

Feasibility Study for Electronic Fitness for Duty Medical Examination Reporting and Oversight



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FOREWORD

There is an ongoing dialogue about how to proceed with creating a reliable, secure, and efficient medical certification process for drivers of commercial motor vehicles. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005 requires the Federal Motor Carrier Safety Administration (FMCSA) to take actions to improve the process.

FMCSA issued a Final Rule in December 2008 titled, “Medical Certification Requirements as Part of the CDL,” which specifically addresses placing certification data for interstate commercial driver’s license (CDL) drivers on Commercial Driver’s License Information System (CDLIS) driver records available to authorized users. The CDL Advisory Committee Report to Congress said that the rule did not create a reliable, secure, or efficient process for making the medical certification status data available.

Additionally, FMCSA issued a Final Rule in on April 20, 2012 titled, “National Registry of Certified Medical Examiners” (NRCME). This rule addresses the qualification requirements for medical examiners conducting the examinations for all drivers of commercial motor vehicles. It is acknowledged that the rule has only limited capabilities in providing FMCSA with the ability to effectively oversee medical examiner performance.

This report begins with the foundation of the above rules. It examines the feasibility of extending capabilities of those rules via secure electronic transmission of the medical examinations by medical examiners authorized on the NRCME and for CDL drivers transmitting results to the State Driver License Agencies responsible for providing this data to authorized users as part of the CDLIS driver record. In addition, this report looks at opportunities for how such capabilities could also assist with other needs, such as assisting medical examiners in the quality of their medical examinations, Agency oversight responsibilities regarding medical examiner performance, and research for relationships between medical conditions and safety performance of drivers.

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16. Abstract <p>This report examines the institutional and high-level technology aspects associated with potential mandated electronic reporting of every commercial driver license (CDL) driver fitness-for-duty medical examination performed by a medical examiner on the National Registry of Certified Medical Examiners (NRCME). To gauge views and concerns of effected stakeholders, the research team developed a "Base Scenario" outlining the elements of the potential system. A review via interviews was conducted, a similar concept administered by the Federal Aviation Administration was examined, ongoing electronic medical records initiatives in the Department of Health and Human Services were examined, and related third-party system approaches were studied. A historical review was conducted of related recommendations from Congress and other institutions, including the Commercial Driver's License Advisory Committee. Implementation of the NRCME will improve the quality of medical examinations. However, it will not close the number of significant gaps that allow fraud. Based on the findings of these reviews and stakeholder input, three alternative approaches to a mandated electronic records system were examined, including a nationally-based system, a distributed State-based system, and a distributed medical examiner-based system. Architectural approaches were defined and analyzed relating to each approach. The researchers concluded that the most effective approach for Federal Motor Carrier Safety Administration consideration would be a nationally-managed system that would address the gaps. Appendix C outlines a proof of concept to test and evaluate the recommendations for implementing electronic transmission and housing of medical status and examination reports in an accessible database.</p>			
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SI* (MODERN METRIC) CONVERSION FACTORS

Table of APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
In	inches	25.4	Millimeters	mm
Ft	Feet	0.305	Meters	m
Yd	Yards	0.914	Meters	m
Mi	Miles	1.61	Kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yards	0.836	square meters	m ²
Ac	Acres	0.405	Hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	1000 L shall be shown in m ³ Milliliters	mL
Gal	gallons	3.785	Liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
MASS				
Oz	ounces	28.35	Grams	g
Lb	pounds	0.454	Kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE				
°F	Fahrenheit	$5 \times (F-32) \div 9$ or $(F-32) \div 1.8$	Temperature is in exact degrees Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	Lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
Force and Pressure or Stress				
lbf	poundforce	4.45	Newtons	N
lbf/in ²	poundforce per square inch	6.89	Kilopascals	kPa

Table of APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
Mm	millimeters	0.039	inches	in
M	Meters	3.28	feet	ft
m	Meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	Liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	Grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE				
°C	Celsius	$1.8c + 32$	Temperature is in exact degrees Fahrenheit	°F
ILLUMINATION				
lx	Lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
Force & Pressure Or Stress				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

* SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003, Section 508-accessible version September 2009.)

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LIST OF ACRONYMS

Acronym	Definition
AAMVA	American Association of Motor Vehicle Administration
AMCS	Aerospace Medical Certification Subsystem
AME	Aviation Medical Examiner
CDL	Commercial Driver's License
CDLIS	Commercial Driver's License Information System
CFR	Code of Federal Regulations
CMV	Commercial Motor Vehicle
COMPASS	Creating Opportunities, Methods, and Processes to Secure Safety
COTR	Contracting Officer's Technical Representative
CSA	Compliance, Safety, Accountability
CSMS	Carrier Safety Management System
CVISN	Commercial Vehicle Information Systems and Networks
CVSA	Commercial Vehicle Safety Alliance
DHS	Department of Homeland Security
DIR	Driver Information Resource
DIWS	Document Imaging Workflow System
DSMS	Driver Safety Management System
EHR	Electronic Health Record
EMR	Electronic Medical Record
ENS	Employee Notification Service
EOBR	Electronic Onboard Recorder
FAA	Federal Aviation Administration
FFDS	Fitness-for-Duty System
FHA	Federal Health Architecture

