1   Capability

The **Carrier Access to Safety Data** capability is:

> Improve the carrier's ability to review safety-related data (carrier, vehicle, driver, cargo, crash, citation, inspection) collected by a state or federal agency in a timely manner. Consider proactively delivering safety data to the carrier.

2   Working Group Recommendations

The Enhanced Safety Information Sharing Working Group offers these summary recommendations related to this capability:

- The working group supports both options described in this report:
    - One-stop shop to access safety data
    - Proactively notify carrier about new data reports

- The working group proposes two activities related to this capability:
    - Coordinate with Creating Opportunities, Methods, and Processes to Secure Safety (COMPASS) on a one-stop shop "carrier portal" to improve access to safety data.
    - Evaluate Employer Notification Service (ENS) pilot for additional carrier notification functions.

- Members of the Enhanced Safety Information Sharing Working Group should be invited to join a stakeholder group that will help steer the COMPASS efforts so that resources can be used effectively and so that the services deployed via COMPASS meet the stakeholders' top priority concerns.

- Members of the working group and those who are participating in the ENS pilot should be invited to participate in the ENS evaluation effort.

3   Concept of Operations

The term concept of operations (ConOps) means operational attributes of the system from the operators' and users' views. The ConOps allows for the use of a variety of technologies. There may be potential benefits to be gained by using some sophisticated technologies, but only if the technologies are part of a well-conceived and vetted set of practices, are thoroughly understood and tested, and are implemented and used correctly. This section summarizes the proposed concept of operations.

Existing systems contain much of the information needed to achieve the goals of the Expanded Commercial Vehicle Information Systems and Networks (CVISN) initiative. To increase information sharing, expand, merge, establish interfaces between, or enhance existing

information management systems [e.g., Motor Carrier Management Information System (MCMIS), Commercial Driver's License Information System (CDLIS), Safety and Fitness Electronic Records (SAFER), Commercial Vehicle Information Exchange Window (CVIEW), Performance and Registration Information Systems Management (PRISM), International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) clearinghouses] to include:

- Role-based access to services using single sign-on

- Open standards for information sharing

- Improved and flexible user interfaces (e.g., provide default look and feel based on user's role; allow user to tailor)

- Standardization around a small number of standards. This gives each state the flexibility to work within its overall statewide architecture, but still encourages commonality among states' systems and approaches.

- Collection of data once and frequent reuse (e.g., collect census data from a carrier and re-use that data from a single source whenever it's needed)

- Consistent level of service regardless of time-of-day or day-of-year

- Improved access to data about all commercial drivers

- More timely and complete IRP and IFTA data in snapshots

- Consistent identification of carrier, driver, vehicle, and cargo

- Association of entities that are related during a trip (e.g., John Driver working for Carrier XYZ driving vehicle with plate 1234567 registered in Maryland hauling trailer with plate 8901234 registered in Delaware)

- Electronic security device event data (to track the status of and activities related to a security device attached to the container and/or trailer)

- Integrate with or link to asset tracking, arrival scheduling, and other vehicle, port and freight information systems [e.g., Freight Information Real-Time Systems for Transport (FIRST), electronic freight manifest, State On-Line Enforcement System (STOLEN)].

- Access to up-to-date credentialing information [e.g., oversize/overweight (OS/OW) permits].

To improve the quality of information and to improve access, develop, expand, merge, or enhance **data collection and reporting systems** used in the field [e.g., ASPEN, Carrier Automated Performance Review Information (CAPRI)] to include:

- Open standards for data collection and reporting

- Access to driver snapshots

- Out-of-service (OOS) processing

- Uniform citation reporting

- Uniform crash reporting

- Hours of service compliance evaluation

- Vehicle and cargo security checks

- Heavy duty diesel (HDD) emissions inspections

- Interface with electronic on-board systems

- Wireless technology.

