	1-3 weeks
Missouri	ND	3 days	ND	10-15 minutes	8 days
Nebraska	Same day	2 days to 2 weeks	1 hour	ND	3 weeks
South Dakota	ND	15 minutes	15 minutes	15 minutes	ND
Wisconsin	ND	ND	ND	ND	ND
Overall Range	**1 hr to 2 days**	**15 minutes to 2 weeks**	**15 minutes to 2 days**	**3 minutes to 2 days**	**1 to 3 weeks**
ND = Not Determined					

Based on the information presented here, it is clear that renewals require the most time to process of the IRP transactions, and trip permits are completed most quickly. What is most interesting, however, is the range of time necessary to complete supplements, particularly in Nebraska, where up to two weeks can pass during the process.

The table in Exhibit 4-10 shows the responses received from those agencies responsible for administering all or part of the applications for IFTA credentials. The estimated cycle time range is quite large for initial credentials, which may be attributable to the size of the carrier applying for credentials, or the time of year during which the application was submitted, or perhaps a combination of the two. Larger applications would logically take longer to process, as would initial requests filed during busy periods (e.g., renewal periods).

Exhibit 4-10 – Estimated Average Cycle Time for IFTA– State Agency Interview Responses

State	Estimated Average Application to Issuance Cycle Time		
	Initial	Supplement	Renewal
Illinois	15 minutes to 4 days	ND	ND
Kansas	ND	ND	ND
Minnesota	1 day to 1 month	ND	ND
Missouri	ND	ND	8 days
Nebraska	Same day	1 to 1-1/2 hours	1 week
South Dakota	ND	15 minutes	ND
Wisconsin	ND	ND	ND
Overall Range	**15 minutes to 1 month**	**15 minutes to 1-1/2 hours**	**1 week to 8 days**
ND = Not Determined			

The table in Exhibit 4-11 shows the responses received from those agencies responsible for administering all or part of the applications for SSRS credentials.

While the overall range of cycle times is relatively large, within a given state they are relatively small. The longer cycle time ranges associated with the annual renewals are likely due to the busy period during which they are normally processed.

Exhibit 4-11 – Estimated Average Cycle Time for SSRS – State Agency Interview Responses

State	Estimated Average Application to Issuance Cycle Time		
	Initial	Supplement	Renewal
Illinois	1 day	1 day	1 day
Kansas	ND	ND	ND
Minnesota	Not more than 1 day	Not more than 2 days	Not more than 2 days
Missouri	2 to 3 days	1 to 2 days	3 days
Nebraska	1 to 1-1/2 hours	2 to 3 days	2 to 3 weeks
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND
Overall Range	**1 hour to 3 days**	**1 to 3 days**	**1 day to 3 weeks**
ND = Not Determined			

The table in Exhibit 4-12 shows the responses received from those agencies responsible for administering all or part of the applications for OS/OW credentials.

Exhibit 4-12 – Estimated Average Cycle Time for OS/OW – State Agency Interview Responses

State	Estimated Average Application to Issuance Cycle Time	
	Single Trip	Multi-Trip/Annual
Illinois	3 to 15 minutes; fax and super loads 5 minutes to 3 hours	3 to 15 minutes; fax and super loads 5 minutes to 3 hours
Kansas	3 to 5 minutes (not super loads)	3 to 5 minutes (not super loads)
Minnesota	4 minutes to 1 hour; 3 hours if w/bridge analysis	4 minutes to 1 hour
Missouri	5 to 15 minutes; super loads 2 weeks	5 to 15 minutes; super loads 2 weeks
Nebraska	15 minutes to 1 day	15 minutes to 1 day
South Dakota	No more than 15 minutes (w/o bridge analysis)	No more than 15 minutes (w/o bridge analysis)
Wisconsin	3 minutes to 8 hours; 1 to 3 days for super loads	3 minutes to 8 hours; 1 to 3 days for super loads
Overall Range	**3 minutes to 8 hours (up to 2 weeks for super loads**	**3 minutes to 8 hours (up to 2 weeks for super loads**
ND = Not Determined		

Note that the responses for single-trip and multi-trip state agency cycle times are identical. This is because the respondents indicated that the review process is the same for each. The short end of the cycle time range is attributed to the receipt of applications via telephone, while the long end can be attributed to either the complexity of the permit, the fact it was received via fax, or a combination of the two.

In order to assess the accuracy of the interview responses, they were compared, where possible, to the cycle time figures obtained from the tracking sheets. The data from the two sources are compared in the table in Exhibit 4-13. To allow for a direct comparison of the state agency portion of the cycle times from the two sources, the time prior to the receipt of applications, and the time after the approval are subtracted from the cycle times derived from the tracking sheets.

Exhibit 4-13 – Comparison of Tracking Sheet and Interview Data – State Agency Responses

State	Comparative State Agency Cycle Times					
	Tracking Sheets	Interview	Tracking Sheets	Interview	Tracking Sheets	Interview
	IRP Supplement		IRP Temporary		OS/OW Single Trip	
Kansas	N / A	N / A	N / A	N / A	10 minutes	3 to 5 minutes
Minnesota	4 hours	1-2 days	3 hours	1-2 days	N / A	N / A
Missouri	55 hours	3 days	N / A	N / A	15 minutes	4 minutes to 1 hour
Nebraska	50 hours	2 days to 2 weeks	68 hours	1 hour	N / A	N / A
South Dakota	N / A	N / A	N / A	N / A	25 minutes	No more than 15 minutes

The findings show that, in most cases, interviewees gave reasonably accurate estimates of cycle time in their responses. Actual tracking sheet figures, for the most part, fall within the ranges offered by respondents. Those that don't, with one exception, are still reasonably close. The single significant outlier, for IRP temporary credentials in Nebraska, is a reflection of the extended delay associated with actually beginning the processing of applications. It is not unusual that this portion of the cycle would be overlooked, since it is not common practice for state agencies to keep records regarding this delay.

Motor Carriers - Baseline:
Because the tracking sheets described in the State Agency baseline data collection section above were intended to provide an end-to-end data collection mechanism, the data provided above is applicable to the carrier baseline data collection effort, as well. As with the state agency portion, interviews were conducted with carrier credentialing personnel.

The figures provided in Exhibit 4-14 illustrate the findings regarding IRP cycle time obtained from carrier interviews. Rather than provide this information on a carrier-by-carrier basis, it is presented according to base state. One of the more noticeable trends in the data is the larger range of cycle times reported for each type than were reported by the state representatives, which are shown in the added row at the bottom of the table. At the higher end of the estimates, a portion of this range can be attributed to the fact that the state representatives were estimating the time that elapses from their receipt of an application to the forwarding of credentials, while

carriers included application preparation and submittal, and receipt of credentials. As for the lower end, carrier responses could reflect the fact that those that participated in the test were, for the most part, considered very reputable.

Exhibit 4-14 – Estimated Average Cycle Time for IRP – Motor Carrier Interview Responses

Base State	Estimated Average Application to Issuance Cycle Time				
	Initial	Supplement	Temporary	Trip Permit	Renewal
Illinois	ND	3 hours	ND	ND	4 hours
Kansas	ND	15 minutes to 3-1/2 weeks	ND	ND	15 minutes to 2 months
Minnesota	20 minutes to 3 weeks	20 minutes to 3 weeks	20 minutes to 3 weeks	20 minutes to 3 weeks	ND
Missouri	2 to 2-1/2 weeks	2 to 2-1/2 weeks	5 to 10 minutes	2 to 2-1/2 weeks	ND
Nebraska	ND	2 weeks	ND	ND	5 to 6 weeks
South Dakota	ND	ND	ND	ND	ND
Wisconsin	ND	ND	ND	ND	ND
Multiple	1 week	1 hour to 4 days	ND	ND	3 weeks to 5 months
Overall Range	**20 minutes to 3 weeks**	**15 minutes to 3-1/2 weeks**	**5 minutes to 3 weeks**	**20 minutes to 3 weeks**	**15 minutes to 5 months**
Overall Range from State Agency Respondents	**1 to 2 days**	**15 minutes to 2 weeks**	**15 minutes to 2 days**	**3 minutes to 2 days**	**8 days to three weeks**
ND = Not Determined					

Carrier interview responses for IFTA transaction cycle times are provided in Exhibit 4-15. State agency responses are again provided for comparison at the bottom of the table. As with the IRP data above, carrier reported cycle times are longer, on average, than state agency reported cycle times. This could be again at least partially attributable to the fact that the carrier cycle includes more steps than does the state agency cycle. The single exception is the renewal cycle time for the carrier that bases its fleet in multiple states. A part of this difference could be attributed to the fact that this carrier bases parts of its fleet in states other than those participating in this FOT.

The table in Exhibit 4-16 illustrates the carrier interview responses for average SSRS credential cycle time. Consistent with the findings for IRP and IFTA, the figures for the overall range of cycle time for each type are longer than provided by the state agency respondents. The range provided by the carrier based in multiple states is

substantially larger than the state estimates, which could be partially due to the very large size of the carrier.

Exhibit 4-15 – Estimated Average Cycle Time for IFTA– Motor Carrier Interview Responses

Base State	Estimated Average Application to Issuance Cycle Time		
	Initial	Supplement	Renewal
Illinois	ND	30 to 45 minutes	ND
Kansas	ND	2 weeks	ND
Minnesota	1 to 3 weeks	1 to 3 weeks	1 to 3 weeks
Missouri	6 weeks	1 day to 1 week	ND
Nebraska	ND	1 to 2 weeks	1 month
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND
Multiple	1 month	1 to 2 weeks	2 months
Overall Range	**1 to 6 weeks**	**30 minutes to 3 weeks**	**1 weeks to 2 months**
Overall Range from State Agency Respondents	**15 minutes to 1 month**	**15 minutes to 1-1/2 hours**	**1 week to 8 days**
ND = Not Determined			

Exhibit 4-16 – Estimated Average Cycle Time for SSRS – Motor Carrier Interview Responses

Base State	Estimated Average Application to Issuance Cycle Time		
	Initial	Supplement	Renewal
Illinois	ND	ND	At least 4 weeks
Kansas	ND	ND	6 weeks
Minnesota	ND	1 to 2 weeks	1 to 2 weeks
Missouri	ND	1 week to 1 month	1 week to 1 month
Nebraska	ND	7 to 10 days	1 month
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND
Multiple	6 weeks	7 to 10 days	7 to 10 days
Overall Range	**6 weeks**	**1 week to 1 month**	**1 to 6 weeks**
Overall Range from State Agency Respondents	**1 hour to 3 days**	**1 to 3 days**	**1 day to 3 weeks**
ND = Not Determined			

The table in Exhibit 4-17 illustrates the carrier interview responses for average OS/OW permit cycle time. Of all the comparisons between state agency and carrier responses regarding cycle time, the figures for OS/OW permits were the closest. The exception was one carrier in Minnesota that offered that it may take up to 4 days to process a permit request. Based on the other responses provided by this carrier, it is likely that requests that take more than 1 day to process require bridge analysis or special routing.

Exhibit 4-17 - Estimated Average Cycle Time for OS/OW – Motor Carrier Interview Responses

Base State	Estimated Average Application to Issuance Cycle Time	
	Single Trip	Multi-Trip
Illinois	ND	ND
Kansas	Less than 1 day	Less than 1 day
Minnesota	5 minutes to 4 days	5 minutes to 4 days
Missouri	3 hours	3 hours
Nebraska	20 minutes to 2 days	20 minutes to 2 days
South Dakota	ND	ND
Wisconsin	5 minutes to 8 hours	5 minutes to 8 hours
Multiple	ND	ND
Overall Range	**5 minutes to 4 days**	**5 minutes to 4 days**
Overall Range from State Agency Respondents	**3 minutes to 8 hours (up to 2 weeks for super loads**	**3 minutes to 8 hours (up to 2 weeks for super loads**
		ND = Not Determined

State Agencies – Post-MEOSS Implementation:
The extremely limited system use that took place during the operational test prevents the presentation of any meaningful data regarding MEOSS application-to-issuance cycle time. However, a number of the state respondents did offer opinions regarding whether they thought a system such as MEOSS would have saved time.

State representatives were in agreement that a system such as MEOSS offers its greatest benefit to the carriers, as opposed to state agencies. Specifically, they cited the fact that the actual review process would not change under MEOSS, and the need to enter data into state legacy systems eliminates most of the benefits associated with receiving electronic applications. In fact, several respondents offered that, in many instances, it is not the lack of automation that causes significant delays in credential processing, but rather its the actual processes that must be completed under current regulatory or administrative rules. Simply automating current processes was not perceived as offering a great deal of value,

particularly given that many respondents believe their current level of automation was moderate to high prior to the introduction of MEOSS.

As a group, they felt the built-in error checking function and the fact that application legibility would be consistently good were not sufficient to make a substantial difference in processing time. This was particularly true in the case of OS/OW permits, where a large portion of applications are currently taken over the telephone and directly entered into state systems by permitting agents. As a result, some respondents felt MEOSS would actually increase the amount of time required for processing.

In spite of the limited value perceived by state agency representatives, most felt the widespread implementation of such systems was inevitable primarily due to the potential benefits it offered carriers during application preparation.

Motor Carriers – Post-MEOSS Implementation:
As was the case with the state agency cycle time assessment, an insufficient number of transactions were processed to conduct a numerical analysis of the effects of MEOSS on the credential cycle. However, carrier interviewees were asked to provide their perceptions regarding the possibility for improvement due to electronic one-stop shopping.

The majority of respondents were not comfortable estimating cycle time savings due to the use of MEOSS, but did offer opinions regarding the conditions under which such a system might actually result in some improvement. All carriers agreed that their participation in this FOT indicated they were confident that electronic one-stop shopping would benefit them, and that their perception had not changed, regardless of their level of use of the MEOSS system. Many indicated, however, that such systems only offered cycle time benefits for certain credential types.

For instance, for those carriers that apply for and receive OS/OW permits over the telephone, it was difficult to identify how one-stop systems would shorten this time. For IRP renewals, carrier representatives were in agreement that the ability to receive an electronic renewal notice from the state that could be compared to existing fleet records and changed as required would result in substantial savings in cycle time. However, more benefit would be derived from the labor savings that would result from more efficient automation, than from the reduction of cycle time. In fact, for renewal transactions, it is not uncommon for a carrier to delay completion of the process to the end of the renewal period in order to retain funds for as long as possible.

Some credentials, like IRP supplements and temporary credentials, were seen as time sensitive. It was for these credentials that one-stop shopping was perceived to offer carriers the most significant benefit from cycle time savings. Simply put, the

faster a carrier can get a new vehicle on the road earning revenue, the better. They also agreed that IFTA quarterly reports could possibly be processed more quickly at the state level if the one-stop system could consistently provide accurate tax tables to the carriers in a timely manner.

Objective	Result
1.3 Compare the application-to-issuance cycle times of MEOSS to the current system	Insufficient Data

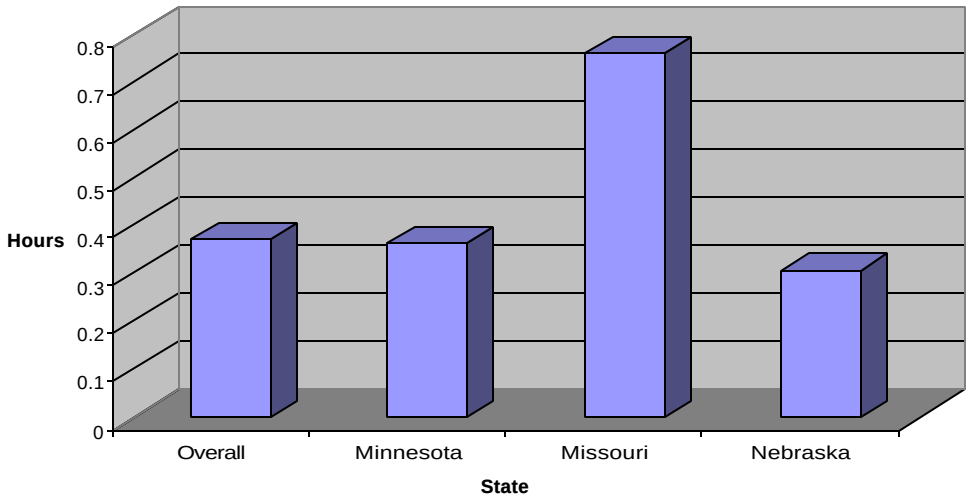
Objective 1.4: Assess Carrier Productivity Improvements Due to the Use of MEOSS

State Agencies – Baseline:
This objective does not apply to state agency processes.

Motor Carriers – Baseline:
In order to develop a perspective regarding the potential of the MEOSS system to reduce the labor and time required for carrier representatives to prepare applications, two sources of data were used. Once again, data from tracking sheets were extracted, and carrier representatives were asked to offer estimates for the completion of these tasks under current processes.

The graph in Exhibit 4-18 shows the composite average preparation time, in hours, for IRP supplements for all tracking sheets received, and the individual states of Minnesota, Missouri, and Nebraska.

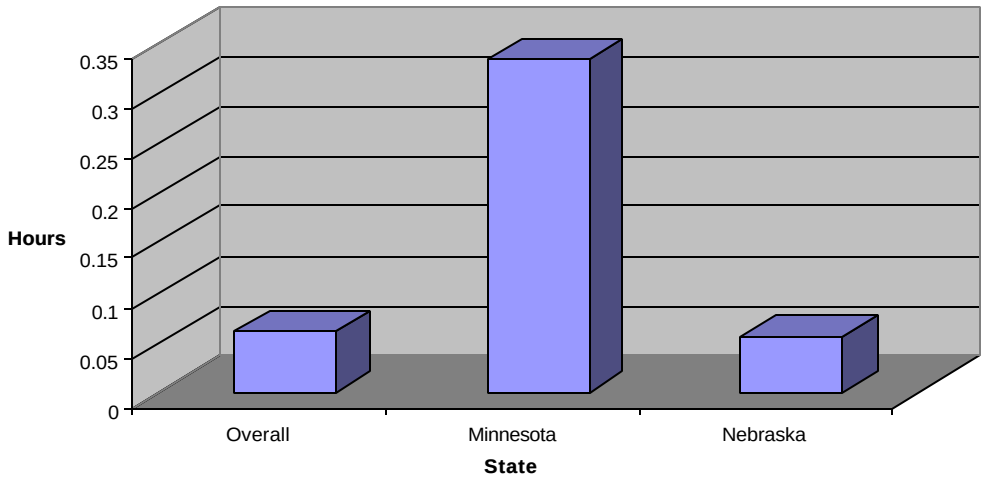
Exhibit 4-18 – Credential Application Preparation Time – Tracking Sheet Data for IRP Supplements



The tracking sheet data indicate application preparation time is fairly consistent across the three states, ranging from approximately 20 minutes to 40 minutes.

The figure in Exhibit 4-19 shows the composite average preparation time, in hours, for IRP temporary credentials for all tracking sheets received, and the individual states of Minnesota and Nebraska.

Exhibit 4-19 – Credential Application Preparation Time – Tracking Sheet Data for IRP Temporary Credentials



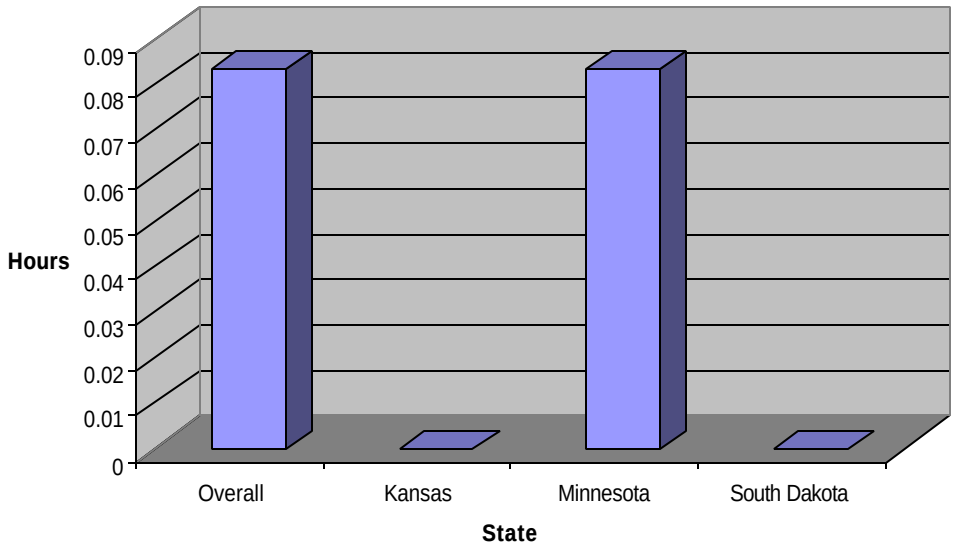
The data indicates that temporary applications can be completed quite quickly, with the overall range of between 2 minutes and 20 minutes. The fact that the overall average is close to the low end of the range indicates that most tracking sheets showed preparation times at the lower end of the range.

The graphic in Exhibit 4-20 illustrates the average application preparation time for single trip OS/OW permits. Once again, information from all tracking sheets received, and for those in the states of Kansas, Minnesota and South Dakota are presented.

While the graphical depiction appears to show a wide variance in preparation times among the carriers in the three states, what is actually being depicted is the fact that in the states of Kansas and South Dakota, the carrier did not complete an actual paper application. Rather, information required to process the credential was actually recorded and entered directly into state records by a state agency representative. In addition, the overall scale is quite small.