Acronym	Definition
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
GAO	Government Accountability Office
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act
IT	Information Technology
MCMIS	Motor Carrier Management Information System
MCSAP	Motor Carrier Safety Assistance Program
MVR	Motor Vehicle Record
NIEM	National Information Exchange Model
NLETS	National Law Enforcement Telecommunications System
NRCME	National Registry of Certified Medical Examiners
NPRM	Notice of Proposed Rulemaking
NTSB	National Transportation Safety Board
OMB	Office of Management and Budget
ONC	Office of the National Coordinator
OST	Office of the Secretary
PIA	Privacy Impact Assessment
PII	Personal Identification Information
PSP	Pre-Employment Screening Program
SAFER	Safety and Fitness Electronic Records
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDLA	State Driver's Licensing Agency
SORN	System of Records Notice
SPE	Skill Performance Evaluation

Acronym	Definition
SSN	Social Security Number
USDOT	U.S. Department of Transportation
XML	Extensible Markup Language

EXECUTIVE SUMMARY

PURPOSE

The Federal Motor Carrier Safety Administration (FMCSA) sponsored this study to examine the research question:

Would mandating electronic reporting of every fitness-for-duty medical examination for every commercial motor vehicle (CDL) driver by medical examiners listed on the National Registry of Certified Medical Examiners (NRCME) provide a mechanism to effectively address gaps in the physical qualification programs for CDL drivers?

PROCESS

The core concern that the above research question addresses is the potential for commercial drivers to continue driving a commercial vehicle despite having medical problems that would disqualify them from meeting FMCSA fitness-for-duty requirements. Under current procedures, such individuals can “game” the medical examination process, or commit fraud by submitting a bogus certification to the State Driver Licensing Agency (SDLA), and thus fraudulently avoid a negative report of their medical condition(s). This research does not address the examination process itself. It assumes that the NRCME will be implemented and successfully raise the bar for the quality of medical examinations.

RATIONALE AND BACKGROUND

The NRCME and Commercial Driver’s License Information System (CDLIS) Modernization programs will not eliminate opportunities for deception, nor will they close many major gaps identified by the National Transportation Safety Board (NTSB), Government Accountability Office (GAO), and the Congress regarding medical examination fraud and data quality issues relating to providing trusted data to all who need it as part of the medical certification process. These and other concerns have been the subject of Congressional and other Federal agency investigations and actions for more than 15 years. This analysis indicates that implementation of a Fitness-For-Duty System (FFDS) could resolve the vast majority of these longstanding issues.

To assure that FMCSA can take advantage of lessons learned from developing other information systems that might assist with the concept for an FFDS, the researchers looked for similar systems in other Federal transportation agencies, particularly the system currently used by the Federal Aviation Administration (FAA) to track medical certification of pilots. Additionally, the researchers sought out information on ongoing practices relating to Electronic Health Records (EHRs), including privacy concerns. The researchers looked at private sector products and systems that might be utilized in conjunction with an FFDS and considered how an FFDS might relate to such information systems. Finally, it looked at how the FFDS should interrelate with CDLIS and the NRCME.

Based on the findings of these reviews and stakeholder input, three alternative approaches for implementing a mandated electronic records system were examined. They include a distributed State-centric system, a distributed medical examiner-centric system, and a national-centric system. Architectural approaches were defined and analyzed relating to each approach.

STATE-CENTRIC ARCHITECTURE

The logic behind the State-based architectural option is that the State Driver's Licensing Agencies (SDLAs) are to become the source for the medical certification status for CDL drivers, and a few are already engaging in additional data quality activities by collecting and reviewing the medical examination reports. In this option, each medical examiner would submit the certification results of the medical examination and the medical examination report directly to the driver's current SDLA.

Functionality of the State-centric FFDS concept would be distributed across each of the States and the District of Columbia. Each State would need to maintain a separate, secure database to contain the medical examination report information separate from the CDLIS driver record with the certification status data.

A consequence of this approach is that it may require examiners accessing more than one State's FFDS to obtain historic results for drivers who have moved to another State. The distribution of driver medical examination results across States also limits the usefulness of any type of data analysis algorithms that might be developed to compare examination results for inconsistencies. The alternative would be to define a process by which each State would maintain a complete history for each driver and pass it along to the new licensing State, analogous to what they are required to do for CDLIS driver histories.

EXAMINER-CENTRIC ARCHITECTURE

Under the examiner-centric system, each NRCME examiner would maintain his or her own examination and certification results electronically as distributed components of an FFDS. This implies up to 40,000 separate systems (some examiners may participate in consortia with shared software, which could lower the number of separate systems). These systems would need to respond to inquiries from all other medical examiners interactively requesting the appropriate data. In this approach, when the driver is examined, the medical examiner would keep the results and transmit only the medical certification report for CDL drivers to the driver's licensing agency in the driver's State of residence. As in the State-centric architecture, each medical examiner and State driver's licensing agency would have to be able to authenticate each other and communicate directly.