Look for successes within innovative programs and build on or adapt their business models for broader use. Categories of programs/systems to review include:

- Electronic toll collection systems (e.g., E-ZPass)

- Electronic credentialing systems for multiple credentials [e.g., One-Stop Credentialing and Registration (OSCAR)]

- Regional data-sharing systems [e.g., Extensible CVIEW (xCVIEW)]

- Roadside information reporting systems (e.g., ASPEN)

- Port scheduling/access programs (e.g., PierPass)

- Freight security improvement programs [e.g., Operation Safe Commerce (OSC)]

- Cross-program technical interchange (e.g., CVISN/PRISM)

- Border-crossing improvement programs [e.g., Free and Secure Trade (FAST)]

- Data challenge and correction (e.g., DataQs).

Review and build on technology lessons learned. Categories of programs/initiatives to review include:

- Recent operational tests [e.g., Federal Motor Carrier Safety Administration's (FMCSA's) Hazardous Materials (HazMat) Op Test]

- Intelligent Transportation Systems (ITS) initiatives [e.g., Vehicle Infrastructure Integration (VII)]

- Applications and uses of standards [e.g., Dedicated Short Range Communication (DSRC) standards]

- Technology transfer opportunities [e.g., Federal Rail Administration's (FRA's) railroad track status reporting]

- Commercial Vehicle Operations (CVO) infrastructure deployments (e.g., e-screening)

- E-credentialing deployments (e.g., Core CVISN Web credentialing)

- Broader transportation infrastructure deployments (e.g., e-toll collection)

- Data sharing models (e.g., CDLIS).

For the **Carrier Access to Safety Data** capability, consider an approach that provides a one-stop shop for data review and challenge.

4   Requirements

Discussions with the members of the Enhanced Safety Information Sharing Working Group established by FMCSA via the ITS/CVO 2005 Deployment Showcase seeded the requirements stated in this section. Subsequent review by members of the working group finalized the requirements.

To clarify what we mean by "safety data," this definition is suggested: Safety data includes all information used to

- Identify a carrier, vehicle, driver, shipper, or cargo

- Evaluate compliance with all commercial motor vehicle regulations

- Compute safety assessment.

Motor carriers need access to safety data in order to

- Ensure that records are accurate and up-to-date

- Improve their ability to enforce carrier-based policies (e.g., maintenance policies)

- Improve driver review and hiring practices

- Address the growing use of these data by the shipper community

- Assure that any sanctions are warranted, or better, avoid them

- Avoid surprises at critical points, such as renewing credentials

- Increase productivity

- Improve compliance with regulations.

The information that carriers need to access includes:

- *Carrier safety data*
    – Identifiers
    – Safety ratings
    – OOS violations
    – Crash data
    – Inspection data
    – Compliance review data
    – Census data (e.g., business identification, contact data, operation data, state-specific data)
    – Credentials status/flags [e.g., IRP, IFTA, Single State Registration System (SSRS), operating authority]
    – Insurance data

- *Vehicle data*
    - Identifiers
    - Census (e.g., title, state-specific data)
    - Credentials status/flags (e.g., registration weights/states/dates, permit characteristics and status, tax payment status/flag)
    - Transponder event data

- *Driver safety data*
    - Identifiers
    - Summary safety data [e.g., latest summary of information from crash and inspection reports; safety rating (proposed new item); security rating (potential new item)]
    - Driver history
    - Violations (OOS, inspection, moving; both citations and convictions)
    - Medical waiver (potentially)
    - Driver license data

- Any other information needed by enforcement at the roadside (e.g., state-specific credentials, highway use tax, regional OS/OW permits).

    Note: Please see the **Driver Snapshots** capability report (reference 1) for a list of potential driver data elements to be shared and the **Access to Credentials Data** capability report (reference 2) for a list of credentials data to be shared.

Access requirements include:

- To streamline operations, the data should be presented in a consolidated format.

- The presentation should provide a simple means to challenge data errors.

- Consider proactively delivering summary information to the carrier on a periodic basis.

- Consider proactively notifying the carrier about certain critical events/reports. Do not overwhelm carriers with too many notifications. Perhaps a weekly report would suffice.

