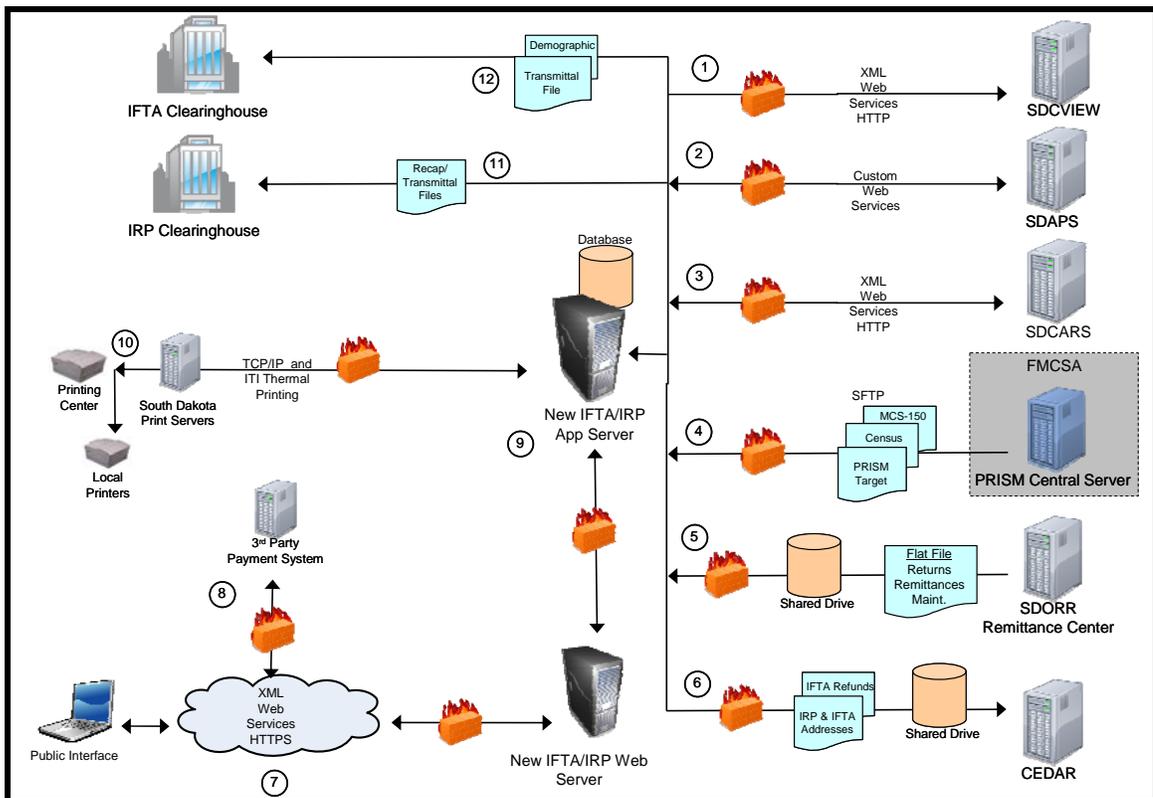**South Dakota
Department of Transportation
Office of Research**

**U.S. Department
of Transportation**

**Federal Highway
Administration**

International Registration Plan & International Fuel Tax Agreement System Requirements Analysis

Study SD2006-15
Executive Summary

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The complete South Dakota IRP and IFTA System Specification document is posted on the SDDOT Office of Research web page. ("Findings section.")

16. Abstract
The South Dakota International Registration Plan & International Fuel Tax Agreement System Requirements Analysis System Specification provides a comprehensive listing of business and technical system requirements for a new IRP and IFTA system for the State of South Dakota. These requirements were gathered through a series of on-site meetings with South Dakota Department of Revenue and Regulation, South Dakota Department of Transportation and the South Dakota Bureau of Information and Telecommunications. Additional input was gathered from the motor carrier industry through interviews with a number of motor carrier service providers. The on-site meetings generated fifty-six unique Use Cases describing current operational conditions. Seventeen distinct categories of requirements were developed. The requirement categories helped provide the framework for describing over three-hundred and fifty detailed system requirements.

A requirement rating system was applied to all detailed requirements. This system; (mandatory, mandatory/flexible, optional), provides a basis for evaluating the relative importance of the requirements as they relate to each other and to the total system.