In an attempt to gain additional insight into the administrative burden imposed on carriers, participating carrier representatives were also asked to provide estimates of the amount of time required to prepare applications. What follow are tabular summaries of their responses.

Exhibit 4-20 – Credential Application Preparation Time – Tracking Sheet Data for OS/OW Single Trip Permits



The table in Exhibit 4-21 contains response data from carrier representatives regarding the estimated amount of time necessary to complete IRP credential applications. Once again, carrier responses are grouped according to base state.

Exhibit 4-21 – Estimated Average Application Preparation Time for IRP Credentials - Motor Carrier Interview Responses

Base State	Estimated Average Application Preparation Time				
	Initial	Supplement	Temporary	Trip Permit	Renewal
Illinois	ND	1 hour	ND	ND	ND
Kansas	ND	10 minutes to 1 hour	ND	ND	1 hour to 3 weeks
Minnesota	ND	5 minutes to 2 hours	ND	ND	1 hour to 2 days
Missouri	ND	2 minutes to 2 days	ND	ND	Up to 1 month
Nebraska	ND	20 minutes to 8 hours	ND	ND	2 hours to 6 weeks
South Dakota	ND	ND	ND	ND	ND
Wisconsin	ND	ND	ND	ND	ND
Multiple	10 minutes	5 minutes	ND	ND	2 to 60 hours
Overall Range	**10 minutes**	**2 minutes to 2 days**	**ND**	**ND**	**1 hour to 6 weeks**
ND = Not Determined					

One of the more startling observations is the large overall response range offered by carriers in Missouri and Nebraska. Based on a review of which carriers provided which estimates, it appears that a substantial portion of these larger preparation times are attributable to larger carriers requiring extensive document searches to verify renewal information provided them by states.

Equally obvious is the very short preparation time provided for the carrier based in multiple states. This is not surprising given the relative frequency with which large leasing companies, of which this firm is one, register new fleets.

The figures provided in the table in Exhibit 4-22 reflect carrier representatives' responses regarding the estimated time required to prepare IFTA documentation for submittal to the states involved in the FOT. Once again, carriers are grouped by base state.

Exhibit 4-22 – Estimated Average Application Preparation Time for IFTA Credentials - Motor Carrier Interview Responses

Base State	Estimated Average Application Preparation Time		
	Initial	Supplement	Renewal
Illinois	ND	ND	1 week
Kansas	ND	ND	5 minutes to 8 hours
Minnesota	30 minutes to 2 hours	5 to 30 minutes	1 to 4 hours
Missouri	ND	5 to 10 minutes	3 hours
Nebraska	ND	1 to 10 minutes	30 minutes
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND
Multiple	2 hours	5 minutes	15 minutes
Overall Range	**30 minutes to 2 hours**	**1 to 30 minutes**	**5 minutes to 1 week**
ND = Not Determined			

All respondent estimates were fairly consistent, with the exception of the Illinois carrier's estimate for renewal. This answer most likely reflects the elapsed time from start of application preparation to completion, rather than actual work time, particularly since this is a medium-sized carrier with moderate to high automation.

The table in Exhibit 4-23 contains carrier respondents' estimates for application preparation time for SSRS credentials. A review of this data reveals a rather surprisingly large range for the SSRS renewal application preparation–from a low of 15 minutes to a high of 1 month. One reason for this range is likely due to one

carrier in Missouri, with a particularly large fleet based in multiple states outside the state, that indicated a very low overall level of automation.

Exhibit 4-23 – Estimated Average Application Preparation Time for SSRS Credentials - Motor Carrier Interview Responses

Base State	Estimated Average Application Preparation Time		
	Initial	Supplement	Renewal
Illinois	ND	ND	1 week
Kansas	ND	ND	30 minutes
Minnesota	ND	10 to 60 minutes	6 to 40 hours
Missouri	ND	10 to 90 minutes	1 month
Nebraska	ND	5 to 25 minutes	8 hours
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND
Multiple	2 hours	5 minutes	15 minutes
Overall Range	**2 hours**	**5 to 90 minutes**	**15 minutes to 1 month**
ND = Not Determined			

Carrier estimates regarding OS/OW application preparation times are provided in the table in Exhibit 4-24.

Exhibit 4-24 – Estimated Average Application Preparation Time for OS/OW Permits - Motor Carrier Interview Responses

Base State	Estimated Average Application Preparation Time	
	Single Trip	Multi-Trip
Illinois	ND	ND
Kansas	ND	ND
Minnesota	5 to 10 minutes	5 to 10 minutes
Missouri	2 minutes to 1 week	2 minutes to 1 week
Nebraska	5 to 30 minutes	5 to 30 minutes
South Dakota	ND	ND
Wisconsin	5 to 10 minutes	5 to 10 minutes
Multiple	ND	ND
Overall Range	**2 minutes to 1 week**	**2 minutes to 1 week**
ND = Not Determined		

The lower end of the time range describes the amount of time needed to provide state permitting agents with the necessary information over the telephone, less the time spent on hold. The upper end of the range is consistent with faxed permit requests. All the participating states accept telephone applications from at least a portion of the carrier population that is based in their state, or that routinely travel within it.

State Agencies – Post-MEOSS Implementation:
This objective does not apply to state agency processes.

Motor Carriers – Post-MEOSS Implementation:
As with the state agency users, far too few applications were completed and processed to allow for a meaningful assessment of application preparation time. Nonetheless, carrier interview responses do offer some useful insights into the likelihood a system like MEOSS would offer time savings.

Carrier interviewees expressed cautious optimism regarding time savings due to electronic one-stop shopping. While actual savings were only realized in a couple of instances, most felt one-stop shopping held significant promise. In fact, most carrier representatives felt its implementation, in some form, was inevitable–an opinion shared with state agency representatives. This was particularly true for the more technologically advanced carriers. The consensus for MEOSS, however, was that until some method is derived to extract information from carrier legacy systems, that its value would be limited. In fact, many of the participating carrier representatives felt the MEOSS system would take longer to use for application preparation until the system's database became populated with all fleet information. The lack of familiarity with the operation of the system was a significant contributor to this perception, since most expressed discomfort over the data input process.

Because the amount of interaction required to correct incomplete or erroneous application information also represents an administrative burden on carriers, the results offered under Objective 1.1 also apply here. As was stated earlier, the ability of the MEOSS system to reduce the rate at which incomplete or incorrect applications are submitted was not able to be determined due to lack of system use. Nonetheless, carrier users perceived that the incorporation of an error checking capability in the software had the potential to reduce this rate.

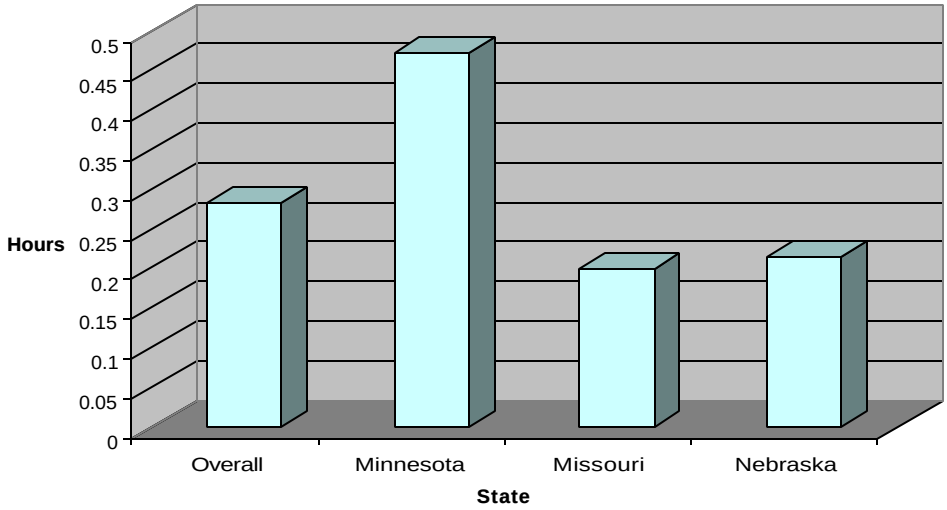
Objective	Result
1.4 Assess carrier productivity improvements due to the use of MEOSS	Insufficient Data

Objective 1.5: Assess State Agency Productivity Improvements Due to the Use of MEOSS

State Agencies – Baseline:
In order to develop a perspective regarding the potential of the MEOSS system to reduce the labor and time required for state agency representatives to review applications, two sources of data were used. Once again, data from tracking sheets were extracted, and agency representatives were asked to offer estimates for the completion of these tasks under current processes.

The graph in Exhibit 4-25 shows the composite average review time, in hours, for IRP supplements for all tracking sheets received, and the individual states of Minnesota, Missouri, and Nebraska.

Exhibit 4-25 – Credential Application Review Time – Tracking Sheet Data for IRP Supplements



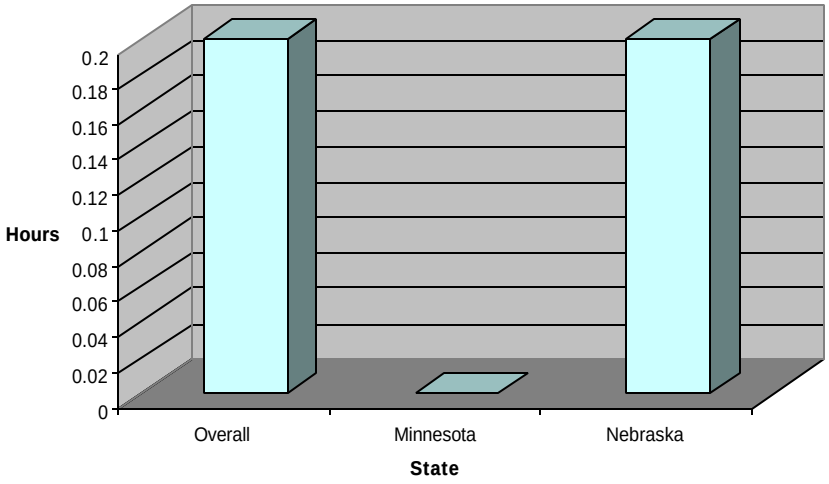
Based on this data, the most obvious observation is the contrast between the overall average cycle time for IRP supplements discussed earlier, and the consistency between review times of the three states. More specifically, the earlier data suggested that Minnesota carriers can get their applications processed more quickly, while this data clearly suggests the overall cycle time is less a function of the actual review process than some might think. This data serves to highlight once again the impact that processing delay has on cycle time. Overall average review time for IRP supplements ranged from 10 to 25 minutes.

The graph in Exhibit 4-26 shows the composite average review time, in hours, for IRP temporary credentials for all tracking sheets received, and the individual states of Minnesota and Nebraska.

The average review time in Nebraska was approximately 11 minutes, a reflection of the simple nature of IRP temporary credential processing. The data depicted for

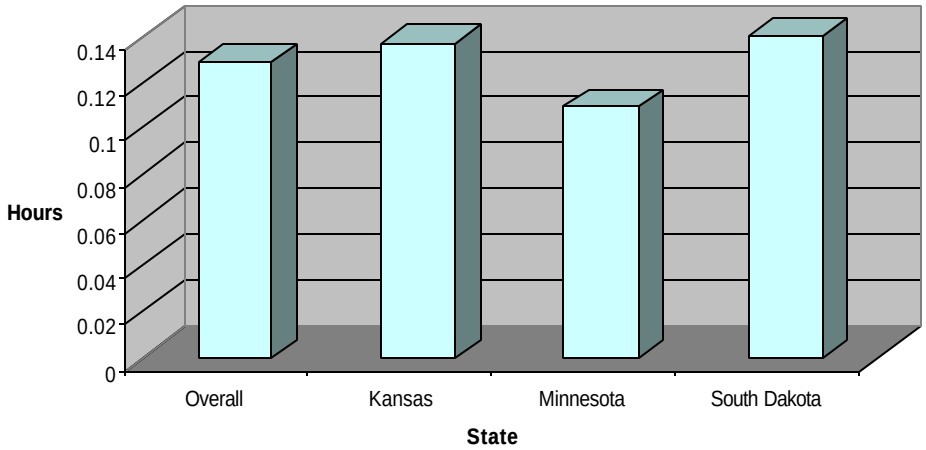
Minnesota actually reflects a review time of 0 minutes because the tracking sheet contained no entry for review.

Exhibit 4-26 – Credential Application Review Time – Tracking Sheet Data for IRP Temporary Credentials



Finally, a look at the average time required to review single trip OS/OW permit applications reveals consistent averages across the states of Kansas, Minnesota and South Dakota. Figure 4-27 illustrates that each completed the review process in an average time of between 6 and 8 minutes.

Exhibit 4-27 – Credential Application Review Time – Tracking Sheet Data for OS/OW Single Trip Permits



As discussed previously, state agency representatives were also asked for estimates regarding the amount of time required to complete the application review process. What follow are tabular summaries of their responses.

The table in Exhibit 4-28 contains responses regarding the estimated amount of time required to review IRP credential applications.

Based on the information presented here, it is clear that renewals and initials require the most time to review of the IRP transactions, and temporaries, trip permits, and supplements are completed most quickly. The large spread indicated for initials and supplements, according to respondents, is due to the size of the carrier.

Exhibit 4-28 – Estimated Average Review Time for IRP – State Agency Interview Responses

State	Estimated Average Application Review Time				
	Initial	Supplement	Temporary	Trip Permit	Renewal
Illinois	ND	10 to 15 minutes	10 to 15 minutes	10 to 15 minutes	ND
Kansas	ND	3 to 5 minutes	3 to 5 minutes	3 to 5 minutes	ND
Minnesota	ND	10 minutes	10 minutes	10 minutes	ND
Missouri	5 minutes to 3 days	10 minutes	ND	10-15 minutes	5 minutes to 3 days
Nebraska	60 to 90 minutes	10 minutes to 4 hours	ND	ND	5 minutes to 10 days
South Dakota	ND	15 minutes	15 minutes	15 minutes	ND
Wisconsin	ND	ND	ND	ND	ND
Overall Range	**5 minutes to 3 days**	**3 minutes to 4 hours**	**3 to 15 minutes**	**3 to 15 minutes**	**5 minutes to 10 days**
ND = Not Determined					

The table in Exhibit 4-29 shows the responses received from those agencies responsible for administering all or part of the applications for IFTA credentials. Most noticeable is how very quickly all IFTA requests are processed. It should be noted here that, according to agency representatives, very few carriers actually need to submit applications for supplements, since most opt to order extra decals during the renewal period.

Exhibit 4-29 – Estimated Average Review Time for IFTA– State Agency Interview Responses

State	Estimated Average Application Review Time		
	Initial	Supplement	Renewal
Illinois	10 minutes	ND	10 minutes
Kansas	ND	ND	ND
Minnesota	2 minutes	ND	2 minutes
Missouri	5 minutes	5 minutes	5 minutes
Nebraska	45 minutes	ND	5 minutes
South Dakota	ND	ND	ND
Wisconsin	ND	ND	ND

Overall Range	**2 to 45 minutes**	**5 minutes**	**2 to 10 minutes**
			ND = Not Determined

The table in Exhibit 4-30 contains agency representatives' estimates of the time needed to review SSRS applications. The very brief review times estimated by all respondents reflect the relative simplicity of the SSRS application review process. In addition, several of the agencies had incorporated at least some small degree of automation, which served to compress the estimates in those states.

Exhibit 4-30 – Estimated Average Review Time for SSRS – State Agency Interview Responses

State	Estimated Average Application Review Time		
	Initial	Supplement	Renewal
Illinois	5 minutes	5 minutes	5 minutes
Kansas	ND	ND	ND
Minnesota	10 minutes	10 minutes	10 minutes
Missouri	1 hour	15 minutes	20 to 30 minutes
Nebraska	1 hour	15 to 20 minutes	15 to 20 minutes
South Dakota	5 to 10 minutes	3 to 4 minutes	3 to 4 minutes
Wisconsin	ND	ND	ND
Overall Range	**5 minutes to 1 hour**	**3 to 20 minutes**	**3 to 30 minutes**
			ND = Not Determined

The table in Exhibit 4-31 shows the responses received from those agencies responsible for administering all or part of the applications for OS/OW credentials. As depicted in the table, the actual review time for standard OS/OW permits is quite short. In fact, in those states that accept applications over the telephone, the review is actually completed during the data entry process. This is not the case with super loads, or with shipments that reach dimensions for which bridge analysis must be performed.

Note that once again the responses for single-trip and multi-trip state agency review times are identical. This is because the respondents indicated that the review process is the same for each

Again, the accuracy of the interview responses was assessed by comparing them, where possible, to the cycle time figures obtained from the tracking sheets. The data from the two sources are compared in the table in Exhibit 4-32. The findings show that, in most cases, interviewees once again gave reasonably accurate estimates of review time in their responses.

What is most interesting is the relatively small percentage of the total cycle time is actually due to the review process. In fact, a review of the component times for each of the credential cycles reveals that the overwhelming majority of the time that elapses between the submission of an application and the delivery of the requested credential is the result of delays. These delays stem mostly from the method chosen to deliver the application and credential, the time between when an application arrives at the state agency and begins being processed, and the payment cycle, from invoice to delivery.

Exhibit 4-31 – Estimated Average Review Time for OS/OW – State Agency Interview Responses

State	Estimated Average Application Review Time	
	Single Trip	Multi-Trip
Illinois	3 to 4 minutes; fax and super loads 5 to 10 minutes	3 to 4 minutes; fax and super loads 5 to 10 minutes
Kansas	1 minute to 8 hours; super loads up to 2 weeks	1 minute to 8 hours; super loads up to 2 weeks
Minnesota	1 minute	1 minute
Missouri	5 to 15 minutes	5 to 15 minutes
Nebraska	1 to 2 minutes; super loads 5 hours	1 to 2 minutes; super loads 5 hours
South Dakota	No more than 15 minutes (w/o bridge analysis)	No more than 15 minutes (w/o bridge analysis)
Wisconsin	3 minutes; fax and super loads 15 to 90 minutes	3 minutes; fax and super loads 15 to 90 minutes
Overall Range	**1 minute to 8 hours; super loads 5 minutes to 2 weeks**	**1 minute to 8 hours; super loads 5 minutes to 2 weeks**
ND = Not Determined		

Exhibit 4-32 – Comparison of Tracking Sheet and Interview Data – State Agency Responses

State	Comparative State Agency Application Review Times					
	Tracking Sheets	Interview	Tracking Sheets	Interview	Tracking Sheets	Interview
	IRP Supplement		IRP Temporary		OS/OW Single Trip	
Kansas	N/A	N/A	N/A	N/A	8 minutes	1 minute to 8 hours; super loads up to 2 weeks
Minnesota	25 minutes	10 minutes	N/A	N/A	6 minutes	1 minute
Missouri	10 minutes	10 minutes	N/A	N/A	N/A	N/A

Nebraska	12 minutes	10 minutes to 4 hours	N/A	N/A	N/A	N/A
South Dakota	N/A	N/A	N/A	N/A	8 minutes	No more than 15 minutes

Motor Carriers – Baseline:
This objective does not apply to motor carrier processes.

State Agencies – Post-MEOSS Implementation:
The same lack of post-implementation credentialing activity that prevented meaningful assessment of the MEOSS system's ability to improve carrier productivity also precludes substantial analysis of the state agency productivity effects. However, based on the ability of the MEOSS system to facilitate immediate transmission of application data, it would be logical that certain portions of the credential cycle for some credentials could be measurably reduced.

The fact remains, however, that, because the actual review process is not changed by the MEOSS system, the length of that process would not likely be reduced, except in those instances where the system's error checking capacity would prevent the transmittal of incorrect or incomplete applications. A reexamination of the data in Exhibit 4-2 indicates there are certain credentials for which this could result in significant benefit to state productivity. Unfortunately, because so few transactions were attempted with MEOSS, this feature, and its impacts, could not be empirically evaluated.

Objective	Result
1.5 Assess state agency productivity improvements due to the use of MEOSS	Insufficient Data

User Acceptance

As discussed earlier, the purpose of the user acceptance assessment is to evaluate the extent to which the MEOSS system satisfied the requirements and suited the preference of its users. Specifically, it refers to the degree to which the levels of functionality, utility and value provided are acceptable to users. Three objectives were established to address this goal:

- Ease of use of MEOSS as compared to the present system
- Motor carrier acceptance of MEOSS
- State agency acceptance of MEOSS

The findings for each objective are presented here.

Objective 2.1: Assess Ease of Use MEOSS as Compared to the Present System

To address this objective, motor carrier and state agency personnel were asked to complete surveys and submit to interview questions regarding current systems and the MEOSS system. In this manner, a comparative analysis would be facilitated.