- Indicate which data are new (e.g., whether the user has already viewed the data on a previous visit to the Web site).

- Authorized carrier representative should be able to indicate that needed repairs noted during an inspection have been completed.

- Different access levels should be provided:
    - Only a safety director or above should be allowed to change data
    - Everyone should be allowed to view certain data as authorized by federal or state regulation

- For requirements concerning sharing driver data, please see the **Driver Snapshot** and **Access to Driver Data** reports (references 1 and 3).

- Improved access is required both by people (e.g., via a browser to a well-designed Web site) and systems (e.g., for automated processing of information). If the resources for making changes are limited, improved access for people has precedence over improved access for systems.

- Show data in the context of similar entities. One approach might be to show average values in order to compare an individual carrier's/driver's ratings to a standardized norm.

Data needed by multiple systems (e.g., census data) should be accessed from a single source instead of replicating the information.

Outreach and training should be provided to

- Increase awareness of tools and services available to review data

- Educate users about how to challenge errors.

Today there are some data quality problems regarding safety data associated with a carrier. Any attempt to improve access to the information should also include improvements in the way carriers can challenge the information. Please see the **Safety Data Quality** capability report (reference 4) for requirements about safety data quality and data challenge requirements.

5 Potential Solution Alternatives

In Draft 1 of this report, several potential solution options for the **Carrier Access to Safety Data** capability were identified. In Draft 2, the original options were reworked to combine some features. The potential options discussed here are not necessarily mutually exclusive.

- Recommended Option 1: One-stop shop to access safety data (COMPASS)

- Recommended Option 2: Proactively notify carrier about new data reports.

The first option provides users with improved access to data through a single Web portal (or other technology that provides equivalent functionality). In this solution carriers visit a Web site to retrieve information. Energy would be placed on making user-friendly interfaces tailored to the carriers' needs. The second option focuses on pushing some information to the carrier; several approaches are described. For each of these solution options, the architecture and possible impacts on federal, state, and industry systems/business processes are summarized.

The working group understands that the COMPASS initiative plans to issue a solicitation soon for system integrator services related to a carrier portal. That would tie directly to Option 1. The ideas expressed in this report should be shared with the COMPASS team and incorporated, if possible, in the solicitation. Based on the assumption that COMPASS is already planning to handle most of what is described as Option 1, when asked to choose between Options 1 and 2, the group selected Option 2. However, if the COMPASS initiative is not planning to accomplish what is described as Option 1, the group would choose Option 1 as the higher priority.

5.1 Recommended Option 1: One-stop shop to access safety data (COMPASS)

In this option, FMCSA provides a user-friendly interface for a carrier to access all safety-related data. Authorized users would be able to view consolidated safety information about a carrier. The information would come from a combination of FMCSA sources and state sources. The information accessible via the one-stop shop would include the items listed in the Requirements section of this report under:

- Carrier safety data

- Vehicle data

- Driver safety data.