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GLOSSARY OF ACRONYMS

CVIEW	Commercial Vehicle Information Exchange Window
CVISN	Commercial Vehicle Information Systems and Networks
IFTA	International Fuel Tax Agreement
IRP	International Registration Plan
SDBIT	South Dakota Bureau of Information and Telecommunications
SDDORR	South Dakota Department of Revenue and Regulation
SDDOT	South Dakota Department of Transportation
RFP	Request for Proposal

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1.0 EXECUTIVE SUMMARY

1.1 PROBLEM DESCRIPTION

South Dakota currently uses R. L. Polk's COVERS system for commercial vehicle IRP (International Registration Plan) and IFTA (International Fuel Tax Agreement) administration. R. L. Polk has announced that the company will no longer support the COVERS system after 2010, and South Dakota—among many states—must migrate to another system for IRP and IFTA registration processing and management.

For many reasons, a new solution should be identified and developed as soon as possible. First, commercial motor carrier administration is a complex process, particularly in the case of IRP, requiring input from a large number of sources, including other states and the federal government. Second, it is presumed that Polk will make the data table structure used in COVERS available to its client states. South Dakota has its archived data and current registration information stored in the COVERS tables. Understanding the data structure may be complicated, and South Dakota will need significant lead time in order to safely do a smooth, error-free transition to a new system.

Third, because Polk intends to discontinue its support of the COVERS system, it is not clear how strong or comprehensive their support will be in the coming years. Support staff may move on to other priorities and career opportunities, or Polk may not fund support at the same level it has previously.

Fourth, the COVERS system is currently an important component in CVISN data sharing through South Dakota's SDCVIEW. Data sharing problems arising from SAFER changes may disrupt the interface between SDCVIEW and COVERS resulting in a loss of the ability to share data with other jurisdictions.

Proactive steps in addressing the eventual sun setting of the COVERS system will also enable South Dakota to implement important CVISN electronic credentialing capabilities not currently supported by COVERS. In South Dakota, COVERS did not offer an effective online registration option that would have allowed commercial vehicle carriers to register their vehicles and pay fees via the Internet. Upon implementation of a new IRP and IFTA system with electronic credentialing features, South Dakota will be in position to be certified as Core CVISN compliant by the Federal Motor Carrier Safety Administration.

1.2 RESEARCH OBJECTIVES

The overall objective of the International Registration Plan & International Fuel Tax Agreement System Requirements Analysis project was:

"*Define and document high-level and detailed functional system requirements and comprehensive specifications for acquisition or development of a new registration system for interstate commercial vehicles that fully supports IRP, IFTA, UCR and CVISN core requirements.*"

In order to achieve this objective, Iteris developed the following research principles to be applied to this study:

✓ Develop requirements and specifications that are consistent and compliant with the National ITS Architecture.

✓ Define requirements and specifications for a new registration system with an open structure and a clearly defined data dictionary to ensure simplicity in future modifications.

✓ Encourage the participation of all participating South Dakota agencies and selected motor carrier stakeholders who would assist in review of e-credentialing requirements.

✓ Ensure that system interfaces are based upon requirements that are open and flexible so that future interface modifications can be implemented with a minimum level of effort.

1.3 RESEARCH APPROACH

The International Registration Plan & International Fuel Tax Agreement System Requirements Analysis research project comprised nine tasks. Each of these tasks had specific objectives designed to provide a basis for creation of the system specifications.

Task 1: Review and Finalize the Project Scope & Work Plan

Objective: To review the proposed project scope and refine the plan to meet the project's technical panel's requirements.

Upon receipt of the Notice to Proceed, Iteris requested comments and notes on the proposed research plan. Iteris compiled the comments and developed a strategy for addressing each to ensure the research met the panel's objectives. Iteris developed a project website to act as the repository for all project-related materials and deliverables. Iteris staff met on-site with the technical panel in South Dakota to discuss the comments and scope changes. In addition, during the first on-site meeting, Iteris began capturing current practices and functions through a series of meetings with key stakeholders.

Deliverables: Finalized Project Scope and Work Plan

Task 2: Summarize Existing Practices and Identify New Practices

Objective: To ensure that all potential functionality is identified and defined for a new IRP and IFTA and United Carrier Registration systems.

In this task, Iteris worked with SDDORR and SDBIT to review the current functionality of the Polk COVERS system. Iteris conducted one-on-one meetings, as well as group meetings, with SDDORR, SDDOT and SDBIT during the Task 1 on-site visit. This activity built upon Iteris' understanding of South Dakota's CVISN systems, based upon Iteris' experience in developing the South Dakota CVISN Program Plan and South Dakota's CVIEW system. The CVIEW system includes working with Polk to develop the SDCVIEW / COVERS legacy system interface.