State Agency – Baseline:
Prior to the implementation of the MEOSS system, surveys were distributed to the state agencies participating in the FOT. These surveys asked agency representatives to rate their current methods and systems for completing application review and credential processing. A total of ten scaled response statements were provided, against which the respondents were asked to rate their current systems. Four of these statements dealt with ease of use:

Q1. I find it *convenient* to process credentials using the current procedures
Q2. It is *easy* to process credentials using the current procedures
Q3. The current system for processing credentials allows me to carry out my job *properly*
Q4. The current system for processing credentials allows me to process credentials *quickly*

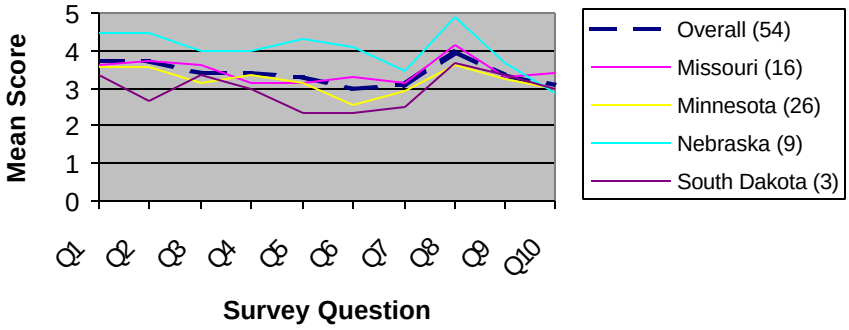
The available responses were:

1. Disagree Strongly
2. Disagree Somewhat
3. Neutral
4. Agree Somewhat
5. Agree Strongly

The agency responses were aggregated by credential type (IRP, IFTA, SSRS, and OS/OW), and the results are presented here in graphical format. What is important to remember here is that once again, the number of responses for each credential type were relatively small, and do not represent a sample either large enough or well-distributed enough to be considered statistically valid. Nonetheless, they do offer insight into the feelings agency representatives have regarding their current processes and systems.

The figure in Exhibit 4-33 shows the responses received for all 10 scaled response questions from the state agency respondents for IRP. As the figure shows, a total of 54 responses were received from Missouri, Minnesota, Nebraska, and South Dakota.

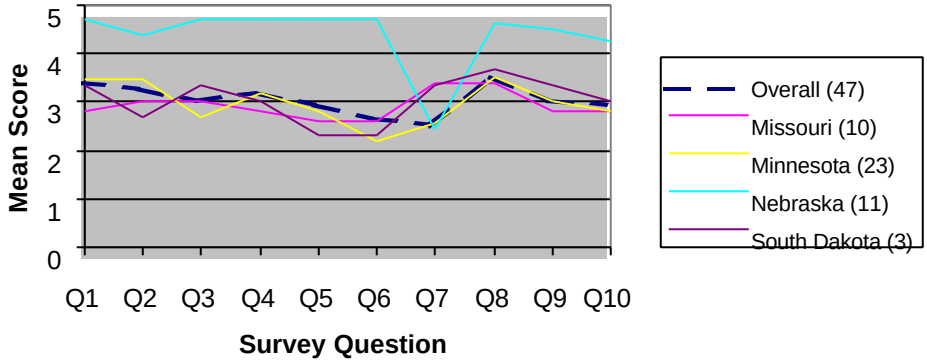
Exhibit 4-33 – State Agency Survey Responses – Baseline IRP Ease of Use



Looking at the scores provided for questions 1 through 4 indicates agency users are fairly satisfied with their current systems and processes, with the respondents from South Dakota being the only ones to offer disagreement.

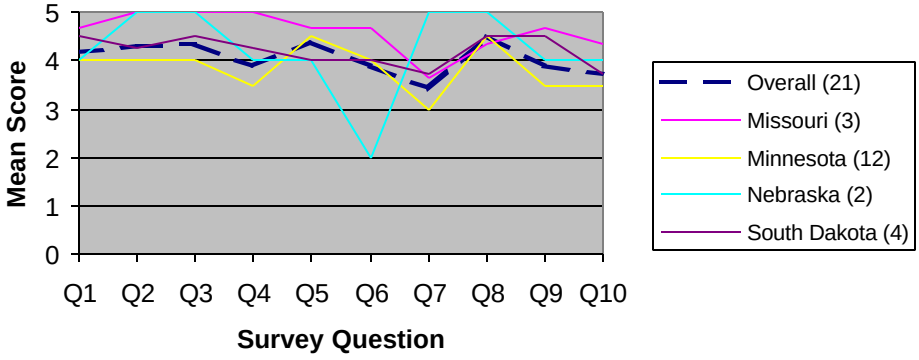
The chart in Exhibit 4-34 illustrates the responses from those representatives that process IFTA transactions. These 47 responses show that most are relatively neutral about current IFTA processing systems and procedures. Only Nebraska respondents agreed strongly that current processing was convenient and easy.

Exhibit 4-34 – State Agency Survey Responses – Baseline IFTA Ease of Use



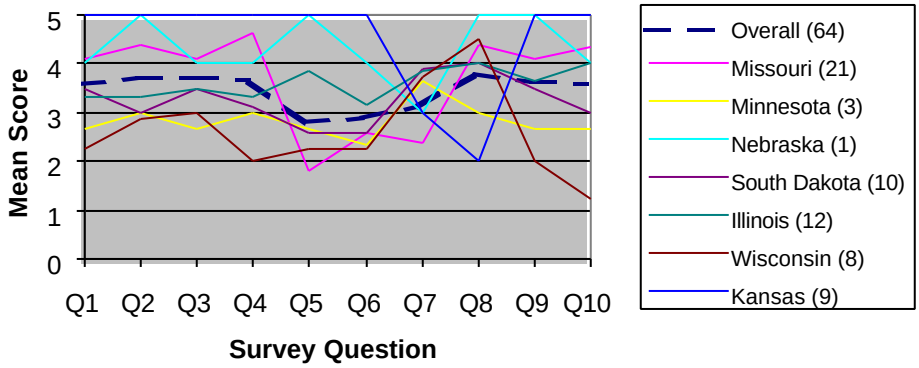
The figure in Exhibit 4-35 represents the responses received from SSRS credentialing personnel. The chart shows that, in general, SSRS personnel are very satisfied with the ease of use of current systems. This finding is consistent with comments received regarding the relative simplicity of the SSRS credentialing process.

Exhibit 4-35 – State Agency Survey Responses – Baseline SSRS Ease of Use



Finally, the state agency ease of use responses for current OS/OW permitting systems and processes are depicted graphically in Exhibit 4-36. Unlike the other credential types, responses were obtained from each of the seven participating states. Also unlike the other types, the variation in responses was substantial. Respondents from Kansas were very positive about current systems, while those from Minnesota and Wisconsin were somewhat negative.

Exhibit 4-36 – State Agency Survey Responses – Baseline OS/OW Ease of Use



To supplement the survey data, state agency representatives were interviewed to gain additional insight into the ease of use of current systems. The table in Exhibit 4-37 contains their responses to the question, "Would you consider the current systems for reviewing and processing credentials easy to complete?"

Exhibit 4-37 – State Agency Interview Responses – Baseline Ease of Use

State	Credential Type			
	IRP	IFTA	SSRS	OS/OW
Illinois	Yes	Yes*	Yes	Yes
Kansas	Yes	Yes	Yes	Yes
Minnesota	Yes*	Yes	Yes	Yes
Missouri	Yes	Yes	Yes*	Yes
Nebraska	Yes*	Yes*	Yes*	Yes*
South Dakota	Yes	Yes	Yes*	Yes
Wisconsin	N/A	N/A	N/A	No

As can be seen from the survey data, nearly all respondents indicated a positive comfort level with current systems and processes. The single outright exception was in Wisconsin. The asterisks (*) in the table denote pensive, or conditional responses. Typically, the respondents were speaking from a position of experience–in other words, they felt it was easy once the credentialing agent became accustomed to it. Based on the demographic data obtained from interviewees, very few had less than 5 years experience in their current position, and more than half had at least 10 years of related experience. Without a numerical rating system for the interviews it is

difficult to perform a direct comparison with survey data, but in general, the responses appear to be relatively consistent.

Motor Carriers – Baseline:
The procedures used to gather baseline data from carrier participants was identical to that used for the state agency effort. A combination of surveys and interviews were utilized to gain insight into the ease of use of current systems. The first four questions on the carrier surveys were identical to those on the agency surveys, and the same response scale was utilized.

The graph in Exhibit 4-38 illustrates the responses obtained from carrier IRP personnel. Carriers are once again grouped according to base state. The data clearly shows respondents were largely neutral, with the exception of those from South Dakota, who rated the current systems and processes as quite difficult.

Exhibit 4-38 – Motor Carrier Survey Responses – Baseline IRP Ease of Use

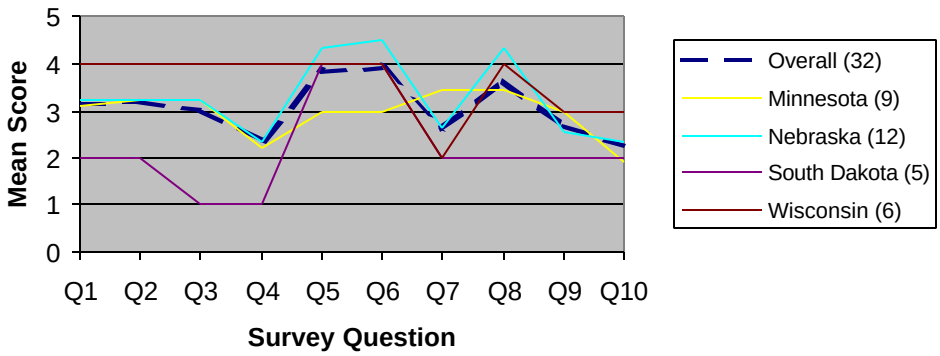
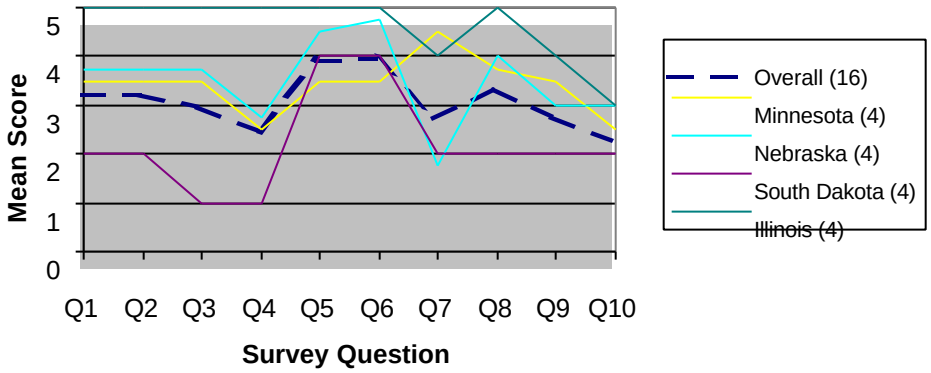


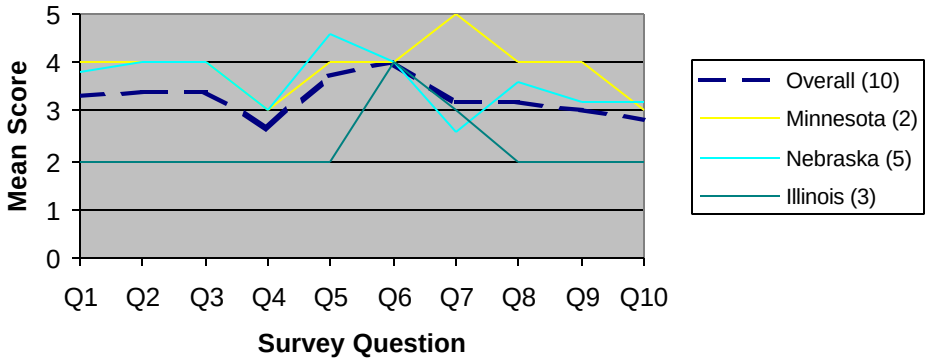
Exhibit 4-39 depicts the responses received from those motor carrier personnel responsible for the completion of IFTA credentialing activities. These show a level of ease of use consistent with, but slightly higher than, the IRP responses for every state except South Dakota.

Exhibit 4-39 – Motor Carrier Survey Responses – Baseline IFTA Ease of Use



The carrier ease of use responses regarding current SSRS credentialing processes and systems are illustrated in Exhibit 4-40. Once again, responses reflect user opinions that current processes and systems are relatively easy to use.

Exhibit 4-40 – Motor Carrier Survey Responses – Baseline SSRS Ease of Use



None of the carriers returned baseline surveys regarding the ease of use of OS/OW permit processes and systems.

The table in Exhibit 4-41 provides carrier responses to interview questions regarding current system ease of use. In contrast to the agency responses, and consistent with the survey data, carriers' opinions regarding current system ease of use are slightly less positive.

Exhibit 4-41 – Motor Carrier Interview Responses – Baseline Ease of Use by Base State

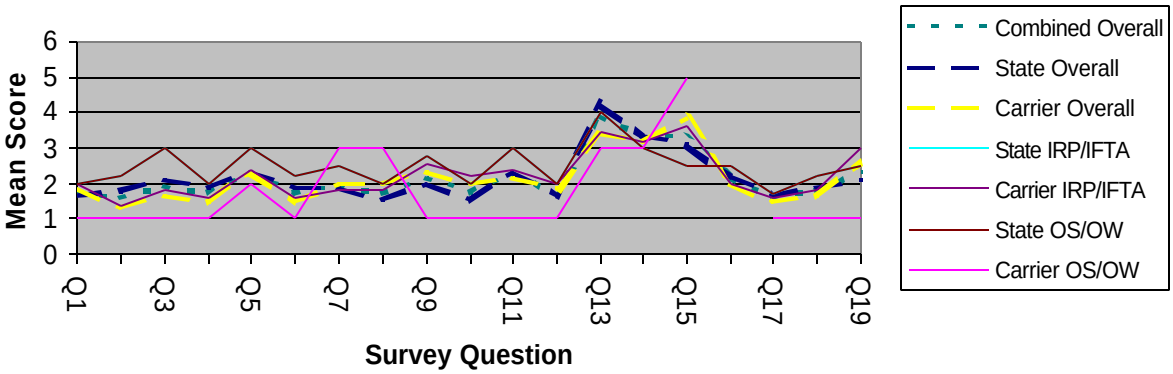
Base State	Credential Type			
	IRP	IFTA	SSRS	OS/OW
Illinois	No	No	Yes	N/A
Kansas	Yes*	Yes	N/A	N/A
Minnesota	Yes	Yes, No	Yes	Yes
Missouri	Yes, No	Yes	Yes*	Yes
Nebraska	Yes	Yes*	N/A	N/A
South Dakota	N/A	N/A	N/A	N/A
Wisconsin	N/A	N/A	N/A	Yes*
Multiple	Yes*	N/A	N/A	N/A

Carrier responses in Minnesota for IFTA, and Missouri for IRP were divided. Some felt current processes were easy, while others did not. However, as a group, most felt the processes and requirements could and should be simplified, but offered little in the way of suggestions regarding how it could be done. All felt some sort of electronic system that allowed their computers to talk to agency computers to transfer fleet information had significant potential. As a result, all were receptive to the one-stop concept.

State Agency – Post-MEOSS Implementation:
As with the baseline data collection, state agency representatives were asked to complete surveys and subject to interviews once they had the opportunity to use the MEOSS system. Of course, since the system was used so little, respondents were only able to offer impressions based on those few experiences they had either attempting to complete transactions, or informally examining the functional capabilities of the system.

A total of only 15 post implementation surveys were returned by all agency and carrier representatives, combined. Hence, all of the responses were combined on a single graph, which is shown in Exhibit 4-42.

Exhibit 4-42 – Post-MEOSS Implementation Survey Data – State Agencies and Motor Carriers



The same four statements and rating scale were used to assess the MEOSS system ease of use, plus four comparative statements were asked. These statements are numbered 1 through 8 in the post-implementation survey, and are provided here:

Q1. I find it *convenient* to process credentials using One-Stop
Q2. It is *more convenient* to process credentials with One-Stop than with my usual method
Q3. It is *easy* to process credentials using One-Stop
Q4. It was *easier* to process credentials using One-Stop than with my usual method
Q5. One-Stop allows me to carry out my job *properly*
Q6. One Stop allows me to carry out my job *better* than my usual method
Q7. One-Stop allows me to process credentials *quickly*
Q8. One-Stop allows me to process credentials *more quickly* than my usual method

As can be seen in the figure, user responses for MEOSS were predominantly slightly negative, with MEOSS scoring lower on a comparative basis. They are also slightly

lower than the baseline data. While caution must be exercised in drawing conclusions from these findings, in combination with interview responses, significant insight can be gained into the ability of a system like MEOSS to meet the ease of use demands of its potential users.

Interview responses from state agency representatives were consistent with the survey data. In general, those experienced with Windows-based PCs users found it relatively easy to understand and use, but slightly more difficult than current systems. Those without such experience rated it more difficult than did the others. A number of users indicated their difficulty stemmed from the fact that the data entry process was unfamiliar, and that with repeated use, their comfort and proficiency should increase.

Motor Carriers – Post-MEOSS Implementation:
A repeat look at the survey data in Exhibit 4-41 shows that carrier responses were similar to those from agency representatives. Interestingly, fewer interviewees felt comfortable offering responses. Once again, those users with more computer experience were more comfortable with MEOSS, but overall, the responses were negative. Based on the responses offered, it appeared that some of the issues users voiced were due at least in part to problems getting the system up and running.

However, the majority of complaints had to do with the process by which data was entered into the system. The primary problem stemmed from the fact that the MEOSS system often required them to enter data in a manner or order different than that to which they were accustomed. There were also instances where the system didn't allow them to enter the required data in a format specified as required by law. One particular instance dealt with the entry of axle weights in over-dimensional permit applications.

Objective	Result
2.1 Assess Ease of Use of MEOSS as Compared to the Present system	State Agency and Motor Carrier personnel considered the MEOSS system to be slightly less easy to use than current systems. However, user responses indicate that a lack of familiarity with the system, and difficulties encountered setting it up contributed to these ratings.

Objective 2.2: Assess Motor Carrier Acceptance of MEOSS

Two measures were established to assess motor carrier acceptance of the MEOSS system. The first was the preferences of users regarding which system they would like to use. The second was user responses regarding the benefits that a system like MEOSS offers.

Motor Carriers – Baseline:
The establishment of a preference does not require the gathering of baseline data, and hence, none was obtained. Instead, users were simply asked for their preference during the post-implementation data collection effort.

Motor Carriers – Post-MEOSS Implementation:
User preferences and perceived benefits were obtained using the same user surveys and interviews discussed earlier. Seven survey statements were presented to users, for which scaled responses were requested:

- Q2. It is more convenient to apply for and receive credentials with One-Stop than with my usual method
- Q4. It was easier to apply for and receive credentials with One-Stop than with my usual method
- Q6. One-Stop enables me to carry out my job better than my usual method
- Q8. One-Stop allows me to apply for and receive credentials more quickly than my usual method
- Q13. Using One-Stop, I often need to contact the state agency to clarify questions regarding credential applications
- Q16. I was satisfied with the One-Stop procedures used for applying for and receiving credentials
- Q17. I was more satisfied with the One-Stop procedures used for applying for and receiving credentials than with my usual method
- Q18. I wish to continue applying for and receiving credentials using One-Stop

These carrier responses to these statements appear in Exhibit 4-42, as Q2, Q4, Q6, Q8, Q13, and Q16 through Q18. As the figure shows, carrier respondents consistently disagreed with these statements, with the exception of Q13, for which a higher numeric value actually indicated a negative rating, and the OS/OW function, for which the response was neutral (no carrier response was obtained for Q16).

Responses gained during interviews with carrier personnel were consistent with those obtained from surveys. Interviewees consistently rated the MEOSS system as slightly more difficult to use, and as a result, less acceptable than current methods. Specifically, all felt that MEOSS, in its current form, was not acceptable, and that they would prefer to continue to use their current systems and processes. However, all also agreed that the one-stop concept holds significant promise, and that if MEOSS were to be modified to more closely reflect and address the specific needs of their organization, they would support its adoption and use.

When asked about the benefits to be gained from the use of the MEOSS system, carrier interviewees were reluctant to offer any specific benefits, since none felt any were apparent during the FOT. Nonetheless, most were confident that a fully

functional system would be of benefit. The most cited potential benefits were the reduction in overall cycle time, and the reduction in the amount of time and labor necessary to complete applications that would come about if the system were able to extract information from existing company databases. Reduced paperwork was also an often-cited potential benefit.

The most cited shortcomings of the MEOSS system stemmed from the actual software design and user interface. A number of carrier respondents complained that the data entry process was cumbersome, and that one had to navigate through too many screens to enter information, some of which appeared redundant. Another common complaint was that the system was not tolerant of errors in data entry–that backing up through the process was very difficult.

Most carriers were also in agreement that the level of interaction required to process a credential using MEOSS was not significantly different than with current systems. This was most likely due to the fact that any reductions in interaction stemming from more complete and accurate applications were negated by system technical difficulties.

Objective	Result
2.2 Assess Motor Carrier Acceptance of MEOSS	Motor Carrier personnel preferred to continue to use their current systems rather than MEOSS in its current form. However, they indicated a continued desire to use one-stop shopping, citing potential benefits to their operations as a reason.

Objective 2.3: Assess State Agency Acceptance of MEOSS

Two measures were established to assess state agency acceptance of the MEOSS system. The first was the preferences of users regarding which system they would like to use. The second was user responses regarding the benefits that a system like MEOSS offers.

State Agencies – Baseline:
The establishment of a preference does not require the gathering of baseline data, and hence, none was obtained. Instead, users were simply asked for their preference during the post-implementation data collection effort.