Carriers and their designated agents would be able to register to be authorized to access the information listed above. As the user reviews information, the system would keep track of which items had been accessed so that, upon a return visit, the user could choose to skip over the information he/she had already seen. If the user has the appropriate authority, the user interface would also provide a simple mechanism to challenge or update the information. Figure 5-1 illustrates the high-level architecture for this option. It is our understanding that the COMPASS initiative is already planning to undertake something similar to this venture.
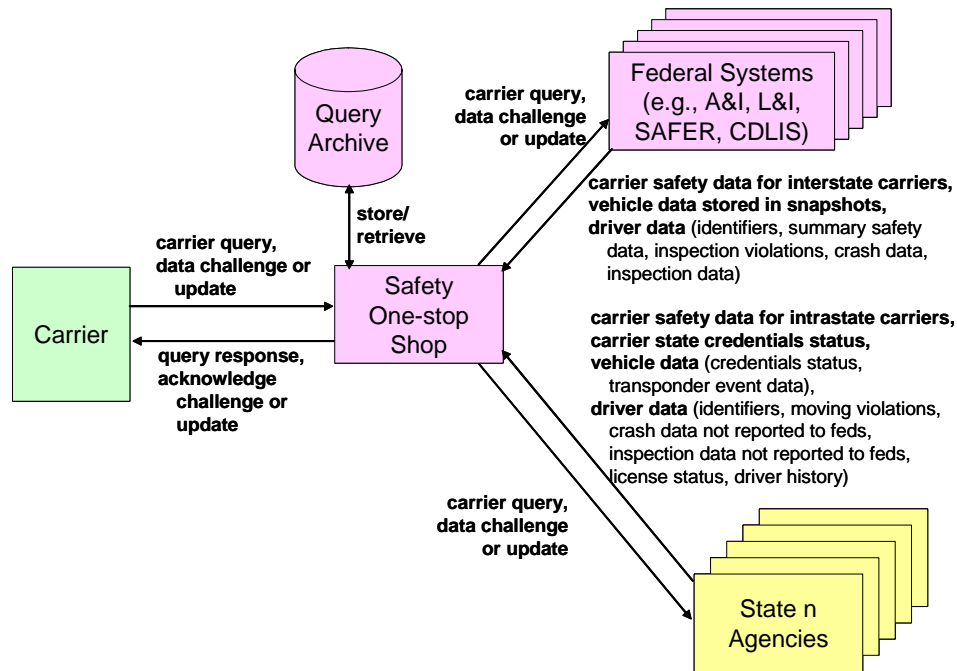

Figure 5-1. Recommended Option 1: One-stop shop to access safety data

Under this option, the impact on Licensing and Insurance (L&I), Analysis & Information (A&I), SAFER, or some other system that presents safety information to carriers for review could be substantial. The system that supports this service would manage access according to business

rules, follow industry best practices for the user interface, and link to information throughout the FMCSA enterprise systems. The query parameters would be passed to state systems as well as FMCSA systems so that data held by the state could be returned. The impact on states could be significant. However, if a state has a CVIEW or equivalent, the interface to the Safety One-Stop Shop could be via CVIEW. Examples of data the state might provide include inspection and crash data about intrastate carriers, crash information not reported to the federal systems, status of state-issued carrier credentials, status of vehicle credentials, driver violations, and driver license status. Data about drivers would be associated with a carrier through the inspection reports, crash reports, and via a voluntary registry. The one-stop shop would manage driver license queries via CDLIS. The one-stop shop would sort through the data returned from different systems and filter out duplicate information. The system would verify that data returned matches the query parameters and would flag potential errors (e.g., reports that may be near-duplicates because of date similarities). If the user has the appropriate authority, the user interface would also provide a simple mechanism to challenge the information. Carriers (people) would access the improved service using commercially-available browsers. Potentially, the service would also provide a facility to download information for subsequent automatic processing by a carrier's systems.

5.2 Recommended Option 2: Proactively notify carrier about new data reports

This option would focus on government systems pushing information to carriers using open standard interfaces. This option does not involve changing the user interface for existing Web sites or for creating new Web sites. Instead, this option packages information as it is gathered and sends it to the carrier proactively. Presumably, the carriers could implement automated processing of that information. Carriers interested in receiving notifications would voluntarily request this service. Those carriers would need to provide (and keep up to date) accurate contact information to enable the proactive notification process.

In this option, efforts would be focused on proactively notifying the carrier when new data reports pertaining to that carrier are processed. Carriers could automate their systems to handle the proactive notification/information. Three approaches are under consideration. All three potentially involve changing both the federal and state systems that collect or manage the data. If possible, the same approach should be taken to reach both interstate and intrastate carriers. The working group expressed a preference for Option 2b. The Employer Notification Service depicted as Option 2c should be evaluated as a model for the simplified expression of similar functionality shown in Option 2b.