The need for interactive communications would increase the systems development and operating cost for each medical examiner. This would create a disincentive and might cause medical examiners with lower volumes to decide not to bother participating in the certified medical examiner program.

In terms of workflow, the medical examiner-centric architecture is very similar to the State-centric architecture. The primary difference is that instead of storing it in the current licensing State's FFDS for all of their drivers, it would remain distributed among many different medical examiners.

One can envision scenarios where a driver insists he or she does not (or chooses not to) remember his prior examiner, i.e., simply decides (perhaps for fraudulent reasons) to omit mentioning a prior examination. With a distributed State-centric system across 50 States and the District of Columbia, or national-centric architecture, an examiner concerned about a driver's truthfulness could either search across all State-centric FFDS implementations or access the index of the national-centric system. With a distributed medical examiner-centric FFDS across up to 40,000 medical examiners, it is functionally impossible to insure that such "hidden" previous medical examination results could be found, unless a central index comparable to that used by the National Driver Register's Problem Driver Pointer System were developed.

NATIONAL-CENTRIC ARCHITECTURE

A third option is for a designated national entity (not necessarily a Federal entity) to take on the responsibility for the system concept, either alone or in conjunction with a public or private third-party organization(s), using a centralized FFDS approach. In this approach, the examiner would transmit the examination and certification results for all CDL drivers to a single national FFDS. The FFDS would then automatically securely transmit certification status information for CDL drivers to the current SDLA.

Since it is automated, it can be expected this approach would impose substantially fewer operational costs when compared to the other two candidate architectures. Access could be direct or via a third-party information management system. Drivers would be able to access the centralized FFDS both to review the medical examination results and to update medical history prior to an examination. Examiners would be able to retrieve a driver's complete examination history from the centralized FFDS, regardless of the history of States in which the driver has resided or the number of examiners by whom the driver has been examined.

As of January 2012, FMCSA requires that most drivers performing a CDL transaction (new, renewal, upgrade, transfer) must provide the SDLA with a copy of their medical certification. Thus, a logical candidate for transmission of the certification information to the licensing SDLA is to use a new CDLIS transaction to transmit FFDS data. FMCSA is already connected to CDLIS, and there is already a model for analogous unsolicited reporting of conviction data to State driver's licensing agencies via CDLIS.

Additional strengths of this approach include:

- It would remove all requirements for States to maintain manual operations for data entry from the medical certificates currently required to be provided to the SDLAs. This data entry from medical certificates would otherwise be a continuing operational cost to States under the existing rule.

- It minimizes imposing additional systems development and operational cost on the State driver's licensing agencies, other than those already required by current regulations, which would occur under the State-centric or medical examiner-centric alternatives.
- It would take advantage of the existing design of CDLIS, which has been working for many years to refine the processes used for receiving data from other States. The analogy is the receiving and recording of traffic convictions from other States where the driver was convicted.

Using CDLIS as a transmission model, however, should not be assumed to be the only approach for a national-centric architecture. A third-party systems approach could also be used to create the "hub" of the connectivity to link with multiple examiners and with multiple State driver's licensing agencies. Such systems exist as "clearinghouses" for transaction management, such as those developed for the International Registration Plan and International Fuel Tax Agreement programs. However, such a new non-CDLIS approach may impose greater systems developmental and operational costs on the States.

CONCLUSIONS

The researchers conclude that the most effective approach for FMCSA consideration would be a nationally managed system. They outline a potential pilot concept to test and evaluate the recommended concepts for mandating electronic transmission and housing of medical status and examination reports in an accessible database.

The research team recommends that initial follow-on efforts focus on the more limited issue of a process for transmission of only medical certification status data. The recommended repository of full medical examination reports ("long forms") can be addressed as a second phase of implementation.

1. INTRODUCTION

The purpose of this study sponsored by the Federal Motor Carrier Safety Administration (FMCSA) is to examine the research question:

Would mandating electronic reporting of every fitness-for-duty medical examination for every Commercial Motor Vehicle (CDL) driver by Medical Examiners listed on the National Registry of Certified Medical Examiners (NRCME) provide a mechanism to effectively address gaps in the physical qualification programs for CDL drivers?

1.1 BACKGROUND AND RATIONALE FOR THE RESEARCH QUESTION—THE CASE FOR A MANDATED ELECTRONIC REPORTING SYSTEM TO CLOSE GAPS

The core concern the above research question addresses is the potential for commercial drivers with medical problems that would disqualify them from meeting FMCSA fitness-for-duty requirements to otherwise be able to continue driving a commercial vehicle. Under current procedures, such individuals can “game” the medical examination process, or provide a bogus certificate, and thus fraudulently avoid a negative report of their medical condition(s). This research does not address the examination process itself. It assumes that the NRCME will successfully raise the bar for the quality of medical examinations.

Under the currently planned systems, drivers can deliver a falsified medical certificate, find a medical examiner who will issue a certification, or game the medical examiner by fraudulently withholding medical history as part of medical examiner shopping. These and other concerns have been the subject of the following Congressional and Federal agency investigations and actions for more than 15 years.