State Agencies – Post-MEOSS Implementation:
User preferences and perceived benefits were obtained using the same user surveys and interviews discussed earlier. Seven survey statements were presented to users, for which scaled responses were requested:

Q2. It is more convenient to process credentials with One-Stop than with my usual method
Q4. It was easier to process credentials with One-Stop than with my usual method
Q6. One-Stop enables me to carry out my job better than my usual method
Q8. One-Stop allows me to process credentials more quickly than my usual method
Q13. Using One-Stop, I often need to contact the motor carriers to clarify questions regarding credential applications
Q16. I was satisfied with the One-Stop procedures used for processing credentials
Q17. I was more satisfied with the One-Stop procedures used for processing credentials than with my usual method
Q18. I wish to continue processing credentials using One-Stop

These agency responses to these statements appear in Exhibit 4-42, as Q2, Q4, Q6, Q8, Q13, and Q16 through Q18. As the figure shows, agency respondents, like the carrier representatives, consistently disagreed with these statements, and negatively rated Q13.

Responses gained during interviews with agency personnel were consistent with those obtained from surveys, and nearly identical to those obtained from carriers. MEOSS was again consistently rated as slightly more difficult to use, and as a result, less acceptable than current methods. All felt that MEOSS, in its current form, was not acceptable, and that they would prefer to continue to use their current systems and processes. Again consistent with carrier responses, all also agreed that the one-stop concept holds significant promise, and that if MEOSS were to be modified to more closely reflect and address the specific needs of their organization, they would support its adoption and use.

When asked about the benefits to be gained from the use of the MEOSS system, agency interviewees were quick to point out that carriers stood to benefit more than agencies. Some felt that a fully functional system might result in some efficiency gains, and that electronic exchange of information would reduce paperwork and information storage demands. More importantly, several felt that the application of automation to current processes would result in limited benefit. They indicated that current systems were designed with current processes in mind, and that MEOSS did not represent a significant improvement. In fact, they indicated that it appeared that it was actually designed independently, since they felt users weren't consulted during the design process.

The most cited shortcomings of the MEOSS system were the fact that it didn't work as intended, it was unable to interface with current systems, and it took longer to process credentials than with current systems. Few actually complained about the

software design and user interface–it usually came down to an issue of whether the necessary tasks could be accomplished. Interestingly, agency interviewees expressed reservations about the very thing that was most cited as a system need–the ability to interface with existing systems. Some indicated concern about the corruption of existing databases due to the use of MEOSS, though no specific occurrences precipitated this conclusion.

Objective	Result
2.3 Assess State Agency Acceptance of MEOSS	State Agency personnel preferred to continue to use their current systems rather than MEOSS in its current form. However, they indicated a continued desire to use one-stop shopping, citing carrier demand for such a system as a driving factor.

System Deployability

To repeat what was stated earlier, the goal of this portion of the evaluation was to assess the degree to which the MEOSS system provided a viable platform for full deployment of a multi-state electronic one-stop credential system. As part of that assessment, it was also necessary to estimate the capital and operating costs carriers and state agencies can expect to incur in accessing and using such a system. Ten objectives were selected to address this goal:

- Determine the minimum configuration requirements for carrier access to and use of MEOSS
- Determine the minimum configuration requirements for state agency access to and use of MEOSS
- Estimate the capital costs for carrier access to and use of MEOSS on a deployed basis
- Estimate the operating costs for carrier access to and use of MEOSS on a deployed basis
- Estimate the capital costs for state agency access to and use of MEOSS on a deployed basis
- Estimate the operating costs for state agency access to and use of MEOSS on a deployed basis
- Document the motor carrier and state agency training efforts during the test
- Assess motor carrier position on deployment of MEOSS
- Assess state agency position on deployment of MEOSS

The motor carrier and state agency MEOSS software applications were developed using the same development package, and were designed to operate on the same

hardware. Because the state and carrier applications had to work together, it is logical that they would resemble each other. As a result, most of the requirements were the same for both systems. For the purposes of clarity, brevity, and cohesiveness of results, those objectives for which carrier and agency results are identical are addressed together.

Objectives 3.1 and 3.2: Determine the minimum configuration requirements for carrier and *state agency access to and use of MEOSS*

Motor Carriers / State Agencies – Baseline:
The collection of baseline data was not necessary to address this objective.

Motor Carriers / State Agencies – Post-MEOSS Implementation:
The data necessary for this objective was drawn from system design requirements defined by the system developer. The MEOSS software was designed to operate on a PC, running in a Windows NT or Windows 95 environment. As is typical with software applications for PCs, system requirements are determined based on the anticipated computational demand, the connectivity requirements with peripheral devices, and estimates regarding the minimum acceptable performance demands of the intended users. With these requirements in mind, RS Information Systems identified the minimum system configuration requirements.

These requirements are provided in the table in Exhibit 4-43. It should be noted that the ability of the system to meet the performance requirements of its intended users is addressed later in this report.

Exhibit 4-43 – Minimum Carrier and Sate Agency Configuration Requirements for MEOSS

Item	Specifications
Personal Computer	• 586 / 75 MHz or greater processor • 16 MB RAM
Operating System	Windows NT or Windows 95
Communications	14.4 KBPS modem

All indications were that PCs that met these requirements were sufficient to accomplish the basic functions necessary to use MEOSS

Objective	Result
3.1 and 3.2 Determine the minimum configuration requirements for carrier and	PC with 586 / 75 processor, 16 MB RAM, Windows NT or 95, 14.4 KBPS modem

state agency access to and use of MEOSS	

Objective 3.3 and 3.5: Estimate the Capital Costs for Carrier and *State Agency Access to and Use of MEOSS on a Deployed Basis*

Motor Carriers / State Agencies – Baseline:
The collection of baseline data was not necessary to address this objective.

Motor Carriers / State Agencies – Post-MEOSS Implementation:
The estimation of capital costs was accomplished through the combination of the capture of costs associated with carrier and state agency participation in the MEOSS FOT, and the estimation of costs of activities associated with getting it up and running. Specifically, costs were to be estimated for hardware, training, software and enrollment for the use of the system.

Hardware costs were easiest to estimate. Based on the functional requirements identified by the software developer, total system costs were estimated to be less than $1,000 per installation. This includes the PC, a modem, and an inkjet printer. At this writing, it has actually become increasingly difficult to find a computer with a processor speed less than 166 MHz. A number of carriers and state agencies had to install a separate phone line for the system. The typical cost for this was less than $50.

Because of its prototype nature, the software cost is much more difficult to estimate. In fact, software developer representatives were reluctant to offer price projections. Presuming the bulk of the development costs would be covered under the FOT budget, it would probably be safe to assume that a single license software package would range between $200 and $500.

Training costs are probably best estimated based on the training offered during the FOT. That training basically consisted of a day-long, hands-on, interactive session led by software development personnel. Provided this is sufficient to allow for personnel to develop enough proficiency to operate the system, the internal training costs would then simply be the sum of the number of hours of training, multiplied by the average labor rate of the staff in attendance. However, the findings discussed later in this report indicate that this amount of training might be insufficient. Of course, the cost for providing someone to conduct the training must be added to this cost. Estimates for these external training costs were not made.

Based on the system configuration demonstrated during the FOT, enrollment costs may well be non-existent.

Objective	Result
3.3 and 3.5 Estimate the capital costs for carrier and state agency access to and usage of MEOSS on a deployed basis	• System cost <$1000 • Software cost = $200 - $500 • Training – Internal = Staff hours X Staff hourly rate; External = Insufficient data • Enrollment = $0

Objective 3.4 and 3.6: Estimate the Operating Costs for Carrier and *State Agency Access to and Use of MEOSS on a Deployed Basis*

Motor Carriers / State Agencies – Baseline:
The collection of baseline data was not necessary to address this objective.

Motor Carriers / State Agencies – Post-MEOSS Implementation:
Because the system was designed to allow for direct transmission of data from carrier to agency PC and back, it is anticipated that operating costs are likely to be limited to long distance telephone charges for data transmission, and perhaps transaction costs for electronic funds transfers. This result assumes that the introduction of one or two additional PCs will not result in a significant increase in system administration and maintenance costs.

Objective	Result
3.4 and 3.6 Estimate the operating costs for carrier and state agency access to and usage of MEOSS on a deployed basis	• Long Distance charges = Minimal • EFT fees = Insufficient data

Objective 3.7: Document Motor Carrier and State Agency Training Efforts during the Test

Evaluator personnel attended a number of training sessions at locations spread through the partner states to gather information to address this objective.

Motor Carriers / State Agencies – Baseline
The capture of baseline data was not necessary for this objective.

Motor Carriers / State Agencies – Post-MEOSS Implementation:
As briefly discussed earlier, a one-day, hands-on, interactive training session was conducted in each FOT state, to which all participating agencies and carriers were invited to send representatives. During the sessions, participants were provided an overview of the system functionality and features, and were walked through the completion and submittal of an application, and the review and approval of the

same application. Ordinarily, time constraints only permitted the completion of one type of transaction (e.g., IRP, IFTA, SSRS, and OS/OW), and this was usually chosen in accordance with the desires of the majority of the attendees.

Representatives from RSIS conducted the sessions, and allowed attendees to interrupt to ask questions as the need arose. A structured instruction guide was followed to ensure that each of the necessary topics was addressed, and the attendees were provided user manuals to use once they returned to their offices. The classroom was set up to allow for small groups of users, usually 2 to 3 to a group, to have access to a PCs equipped with the MEOSS software. Carrier and agency representatives were instructed regarding the entry, review, and validation of data, and were encouraged to exercise the system.

Objective	Result
3.7 Document the motor carrier and state agency training efforts during the test	• System Overview • Step-by-step instruction • Hands-on experience • User Manuals

Objective 3.8: Estimate Motor Carrier and State Agency Training Requirements for Deployment

This objective was identified as a means to assess the ability of the training conducted during the FOT to meet the needs of users under deployment conditions. To address this objective, carrier and state agency users were presented with questions on the aforementioned surveys, and were asked additional questions during the interview process.

State Agencies – Baseline:
During baseline data collection, agency and carrier personnel were asked to respond to the following survey statement by providing a scaled response. "I was adequately trained to process credentials using the current approach. Agency representatives' responses are again illustrated in Exhibits 4-33 through 4-36 as responses to question Q8.

With the exception of OS/OW permitting, agency respondents offered responses that were generally in agreement with the statement. That is, the responses fell between "Agree Somewhat" and "Agree Strongly." Responses regarding OS/OW training varied substantially across the states, with those from Kansas and Minnesota expressing disagreement with the statement.

Baseline training data was not gathered during the interviews.

Motor Carriers – Baseline:
Carrier representatives were presented with a similar survey statement to which they were asked to assign a score. The statement read, "I was adequately trained to apply for and receive credentials using the current approach."

Carrier responses are provided in Exhibits 4-38 through 4-40 as responses to question Q8. As discussed earlier, no baseline survey responses were received for OS/OW. Responses for all three remaining types were generally positive, with the exception of the three responses from Illinois carriers, which indicated moderate disagreement with the statement.

Carrier baseline training was not addressed during the interview process.

State Agencies – Post-MEOSS Implementation:
Survey instruments and user interviews were used to gain insight into the adequacy of the MEOSS system training offered by RSIS. Specifically, users were asked to offer scaled responses to the statement, "I was adequately trained to process credentials using One-Stop."

Agency users' responses are graphically presented in Exhibit 4-42 as responses to question Q15. As can be seen in the figure, responses ranged from neutral to positive, with IRP and IFTA training rated slightly higher than that for OS/OW.

Interview responses indicated a much wider range of training success. In general, those users familiar with Windows-based software applications running on PCs expressed higher levels of satisfaction with the training offered. Those less experienced with PCs tended to feel the training was a bit rushed, and didn't allow sufficient practical, hands-on system use. A number also expressed frustration that the program didn't work properly during some sessions, which detracted from the training. Finally, very few users indicated they referred to the user's manual, and those that did felt it was not adequate for inexperienced PC users.

Motor Carriers – Post-MEOSS Implementation:
The means for gathering carrier perceptions regarding the adequacy of training were identical to that used for state agencies. The survey statement read, "I was adequately trained to apply for and receive credentials using One-Stop."

Once again, carrier responses to the survey statement are provided in Exhibit 4-42 as scaled responses to question Q15. Interestingly, carrier responses were higher overall than state agency responses, with the OS/OW respondents indicating training was quite adequate.

According to interview responses, 11 of the 16 carriers felt the training was at least adequate. Those that didn't, as with the state respondents, indicated it was geared

toward users with at least some PC proficiency. Most agreed, however, that they would benefit from a longer training session with more opportunity to actually use the system.

Objective	Result
3.8 Estimate motor carrier and state agency training requirements for deployment	The training format used during the FOT, lengthened to accommodate the time necessary to allow less proficient and inexperienced PC users to become comfortable with the application, would be sufficient. In addition, better user manuals would be required.

Objectives 3.9 and 3.10: Assess Motor Carrier and *State Agency Position on Deployment of MEOSS*

This objective was addressed by gathering indications regarding whether or not the systems intended users would welcome the deployment of a system like MEOSS.

State Agencies / Motor Carriers - Baseline:
Baseline data collection was conducted in an attempt to better understand whether carrier and agency personnel had an predisposed opinions regarding changing from their current methods. Survey respondents were presented with one statement, to which they were again asked to provide a scaled response regarding their level of agreement: "I wish to continue applying for and receiving *or* processing credentials as I normally do."

State agency responses are graphically depicted as responses to question Q10 in Exhibits 4-33 through 4-36. Carrier responses are shown in Figures 4-38 through 4-40. As shown on the figures, agency representatives were neutral regarding IRP credentials, were in favor of retaining current methods for IFTA and SSRS, and offered widely varying responses regarding OS / OW. In fact, for OS / OW, the two extremes are illustrated, with Illinois strongly agreeing, and Wisconsin strongly disagreeing.

Carrier responses were generally less favorable, with IRP receiving the lowest average responses, and IFTA and SSRS being rated neutrally. Interviews were not used to gather baseline information.

State Agencies / Motor Carriers – Post-MEOSS Implementation:
The post-implementation data collection effort was again two-fold in nature. Surveys were distributed, and interviews were conducted with system users. Survey respondents were again presented with one statement, to which they were asked to provide a scaled response regarding their level of agreement: "I wish to continue applying for and receiving *or* processing credentials using One-Stop."

State agency and carrier responses are depicted together in the graph in Exhibit 4-42 as responses to question Q18. As can be seen in the figure, both agency and carrier respondents were in disagreement with the statement, indicating they were not supportive of the deployment and use of MEOSS.

Interview responses were very much in agreement with the survey findings. None of the interviewees, either agency or carrier, indicated they felt the MEOSS system was ready for deployment. Most cited the technical difficulties experienced during the FOT as the primary reason. They felt it simply was not complete and substantially free from defects to the level necessary to represent a viable product they would use.

Concerns over functional shortcomings extended to the fact that the system was not able to interface directly with carrier and agency legacy systems, did not allow for electronic funds transfer, and would not support current processes.

Many were in agreement that some level of customization would likely be required to make it truly useful. Because the system was designed with the needs of a large group of diverse user organizations, many felt that some of its appeal was lost because it was not able to provide functionality tailored to the specific needs of each user organization. There was also agreement, however, that one-stop shopping remains a viable approach to credentialing, and that a well-designed system that incorporates the needs of its intended users would surely find support for deployment.

Objective	Result
3.9 and 3.10 Assess motor carrier and state agency position on deployment of MEOSS	Agency and carrier personnel felt the MEOSS system as demonstrated in the FOT was not ready for deployment, but that one-stop shopping was still a viable approach that would receive support.

Institutional Issues

The primary purpose for the institutional issues portion of the evaluation is to identify the non-technical issues encountered during the FOT, and provide insight into the potential impact these issues, and whatever solutions were employed during the FOT, may have on the deployment of such a system. Two objectives were established to address this goal:

- Document institutional issues and solutions encountered during the operational test

- Assess potential impacts of institutional issues and solutions on MEOSS deployment

The FOT findings for each objective are presented here.

Objective 4.1: Document Institutional Issues and Solutions Encountered during the Operational Test

To address this objective, all test participants were asked to submit to interview questions regarding the issues they encountered during the test, and solutions that were used to address them. Once again, the responses of all interviewees are combined here, rather than by carriers and agencies. In addition, the nature of this objective renders the collection of baseline data unnecessary.

It is important to note that, because practically none of the states intended to issue real credentials or permits based solely on MEOSS transactions, the number and complexity of institutional issues encountered was probably less than would have been encountered had the transactions been accepted. Nonetheless, several issues were identified. These issues are summarized here:

- EFT – A number of users indicated that being forced to continue to pay for credentials using a method of invoicing and payment by company check ran counter to the concept of electronic one-stop shopping. Interestingly, however, some carriers were also concerned that EFT would result in their relinquishing some control over their finances. *This issue was not addressed during the FOT*

- Supplemental Documentation – Nearly all respondents agreed that continued requirements to file supplemental documentation (e.g., vehicle titles, proof of payment of heavy vehicle use tax, proof of insurance, etc.) will prevent the full benefits of one-stop from being realized. *This issue was addressed in most states during the test by not allowing MEOSS transactions to serve as actual transactions. Only South Dakota had committed to using MEOSS transactions as actual transactions, including the use of MEOSS printed approvals as OS/OW trip permits.*

- Organizational Inertia – Many participants felt the switch to an electronic one-stop system would be resisted by some carriers and agencies due to the mindset regarding change. *This issue was not addressed during the FOT.*

- Internal Process Ownership – A number of agency and carrier representatives expressed disappointment over the fact that a system designed to accommodate the needs of so many different organizations

could not be designed to match the current processes to which personnel have become accustomed. *This issue was not addressed during the test.*

- Original Signatures – While most felt that it was a minor issue that could be resolved easily, all agreed that statutory requirements regarding original signatures represented an issue not yet addressed satisfactorily. *This issue was not addressed.*

- Records Reconciliation – The fact remains that, because the MEOSS system was not designed to accommodate the exchange of information with exiting state and carrier computer systems, that two distinct and separate stores of information would have to be retained or reconciled in some manner. This was of particular concern regarding the provision of auditable, verifiable records in the event of dispute. *This issue was addressed during the FOT by not allowing MEOSS transactions to serve as actual transactions in most states.*

- Interagency Coordination – At the start of the FOT, there was concern regarding the ability to establish and maintain effective cooperative relationships among the agencies participating in the test. It was thought that inconsistent rules and practices would represent a substantial barrier to the successful completion of the FOT. *While no significant rule or process changes took place, agency representatives were unanimous in stating that interagency cooperation was enhanced through participation in the FOT.*

Objective	Result
4.1 Document institutional issues and solutions encountered during the operational test	• EFT – No solution • Supplemental documentation – SD allowed MEOSS transactions to serve as actual transactions–others did not • Organizational inertia – No solution • Internal process ownership – No solution • Original signatures – No solution • Interagency cooperation – Enhanced cooperation

Objective 4.2: Assess Potential Impacts of Institutional Issues and Solutions on MEOSS Deployment

This objective was to be addressed by drawing a comparison to the institutional issues utilized during the operational test to those required for full deployment. However, as discussed above, none of the issues were actually resolved, with the exception of the agreement on the part of the State of South Dakota to accept MEOSS generated documents as actual permits.

For successful deployment of a system like MEOSS, each of the identified issues will have to be addressed in some manner, if not in total. Each still represents a barrier to the implementation and acceptance of electronic one-stop shopping.

With regard to EFT, electronic signatures, and supplemental documentation requirements, the MEOSS concept was founded on the premise that, in order to achieve target improvements in efficiency, the need for paper documentation would have to be removed or mitigated. As demonstrated earlier in this document, a substantial portion of the delays in completing credential transactions rests in the exchange of information between agencies and carriers. If carriers and agencies are forced to continue the routine exchange of paper documentation, the full benefit of electronic one-stop shopping will not be realized. Hence, the administrative and statutory rules governing these requirements must be changed or amended to allow for the incorporation of these capabilities.

Organizational inertia is a condition that affects every organization, regardless of size or complexity. Along with internal process ownership, it reflects the resistance on the part of its members to embrace change. Because change brings uncertainty, its acceptance will force individuals to step outside their comfort zones and address their concerns. In a number of instances, participants in this test expressed a great deal of reluctance to change from an approach they already considered optimal–they felt there was no way to improve their productivity, and the introduction of a system like MEOSS actually represented a step backwards.

The only way to effectively deal with this issue is to closely examine the methods currently in practice, and redesign them with an eye toward improving efficiency. This kind of process reengineering first looks to identify and correct deficiencies in the way credentialing is conducted, and then define the technological and organizational changes and implementations that can be used to maximize the effectiveness of the changes. The challenge is to generate the user support and commitment necessary for successful implementation. This can only be accomplished by plainly demonstrating the benefits of participation, and to enlisting the support of those affected by the changes, for the changes.

Unlike the other issues addressed here, records reconciliation is primarily a technically driven institutional issue. Electronic funds transfer, original signatures, and supporting documentation issues simply come down to the acceptance of an electronic substitute for paper-based documentation. Records reconciliation, on the other hand, has more to do with the effective marriage of disparate systems and databases. This is not to say that it represents a significant technical challenge. In fact, it can be easily rectified from a technical standpoint, either through the use of translation software or system upgrade and/or replacement. Rather, it will likely come down to the need for decisions to be made regarding investment in information systems.

Finally, the fact remains that, in spite of the standardization brought about by the implementation of IRP and IFTA, and the relative simplicity of SSRS, significant variation exists between the states regarding the way business is conducted, and the rules that are applied. Participation in the MEOSS FOT has resulted in increased dialogue among the partner states, however, for the commercial vehicle community to benefit, this cooperation must extend into the development and acceptance of standard practices and technologies that simplify the process for both the public and private sectors. This will require continued development and nurturing of the relationships established here.