Working with SDDORR staff, Iteris defined each function of COVERS. This included capturing screen images, work procedures, work practices and summarizing COVERS documentation in order to understand not only how system functions are performed, but also how SDDORR staff interact with the COVERS system and applications.

Working with SDBIT, Iteris developed graphical and textual representations of COVERS hardware and network components. Included in this effort was development of data flows and data security issues.

In addition to documenting existing functionality and system design, Iteris worked with SDDOT, SDDORR and SDBIT to determine how additional functions, such as electronic credentialing, may be provided and where hardware and software for them may reside. Iteris prepared a draft and final Technical Memorandum #1 to summarize existing and proposed functionality of the system.

Deliverables: Technical Memorandum #1: Existing and Proposed Functionality of South Dakota's IRP and IFTA Registration Systems

Task 3: Develop Draft Use Cases

Objective: To create use case scenarios that illustrate the needed usability and functionality of a new IRP and IFTA Registration System.

Working with SDDORR, SDBIT and designated motor carrier stakeholders, Iteris developed a set of Draft Use Cases that represent how different users will interact with a new IRP and IFTA registration system. The Draft Use Cases included:

- ✓ IFTA and IRP Registrations for a new carrier.
- ✓ IFTA and IRP Registrations for an existing carrier with a good safety record.
- ✓ IFTA and IRP Registrations for an existing carrier with a poor safety record.
- ✓ Identification of a carrier with a poor safety record trying to add vehicles or register using a different USDOT number.
- ✓ Quarterly IFTA filing.
- ✓ A new carrier registers his vehicles online.
- ✓ A carrier with current credentials renews them online.
- ✓ A carrier checks the status of his credentials online.

Each use case describes how the user enters or collects information, how the user interacts with the IRP and IFTA registration system, the internal functions of the system, including error-checking and security routines, and how the system exchanges data with other systems.

Deliverables: Draft Use Cases

Task 4: Validate, Refine and Finalize Draft Use Cases

Objective: To finalize the draft use cases and ensure that these completely represent the critical functionality of the IFTA and IRP Registration System.

In its second on-site meeting in South Dakota, Iteris met with SDDORR, SDBIT and SDDOT to present the draft use cases. The group made further revisions to the draft use case scenarios. Iteris documented comments and recommended changes in order to begin development of the Second Stage Use Cases in Task 5.

Deliverable: Meeting Notes

Task 5: Develop Second Stage Use Cases

Objective: To develop detailed Second Stage Use Cases for the IRP and IFTA Registration System.

Once a set of basic use cases were developed, Iteris focused on development of Second Stage Use Cases. These use cases focused on ensuring the new system can address and react to preconditions, triggers, basic course of events, alternative paths, post conditions, business rules, unanticipated system errors and security breaches. Iteris worked with SDDORR and SDBIT to identify existing conditions and potential risks that are currently encountered. The second stage use cases addressed issues including:

- ✓ How and who to contact in cases of data and system faults.
- ✓ Where to direct users in cases of errors or invalid data.
- ✓ How to limit user access to relevant areas of the system.

Because the system contains sensitive data and may interact with financial institutions, Iteris also examined how SDBIT handles related issues of security. The background information for this task was gathered concurrently with Task 4. Iteris developed a draft and final Technical Memorandum #2 detailing the second stage IRP and IFTA use cases.

Deliverable: Technical Memorandum #2: Complete Second Stage IRP and IFTA Registration System Use Case Scenarios

Task 6: Develop Detailed System Requirements

Objective: To create detailed system requirements for IRP and IFTA Registration System that meets South Dakota's current needs, federal requirements and is scaleable to meet future requirements.

In this task, Iteris used the information generated in Task 2 through Task 5 to generate detailed system requirements. These system requirements included:

- ✓ Detailed second stage use cases that illustrate the concept of operations and system needs.
- ✓ Basic screen interfaces that depict how users will interact with the system, both online and offline; how information will be entered and retrieved; how the system will be navigated; how reports will be generated.
- ✓ The types of reports that can be generated, their contents and their output format.
- ✓ Auditing functions.
- ✓ Graphical depictions of system-to-system connections and information flows.
- ✓ Graphical depictions of hardware and network interfaces for the IRP and IFTA Registration System and other systems, such as CVIEW. The depictions will identify any firewalls or other security issues that may be present.

Deliverables: Draft Detailed System Requirements for IRP and IFTA Registration System

Task 7: Review and Approve Detailed System Requirements

Objective: To ensure that the Detailed System Requirements for IRP and IFTA Registration System meet the needs of SDDORR and SDBIT.