1.1.1 Federal Highway Administration Negotiated Rulemaking

In 1996–97, the Office of Motor Carriers (which is now FMCSA) conducted a negotiated rulemaking relating to merger of Commercial Driver’s License (CDL) processes and medical certification. The discussions included a possible medical certifications tracking system, as well as how results of current certification might be used by law enforcement officials and/or interested carriers. Several of the proposals included models for a national registry and for certification of medical examiners (61FR 18713, April 29, 1996 and 61 FR 38133, July 23, 1996). That negotiation process did not establish a consensus, but the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—the 2005 reauthorization that includes FMCSA—contained requirements for both of these components.

1.1.2 National Transportation Safety Board (NTSB) Recommendations (2001)

Following its investigation of a 1999 motorcoach accident involving a medically unfit driver, NTSB issued eight recommendations to FMCSA outlining a comprehensive medical oversight program for interstate commercial drivers.⁽¹⁾ Among those recommendations was a suggestion to

develop a comprehensive medical oversight program for interstate commercial drivers, which contains the following program elements:

- A tracking mechanism to ensure that every prior application by an individual for medical certification is recorded and reviewed. (H-01-18). This recommendation remains on the NTSB “Most Wanted List,” first added by the Board in 2003.⁽²⁾ The last word “reviewed” could imply that NTSB may want FMCSA to follow the Federal Aviation Administration (FAA) model, where FMCSA would have staff to review questionable medical examinations. SAFETEA-LU did not authorize such an activity.
- Mechanisms for reporting medical conditions to the medical certification reviewing authority and for evaluating these conditions between medical certification exams, as well as ensuring that individuals, health care providers, and employers are aware of these mechanisms. (H-01-24).
- A review process that prevents, or identifies and corrects, the inappropriate issuance of medical certification. (H-01-21).
- A method for enforcement authorities to identify invalid medical certification during safety inspections and routine stops. (H-01-22).
- A process so that enforcement authorities can prevent an uncertified driver from driving until an appropriate medical examination takes place. (H-01-23).

1.1.3 Commercial Driver’s License Information System (CDLIS) Modernization

In 2005, as part of SAFETEA-LU’s reauthorization,⁽³⁾ Congress authorized FMCSA to initiate grants to assist the American Association of Motor Vehicle Administrators (AAMVA) and the States to modernize CDLIS. The project is mandated in Title IV (Motor Carrier Safety Reauthorization Act) of SAFETEA-LU. FMCSA implemented this effort in early 2012. Included in this effort is a requirement to integrate information about the current medical certification status as part of the CDLIS driver record. The 2008 FMCSA Final Rule requires States to obtain the data from the driver’s paper documentation and record the medical certification status information on the CDLIS driver record. The rule spells out the details on required data. This has been further augmented by detailed specifications (for CDLIS Modernization) published by AAMVA on how to implement the requirements of the 2008 Final Rule.

1.1.4 Government Accountability Office (GAO) Report on Commercial Drivers (2008)

In June 2008, the GAO published a report on the certification process for drivers with serious medical conditions. Among its findings was that, in some instances, commercial drivers produced fraudulent documentation or failed to disclose conditions found in a previous examination with different medical examiners.⁽⁴⁾

1.1.5 U.S. House of Representatives, Committee on Transportation and Infrastructure

In 2008, the committee staff ran a small survey that collected copies of medical certificates as part of normal Motor Carrier Safety Assistance Program (MCSAP) roadside inspections. The medical examiner identified on the certificate was then contacted and asked to verify if he or she had issued the certification to the driver named on the certificate. Approximately 5 percent of the

certificates appeared to be fraudulent.⁽⁵⁾ Other fraud, such as medical examiner shopping (i.e., finding an examiner who is willing to falsify medical records or provide a passing examination result), would be in addition to this.

1.1.6 December 1, 2008, Final Rule of the Federal Motor Carrier Safety Administration

This rule⁽⁶⁾ requires States to record the current medical certification status information for interstate CDL drivers required to be medically certified (obtained in paper form from the drivers) on the CDLIS driver record and provide that data in responses as part of the CDLIS driver record to authorized inquiries. It also requires recording and reporting whether the CDL driver is restricted to intrastate or exempt operations. The purpose of this is to 1) begin the process of creating a single electronic CDLIS driver record (available to all who are authorized to access CDLIS information) which now contains the CDL status and 2) add the fitness-for-duty certification. This implementation requirement is one of the elements included in the CDLIS Modernization Project discussed above.