- Option 2a: Modify the data collection systems that generate the reports (e.g., ASPEN, crash reporting, citation reporting) to push reports to the carrier in parallel with sending the reports to the government database. The information pushed to the carrier could be either the entire report or a notification that a new report has been generated. Figure 5-2 illustrates the approach.
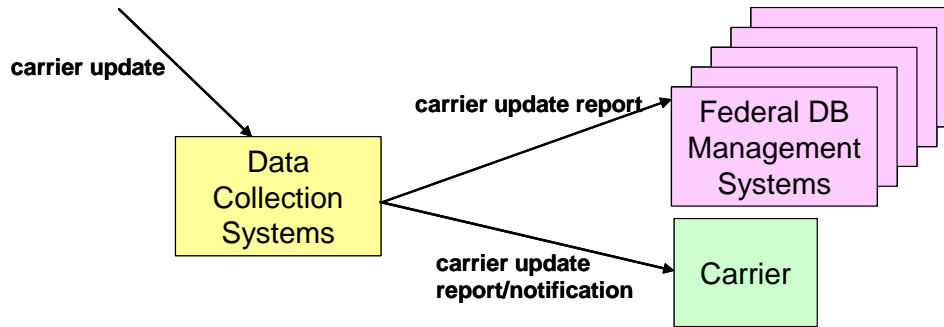
Figure 5-2. Option 2a: Data collection systems proactively notify carrier

- Preferred Option 2b: Modify the government database/data management systems (e.g., MCMIS, SAFER, A&I) to push information about the reports to the carrier upon receipt from the data collection system. The information pushed to the carrier would be a notification that a new report has been received. Figure 5-3 illustrates the approach. Note that this approach would serve intrastate carriers only if the reports were sent to the federal safety data management systems. In today's environment, that would be most likely to happen in states that assign US Department of Transportation (USDOT) numbers to intrastate carriers. As of 2002, at least 28 states assign USDOT numbers to intrastate carriers.
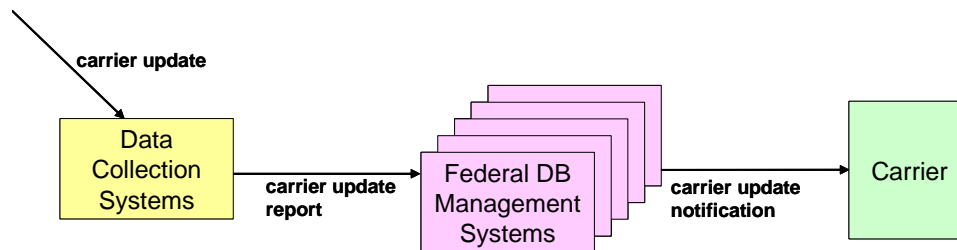

Figure 5-3. Preferred Option 2b: Data management systems proactively notify carrier