In its third on-site meeting in South Dakota, Iteris coordinated with SDDORR and SDBIT staff to review the Draft Detailed System Requirements for the South Dakota IRP and IFTA System. SDDORR and SDBIT staff, as well as other stakeholders, received the draft requirements in advance, and reviewed them before the meeting.

During the meeting, Iteris documented all discussion and recommended changes to the system requirements. Each comment and recommended change was addressed for the final Detailed System Requirements for IRP and IFTA Registration System.

Deliverable: Meeting Notes, Detailed System Requirements for IRP and IFTA Registration System

Task 8: Prepare Comprehensive IRP and IFTA Registration System Specifications

Objective: To complete a set of specifications that can be used by South Dakota to procure a complete IRP and IFTA registration system.

Iteris developed comprehensive specifications that will be inserted directly into a Request for Proposals (RFP) for procuring the described system. Iteris worked with SDDOT and SDDORR staff to ensure that the format of specifications is consistent with their RFP format. The specification fully describes requirements which are placed into the following categories:

- ✓ General Requirements (GR)
- ✓ System Administration (SA)
- ✓ Account Processing (AP)
- ✓ IFTA Processing (IF)
- ✓ IRP Processing (IR)
- ✓ Financial Management (FM)
- ✓ Inventory (IN)
- ✓ User Interface (UI)
- ✓ Web Functions (WF)
- ✓ Querying and Reporting (QR)
- ✓ Printing (PR)
- ✓ System Functions & Screen Elements (SF)
- ✓ System Architecture (AR)
- ✓ System Interfaces (SI)
- ✓ Data Conversion (DC)
- ✓ Security (SE)

The specifications are consistent with industry standards for open systems development and commercial banking standards.

Deliverable: Comprehensive IRP and IFTA Registration System Specifications

Task 9: Prepare a PowerPoint Presentation

Objective: To prepare an executive PowerPoint presentation detailing the findings and results of this project for use by South Dakota Office of Research staff.

At the conclusion of the project, Iteris compiled project documentation, developed a high-level presentation using Microsoft PowerPoint and provided an Executive Summary document to be used to inform the SDDOT Research Review Board of this project's findings. The presentation briefly describes the project background, objectives, tasks and resulting findings, including a summary of functions defined for the new South Dakota IRP and IFTA System.

Deliverable: Executive PowerPoint Presentation, Executive Summary

1.4 CONCLUSIONS

Fifty-six individual use cases were developed as a basis for the South Dakota IRP and IFTA System requirements. As displayed in the table below, seventeen distinct categories of system functions were used to characterize three hundred and seventy-six unique system requirements.

Table 1 – System Requirements Summary

System Requirement Category	Mandatory	Mandatory / Flexible	Optional	Total
General Requirements (GR)	17	9	1	27
System Administration (SA)	6	20	9	35
Account Processing (AP)	4	15	2	21
IFTA Processing (IF)	6	21	11	38
IRP Processing (IR)	32	23	3	58
Financial Management (FM)	1	9	3	13
Inventory (IN)	0	4	0	4
User Interface (UI)	3	10	4	17
Web Functions (WF)	9	19	10	38
Querying and Reporting (QR)	5	10	3	18
Printing (PR)	9	2	4	15
System Functions & Screen Elements (SF)	0	28	0	28
System Architecture (AR)	9	6	0	15
System Interfaces (SI)	12	0	0	12
Data Conversion (DC)	3	0	0	3
Security (SE)	1	20	0	21
Documentation, Maintenance, Testing and Training (DM)	7	6	0	13
Total	124	202	50	376
Percentages	33%	54%	13%	100%

Examination of the priority given to the requirements indicates that only 1/3 are "mandatory". This indicates a well balanced set of requirements which will provide the foundation for a successful procurement action.

1.5 RECOMMENDATIONS

System Procurement
South Dakota should move forward with a procurement action for a new IRP & IFTA system. This activity should begin as soon as possible in order to have sufficient time for system deployment and conversion, before the 2010 deadline for support of the current COVERS system. Despite the exit of Polk as a supplier to the IRP and IFTA system market, several new vendors have entered, presenting South Dakota with choices among competing products.

Procurement Lead Time
Sufficient time should be allowed for vendors to review and respond to the Request For Proposal (RFP). The quality of responses to a RFP is directly related to the quality of the requirements, and, the time allowed for potential vendors to respond. Sufficient time would entail giving vendors a 50-60 day period to review the requirements, ask questions, interpret responses to questions and develop a quality response. This time should be added to any time required by South Dakota procurement to create the RFP and obtain approvals for release.