1.1.7 Report of the CDL Advisory Committee (December 2008)

FMCSA's CDL Advisory Committee was formed under the requirement of Section 4135 of SAFETEA-LU to study and address current impediments and foreseeable challenges to the Commercial Driver's License Program.⁽⁷⁾ Among its 15 recommendations are the following:

- Integrate medical certification tracking with the CDL.
 - The December 1, 2008 Final Rule to integrate tracking of medical certification status information with the CDL program by recording driver-reported medical certification status on the CDLIS driver record should be strengthened. It should be enhanced to prevent fraud through augmentation of CDLIS to provide seamless information system capabilities for medical examiners to report all examination results electronically to the State Driver's Licensing Agency (SDLA) using CDLIS.
 - The task force concluded that the rule as then proposed, and later when issued as a Final Rule, did not provide sufficient benefit to the CDL program to justify the costs to the States. The Notice of Proposed Rulemaking (NPRM) seems to increase compliance costs for States without fully addressing the requirements of the original authorizing legislation in 49 U.S.C.31305(a)(7). The proposed system is still as vulnerable to driver fraud.
 - The following are some scenarios that the December 1, 2008 Final Rule did not cover:
 - Prevent drivers from fraudulently producing medical certificates and providing them to the SDLAs.
 - Report drivers who fail a physical examination before expiration of their certificate or update their CDLIS driver record so it indicates the failure.
 - Address the practice of medical examiner shopping.
- The task force concluded that implementing a central Web application as part of CDLIS would be the best approach for handling reporting of all medical examination reports.

This new CDLIS module capability could be implemented through the efforts of AAMVA as part of the CDLIS Modernization effort.

1.1.8 The National Registry of Certified Medical Examiners

The core purpose of the registry⁽⁸⁾ is to restrict who can perform FMCSA medical examinations for interstate CDL drivers. Authorized medical examiners are listed on a registry of certified medical examiners. In order to be on the registry, examiners are required to meet certain educational and other status requirements. Within the registry concept is a rudimentary process for monitoring performance of the medical examiners, including:

- Monthly electronic transmission of summary certification data for every examination for each driver examined, including determination results (not complete exams) through a central secure Web site process run for FMCSA.
- Retention by the medical examiner of each original completed examination and related documentation, for potential audit by FMCSA.
- Upon demand by FMCSA, the medical examiner provides requested medical examination records to the location specified by FMCSA for an audit.
- The monthly reports by the medical examiners may be used by FMCSA to determine an after-the-fact indicator that medical examiner shopping may have taken place. FMCSA could notify the SDLA of that possibility so that the SDLA can take action according to whatever State laws it may have regarding such. If it is determined to be fraud by the driver, then the medical certification can be invalidated, per the driver's signed certification of the health history provided to the medical examiner.

1.2 HOW CURRENT INITIATIVES ADDRESS IDENTIFIED GAPS

Based on the historical investigation and reports related to this effort outlined above, the researchers identified that the three ongoing initiatives discussed below only partially address the gaps discussed above.

- *The December 1, 2008, Final Rule of the Federal Motor Carrier Safety Administration Requiring Linkage of Medical Exams and CDL Records.* As discussed in further detail below in Section 4.2.2 of this report, the requirements for placing the medical certification status data into the CDLIS driver record are being partially addressed through the CDLIS Modernization effort. While inclusion of medical certification status data in the CDL record provides an accessible location for this information, the rule does not establish a secure method of delivery of the medical certification status (onus is on the driver), and it does not provide an electronic communication mechanism from a trusted source to populate the CDLIS driver record. It also does not address the medical examination report itself (the "long form").
- *CDLIS Modernization.* As noted above, the 2008 FMCSA Final Rule requires States to obtain the data from the driver's paper documentation and record the medical certification status information on the CDLIS driver record. Specifications to accomplish

this are included in the CDLIS Modernization project. CDLIS Modernization provides for data fields for the medical certification status data but does not include a secure, trusted mechanism for electronic communication of the data to populate the fields. Long form medical exam reports are not included or recorded in this process.

- *The National Registry of Certified Medical Examiners*. The focus of this regulation is on medical examiner qualification and limited medical examiner oversight. The audit and records requirements of this rule could be fulfilled by an electronic reporting system. The NRCME does not address the near real-time need of an electronic communication of certification results to SDLAs from a trusted source.

Therefore, current and proposed regulatory and information systems requirements do not fully address concerns of the research question. The framework created by the current initiatives leaves a number of significant gaps in assuring that drivers are physically qualified. The concerns regarding fraud discussed in Section 1.1 focus on the current ability of drivers to either deliver a falsified medical certification status, shop to find a medical examiner who will issue a passing exam result, or falsify medical history to hide information from the medical examiner.

The NRCME is expected to provide assurance that medical examiners on the registry are fully aware of and can apply appropriate standards. But, neither the NRCME nor the requirement under the 2008 FMCSA Final Rule change the reality that the certificate is still to be delivered physically by the driver to the SDLA. Neither system will provide a near real-time mechanism for easily tracking exams by drivers to detect possible examiner shopping, or provide a means to track the medical history of drivers throughout their driving careers to detect a fraudulent medical history. Significant gaps remain in assuring that drivers are physically qualified to perform their jobs in a safe manner.

The remaining gaps are summarized in Table 1. It also indicates how the above-listed three items (the 2008 FMCSA Final Rule for placing the medical certification on the CDLIS driver record, CDLIS Modernization, and the NRCME initiatives) do or do not address respective gaps in the physical qualification programs for CDL drivers. The 2008 Final Rule creates a requirement for the driver to provide a medical certification to the SDLA and for the SDLA to enter the medical certification status on the CDLIS driver record. There is no requirement for establishing an electronic system linkage to ensure that the certification came from an authorized medical examiner on the NRCME, via a trusted system. Thus it only poorly meets the linkage requirement. The NRCME rather strongly addresses the issue of qualification of medical examiners on the registry, and partially addresses protocols and standards for completing forms, plus limited auditing functions of medical examiner performance.