Objective	Result
4.2 Assess the potential impacts of institutional issues and solutions on MEOSS deployment	• EFT, supplemental documentation, original signatures – fundamental technical capabilities that can be easily incorporated, provided administrative and statutory rules are changed • Organizational inertia, internal process ownership – business process reengineering and personnel commitment and ownership in change process • Interagency cooperation – Continued cooperation, and the development of standards for processes and technologies

System Performance

The purpose for this portion of the evaluation was to assess the degree to which the MEOSS system met the performance needs of its users. Two objectives were established to address this goal:

- Assess the compatibility of the MEOSS system with existing business practices
- Assess the capacity of the MEOSS system

As discussed earlier, the technical difficulties experienced by the systems intended users resulted in a lack of actual system use. Users were reluctant to attempt to use the system even after representatives from RSIS visited their sites to ensure proper system function. As a result, the objectives stated here could not be fully addressed

as intended. Nonetheless, the available results are presented here, where possible, with agency and carrier findings combined.

Objective 5.1: Assess the Compatibility of the MEOSS System with Existing Business Practices

State Agencies / Motor Carriers – Baseline:
The collection of baseline data was not required for this objective.

State Agencies / Motor Carriers – Post-MEOSS Implementation:
Three separate measures were defined to address this objective. The first was the degree to which the information acquired by and forwarded through the MEOSS system was adequate to process credentials. To address this measure, state agency users were asked during the interviews to provide their perceptions regarding the ability of MEOSS to ensure adequate information.

Responses were divided into three categories: those that felt it did provide for sufficient information, those that felt it didn't, and those that were unable to comment. The table in Exhibit 4-44 illustrates the responses according to credential type.

Exhibit 4-44 – Ability of MEOSS to Ensure Adequate Information for Processing

Credential Type	Information Adequacy		
	Yes	No	N/A
IRP	2	0	1
IFTA	0	1	2
SSRS	1	1	2
OS / OW	2	2	4
Totals	**5**	**4**	**9**

No apparent trend exists in the results, but it is clear that the system would need some detailed analysis to determine the actual extent to which specific required elements are included in the software. This level of analysis was neither planned nor conducted as part of this evaluation.

The second measure pertained to users' perceptions regarding the degree to which the system was compatible with their operations. Once again, users were asked to provide scaled responses to a survey statement, and answer an interview question on the same topic.

User responses to the survey statement, "One-Stop's handling of the credential applications was compatible with the standard practices in our work area," are

provided in Exhibit 4-42 as responses to question Q19. As shown in the figure, responses ran from strong disagreement to neutrality, with most falling around moderate disagreement.

Interview responses indicated that, with one exception, the MEOSS system was not compatible with state agency processes. Most of the complaints stemmed from the fact that the data entry and review sequence defined by the system did not match the process logic currently in use at the agencies. From a practical standpoint, this meant that the individual information elements, and the sequence in which they were presented to the system user, did not match the expectations of the users.

In contrast to the state agency responses, carriers rated the system's compatibility with current processes favorably. While certain data fields were not adequate–for instance, insufficient space was provided for routing information of OS/OW loads–most felt the system could be easily integrated into their processes. However, many carrier users felt the system still needed to incorporate the ability to interface directly with existing systems and databases.

The third measure was the proportion of all commercial vehicle transaction types that could be processed through the system. While the system was intended to offer the ability to apply for and receive all IRP, IFTA, SSRS credentials, and all standard OS/OW permits, insufficient system use prevents the full assessment of this measure.

Objective	Result
5.1 Assess the compatibility of the MEOSS system with existing business practices	• Inconsistent with state processes – review logic is inconsistent • Consistent with carrier processes, but needs to accommodate data transfer with existing systems

Objective 5.2: Assess the Capacity of the MEOSS system

The capacity of the MEOSS system was to be quantified by assessing the potential degradation in application to issuance cycle times with an increasing volume of submitted credential applications. Due to the extremely limited number of transactions attempted, this objective could not be addressed.

Objective	Result
5.2 Assess the capacity of the MEOSS system	Insufficient data

System Accessibility

The final goal was the assessment of the degree to which the MEOSS system met the accessibility expectations of its users. Specifically, two objectives were identified to address this goal:

- Determine the perceived improvements in the accessibility of information and tools needed to process credentials using MEOSS
- Assess the availability of the MEOSS system from the motor carrier perspective

Objective 6.1: Determine the Perceived Improvements in the Accessibility of the Information and Tools Needed to Process Credentials Using MEOSS

To address this objective, agency and carrier representatives were asked to respond to survey statements and interview questions regarding the ability of both their current systems, and the MEOSS system, to provide the user all he/she needed to complete the credential process. This includes guidance regarding what information is required to complete a given application, and the procedures for forwarding applications and responses, among others.
State Agencies – Baseline:
The user surveys asked respondents to provide scaled responses to two statements:

- With the current credentialing method, the tools I need to process credentials are easily accessible
- With the current credentialing method, the information I need to process credentials is easily accessible

Agency responses are depicted graphically in Exhibits 4-33 through 4-36 as responses to questions Q5 and Q6. Reponses regarding IRP generally ranged from neutral to slight agreement with the statements, with the exception of South Dakota, which rated indicated slight disagreement with both, and Minnesota, which indicated slight disagreement regarding the needed information. With the exception of Nebraska, where strong agreement was indicated, respondents felt neutral about the accessibility of information and tools for processing IFTA transactions.

Responses regarding SSRS were generally positive, with the lone exception being Nebraska, which rated the information accessibility as slight disagreement with the statement. Finally, the responses regarding OS/OW were quite varied, ranging from slight disagreement to strong agreement, while the overall average was neutral.

Interview responses were less than consistent with the survey responses. Most felt the tools and information necessary was easily accessible and understood using the current system. The reasons for this difference were not explored.

Motor Carriers – Baseline:
The user surveys asked respondents to provide scaled responses to two statements:

- With the current credentialing method, the tools I need to apply for and receive credentials are easily accessible
- With the current credentialing method, the information I need to apply for and receive credentials is easily accessible

Carrier responses are depicted graphically in Exhibits 4-38 through 4-40 as responses to questions Q5 and Q6. With the exception of the neutral responses from Minnesota carriers regarding IRP and IFTA, and the negative reply from Illinois carriers regarding SSRS, the responses indicated general agreement with the statements. That is, tools and information are easily accessible.
Interview responses were consistent with the survey responses. Most felt the tools and information necessary was easily accessible and understood.

State Agencies – Post-MEOSS Implementation:
Once again, participants were asked to respond to survey statements and interview questions, this time with regard to the ability of the MEOSS system to provide easily accessible information and tools. The user surveys asked participants to provide scaled responses to four statements:

Q9. Using One-Stop, the tools I need to process credentials are easily accessible
Q10. Using One-Stop, the tools I need to process credentials are more easily accessible than with my usual method
Q11. Using One-Stop, the information I need to process credentials are easily accessible
Q12. Using One-Stop, the information I need to process credentials are more easily accessible than with my usual method

Survey results are illustrated in Exhibit 4-42 as the responses to questions Q9 through Q12. The figure indicates that the statements regarding the accessibility of the information and tools with MEOSS were met with slight disagreement, while the comparative statements were slightly more negative.

State agency representatives were reluctant to offer responses to interview questions regarding the subject. Most felt they had not used the system enough to be comfortable offering a response. The few that did respond did not indicate they noticed a significant difference.

Motor Carriers – Post-MEOSS Implementation:
Carriers were asked to respond to survey statements and interview questions, similar to those presented to state agency respondents. The user surveys asked participants to provide scaled responses to four statements:

Q9. Using One-Stop, the tools I need to apply for and receive credentials are easily accessible
Q10. Using One-Stop, the tools I need to apply for and receive credentials are more easily accessible than with my usual method
Q11. Using One-Stop, the information I need to apply for and receive credentials are easily accessible
Q12. Using One-Stop, the information I need to apply for and receive credentials are more easily accessible than with my usual method

Survey results are illustrated in Exhibit 4-42 as the responses to questions Q9 through Q12. The figure indicates that, with the exception of OS/OW, the statements regarding the accessibility of the information and tools with MEOSS were met with slight disagreement, while the comparative statements were slightly more negative. Results for OS/OW indicated the lowest possible response.

Carrier representatives were also reluctant to offer responses to interview questions regarding the subject. Most felt they had not used the system enough to be comfortable offering a response. The few that did respond did not indicate they noticed a significant difference, except in the case of a single response regarding OS/OW, which was negative.

Objective	Result
6.1 Determine the perceived improvements in the accessibility of the information and tools needed to process credentials using MEOSS	Carriers and agencies rated the accessibility lower for MEOSS than for current systems and methods

Objective 6.2: Assess the Availability of MEOSS from the Motor Carrier Perspective

This objective was to be addressed by measuring the percentage of instances in which the MEOSS system was available at the time desired by users. Once again, however, the system was used so infrequently that a meaningful assessment of its availability was not possible.

Objective	Result
6.2 Assess the availability of the MEOSS system from the motor carrier perspective	Insufficient data

Lessons Learned

In spite of the fact that the MEOSS system met with very limited use, a number of technical lessons were learned regarding the development and deployment of such a system. The lessons learned during the FOT are offered here.

Application Development

Most of the larger carriers, and many state agencies, currently utilize software applications that were either designed specifically for them, or are adaptations of commercially available packages. As such, they have become accustomed to having the use of systems that meet the specific needs of their operations. One of the challenges faced with limited success was the development of a software application that met the specific needs of the individual participants without creating something too complex and costly to be considered suitable for deployment.

Generally speaking, software applications that are modular in design allow for the incorporation of the necessary core functionality required by all, while allowing for relatively simple modification to accommodate the specific needs of individual user organizations, tend to meet with larger success and acceptance. This result underscores the importance of querying potential users for input throughout the design, a common practice among the developers of successful systems.

Another issue system developers must consider is the level of technology literacy of the intended users. It was not uncommon to find both public and private participants who had little or no experience with personal computers. Smaller carriers often do not use PCs when filing for credentials or preparing quarterly returns, and as a result, require a considerably more user-friendly interface than those who regularly use them. This is particularly true when the carrier is also responsible for system setup. Many respondents claimed to have been comfortable with the use of PCs, yet were not familiar or comfortable with the installation of software–a task considered by more computer literate individuals to be quite simple.

Finally, the amount of time and effort required to develop a software application is very easy to underestimate. While the actual development and testing of the software code is relatively easy to quantify, and hence easy to plan, the identification of system requirements is a very labor-intensive, time-consuming process. This process becomes even more difficult if the customer is also undertaking process reengineering, which is discussed later.

Communications

Land-based EDI communications routinely provide a relatively reliable and cost-effective approach for exchanging electronic data. The approach for providing the

physical link between carriers and agencies is critical to the success of the transmission. The MEOSS system relied on direct dial telephone modem-to-modem interfaces. As such, the reliability and transfer speed will be functions of the capabilities of the hardware and software components and the quality of the telephone connection. In spite of the communications difficulties encountered during early system set-up, it can be reasonably assumed that this represents a viable method.

The primary communications lesson learned was that operational requirements have a significant impact on the acceptability of the method of transfer. The size of the data files being transmitted, and the rate at which transfer requests are sent to receiving systems, are both critical factors to be considered when selecting system hardware and software. For instance, agencies receiving large volumes of temporary credential requests will need systems that can rapidly handle the incoming volume. Hence, any given system design must take these factors into account.

Finally, in order for these systems to effectively communicate with each other, standard file formats must be used. Largely, as a result of these, and other similar tests, a number of draft transaction set standards are currently either in development or under review by governing bodies. The MEOSS system utilized these standard file formats.

Legacy Systems Interface

Almost without exception, both the private and public participants indicated that the largest remaining issue was the ability of the system to be interfaced with legacy systems. As was stated earlier in this report, these systems represent substantial investments of time and money. In many cases, because of the costs associated with their replacement, they also represent the systems that will be in place for a number of years to come. In order for new systems and services to receive the acceptance necessary for encouraged widespread deployment, an effective alliance between these systems and legacy systems must be developed.

The system developer and the carrier and agency participants felt confident that a system like MEOSS could be effectively and affordably interfaced with legacy systems, provided open standards are used. However, these interfaces were not explored during the FOT. Given the importance placed on this feature by participants, future efforts in this area should focus considerable effort on the delivery of this capability.

Operating Platform

The PC was chosen as the platform for the MEOSS system because of its proliferation and availability, and the ease with which new applications can be developed for it. As PC prices continue fall (well-equipped machines with reasonably fast processors can be purchased for less than $1,000), more and more Americans are getting the opportunity to gain experience with them. From that standpoint, the selection of the PC as the platform seems quite logical. Unfortunately, it also creates a problem in some cases.

Small carriers (less than 50 trucks), many of whom choose to perform their credentialing and fuel tax reporting in-house, may not be willing to dedicate the necessary resources to this purpose. Whatever equipment they have is likely to be called upon to perform multiple duties, and staff are less likely to be experienced in personal computer use. Hence, many may be excluded from participation in these programs in the near term.

From the state perspective, credentialing and permitting agents, many of whom have held their positions for extended periods of time, have become not only accustomed to performing their duties using current systems, but quite efficient as well. As a result, asking them to switch platforms may not only cause consternation, but may actually result in a degradation of efficiency.

These issues contribute to the argument for the development of a final application that is, to the extent possible, platform independent, and widely accessible.

Operations

In addition to the comfort level some agency and carrier staff have developed with the instruments with which the conduct their tasks, some have also become accustomed to, and at times, possessive of, the processes. As a result, well-designed, well-intentioned efforts to institute meaningful change often sometimes fall victim to a resistance to change. Either out of previous experience, or simply out of fear, some are uncomfortable with change, preferring to stay with something they perceive works well, in spite of evidence to the contrary. While this trait cannot be universally applied to the participants in this test, there were instances where it was evident.

Such is the case with the processes by which credentialing is conducted. The fact that the MEOSS system met with a lukewarm reception was as much due to the fact that it represented, at least in the minds of its intended users, a different way to do the same thing, as it was due to its inherent shortcomings. As evidenced in the results offered in the previous section, process inefficiency cannot always be resolved by the application of technology alone. The processes themselves are often the problem. For example, the time that an application sits awaiting processing

represented a significant amount of delay. Simply offering a means to deliver the application more quickly will not address this issue. The review process must also be examined and modified.
The actual examination and refinement of the processes, often referred to as business process reengineering, is a crucial intermediate activity in effecting substantive, sustainable changes in efficiency. Only after this occurs can technology by effectively implemented. Simply applying technology to existing processes will likely mitigate, or perhaps eliminate, the positive effects of the intended change.

Agencies in many of the Midwest states recognize this, and have begun to make significant strides in this area. Missouri, for instance, has embarked upon an aggressive set of initiatives that call for an extensive examination of the means by which credentialing is conducted, and has already made significant progress in many areas. Additionally, Illinois has begun preparations for a process reengineering and technology implementation planning project.

Deployment Issues

As evidenced by the responses of agency and carrier representatives, the concept of electronic one-stop shopping has tremendous merit. Even in light of the disappointments encountered during this FOT, participants agreed that it should, and would, be pursued further by their organizations. Pressure to control costs, both at the public and private levels, coupled with continued Federal support, will serve to perpetuate the incentive for participation.

Effective implementation, however, will be dependent upon a comprehensive planning process that ensures the proper marriage of technology and process change. This planning process must build on the experience gained here, and with other one-stop FOTs, and result in an approach that fully considers the technical and institutional issues that will ultimate drive many aspects. Consideration must be given to the need for the resulting approach to be fully interoperable with other efforts within a given state, and with the surrounding states.

The technology itself, as demonstrated here, is of a reasonable cost, and the ongoing operations and maintenance costs should not represent a significant burden on those that choose to implement it.

The system configuration chosen for this FOT may not represent the best alternative. The logistics associated with the distribution of software, including version control, are complex. Tasks such as updating tax tables are fundamental to the ultimate success of one-stop, and the tasks associated with modifying and distributing the software to accommodate this need could become a significant burden, and the source of potentially significant errors. One alternative is a World Wide Web

(WWW) based application, housed on a single state system, to which a carrier could connect to conduct credentialing. Another is the establishment of a carrier account management team approach, where larger carriers team with state agency representatives to conduct direct transactions from one system to another.
The number of agencies responsible for the administration of commercial vehicle credentials remains formidable. With the exception of Kansas, Minnesota and Nebraska, carriers must still interact with multiple agencies within a single state to meet the requirements to operate legally. Until this organizational complexity is tempered, the implementation of a one-stop system will remain very challenging.

Appendices

Appendix A – State Participation in MEOSS

Credential/Permit	State						
Vehicle Registration	**IL**	**KS**	**MN**	**MO**	**NE**	**SD**	**WI**
IRP Initial			✓		✓		
IRP Renewal			✓		✓		
IRP Supplement—Add State			✓	✓	✓		
IRP Supplement—Add Vehicle			✓	✓	✓		
IRP Supplement—Delete Vehicle			✓	✓	✓		
IRP Supplement—Add / Delete Vehicle			✓	✓	✓		
IRP Supplement—Weight Increase			✓	✓	✓		
IRP Supplement—Weight Decrease			✓	✓	✓		
IRP Supplement—Lost Credential			✓	✓	✓		
IRP Supplement—Change of Ownership			✓	✓	✓		
IRP Temporary			✓	✓	✓		
Interstate Registration Trip Permit		✓	✓	✓	✓		
Fuel Tax							
IFTA Initial Application		✓	✓	✓	✓		
IFTA Renewal		✓	✓	✓	✓		
IFTA Quarterly Report		✓	✓	✓	✓		
Trip Permit: Fuel		✓	✓	✓	✓		
Motor Carrier Authority							
SSRS First Time	✓				✓		
SSRS Renewal	✓		✓	✓	✓		
SSRS Supplement—Add State	✓		✓	✓	✓		
SSRS Supplement—Add Vehicle	✓		✓	✓	✓		
OS/OW							
Temporary / Single Trip	✓	✓	✓	✓	✓	✓	✓
Multi-Trip	✓	✓	✓	✓	✓	✓	✓
Annual	✓	✓	✓	✓	✓	✓	✓
Superload							
Intrastate	✓	✓	✓	✓	✓	✓	✓
Other		✓		✓	✓		

Appendix B – Project Manager's Report

This report is intended to provide a summary documentation of the Midwest Electronic One-Stop Shopping Operational Test from a project development and management perspective. A separate report prepared by the project evaluation team headed by BAH provides project evaluation findings. Included in this manager's report, however, are a number of useful "lessons learned" regarding testing and implementation of electronic one-stop shopping or similar technologies.

Background

The Midwest Electronic One-Stop Shopping Operational Test project was developed in response to an FHWA RFP issued in Fall 1993. Three electronic one-stop shopping projects were selected by FHWA as a result of this solicitation: the Midwest Electronic One-Stop, the Southwest One-Stop, and the HELP One-Stop projects. The Midwest Electronic One-Stop project was the largest and most comprehensive effort to develop electronic one-stop shopping, including seven states and encompassing most of the routine processes for IFTA, IRP, SSRS, and Oversize/Overweight credentials and permits. In fact, no other operational test of electronic one-stop shopping included testing of Oversize/Overweight processes.

The partners in the Midwest Electronic One-Stop Shopping Operational Test were:

Illinois DOT
Illinois Commerce Commission
Iowa DOT(advisory only)
Kansas DOT
Kansas Department of Revenue
Minnesota DOT (lead agency)
Minnesota Department of Public Safety
Missouri DOT
Missouri Department of Revenue
Missouri HRSC
Nebraska Department of Roads
Nebraska Department of Revenue
South Dakota Highway Patrol
Wisconsin DOT
Federal Highway Administration
RS Information Systems
AAMVAnet
CTRE
Booz-Allen Hamilton
North-Carolina A&T

The motor carriers, truck leasing/administrative services, and permitting services participating in the operational test included:

Anderson Truck Services (ATS)	PFT Roberson
CENEX Inc.	Prorate Services
Contract Freighters, Inc.	Rollins Leasing Corporation
Farm Credit Leasing	Schneider National
Kansas Motor Carriers Association	Seward Motor Freight, Inc.
Lakeville Motor Express	Taylor Crane & Rigging
Midwest Coast Transport	Terminal Consolidation
Midwest Specialized, Inc.	Truck Services, Inc.
OTR Express	United Van Lines
Overnite Express, Inc.	Werner Enterprises, Inc.

The functions originally envisioned by the project included all IFTA, IRP, and SSRS credentials and permits and routine Oversize/Overweight permits (no exotic or superload permits). To provide participating state agencies with the flexibility to test those functions they were best equipped to support, each agency was allowed to choose which credentialing functions it would support during the operational test. Figure 1 illustrates the high-level architecture envisioned early in the project.

The project was designed around a 22-month schedule that allowed nine months for system development and thirteen months for operational testing. A 13-month operational testing period was planned to ensure that renewal periods for all credentials would be included in the operational test. The project was selected for funding in June 1994; it held its inaugural meeting in December 1994.

Operational Test

The operational test efforts can be categorized as system development, software distribution, training, and actual operational testing. While not entirely separate efforts, each had its unique requirements and challenges that warrant separate discussion. Each of these efforts is discussed in the following sections.

System Development

Once the project was officially underway, a steering committee was formed and system development efforts began. AAMVAnet Inc. was the original system developer and integrator for the Midwest Electronic One-Stop Shopping project. When the test began, no standards for EDI transaction sets for commercial vehicle credentialing and permitting existed. The project was not intended to develop such standards, but to provide basic information on the feasibility and benefits of electronic business practices as applied to commercial vehicle credentialing and permitting.