- Option 2c: Modify the government database/data management systems to track receipt of new information about a carrier, periodically merge/summarize the new information, and then push a summary to the carrier at some agreed-to periodic schedule. This approach might be similar to the Employer Notification Service being prototyped to share information about drivers with the carriers for whom they work. Figure 5-4 illustrates the ENS approach. **Connections similar to those shown for driver information management systems would be required for other systems that manage data about carriers and vehicles.**
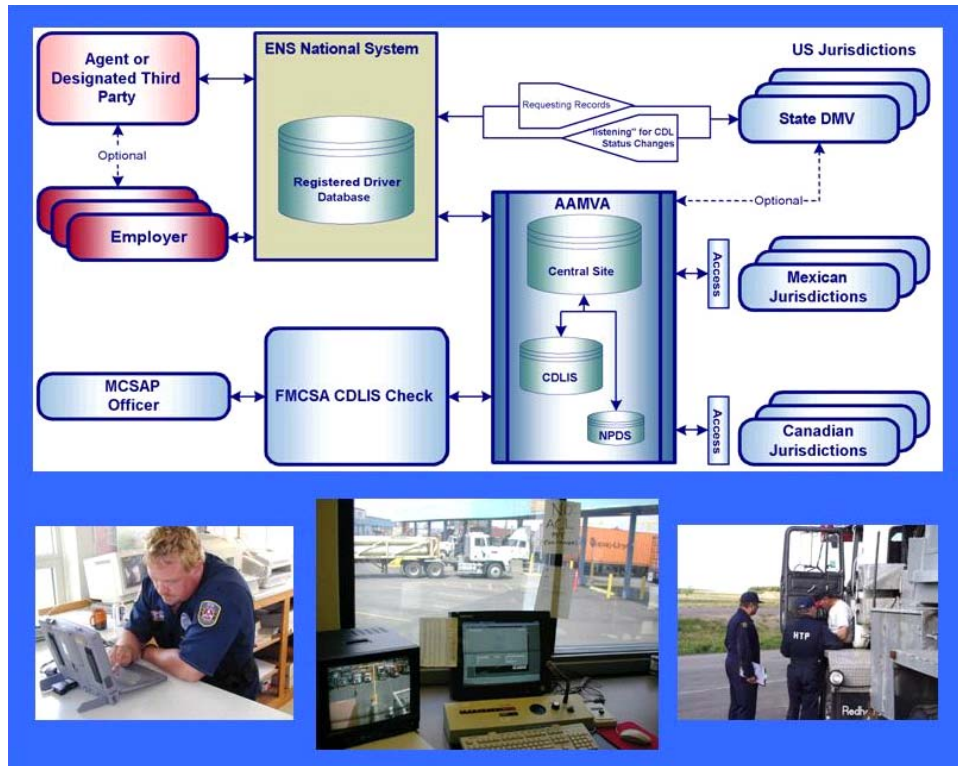

Figure 5-4. Option 2c: Employer notification services illustration, from SAIC

6 Cost-Benefit Analysis

The following table provides a high-level cost-benefit analysis for each solution option identified in the previous section. Putting the issues described in Section 8 aside, the common pros and cons across all options include:

- Pro: Carriers' access to their own safety data would be improved.

- Pro: As a result, compliance with safety regulations should be improved.

- Pro: With on-line access to transponder event data collected by government systems, industry members should realize increased productivity.

- Pro: Data quality is likely to improve as the data are reviewed more by carriers.

- Con: Industry members who do not use the Internet will not realize benefits.

The cost figures are rough estimates provided by working group members.

- Low means less than $100K

- High means more than $1M

- Medium is everything in between.

Option	Pro	Con	Cost
1 (One-stop shop to access safety data)	All: --- Federal: Builds on existing systems. Opportunity to integrate with and leverage COMPASS initiative. State: Achieves new capability via an interface with a single federal system. Industry: Easy on-line access to safety data.	All: --- Federal: Potentially, interface with many state systems. Sorting out query responses will be a significant task. State: May require an overhaul of existing state legacy systems to meet the technical standards required, especially the real-time query component. Systems may support multiple functions including those beyond CVO (example: driver registration). Intrastate operations and data may not map neatly to the queries identified because of differences between intrastate and interstate processes and information. Industry: ---	Federal: Medium to High, but COMPASS should be handling most of this, so cost to CVISN may be low. State: Low to Medium, depending on state. Industry: Low. Will vary depending on how the carrier decides to use the information.
2a (Data collection systems proactively notify carrier)	All: Immediate notification to carrier. Federal: --- State: --- Industry: Raw data that can be tailored to fit the carrier's business process, including pushing the data further out to the carrier's customer base if desired.	All: Multiple systems would need to notify the associated carrier. Risk of becoming out of sync with data definitions due to standards, legislative, or regulatory change at the state level. Difficult to maintain current contact information for the carrier and to connect the carrier with the correct vehicles and drivers. Federal: --- State: Would need to adjust current systems to provide immediate notification. Industry: ---	Federal: Medium State: Medium Industry: Low