Table 1. Gaps in the CDL Driver Physical Qualification Programs

GAP	FMCSA Final Rule (2008)/CDLIS Modernization	Forthcoming NRCME
Near Real-time, Electronic Communication of Medical Certification Results by Medical Examiner	Not included	Not included
Standardized Electronic Population of CDLIS Driver Record with Certification Status Results	Not included	Not included
Linked Medical Certification Status and CDLIS Driver Record	Poorly	Not included
Single Source for All Driver’s Medical History and Examinations for Medical Examiner Use	Not included	Not included
Consistent Medical Examiner Protocols and Standards for Medical Certification	Not included	Yes
Consistent Medical Examiner Protocols and Standards for Completing Records and Forms	Not included	Partially provided
Auditing Functions for Medical Examiner Performance Reviews, User Access, and Information Tracking	Not included	Limited, but partially provided
Examination Reports to Support Analyzing Medical Conditions and Safety Performance	Not included	Not included

Closing these gaps by implementing an electronic Fitness-For-Duty System (FFDS) is the purpose of this investigation. The following section describes the research methodology applied.

1.3 RESEARCH METHODOLOGY

The research plan included two phases. The first phase consisted of two tasks: 1) development of a base scenario and high level functional requirements that could define a mandatory reporting and oversight system (FFDS) and form the basis for stakeholder input, as well as the gathering of such input, and 2) a state of practice review and synthesis of similar regulatory requirements and related practices in the transportation and medical communities. The review also included consideration of interaction between the potential FFDS and other FMCSA information technology activities, including those related to NRCME, CDLIS, and FMCSA’s evolving new Enterprise Architecture to support field operations, the Driver Safety Management System (DSMS) envisioned under Compliance, Safety, Accountability (CSA), the drug and alcohol system—which was also recommended by the same NTSB report that recommended a better tracking of medical certification status⁽⁹⁾—and private-sector products.

The tasks in the first phase provided guidance to the researchers in conducting the three tasks of the second phase. These final tasks addressed:

- Impacts of stakeholder input and environmental aspects on an FFDS.
- High-level architectural elements of an FFDS.
- Findings and conclusions on alternative approaches to implementation of an FFDS.

2. THE BASE SCENARIO—HIGH LEVEL FUNCTIONAL REQUIREMENTS

The researchers worked with FMCSA to define the first element of Phase I of the research plan. This included a kickoff briefing session with staff from the Research Division, Medical Programs, and others, followed by detailed discussions with the Contracting Officer's Technical Representative (COTR) to develop a *Base Scenario and High Level Functional Requirements* document. The full Base Scenario document is included as Appendix A of this report.

The Base Scenario served two purposes. First, it assured that the research team and FMCSA were consistent in understanding and defining the approach that would address the research question. Second, it served as a reference point for discussions with representative stakeholders to ensure that no significant considerations had been omitted from the high-level functional requirements.

The Base Scenario was not intended to be the final or complete expression of what a mandated electronic medical records system might be. It offered a means to communicate the objectives and general approach of such a system before the overall architectural alternatives were developed.

2.1 BASE SCENARIO

The essence of the Base Scenario is as follows:

The core concept is a secure electronic reporting process in which medical examiners, the authoritative source, securely transmit medical certification status and examination reports to an FFDS. That system records the reports and immediately securely transmits the certification status reports from a trusted source to the appropriate SDLAs for recording on CDLIS driver records. The medical examiner would securely transmit a standardized electronic medical certification status report to the FFDS on the day of the examination and transmit a standardized electronic medical examination report (currently the "long form") to the system within 3 business days after the day of the examination. For drivers who have applied for, or are applying for, a CDL, SDLAs would be provided with the electronic certification status report to record on the CDLIS driver record as required by FMCSA's Final Rule for medical certification information on the CDLIS driver record. This secure electronic delivery from a trusted source would replace the driver providing the SDLA with an uncontrolled paper copy of a certificate. States would also have the option of receiving the certification status to record on the driver record for non-CDL CMV drivers required to have a medical certification. All drivers and medical examiners would use the unique identifier established by CDLIS for drivers and the NRCME for use by medical examiners. Drivers likely would continue being identified by the driver license number and State combination, and the NRCME implemented its own unique medical examiner identifier, which FMCSA's 2008 Final Rule about medical

certification reporting requires the States to record as part of the CDLIS driver record for medical certification.

The Base Scenario document includes elements providing for medical examiner access to previous examinations, authorized fleet and driver access to examinations, and the specific high-level functional requirements for each key stakeholder in the process—the driver, the medical examiner, the SDLA, and the fleet or employer, as well as the overall FFDS effort.