Since no standards for EDI transaction sets for commercial vehicle credentialing and permitting existed at this time, development of a single product that encompassed the participating states requirements was a formidable challenge. To develop the necessary EDI transaction data sets and protocols, system development efforts began with visits to each participating state to discuss their business practices and identify the processes and data used in credentialing and permitting activities.

Since credentialing and permitting requirements are set by government agencies and motor carriers are required to comply, the data used by state agencies and motor carriers is identical for any given state and credential/permit type. However, data requirements for the equivalent credentials or permits can differ among states; basic data requirements such as definitions for business name can even differ among agencies within a state. Even with base-state administration of fuel tax, registration, and authority credentials, the possible differences among states and agencies required significant discussion among states to arrive at only those data that were common among states or absolutely necessary for use by a particular state.

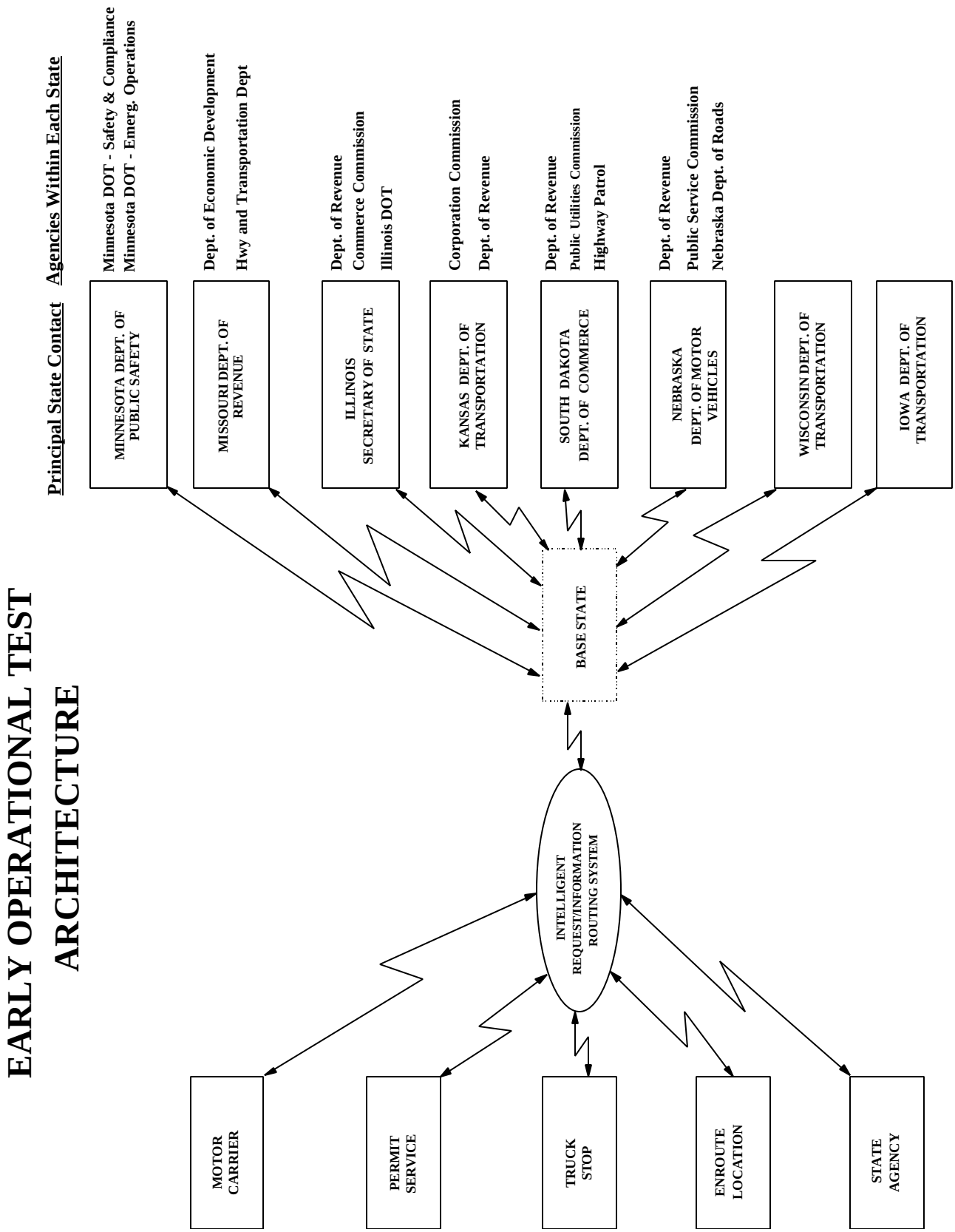


Figure 1. Early Operational Test High-Level Architecture

This phase of development efforts lead to a functional requirements document detailing the processes and data that the electronic one-stop shopping system must replace. The functional requirements document was issued in May 1996 following approval by the project steering committee. AAMVAnet had intended on using the functional requirements document as a guide to develop proprietary software and use a Value-Added Network (VAN) to route the EDI transactions. A number of developmental advantages were available through this architecture. First, AAMVAnet had communication connections into each state as part of the Commercial Driver License Information System (CDLIS). This would allow AAMVAnet to utilize existing communications methods as well as allow use of communication protocols familiar to AAMVAnet and the states. Second, the system could be implemented on a trial basis without the long development time and expense of integration into state mainframe systems. Third, a PC-based solution would allow shared development of software coding common to both state and motor carrier systems. Lastly, the system allowed a large degree of flexibility and ease of upgrade should the Midwest concept be implemented. The system architecture diagram shown in Figure 2 illustrates this design direction.

However, during the system design process, the Federal Highway Administration indicated that the system would need to comply with X.12 data transfer protocols since X.12 had been selected as the near-term standard for EDI transactions in ITS. Development efforts of X.12 standards for credentialing and permitting data exchanges were funded by FHWA and were underway.

Although the selection of X.12 as the standard protocol and development of X.12 transactions sets for ITS-CVO was seen as a very positive move for the project and ITS-CVO in general, it forced a major change in developmental direction for the Midwest electronic one-stop project. Software and communication network development direction changed from being based on proprietary protocols and a VAN to standard protocols and direct dial-up connections. Figure 3 illustrates the general system architecture using X.12 protocols and direct dial-up communication.

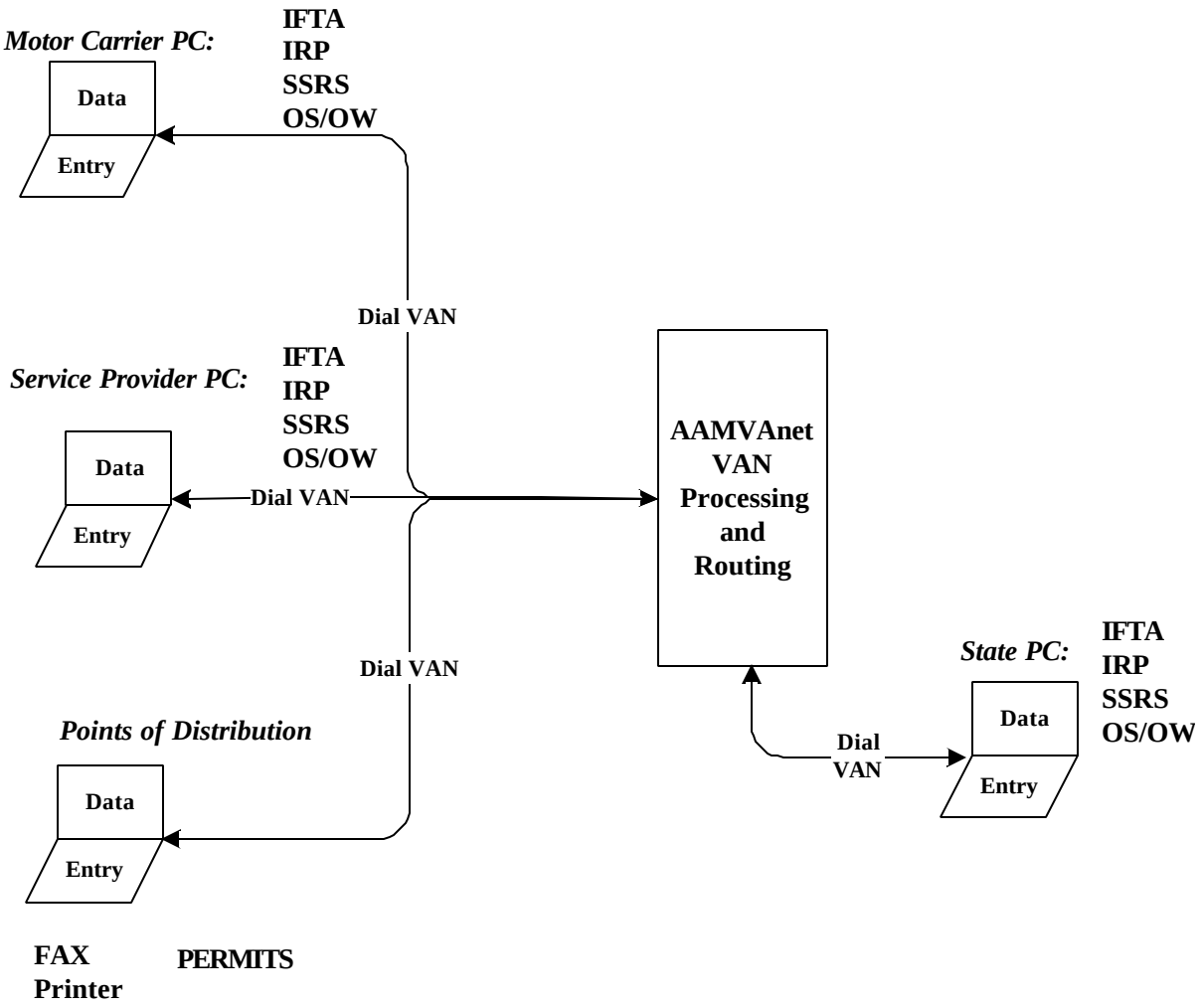


Figure 2. General VAN Architecture

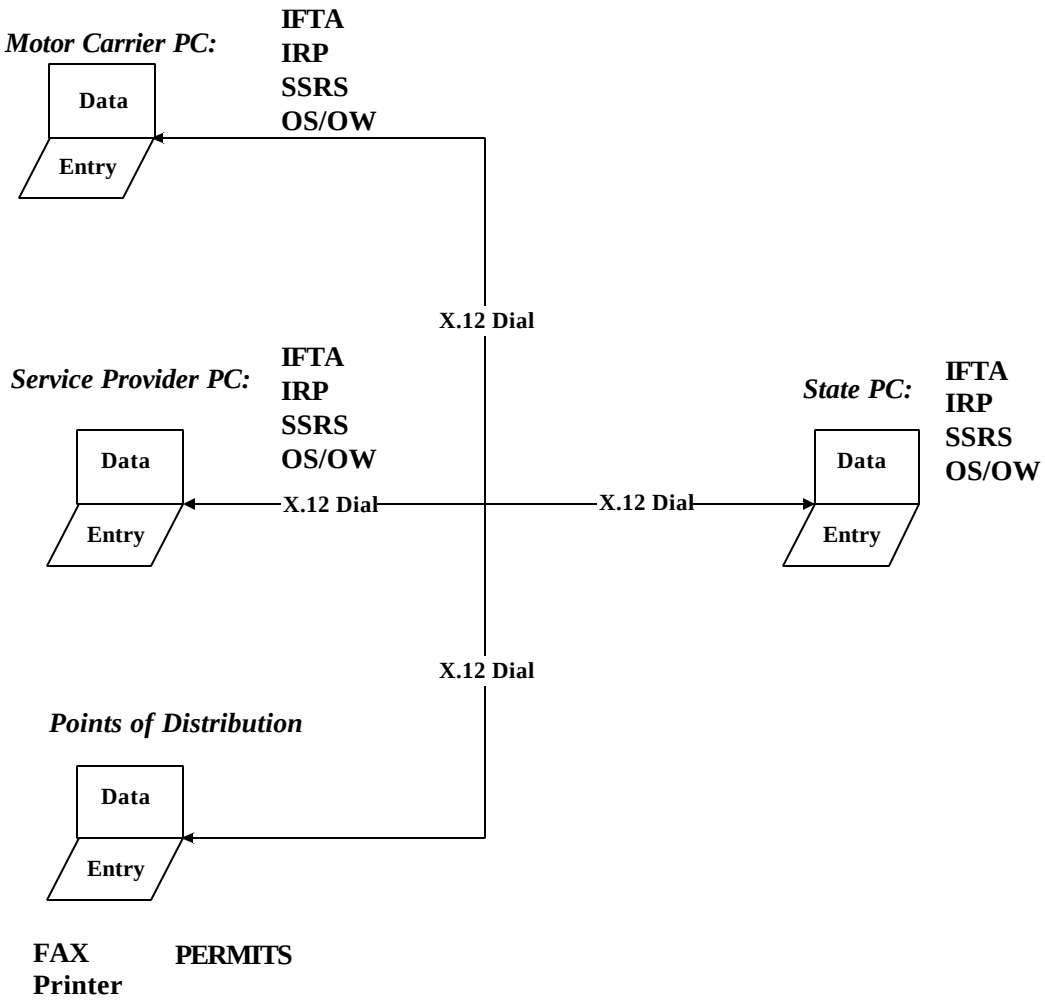


Figure 3. General X.12 Dial-up Architecture

The change in developmental direction required by the move to X.12 standard transactions sets created or exacerbated a number of issues for the Midwest Electronic One-Stop project, including:

- delayed development
- reduced project scope
- increased costs
- shortened operational test period
- reduced momentum

In general, the effect of these issues was a reduction in the potential and final success of the project from the standpoints of functionality, participation, and evaluation information.

The functionality of the electronic one-stop system was greatly affected by the change in direction required by the move to X.12 standards. This change necessitated transfer of development of the actual software to another developer with experience in X.12 standards. A host of problems accompanied the change in development responsibility including delay while the new developer, RSIS, worked to understand the project and the functional requirements document developed by AAMVAnet; delay due to schedule conflicts with RSIS' involvement in FHWA's CVISN projects and their work on the Midwest project; and difficulties in development caused by the lack of direct access to very important situational and anecdotal information gathered by AAMVAnet but not readily apparent in the functional requirements document.

As a result of delays, interruptions, and misunderstandings, development of the Midwest system ultimately lost functionality and did not reach a reasonable level of robustness until the operational test was nearly complete. The areas of lost functionality included: 1) ability to perform OS/OW permits for multiple states; 2) ability to load existing vehicle information into the system via a data import function; and 3) ability to extract vehicle information from the system via a data export function.

The ability to perform multi-state OS/OW permitting was lost since the X.12 system was being designed around direct dial access rather than a VAN. The VAN would have included custom services to route a multiple state OS/OW request to the correct states and hold related permits until all states included in the move had approved the requests. While the system designed around X.12 could have also used the VAN and accommodated the multi-state OS/OW feature, this was not pursued so that scarce development time could be spent on the overall system. Likewise, the data import and export functions were never completed due to a lack of development resources (funding and time). These functionalities were important to maintaining participant support and to final usability of the system. Participating state OS/OW agencies and specialized carriers were quite interested in the advantages of a single system for multi-state permits, indicating a good deal of the benefits of electronic one-stop for OS/OW was in the multi-state functionality. Similarly, motor carriers indicated the data import and export functions were essential to making the system useful in any meaningful way since they would need to be able to integrate information from their business information systems and the electronic one-stop system.

In summary, the change in development direction created time and funding issues that resulted in the system having a much lower functionality. Fortunately, the fuel tax, registration, and authority functions overlapped with work RSIS was performing for its CVISN development project, therefore some development could be shared and resources leveraged.

State and motor carrier participation was affected by the reduced functionality and project delays largely brought about by the change in developmental direction. The delays in project development kept sliding the time frame for the actual operational test period farther and farther out. Initially, this did not reduce participation or momentum, but as testing was pushed out time and again, states and motor carriers became very skeptical that the test would ever take place. Similarly, as information on the reduced functionality of the system was distributed, state and motor carrier participants became less and less enthusiastic about the usability of the electronic one-stop system. These issues would ultimately lead to lower than expected participation and use of the system during the operational test period.

The change in development direction impacted the evaluation of the project through the lower than expected participation and the delays, software bugs, and other issues brought about by the resource limited development caused by this change. With lower participation and fewer transactions, less data is available to evaluate the system. In addition, with a greater number of problems than might have been possible with more development resources, the number of problems experienced by users was higher, thus potentially creating a negative bias among test participants.

Clearly, the change in developmental direction from a proprietary system using a VAN to a direct-dial, X-12 standard system impacted the operational test and evaluation. Not all of these impacts were negative, as the development of X.12 standard transaction sets and protocols for electronic one-stop shopping will be a long-term benefit for all states and motor carriers. Also, states, motor carriers, and system developers have gained a great deal of insight into the functionality, integration, training, support, and hardware necessary to successfully implement electronic one-stop shopping systems. The value of these experiences will, in the long run, outweigh the challenges encountered during the Midwest electronic one-stop project.

Final System Capabilities

Despite the issues created by the changes in developmental direction, the Midwest electronic one-stop shopping system was able to perform most of the functions originally envisioned by the project partners. A number of issues related to reliability and ease of use challenged the project team throughout the test period, but the software demonstrated a significant technical success in its ability to perform most credentialing and permitting functions for the seven states testing the system. Viewed as a beta-product preceding RSIS' CVISN software, the Midwest electronic one-stop software was a great success, providing states and motor carriers with experience and insights into the efforts necessary to achieve implementation of electronic one-stop shopping.

RSIS developed the Midwest electronic one-stop system using PowerBuilder (ver.5) for the GUI/front-end, Sybase SQL Anywhere for the Real-time Database Management System (RDMS), and Mercator v1.3d from TSI International was used for the EDI translator.

The system provided a GUI to process credential applications. The system performed validity checks for data reasonableness and required fields. For example, if the credential application required a Federal Employer Identification Number (FEIN), the software would check that field to ensure an entry was made before allowing the application to be transmitted. The application was mapped into an EDI 286 transaction that was sent to the State. At the State the transaction was translated from the EDI 286 and imported into the State's system to be reviewed and processed. The system used a mailbox function that allowed for the storage, transmission and tracking of application messages by state agencies and motor carriers.

The system used in the operational test provided the following functionality, described in terms of the party initiating the transaction:

Registration (IRP)

Initial	- initial application for permit from the motor carrier to the State
Renewal	- renewal notice from the State to the carrier
Supplements	- motor carrier notice to add, delete, or add/delete vehicle, increase/decrease weights, duplicate credential, change vehicle ownership, or change contact/address information during the registration year
Trip Permits	- motor carrier request trip permits
Payment	- provide copies of payment and invoice information

Fuel Tax (IFTA)

Initial	- initial application for permit from the motor carrier to the State
Renewal	- renewal notice from the State to the carrier
Trip Permits	- motor carrier request for trip permits
Quarterly Tax Reports	- motor carrier submission of tax reports
Tax Rate Tables	- the ability to manually update or import new tax rate tables

Operating Authority (SSRS)

Initial	- initial application for permit from the motor carrier to the State
Renewal	- renewal notice from the State to the carrier
Supplements	- motor carrier notice to add, delete, or add/delete vehicle, increase/decrease weights, duplicate credential, change vehicle ownership, or change contact/address information during the registration year

Oversize/Overweight (OS/OW)

Permits	- motor carrier can request OS/OW permits, including: Single-trip Multi-trip Annual Intrastate Other (special permits such as manufactured housing)

In addition to these credential specific functionalities, the following capabilities were shared among all credential types:

Print Credentials - motor carrier can print a copy of the credential/permit
Print Applications - ability to make a hard copy of the application

These are generalizations of the capabilities of the software; they do not necessarily correspond to the functions tested by each state. Each participating state agency was allowed to select those functions it would test; this resulted in some states testing a range of functions across the credential types while other states limited their testing to functions related to only one or two credential types. See Table 1 for a summary of state participation by credential types.

Table 1 Summary of State Participation

		IL	IA	KS	MN	MO	NE	SD	WI	Motor Carriers
	Service									
1	IRP									
2	First Time				X		X			X
3	Renewal				X		X			X
4	Sup-Add State				X	X	X			X
5	Sup-Add Vehicle				X	X	X			X
6	Sup-Delete Vehicle				X	X	X			X
7	Sup-Add/Delete Vehicle				X	X	X			X
8	Sup-Weight Increase				X	X	X			X
9	Sup-Weight Decrease				X	X	X			X
10	Sup-Lost Credential				X	X	X			X
11	Sup-Change of Ownership				X	X	X			X
12	Temporary				X	X	X			X
13	County Credit									
14	Interstate RegistrationTrip Permit			X	X	X	X			X
15										
16	IFTA									
17	Initial Application				X	X	X			X
18	Renewal			X	X	X	X			X
19	Quarterly Reports			X	X	X	X			X
20	Trip Permits			X	X	X	X			X
21										
22	SSRS									
23	First Time						X			X
24	Renewal				X	X	X			X
25	Sup-Add State				X	X	X			X
26	Sup-Add Vehicle				X	X	X			X
27	Interstate Exempt Authority				X	X	X			X
28	Intrastate Authority				X					X
29										
30	Ovesize/Overweight									
31	Temporary/Single Trip	X		X	X	X	NA	X	X	X
32	Multi-Trip	X		NA		X	NA			X
33	Annual			X		X		X	X	X
34	Superload									X
35	Intrastate	NA		X		X	NA	NA	NA	X
36	Other	NA		X		X	X	NA		X

Software Distribution

Distribution of the software to state and motor carrier participants was performed by CTRE and RSIS. CTRE was the primary distributor of software, using overnight delivery and internet file transfer capabilities to deliver the software to participating state agencies and motor carriers. RSIS provided the software to CTRE, and, on occasion, would provide software to participants during the course of technical assistance efforts. Initial versions of the software were distributed via diskette and world-wide web site in conjunction with the state and motor carrier training sessions. States and motor carriers received the software after attending training on how to set-up and use it.