Option	Pro	Con	Cost
2b (Data management systems proactively notify carrier)	<u>All</u>: Only centralized data management systems would need to notify the associated carrier. <u>Federal</u>: --- <u>State</u>: Minimal, if any, changes required to state systems. <u>Industry</u>: Quick and simple notification. Under own control when to retrieve/review reports.	<u>All</u>: Delay commensurate with the delay between when data are collected, reported, and notification sent. Difficult to maintain current contact information for the carrier and to connect the carrier with the correct vehicles and drivers. <u>Federal</u>: Would expand existing systems. <u>State</u>: --- <u>Industry</u>: There is sometimes a delay in reporting crash data to the federal systems.	<u>Federal</u>: Medium <u>State</u>: Low, if any. <u>Industry</u>: Low
2c (ENS model)	<u>All</u>: Existing data collection or reporting systems interface with single federal system. <u>Federal</u>: --- <u>State</u>: --- <u>Industry</u>: Quick and simple notification. Under own control when to retrieve/review reports.	<u>All</u>: Delay commensurate with the delay between when data are collected, reported, and notification sent. Difficult to maintain current contact information for the carrier and to connect the carrier with the correct vehicles and drivers. <u>Federal</u>: New system development or existing system expansion. <u>State</u>: --- <u>Industry</u>: There is sometimes a delay in reporting crash data to the federal systems.	<u>Federal</u>: Medium <u>State</u>: Unknown <u>Industry</u>: Low

7 Business Case

While SAFER contains various types of safety data including inspection, crash, and citation reports, this data has not been made easily available to motor carriers. Data accessible via A&I may not match the data available via SAFER or the data stored in MCMIS. Individual inspection and crash reports are available via the FMCSA Freedom of Information Act (FOIA) Officer, but it can take 4 weeks. Focus has been on exchanging safety information pertaining to interstate carriers; safety information pertaining to foreign (Mexican and Canadian) and intrastate carriers may not be available electronically.

The potential solution options would improve the ability for both interstate and intrastate carriers to access their own safety data.

Option 1, *One-stop shop to access FMCSA-held safety data*, could be integrated with the COMPASS effort. The concept provides a foundation for improved access to safety data tailored to other kinds of users such as shippers, insurers, etc. The technology to implement Option 1 is readily available.

Any version of Option 2 would enhance the effectiveness of the existing Web sites that allow carriers to access data about themselves, since the carrier would be motivated to review the data via automatic notification of an important change. The technology to implement Option 2 is readily available. Option 2b minimizes the number of systems that would be changed, focusing the changes in federal safety data management systems.

8 Issues

8.1 Institutional Issues

Data about carriers are held by both state and federal information systems. For the most part, those systems were developed to meet regulatory and enforcement needs. The systems were not designed to proactively send reports to carriers. Informing the carrier proactively about new reports in which the carrier is mentioned would require current address information and resources not currently available within the responsible agencies. The number of notifications to be sent to a carrier might be large. The carriers who do not use existing facilities to review their own data would probably be no more likely to enroll in a new program. Privacy concerns must be addressed before sharing data beyond what is shared today. State information technology resources are limited, and making changes to improve information access may be difficult to accomplish.

8.2 Technical Issues

The technology to share information is readily available. Consolidating that information for user-friendly consumption would probably pose the greatest technical challenge associated with this capability. It might be difficult (and expensive) to share data from state systems.

9 Deployment Strategy

In deploying the **Carrier Access to Safety Data** capability, several aspects should be considered:

Improve data quality and integrity:

- Establish a consistent set of data elements that are common across information systems and analysis applications.

- Expand the use of standard identifiers for entities visible at the roadside (carrier, vehicle, driver, cargo, chassis) to link related information.

- Make information collection, access, and use consistent across interstate, foreign, and intrastate operations.

- Capture data electronically as close to the source as possible; once information is available electronically, it should be re-used instead of re-entered manually.

- Expand standard procedures and tools for reviewing, detecting problems in, and correcting errors in publicly-held data.

- Expand the use of on-line tools that provide industry with the ability to challenge and correct their own census, inspection, crash, and citation information.

- Control access to sensitive information.

Work together and share lessons learned:

- Work with stakeholders to define and deploy common data elements and interoperable business processes for all areas of CVISN expansion.