2.2 STAKEHOLDERS' RESPONSES TO BASE SCENARIO

The researchers sought out views of key stakeholders on the Base Scenario and High Level Functional Requirements (Appendix A) seeking to discover if there were other issues that might lead to possible modifications in the Base Scenario that would influence development of revisions in the scenario to be presented to FMCSA.

Three groups of stakeholders external to FMCSA were sought out: SDLAs and the Commercial Vehicle Safety Alliance (CVSA), medical examiners, and industry trade associations (American Trucking Associations, National Private Truck Council, and the American Bus Association). Also, the researchers sought out views of the FMCSA Office of Medical Programs. A detailed summary of the informal discussions that team members had with each of these groups is included as Appendix B. The summary is organized under the general headings and elements of the Base Scenario. It also includes annotated research team comments that address the current regulatory aspects relating to concerns expressed, as well as clarifications as to how the potential FFDS might address those concerns.

The general response is that the external stakeholder groups for the most part strongly support the concept of a secure, fully electronic system for reporting information about CDL medical examinations and certifications, integration of that status information in the CDLIS driver records, and separately, securely maintaining the medical examination data for assisting medical examiners in tracking medical histories. Significant suggestions offered by the stakeholders were related to the following:

- Need for integration between the efforts for NRCME, CDLIS Modernization, and State upgrades of their SDLA driver record systems to receive and record medical certification status data.
- As with CDL conviction data, attention to “pushing” medical certification determinations to SDLAs for necessary medical certification status-related actions.
- Friendliness, speed, and ease of system use.
- Need for standardization and systems integrations to deal with lack of uniformity and sophistication that would otherwise exist across jurisdictions.

Key views of individual stakeholder groups on the Base Scenario and High Level Functional Requirements are listed below.

2.2.1 Responses of SDLAs and CVSA

- The FFDS should be integrated with the CDLIS Modernization and implementation of the FMCSA “merger” requirement.
- Most States are interested only in assuring that a medical certification status is current, although several States are employing various processes with similarities to the FFDS concept.
- Good linkage to roadside enforcement systems is expected in order to provide all applicable records to enforcement personnel.
- Updates of current medical status, at any time an examination occurs, need to be “pushed” whenever data become available following an examination.
- Conflict resolution processes and appeals processes need to be well-defined and, to the greatest extent possible, should be uniform across jurisdictions.
- Integration of unique identifiers across various FMCSA systems is essential.

2.2.2 Responses of Medical Examiners

- Medical examiners should be included in the system design process.
- Managing data input and retrieval before and during medical exams is seen as a concern.
- Processes should provide access to previous examination data allowing the ability of the medical examiners to detect trending and continuum of conditions analysis (i.e., “patients are bad historians”).
- Appeals process needs to be standardized.
- Timeframe for submitting status reports and long forms could be the same throughout the country.

2.2.3 Responses of Industry Trade Associations

- System should be simple and uniform—some States are more sophisticated than others.
- Electronic processing and standardized integration of processes are important.
- Integration of an FFDS with NRCME and other FMCSA systems, including Pre-employment Screening (PSP), the planned Driver Safety Management System (DSMS) jointly supporting CSA with the Carrier Safety Management System (CSMS) that replaced SafeStat, the proposed Drug and Alcohol Clearinghouse, and FMCSA's Enterprise Architecture, is essential.
- Uniform appeals processes are preferred.
- Many firms already require access to long forms as a condition of employment. The FFDS should support this, subject to driver authorization.
- Consideration should be given to requiring results from every medical examination to be transmitted to FFDS and to the SDLAs.

2.2.4 Responses of FMCSA Office of Medical Programs

- Need to address whether holding long forms in a database might lead to potential liability for FMCSA when medical examiners' reports contain possible information that indicates a driver should not have been certified but was, and no specific actions were taken by FMCSA because no individual review process was required.
- The functionality in the Base Scenario for FFDS is beyond current requirements for FMCSA action.
- How would FFDS compare with the Federal Aviation Administration's (FAA's) Medical Examination Systems with respect to:
 - Fitness-for-Duty certifications.
 - Staff interactions with available detailed information.
 - Quality assurance.
- Creation of an FFDS could allow FMCSA to perform medical examiner oversight functions in coordination with NRCME's audit and reporting requirements.
- Coordination with other FMCSA information systems is essential.

3. RELATED REGULATORY REQUIREMENTS AND PRACTICES

To assure that FMCSA can take advantage of lessons learned from developing other health information systems that might assist with the concept for an FFDS, the researchers looked for similar systems in other Federal transportation agencies and sought out information on ongoing practices relating to Electronic Health Records, including privacy concerns. The researchers looked at private-sector products and systems that might relate to such information systems. Finally, the researchers looked at how the FFDS should interrelate with CDLIS and the NRCME.