For the states, RSIS could install the software on their equipment during the training visits, which many states elected to have done. Installation of the software by RSIS was limited to the state agencies due to budget constraints; each state's agencies were generally co-located in the same city allowing installation to coincide with training. Motor carriers, on the other hand, were located across the states, making individual visits to each motor carrier for installation and set-up impossible due to budget constraints. However, in instances where motor carriers encountered issues that could not be resolved by distance technical support, RSIS and/or CTRE traveled to motor carrier installations to install the software or solve installation and use issues.

Software updates were distributed by CTRE as they were released by RSIS. States and motor carriers could either download the software updates from the Midwest Electronic One-Stop world-wide web page maintained by CTRE or have the updates mailed to them on diskettes. In all, three versions of the software were released, the initial version and two updates. Updates were released to all states and motor carriers at the same time to avoid incompatibilities between software versions. Due to the design of the database used by the software, state and motor carrier software had to be using the same version of the database or they would not be able to communicate successfully. A number of instances of database incompatibility were encountered during the operational test, usually due to a state agency or motor carrier not promptly installing the updates.

System Training

Training for state agency and motor carrier personnel was conducted by RSIS with assistance from CTRE and BAH and was coordinated on a state by state basis. Representatives of RSIS, CTRE, and BAH traveled to each state to conduct training sessions. States worked with their participating motor carriers and CTRE and RSIS to schedule training dates and locations. Training sessions ranged from one-half day to two days depending on the number of state and motor carrier personnel participating and the state agencies' level of involvement in the test. Those state agencies participating in a larger number of credentialing and permitting functions required more training. In general, if a state participated in most of the functions training required a day each for state and motor carrier personnel. For states participating in functions from one or two areas of credentialing, training generally required one-half day each for state and motor carrier staff. To enable states to assist motor carriers in the use of the system during the test, state staff were trained on the use of both the state and motor carrier systems.

The training included instruction and demonstration of the installation and set-up of the software and supporting hardware such as modems, use of the software, project evaluation data collection and submission, and technical assistance and problem

tracking procedures. BAH provided training on evaluation data collection and submission.

Training sessions began with an overview explaining the data flow process associated with each type of credential application. Users were provided training materials and user guides to aid in learning and using the software. The training sessions included specific material covering:

- Software Installation
- Setting up the Modem
- Setting up the Database
- Troubleshooting basic installation and set-up problems
- Software navigating techniques
- Setting up the mailbox
- Sending and Receiving Applications
- Creating IRP, IFTA, OS/OW, and SSRS applications
- Printing Applications and Credentials

The training sessions included hands-on practice both during and after the presentation. Participants were seated at computers equipped with working versions of the software, allowing them to follow the training on their screens, becoming familiar with the GUI and the process flows of using the software. Sessions also included discussion of user impressions of the software, potential problems or bugs, and ideas for improving future products.

Training was conducted from mid-May through the first few days of June. States and motor carriers began operational testing as soon as their training was completed.

Operational Testing

Operational testing of the Midwest electronic one-stop shopping system began June 1997 and ended October 1997 (inclusive). Due to the development issues previously discussed, this five-month period began nearly a year later and was much shorter than the 13-month operational test period originally planned. In fact, the test was initially scheduled to end at the close of July but was extended to October to allow states and motor carriers more time to experience the system.

For the operational test, participating state agencies and motor carriers agreed to use the system for credentialing and permitting requests. The operational test did not set a specific number of transaction attempts. State agencies and motor carriers agreed to use the system as much as possible within the constraints of their current business activities. Although this was not a controlled arrangement that would

generate a minimum number of transactions of each type, it did provide state agencies and motor carriers with the flexibility to use the system when it would impact their business the least. This was important because such a test system and its accompanying processes were not expected or likely to be as efficient as well-developed, longstanding practices.

Operational testing included the following activities:

- Software installation
- Software and communication testing
- Credentialing and permitting activities using the system
- Evaluation data collection
- Technical support

The following sections provide insights into each of these activities.

Software Installation

Installation of the Midwest electronic one-stop software was the first step to operational test following training. Where possible, RSIS installed the software for participating state agencies as part of the software training visit. For a few agencies, this was not possible and the software was installed by state personnel with the assistance of RSIS or CTRE when necessary. Most motor carriers performed their own software installations with help from RSIS and CTRE if necessary. A number of problems with software installation arose during the test. Many of these problems were related to a general lack of basic computer and software technical expertise among state and motor carrier staff. For example, a number of participating state and motor carrier personnel were unfamiliar with many of the basics of the Windows operating system, including installing programs using Windows 3.1 or Windows 95, viewing and editing system files such as autoexec.bat, or even knowing what port was being used by their modem. As a result, a good deal of time was spent by RSIS and CTRE walking participants through the installation and set-up procedures.

An additional issue at startup was getting motor carriers to install and test the software in a timely manner. Due to the additional workload of participating in the operational test, many carriers were unable to get the software installed and tested until a window of opportunity appeared in their normal work schedule. In some cases, motor carriers were not able to begin testing until weeks after the operational test started.

These issues resulted in very few operational motor carriers during the first month of the operational test. To regain test momentum, RSIS and CTRE undertook a two-

pronged effort to bring states and motor carriers on-line. First, RSIS and CTRE began aggressive activity to get states and carriers operational through telephone support and follow-up activity to resolve outstanding issues and ensure states and motor carriers become operational. Second, RSIS and CTRE offered on-site technical help for states and motor carriers to achieve operational status. For states and carriers unable to resolve (via telephone support) issues preventing operation of MEOSS, CTRE staff will travel to a site to work with RSIS via phone to help resolve the issues and get the system operational.

To underscore these heightened efforts, RSIS and CTRE staff traveled to participating motor carriers in Minnesota to assist in installing and setting up the software for carriers were not able to do so and to troubleshoot software/setup problems for those Minnesota carriers and agencies who were reporting problems in getting the software installed and working. Minnesota was chosen as a starting point for these efforts due to the their participation in all four credentialing areas (fuel tax, registration, authority, and OS/OW), the large number of Minnesota carriers participating--six, and the close physical proximity of their participating carriers to their agency locations (all were within a short drive from the Minneapolis/St. Paul area). This would allow RSIS and CTRE to have the greatest impact on project participation with the least impact on very scarce project support resources. These efforts resulted in five Minnesota motor carriers and all state credentialing agencies being fully operational in the test.

Software And Communication Testing

Following software installation, the test proceeded with state agencies and motor carriers exercising their one-stop software and its communication capabilities to ensure the systems could successfully communicate data to each other under various hardware setups. This was a very important step in the operational test procedure that uncovered a number of software and user installation issues. These issues ranged from improper user set-up of the software and user modems to problems within the software itself. User set-up problems were addressed via telephone technical support supplied primarily by RSIS with assistance from CTRE.

Software problems included:

- Communication - The software deemed some communication transactions “successful” that were actually unsuccessful transactions in which the data was received but not converted and posted to the database.

- Printing - The software generally had no problems with printing but one particular user set-up could not be made to print more than the first page of a credential application despite all efforts to correct the problem.

- IRP Supplementals - the GUI did not display the correct subsections when working with the various IRP supplement types.
- SSRS - The GUI did not allow entry of the required MailBox ID on the Carrier Tab for a new carrier.

- IFTA - Changing the base state from that which was defined for the software during the install created problems in the software interfacing with its database.

User installation and set-up problems included:

- State and motor carrier users not specifying the correct base state in the setup.ini file before installing the software. While technically this should be correctable by editing the database settings, this did prove to create a problem in the software.

- Improper modem setup including wrong initialization string and improper port setting.

- No modem or no phone line for modem.

- Corrupted software source diskettes.

- Lack of general knowledge and experience with PC operating system, setup, and hardware

These problems and issues were addressed with a number of methods. The software problems were addressed with subsequent releases of revised software. The first software update was issued in July. This update fixed the SSRS and IRP issues. The second software update was issued in September. This second update not only corrected the IFTA issues but also added functionality to the OS/OW permit communication by allowing motor carriers to choose from a list of states the state they want to communicate. Prior to this upgrade, motor carriers were required to enter new dial-up each time they wanted to request OS/OW permits from a different state.

Problems such as these were anticipated. The shortened operational test period, however, made these issues critical. Participating state agencies and carriers could not test the system or could not test some functions until the issues were addressed, thus further reducing the operational test period for some participants. As a result, the project partners agreed on a 3-month operational test extension to allow states and motor carriers more time to exercise the system.

Credentialing And Permitting Activities

The exchange of credential/permit application information using the prototype software was successful. Transactions for IFTA, IRP, SSRS, and OS/OW were performed by motor carriers and states. For most test transactions, motor carriers initiated the transaction. The motor carrier would start the Midwest Electronic One-Stop software, enter the area of the software for the type of credential/permit request to be made (e.g., IFTA, IRP, SSRS, OS/OW), and enter the area for the credential subtype (e.g., IRP supplemental). Once in the correct software form, the motor carrier would fill in the required information, perform a validity check (software function that ensures required data fields have an entry), and send the request using the mailbox function.

Once the credential/permit request was received, state staff would open the application in the mailbox and check the application for completeness. Any questions could be addressed by either sending the application back to the motor carrier with a dialog box message attached or by simply calling the motor carrier. The application is then evaluated for approval and issuance of credentials. An approved credential would be transmitted back to the motor carrier. A rejected permit would also be transmitted back to the carrier and may, depending on the practices of the state agency, include a dialog box message indicating the reason(s) for rejection.

During the operational test, state agencies participated in both actual credential applications and mock applications using previous application data or test data. For actual applications, all agencies but one required that the data received by the electronic one-stop system be re-keyed into their current system to issue the actual permit. These efforts were required by a combination of the need to have the data represented in the official system and the need for the actual permit to be issued in the official formats of each agency. While the test software could have been designed to issue permits in the correct format, the costs of building the required forms into the system was not justified for the operational test.

One agency, however, was able to arrange for the plain paper forms printed by the electronic one-stop system to be recognized as valid permits during the test period. In a bold display of cooperation and institutional issue quashing, the SDHP arranged to have the plain paper forms printed by its Midwest electronic one-stop system to be recognized as valid permits during the operational test. Such permits

included a notation on the permit to contact the issuing port of entry for verification if needed.

The amount of test activity was dependent on three factors: the amount of state support and encouragement for use of the system, the level of motor carrier interest in motivating change to credentialing processes, and the usability and reliability of the electronic one-stop shopping system. These factors were highly interrelated. For example, states with significant interest in and support for use of the system generally exhibited a higher level of interest among motor carriers. Similarly, the higher the level of interest by state agencies or motor carriers, the more likely they were to tolerate issues with the usability and reliability of the test software. Regardless of the initial level of interest and support, the greater the number or severity of software usability and reliability issues encountered by the participating state agency or motor carrier the more rapidly their level of participation waned. This would not likely have been so critical under the original test plan that allowed time and software development resources to correct the more serious issues. Although motor carrier and state testing of the system decreased during the later portions, a number of efforts by CTRE, RSIS, and certain state and motor carrier participants resulted in additional participation and system testing. For example, a large motor carrier in Missouri had been unable to achieve an operational system despite repeated attempts and extensive technical support (via phone) by RSIS. CTRE staff traveled to the motor carrier's location and worked with RSIS to bring the carrier on line. Similarly, a Minnesota agency that had not experienced any test transactions used its renewal process as a springboard to ask participating carriers to file test renewals through the system. Previously, not only had this agency not experienced any SSRS transactions, but none of the participating states had tested SSRS renewal transactions. Thus the continued efforts of CTRE, RSIS, and participating carriers and state agencies resulted not only in additional test information but information that was likely to be collected otherwise.

The operational test portion of the project concluded October 30, 1997; evaluation efforts are expected to conclude in March 1998. With fewer than 30 test transactions from 11 motor carriers (not all participating carriers conducted transactions), the operational test did not generate enough data to perform detailed statistical analysis. This was not surprising to the project participants in light of the shortened operational test period as well as the various software and user issues.

Despite this limited number of actual transactions, participants gained a great deal of insights into implementation of ITS-CVO administrative functions. For example, state OS/OW credentialing staff could better understand how electronic data interchange of permit request and fulfillment information would allow them more flexibility by eliminating the need to key information from phoned, faxed, or mailed applications and filings and reduce real-time communication (e.g., phone)

involvement. Similarly, motor carriers were able to evaluate how an electronic one-stop system might impact their credentialing activities as well as provide guidance to ensure electronic one-stop shopping systems meet their needs.

Additionally, the public and private project development and management team learned a great deal regarding implementation, support, and management of ITS-CVO initiatives involving end-user software and computer systems. These "lessons learned" are reported in a later section of this report, including some suggestions for improving the development, management, and implementation of similar initiatives in the future.

Technical Support

Technical support for the project was provided primarily by RSIS and CTRE with some initial assistance from AAMVAnet. AAMVAnet had been slated to provide technical support for the project in conjunction with their role as software developers. After the change from AAMVAnet to RSIS for primary software development, AAMVAnet remained the planned source for technical support. This approach was taken in an effort to minimize the strain on RSIS' resources from their involvement in both CVISN and the Midwest electronic one-stop. Having AAMVAnet provide technical support would limit RSIS involvement to only those technical support issues that could not be resolved directly by AAMVAnet. Based on these plans, AAMVAnet staff would provide "help desk" technical support after being fully trained on the software by RSIS. Any problems that could not be successfully handled by AAMVAnet would be referred to RSIS.

These plans were changed as a combination of challenges in software development and schedule pressures resulted in software that was not as robust as originally intended for the operational test. As a result, the potential issues with the software and the corresponding need for user technical support were greater. To assure the most direct and expert handling of user issues, RSIS assumed all responsibility for user technical support.

For the most part, user technical support was provided through telephone call-in and e-mail correspondence between state and motor carriers users and RSIS or CTRE. For general problems such as installation and testing, users could call CTRE for assistance. If more difficult software issues were encountered, RSIS was contacted by the user directly or by CTRE. This arrangement provided some relief for RSIS resources. State and motor carrier users were also asked to keep a log of issues they encountered and were given specific forms to help them do so. In addition to trouble logs, users were given forms to provide input on software features and usability for future versions. These trouble logs and input forms were also expected to provide some additional insights into user responses to evaluation

interviews. For example, a user that indicates the system was completely unusable may have encountered a number of technical issues that resulted in the software being deemed "unusable" in its beta version versus having used the software extensively and deeming the design/approach "unusable." More information on the evaluation is available in the evaluation report prepared by evaluation manager BAH.

For particularly troublesome software technical issues, RSIS and CTRE provided on-site support. In general, on-site software support was achieved through the combination of RSIS providing telephone technical support to a CTRE staff member who had traveled to the user's location. This approach provided more robust technical support than that available through phone only efforts with reduced overhead for personnel and travel due to CTRE's closer (relative to RSIS) proximity to the participants' locations. While this support was not available on a daily basis, some users with particularly thorny and persistent technical problems received on-site assistance.

Issues addressed through technical support spanned a wide range of topics from basic PC operating system to software installation to electronic one-stop software "bugs" to RSIS issued "fixes." In general, the issues generating the majority of technical support requests occurred in two categories: 1) general PC operating system and hardware skills/knowledge, and 2) electronic one-stop software communication module. Other issues addressed included software and hardware set-up, software use, and application of updates or "fixes." Further discussion of technical support issues can be found in BAH's evaluation report as well as in the discussion of "Lessons Learned" in this report.

Evaluation Data Collection

A number of approaches and sources were used to collect data for evaluation purposes. These included collection of:

1) pre-operational test data through transaction tracking sheets and questionnaires
2) operational test data through electronic forms provided in the software
3) information from technical assistance calls, trouble logs, and enhancement requests
4) post-operational test interviews

Pre-operational test data was collected from state and motor carrier participants by evaluation subcontractor NCA&T. Operational test data from the electronic forms was submitted by participants via diskette to NCA&T. CTRE provided follow-up support to NCA&T for these evaluation data collection efforts. Postcards and phone

follow-ups were used to encourage participants to provide data in a timely manner. RSIS collected information regarding technical assistance requests, user issues, and suggested improvements. This information was made available to BAH for use in the evaluation. Post-operational test interviews were conducted by BAH. These interviews were designed to gather detailed experiences with the system and the project from state and motor carrier users.

A complete reporting of evaluation methods and results is contained in the evaluation report prepared by BAH. A number of "lessons learned" during the operational test are discussed in the following section.

Areas for Improvement In Operational Test Procedures And Electronic One-Stop Shopping Software

During the project, several challenges highlighted opportunities to improve the success of future ITS operational tests and implementation efforts. Two general types of opportunities were identified: general "lessons learned" and specific enhancements to the electronic one-stop shopping software that would be beneficial or necessary.

Lessons Learned

Lessons learned are those opportunities where the knowledge gained from the Midwest Electronic One-Stop Shopping Operational Test could be used to change the approach to future operational tests and even to implementation. For example, during the Midwest test software installation and set-up was performed by motor carriers and states and not all parts of the software installation were performed automatically by the software. Because many participants were not familiar with software installation, modem/communications set-up, and general personal computer hardware and software set-up and operation procedures, a great deal of the technical support addressed fairly basic personal computer concepts and procedures. This could be avoided in future projects using software or in implementation by making the software installation process require less user knowledge and interaction and/or having support personnel install and set-up all necessary software and hardware. Lessons learned from the Midwest Electronic One-Stop Operational Test can be separated into those related to software design, installation, and training and those related to project direction, funding, and management.

Lessons learned regarding software design, installation, and training

- State and motor carrier personnel are likely to have less PC knowledge and experience than private sector workers, suggesting the inclusion of basic PC software and hardware training and/or more full-featured software that requires less user interaction and technical skill to obtain a successful installation and integration with the user's hardware.

- Training for prototype/new software systems should allow for substantially more training time and follow up than might be expected for more established software applications (such as word processing). As demonstrated by the number of calls to the help desk immediately following the training sessions, users would have benefited a great deal from a few additional hours of one on one training to reinforce basic principles of the work flow and functions of the software.

- Participants software and hardware knowledge and technical expertise should be accurately ascertained early in the project. This is important to ensure that participants have the best opportunity to use a system, that a project is truly a test of the technology and not of previous user knowledge and skills, that training covers the appropriate needs, and that any implementation accommodates the intended users. The Midwest Electronic One-Stop could have benefited from more complete knowledge about the users' computer knowledge and expertise. For example, about 25 percent of the class participants required Windows for Workgroups and Windows 95 training. Lack of experience in these environments made it harder to grasp the basic functions of the software and much more difficult for them to install it and use it in their own environments.

- A competent technical contact at each participant location is needed for projects involving hardware and software setup, particularly communication set-up. Experience during the Midwest One-Stop was that a technical contact at the user site was needed to configure and set-up hardware and software, install upgrades, and assist in debugging any problems. In particular, set up and testing of analog communication required a lot of assistance and generated a significant number of help desk calls due to the lack of technical knowledge and the widely varying hardware and modem configurations.

- System documentation, user's manuals, and related materials need to reflect the level of computer knowledge and familiarity of the intended users. Because of the relative lack of PC technical expertise among Midwest One-Stop participants, these documents needed to be written at more detailed level than they were. This is directly tied to the previously mentioned lesson on the need to know the actual level of expertise of your users very early in the development process.

Lessons learned regarding project direction, funding, and management

- Operational test or implementation efforts encompassing a large number of states and organizations should be phased to ensure system viability and reduce the possibility of overwhelming support resources. The Midwest Electronic One-Stop test involved seven states and 11 agencies. Because of the shortened operational test schedule, all states and agencies were brought on-line during the same time period. Rather than bringing one state and its agencies on-line, solving their issues, and thus reducing the potential issues for following states, all states came on-line in a short time period causing a crush of issues with little time to resolve them. Phasing the test by one state and even one functional area at a time would avoid this crush of issues, provide a more robust test (or implementation) product, and a result in a more successful test (or implementation).

- Federal and state direction and programmatic support for tests or implementations should be consistent throughout the project life. Two events had profound impacts on the Midwest Electronic One-Stop: FHWA's decision to develop X.12 standards for ITS and their decision to fund CVISN development projects that included electronic one-stop efforts. The decision to move forward with X.12 standards changed the design direction and, eventually, the developer of the Midwest software. While a necessary move, it had a large impact on the Midwest test that shortened development and test resources far beyond the accommodations made by FHWA to mitigate such issues. The decision to move forward with CVISN efforts that included electronic one-stop shopping were perhaps more detrimental. FHWA and states now focused on CVISN rather than on projects already in progress, resources and support that would have been available for ITS projects already underway were now taxed by new projects, and non-CVISN states participating in other electronic one-stop tests tended to adopt a "wait until CVISN" approach.

System Enhancement Requests

Following is a list of enhancement requests that were identified during the training and product support phase of the test. Future versions of electronic one-stop shopping software should address these needs.