- Establish standardized terminology and common requirements for data collection, access, quality checks, and making corrections.

- Coordinate standards-related activities with appropriate standards development organizations.

- Actively solicit lessons learned from "early adopters" of CVISN and Expanded CVISN concepts, and determine how to apply those lessons more broadly.

- Actively engage stakeholders in identifying priorities, proposing solutions, and participating in prototype projects.

- Proactively reach out to stakeholders who may be affected by changes to systems or processes that are under discussion.

- Learn from other ITS activities about solutions applicable to CVO.

Deploy targeted solutions incrementally:

- Select information-sharing options based on users' needs and available technology (e.g., proactive data-provider "data push" versus user-initiated "data query").

- Prototype proposed solutions and link to existing capabilities.

- Consider small-scale solutions that can be expanded or serve as models for national deployment.

- Build in metrics to assess real improvements.

- Provide access to on-line analysis tools.

Use appropriate technology to improve operations:

- Equip commercial vehicles with standard DSRC and other technologies, enabling a multitude of safety, security and productivity applications.

- Deploy interoperable technologies to support CVISN and other related CVO activities.

- As products become available, consider 5.9 GHz DSRC as an enabling technology for roadside-to-vehicle, vehicle-to-roadside, and vehicle-to-vehicle data exchange.

- Equip cargo containers and trailers with standard electronic security devices (ESDs).

- Expand the use of and capabilities of portable and remote sensors to monitor environmental, facility, road and vehicle conditions and provide data to interested stakeholders.

- Apply new and emerging wireless capabilities [e.g., Bluetooth, Wireless Fidelity (Wi-Fi), Global Systems for Mobile Communications (GSM)] and onboard technologies to improve on-road and roadside operations and reduce costs.

The working group recommends that the ideas expressed in this report be shared with the COMPASS team and incorporated, if possible, in any solicitations related to development of a carrier portal. Based on the assumption that COMPASS is already planning to handle most of what is described as Option 1, the group recommends funding a project to evaluate the ongoing ENS pilot for possible expansion to address additional carrier notification functions.

9.1   Coordinate with COMPASS for carrier portal

The idea of improving access to safety data for carriers has been a priority for FMCSA. If the COMPASS initiative has near-term plans to develop a Web portal tailored to carrier needs, the ideas presented in this report should ideally be incorporated into that effort. Working group members should be invited to join a stakeholder group that will help steer the COMPASS efforts so that resources can be used effectively and so that the services deployed via COMPASS meet the stakeholders' top priority concerns.

However, if the COMPASS initiative is not planning to accomplish what is described as Option 1, the group recommends, as a higher priority, funding a project to prototype a one-stop shop for access to carrier safety data.

Idaho, Maryland and Wisconsin expressed interest in participating in this activity.

9.2 Evaluate ENS pilot for additional carrier notification functions

FMCSA is currently piloting the deployment of a nationwide Employer Notification Service to notify employers of their drivers' convictions and changes of license status in a more timely manner than required by regulation or exercised in practice. The approach should be evaluated for possible expansion to address additional carrier notification functions including:

- Notification that an inspection has been conducted

- Notification that a crash has been reported

- Notification that a citation has been issued to a driver.

Members of the Enhanced Safety Information Sharing Working Group and those who are participating in the ENS pilot should participate in this evaluation effort.

Idaho, Maryland and Wisconsin expressed interest in participating in this activity.

10 References

1. JHU/APL, *Expanded CVISN Driver Information Sharing Capability Report: Driver Snapshots*, SSD-PL-05-0194, June 2005.
2. JHU/APL, *Expanded CVISN Expanded E-Credentialing Capability Report: Access to Credentials Data,* SSD-PL-05-0201, June 2005.
3. JHU/APL, *Expanded CVISN Driver Information Sharing Capability Report: Access to Driver Data*, SSD-PL-05-0195, June 2005.
4. JHU/APL, *Expanded CVISN Enhanced Safety Information Sharing Capability Report: Safety Data Quality*, SSD-PL-05-0196, June 2005.