- Backward compatibility of the system software and the databases used is essential. Systems for electronic one-stop shopping need the ability to accept and process different software release versions of the EDI transaction sets, i.e., versions older than the current version in use by the state or motor carrier

as well as newer versions. It is very unlikely that carriers and agencies in a base state would be using the same version of software at all times. Agencies or carriers may choose to forego upgrades, postpone them, or implement them at different times. This issue was made very clear during the Midwest Electronic One-Stop as the software required interacting users (agency and motor carrier) to be using the same release version of the software, causing numerous delays and generating technical assistance calls when software updates were not performed by all parties before using the system again.

- System software should be designed and configured to allow for a simple process to update the software and any databases used. Software update processes should support the backup of the original system and data, export of the old data from the old database, and import of the old data into the new database.

- Electronic one-stop shopping software needs a vehicle data import utility to allow larger carriers and service providers to import data from current databases and avoid extensive data entry.

Conclusions

The Midwest Electronic One-Stop Shopping Operational Test project was successful in moving states forward in applying ITS to simplify motor carrier credentialing processes. The operational test gave states and motor carriers experience in development and evaluation of systems to meet their needs, providing them with valuable insights into the potential capabilities of electronic one-stop shopping functions and the many policy and system issues that must be addressed to implement these systems.

The Midwest Electronic One-Stop operational test period was delayed and shortened primarily by the FHWA's adoption of X.12 standards and the resulting change in development needs. Although these issues reduced momentum, lowered the ultimate maturity of the software system, and reduced state and motor carrier involvement in the project, the project was successful in ushering states and motor carriers forward in the development and implementation of business practices and systems for electronic one-stop credentialing. In fact, Kansas, Missouri, Nebraska, and South Dakota have formed the Midwest Mainstreaming consortium to continue their efforts in incorporating ITS technologies and electronic one-stop shopping in particular in their business operations and strategic business plans.

A number of lessons learned and suggestions for improvements to electronic one-stop systems were gained from the project. The insights and those provided by the

project evaluation will improve the development and implementation of electronic one-stop shopping and similar ITS systems.

Appendix C – Data Collection Instruments

The pages that follow contain copies of the baseline and post-MEOSS implementation user questionnaires, and a copy of a credential tracking sheet, including the carrier and state agency instructions.

System Satisfaction Survey - Establishing a Baseline

Your answers to these items will be evaluated only by the Independent Evaluator, Mary Lind . When you have completed the survey, please place it in an envelope, seal it, and return to the person who gave it to. The sealed envelope will then be returned to the Independent Evaluator. For any questions please call Mary at 910-334-7189 ext 4033.

Carrier Name: _____ **Person completing the survey** : _____ **Phone:** _____ **Date:** _____

	Mark the type(s) of credential you handle in a single credential request. place X's on the boxes.					
IRP	First Time	Renewal	Supplementary	Temporary	Trip Permit	
IFTA	First Time	Renewal	Quarterly	Trip Permit: Fuel		
SSRS	First Time	Renewal	Supplementary			
OSOW	Single/Trip	Temporary	Multi-Trip	Intrastate	Government	Other_____

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I find it **convenient** to apply for and receive credentials using the current procedures.	(1)	(2)	(3)	(4)	(5)
It is **easy** to apply for and receive credentials using the current procedures.	(1)	(2)	(3)	(4)	(5)
The current system of applying for and receiving credentials enables me to carry out my job **properly**.	(1)	(2)	(3)	(4)	(5)
The current system of applying for and receiving credentials allows me to **quickly** carry out my job.	(1)	(2)	(3)	(4)	(5)
With the current credentialing method, the **tools** I need to apply for and receive credentials are easily **accessible**.	(1)	(2)	(3)	(4)	(5)
With the current credentialing method, the **information** I need to apply for and receive credentials is easily **accessible**.	(1)	(2)	(3)	(4)	(5)
I often need to contact the state agency to **clarify** questions regarding credential applications.	(1)	(2)	(3)	(4)	(5)
I was adequately **trained** to apply for and receive credentials using the current approach.	(1)	(2)	(3)	(4)	(5)
I am **satisfied** with the procedures used for applying for and receiving credentials.	(1)	(2)	(3)	(4)	(5)
I wish to **continue** applying for and receiving credentials as I normally do.	(1)	(2)	(3)	(4)	(5)

Approximately how much does it cost each hour that you wait for credential approval?	Cost in $ _____ per hour
Please describe what you like about the current process for applying for and receiving credentials:	
Please describe what you don't like, or would like to see changed about the current process for applying for and receiving credentials:	
Please provide any clarification of your answers you feel is necessary:	

System Satisfaction Survey - Using One-Stop

Your answers to these items will be evaluated only by the Independent Evaluator, Mary Lind. When you have completed the survey, please place it in an envelope, seal it, and return to the person who gave it to. The sealed envelope will then be returned to the Independent Evaluator. For any questions please call Mary at 910-334-7189 ext 4033.

Carrier Name: _____ Person completing the survey: _____ Phone: _____ Date: _____

Mark the type(s) of credential you handle in a single credential request, place X's on the boxes.						
IRP	First Time	Renewal	Supplementary	Temporary	Trip Permit	
IFTA	First Time	Renewal	Quarterly	Trip Permit: Fuel		
SSRS	First Time	Renewal	Supplementary			
OSOW	Single/Trip	Temporary	Multi-Trip	Intrastate	Government	Other_____

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I find it convenient to apply for and receive credentials using One-Stop.	(1)	(2)	(3)	(4)	(5)
It is more convenient to apply for and receive credentials with One-Stop than with my usual method.	(1)	(2)	(3)	(4)	(5)
It was easy to apply for and receive credentials with One-Stop.	(1)	(2)	(3)	(4)	(5)
It was easier to apply for and receive credentials using One-Stop than with my usual method.	(1)	(2)	(3)	(4)	(5)
One-Stop enables me to carry out my job properly.	(1)	(2)	(3)	(4)	(5)
One-Stop enables me to carry out my job better than my usual method.	(1)	(2)	(3)	(4)	(5)
One-Stop allows me to apply for and receive credentials quickly.	(1)	(2)	(3)	(4)	(5)
One-Stop allows me to apply for and receive credentials more quickly than my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the tools I need to apply for and receive credentials are easily accessible .	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the tools I need to apply for and receive credentials are more easily accessible than with my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the information I need to apply for and receive credentials is easily accessible.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the information I need to apply for and receive credentials is more easily accessible than with my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, I often need to contact the state agency to clarify questions regarding credential applications.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, I need to contact the state agency to clarify questions regarding credential applications more often than with my usual method.	(1)	(2)	(3)	(4)	(5)
I was adequately trained to apply for and receive credentials using One-Stop.	(1)	(2)	(3)	(4)	(5)

System Satisfaction Survey - Establishing a Baseline

Your answers to these items will be evaluated only by the Independent Evaluator, Mary LindWhen you have completed the survey, please place it in an envelope, seal it, and return to the person who gave it to. The sealed envelope will then be returned to the Independent Evaluator. For any questions please call Mary at 910-334-7189 ext 4033.

Agency Name:_____**Person completing the survey**_____**Phone:** _____**Date:** _____

Mark the type(s) of credential you handle in a single credential request, place X's on the boxes.						
IRP	First Time	Renewal	Supplementary	Temporary	Trip Permit	
IFTA	First Time	Renewal	Quarterly	Trip Permit: Fuel		
SSRS	First Time	Renewal	Supplementary			
OSOW	Single/Trip	Temporary	Multi-Trip	Intrastate	Government	Other_____

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I find it **convenient** to process credentials using the current procedures.	(1)	(2)	(3)	(4)	(5)
It is **easy** to process credentials using the current procedures.	(1)	(2)	(3)	(4)	(5)
The current system for processing credentials enables me to carry out my job **properly**.	(1)	(2)	(3)	(4)	(5)
The current system for processing credentials allows me to process credentials **quickly**.	(1)	(2)	(3)	(4)	(5)
With the current credentialing method, the **tools** I need to process credentials are easily **accessible**.	(1)	(2)	(3)	(4)	(5)
With the current credentialing method, the **information** I need to process credentials is easily **accessible**.	(1)	(2)	(3)	(4)	(5)
I often need to contact the motor carriers to **clarify** questions regarding credential applications.	(1)	(2)	(3)	(4)	(5)
I was adequately **trained** to process credentials using the current approach.	(1)	(2)	(3)	(4)	(5)
I am **satisfied** with the procedures used for processing credentials.	(1)	(2)	(3)	(4)	(5)
I wish to **continue** processing credentials as I normally do.	(1)	(2)	(3)	(4)	(5)

Please describe what you like about the current method for processing credentials:

Please describe what you don't like, or would like to see changed about the current method for processing credentials:

Please provide any clarification of your answers you feel is necessary:

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I was **satisfied** with the One-Stop procedures used for applying for and receiving credentials.	(1)	(2)	(3)	(4)	(5)
I was **more satisfied** with the One-Stop procedures used for applying for and receiving credentials than with my usual method.	(1)	(2)	(3)	(4)	(5)
I wish to **continue** applying for and receiving credential applications using One-Stop.	(1)	(2)	(3)	(4)	(5)
One-Stop's handling of the credential applications was **compatible** with standard practices in our work area.	(1)	(2)	(3)	(4)	(5)

Please describe what you like about the One-Stop method of applying for and receiving credentials:

Please describe what you don't like, or would like to see changed about the One-Stop method of applying for and receiving credentials:

Please provide any clarification of your answers you feel is necessary:

System Satisfaction Survey - Using One-Stop

Your answers to these items will be evaluated only by the Independent Evaluator, Mary Lind. When you have completed the survey, please place it in an envelope, seal it, and return to the person who gave it to. The sealed envelope will then be returned to the Independent Evaluator. For any questions please call Mary at 910-334-7189 ext 4033.

Agency Name: _____ **Person completing the survey:** _____ **Phone:** _____ **Date:** _____

Mark the type(s) of credential you handle in a single credential request, place X's on the boxes.						
IRP	First Time	Renewal	Supplementary	Temporary	Trip Permit	
IFTA	First Time	Renewal	Quarterly	Trip Permit: Fuel		
SSRS	First Time	Renewal	Supplementary			
OSOW	Single/Trip	Temporary	Multi-Trip	Intrastate	Government	Other_____

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I find it **convenient** to process credentials using One-Stop.	(1)	(2)	(3)	(4)	(5)
It is **more convenient** to process credentials with One-Stop than with my usual method.	(1)	(2)	(3)	(4)	(5)
It was **easy** to process credentials with One-Stop.	(1)	(2)	(3)	(4)	(5)
It was **easier** to process credentials using One-Stop than with my usual method.	(1)	(2)	(3)	(4)	(5)
One-Stop enables me to carry out my job **properly**.	(1)	(2)	(3)	(4)	(5)
One-Stop enables me to carry out my job **better** than my usual method.	(1)	(2)	(3)	(4)	(5)
One-Stop allows me to process credentials **quickly**.	(1)	(2)	(3)	(4)	(5)
One-Stop allows me to process credentials **more quickly** than my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the **tools** I need to process credentials are easily **accessible** .	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the **tools** I need to process credentials are **more easily accessible** than with my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the **information** I need to process credentials is easily **accessible**.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, the **information** I need to process credentials is **more easily accessible** than with my usual method.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, I often need to contact the motor carriers to **clarify** questions regarding credential applications.	(1)	(2)	(3)	(4)	(5)
Using One-Stop, I need to contact the motor carriers to **clarify** questions regarding credential applications more often than with my usual method.	(1)	(2)	(3)	(4)	(5)
I was adequately **trained** to process credentials using One-Stop.	(1)	(2)	(3)	(4)	(5)
I was **satisfied** with the One-Stop procedures used for processing credentials.	(1)	(2)	(3)	(4)	(5)

Check the number that best represents your reaction to each item.	(1) Disagree Strongly	(2) Disagree Somewhat	(3) Neutral	(4) Agree Somewhat	(5) Agree Strongly
I was **more satisfied** with the One-Stop procedures used for processing credentials than with my usual method.	(1)	(2)	(3)	(4)	(5)
I wish to **continue** processing credential applications using One-Stop.	(1)	(2)	(3)	(4)	(5)
One-Stop's handling of the credential applications was **compatible** with standard practices in our work area.	(1)	(2)	(3)	(4)	(5)

Please describe what you like about the One-Stop method for processing credentials:

Please describe what you don't like, or would like to see changed about the One-Stop method for processing credentials:

Please provide any clarification of your answers you feel is necessary:

Credential Tracking Sheet

Instructions: Please return the completed sheet in a sealed envelope to the person who gave it to you. Your answers will be evaluated solely by the Evaluator.

- Please annotate this sheet as a credential request is processed. As the application is **mailed or faxed**, please include this Tracking Sheet as the credential is transmitted. Detailed instructions are provided on the reverse side of this form.

1	To indicate the type of this credential, place an X on the appropriate box:						
	IRP	First Time	Renewal	Supplementary	Temporary	Trip Permit	
	IFTA	First Time	Renewal	Quarterly	Trip Permit: Fuel		
	SSRS	First Time	Renewal	Supplementary			
	OSOW	Single/Trip	Temporary	Multi-Trip	Intrastate	Government	Other

	Credential Tracking Questions	Motor Carrier Responses	State Agency Responses	Service Provider Responses
2	Carrier trade name, state agency name (and service provider name, if applicable)			
3	Your name			
4	Credential Number (or Carrier/Service Provider Transaction Identification Code)			
5	Number of vehicles on credential application, broken out by the state for which credentials are sought (for example: MN-25, IL-18, KS-64)			
6	Approximately how long did it take you to complete the application?	___ hr. ___min.		___ hr. ___ min.
7	How did you forward the application?: **FAX, SM, EM, HC, Tel** (see instructions)			
8	Date/time application sent to state agency			
9	Date/time application received by state agency			
10	Date/time processing began at state agency			
11	Approximately how long did it take you to process the application?		___ hr. ___ min.	
12	How did you forward the authorization to operate?:**FAX, SM, EM, HC, Tel** (see instruct)			
13	Date/time authorization to operate sent to carrier or service provider			
14	Date/time authorization to operate received by carrier or service provider			
15	How did you pay for the credential?: **CK, CC, ES, BD, EFT, PP** (see instructions)			
16	Date/time credential payment sent by carrier/service provider (N/A if paid using a standing account)			
17	Date/time credential payment received by state agency / service provider (N/A if paid using a standing account)			
18	Place a tic mark (|) in your column to the right every time you have to contact either one of the other parties (carrier or state agency) to correct or clarify an issue. (If others, briefly describe _____)	more paperwork ____ insurance info _____ signature _____ mileage info _____ other _____	more paperwork _____ insurance info. _____ signature _____ mileage info _____ other _____	more paperwork _____ insurance info. _____ signature _____ mileage info _____ other _____
19	Indicate the target time to complete this type of credential, start to finish.	___days___hr. ___min	___days___hr. ___min	___days___hr. ___min

- Thank you for completing this, and feel free to call the independent evaluator, Mary Lind, at 910-334-7189 ext. 4033, if you have any questions.

Carrier Credential Tracking Sheet Instructions

STEP 1:

Initiate the Transaction

Each time you initiate a credential transaction, whether by filling out an application or calling a state agency, simply take one of the Credential Tracking Sheet forms provided, and fill in the appropriate boxes. Instructions as to what should be entered are provided in the following paragraphs.

- Item **1** - Place an **"X"** on the box which represents the type of credential being sought. The **remainder** of items require a **written** response be entered in the **Motor Carrier or Service Provider column**.
- Item **2** - Enter the **name of the carrier** for which the credentials are being sought. For example: ABC Trucking, Inc.
- Item **3** - Enter **your name** (**Note**: This information will be used solely by the evaluator, should the need arise, to clarify responses).
- Item **4** - If applicable, enter the credential number or transaction identification code assigned either by the motor carrier or state agency for this transaction.
- Item **5** - Enter the **number of vehicles** (power units, trailers, etc.) for which credentials are requested in the **transaction,** broken out by the state for which the credentials are sought, if applicable.
- Item **6** - Write in the **approximate time it took** you to complete the **application** for the credentials.
- Item **7** - Indicate the **means** you used to send the application to the state agency (**FAX**, **SM**=standard mail, **EM**=express mail, **HC**= hand carried, **Tel**=telephone).
- Item **8** - Write in the **date** and **time** (to the nearest minute) the application was sent to the state agency (for example: 1/1/96 11:25 AM).
- Item 1**9** - Write in the **hours** and **minutes that your management targets for processing your part of the credential.**

STEP 2:

Forward the Application

Once you have completed the application, if you are conducting the transaction via mail or fax, simply attach the Credential Tracking Sheet form to the application, and forward the package to the State Agency, or Service Provider. For telephone transactions, you should retain your Tracking Sheet, and complete the remaining items as the transaction progresses. For these telephone transactions, the State Agency and/or Service Provider will also complete Tracking Sheets.

STEP 3:

Complete the Process

For transactions conducted via fax or mail, you should receive the tracking sheet back from the State Agency, or Service Provider. The remaining items in the Motor Carrier Responses column should be filled in when you receive the tracking sheet, along with either the approval of your application, or the rejection notice, and ?make payment for the credentials?. For telephone transactions, simply fill in the remaining items on your tracking sheet as the transaction progresses. Specific instructions for these remaining items are provided below.

- Item **14** - Write in the **date** and **time** (to the nearest minute) you received approval from the state agency to operate the vehicles for which the credential application was filed (provisional or permanent credentials, whichever came first).
- Item **15** - Indicate the method of payment used to pay for the credentials (**CK**=check, **CC**=credit card, **ES**=escrow account, **BD**=bond, **EFT**=electronic funds transfer, **PP**=prepaid with application).
- Item **16** - Write in the **date** and **time** (to the nearest minute) the payment was sent to the state agency.
- Item **18** - Place a tic mark **"/"** in the space provided **each time you have to contact the state agency** for information or clarification of any issue during the process. If you selected "other," please provide a brief explanation in the space provided.

Special Instructions:

Telephone Transactions - For those instances where the credential application and approval process is conducted **entirely over the phone** (no paper exchange), please follow the instructions below, **in addition** to those stated above (forms should be returned to the evaluator in the same manner as for written transactions):

- Items **2 and 3** - In the "State Agency Responses" column, write in the name of the **state agency**, and the **person** with whom you conducted the transaction.
- Item **6** - Write in the **duration** of the telephone **call, rather than** the time to complete the application.

STEP 4:

Return the Form

Once the credentialing transaction has been completed. Simply place the completed tracking sheet form in an envelope (mailing labels are enclosed) which will go to the independent evaluator, Mary Lind. This is to be done every two weeks, with numerous forms enclosed in each envelope. Mary Lind's address is North Carolina A&T State University 1915 Rosecrest Drive Greensboro, NC 27408-6215.

State Credential Tracking Sheet Instructions

STEP 1:

Receive the Transaction

Each time you receive a credential transaction request from a motor carrier participating in this test, simply fill in the appropriate boxes in the state agency column. Instructions as to what should be entered are provided in the following paragraphs.

- Item **2** - Enter the **name of the state agency** from which the credentials are being sought. For example: NE DOR
- Item **3** - Enter **your name** (**Note**: This information will be used solely by the evaluator, should the need arise, to clarify responses).
- Item **4 - If applicable, enter the credential number or transaction identification code assigned either by the motor carrier or state agency for this transaction.**
- Item **9** - Write in the **date and time** (to the nearest minute) **the application was received by the state agency**.
- Item **10** - Write in the **date and time** (to the nearest minute) that processing began on **the application at your state agency**.
- Item **11** - Write in the approximate time it took you to process the credentials.
- Item **12** - Indicate the **means** you used to forward the authorization to operate to the motor carrier (**FAX**, **SM**=standard mail, **EM**=express mail, **HC**= hand carried, **Tel**=telephone).
- Item **13** - Write in the **date** and **time** (to the nearest minute) the authorization to operate was sent to the carrier (for example: 1/1/96 11:25 AM).
- Item 1**7** - Write in the **date** and **time** (to the nearest minute) the payment was received from the carrier (for example: 1/1/96 11:25 AM).
- Item 1**8** - Place a tic mark "/" in the space provided **each time you have to contact the state agency** for information or clarification of any issue during the process. If you selected "other", please provide a brief explanation in the space provided.

STEP 2:

Forward the Application

Once you have completed the application, if you are conducting the transaction via mail or fax, simply make a copy of the tracking sheet, and attach the original to the processed application, and forward the package to the Motor Carrier. The copies should be returned to the Evaluator every two weeks. For telephone transactions, you should retain your Tracking Sheet, and return them every two weeks to the Evaluator. For these telephone transactions, the Motor Carrier will also complete Tracking Sheets.

Special Instructions:

Telephone Transactions - For those instances where the credential application and approval process is conducted **entirely over the phone** (no paper exchange), please follow the instructions below, **in addition** to those stated above:

- Items **2 and 3** - In the "State Agency Responses" column, write in the name of the **state agency**, and the **person at the carrier** with whom you conducted the transaction.
- Item **11** - Write in the **duration** of the telephone **call, rather than** the time to complete the application.

STEP 3:

Return the Form

Once the credentialing transaction has been completed. Simply place the completed tracking sheet form in an envelope (mailing labels are enclosed) which will go to the independent evaluator, Mary Lind. This should be done every two weeks, with numerous forms enclosed in each envelope. Mary Lind's address is North Carolina A&T State University 1915 Rosecrest Drive Greensboro, NC 27408-6215.