3.1 OVERVIEW OF ELECTRONIC MEDICAL RECORD REQUIREMENTS AND PRACTICES IN OTHER TRANSPORTATION SETTINGS

The researchers sought out examples of electronic fitness-for-duty record systems in other regulated transportation industries. Neither the Federal Railroad Administration nor the Coast Guard (vessel masters) uses electronic records in connection with any regulatory fitness-for-duty requirements. However, the FAA supports the Aerospace Medical Certification Subsystem (AMCS), an electronic fitness-for-duty system. A useful description of the differences in medical certification processes utilized by FAA, the Coast Guard, and FMCSA can be found in a 2008 GAO report.⁽¹⁰⁾

This section focuses on FAA's AMCS. The purpose of this review is to provide a baseline for consideration of similarities and differences between airman fitness-for-duty tracking and potential CDL driver fitness-for-duty tracking. The FAA system can be used as a reference point in developing an appropriate CDL driver system. Following the description of the FAA system is a comparison of the system with the Base Scenario and High Level Functional Requirements developed for this feasibility study.

3.1.1 General Summary

3.1.1.1 Core Airman Fitness-for-Duty Medical Requirements

In 2010, FAA, as part of its regulation of the aviation industry, was overseeing approximately 440,000 active airmen. The airmen all must hold both a pilot license and a valid medical certificate, comparable to most CDL drivers. With implementation of the FMCSA December 2008 Final Rule, most CDLIS driver licenses without a currently certified medical status must be downgraded. Therefore, it is anticipated that many drivers who are currently holding a CDL but not driving for a living, are more likely to choose not to pay for medical certifications, and their CDLs will be downgraded. FMCSA estimates that after the downgrades have taken place, there will still be more than 7 million active CDLs that require fitness-for-duty examinations.

Depending on their duties and the medical certificate for which they are applying, the airmen must obtain medical certification periodically from every 6 months to every 5 years. There are three classes of medical certificates. First-class medical certificates are for scheduled airline transport pilots; second-class medical certificates are for commercial, non-airline duties, such as

private freight or charters; and third-class medical certificates are for private pilots, student pilots, and flight instructors.

3.1.1.2 Basic FAA Medical Certification Procedures

The following steps are involved in the FAA Medical Certification Process:

1. Airmen are required to utilize an FAA central Web-based system (FAA MedXpress) or complete a form that provides information for access by aviation medical examiners relating to the airman's medical history, drug and alcohol-related convictions, and other specific information. The National Driver Register is also used as a source of information to verify whether there is any unreported information such as alcohol convictions. The FAA also uses The International Justice and Public Safety Network (Nlets), to retrieve driver records from those States that respond to inquiries received from public safety agencies to check for conviction information. As of spring 2013, there remain approximately seven States that by their State statutes are forbidden to respond to non-law enforcement agencies.
2. FAA-certified Aviation Medical Examiners (AME) review medical histories that are provided and conduct testing (e.g., vision, hearing, electrocardiogram) and a medical examination in accordance with Federal Air Regulations, part 67.
3. AMEs make medical certification recommendation determinations. Recommendations for denials of a medical certificate or deferrals of certification are referred to the FAA Regional Air Surgeon for review by FAA staff.
4. Reports of the examinations are stored in a central data repository operated by the FAA, which serves as the authoritative source for whether an airman has a current and valid medical certification.

3.1.1.3 FAA Electronic Fitness-for-Duty Records Systems

In 2010, two core systems make up the FAA medical certification systems:

- MedXpress is used by airmen to provide required medical history information to AMEs prior to appearing for their aviation medical examination.
- The Aerospace Medical Certification System (AMCS), coupled with the Document Imaging Workflow System (DIWS), is used by AMEs to facilitate their certifications as AMEs and to process airman medical examinations.

MedXpress. Use of MedXpress by airmen is optional.¹ It is an online version of the FAA medical history form, and it allows pilots to submit information electronically by accessing FAA's central secure Web site. It creates a secure access account for users and provides an email notification system for distributing password information and confirmations.

¹ Since this report was written in 2010, FAA has made this system mandatory.

The MedXpress system is managed by FAA's Office of Aerospace Medicine, a part of FAA's Civil Aerospace Medical Institute. The system is integrated with the AMCS/DIWS systems. It enables the airmen to input information for use by AMEs. The AMEs in turn access that information and upload the completed fitness-for-duty report to the AMCS/DIWS.

AMCS/DIWS. These secure FAA systems are used by AMEs for at least two separate functions: first, to file and process their own information to obtain their certifications as AMEs (similar to the NRCME), and second, to process and transmit airman medical exams (similar to the proposed Base Scenario for FFDS). AMEs access these secure socket systems through their own Internet service providers from their offices.

AMEs use the system to add the results of a new exam for a new applicant. AMEs can also search for existing information (either information manually entered by the applicant via MedXpress or previous fitness-for-duty exams), so that they can add a new exam to that airman's existing record. Pending applications submitted by airmen for medical certification can be accessed with unique identifiers used by those systems. The NRCME uses the CDLIS driver license number and State of issuance as the driver unique identifier. (When a driver moves to another State, the CDLIS index keeps track and refers information sent to a previous State of licensure on to the current State of licensure.) The NRCME creates its own unique identifier for medical examiners listed on the FMCSA registry. System screens allow the AMEs to enter examination data and medical information about the applicant. Reasons and data relating to a determination not to certify applicants are entered into the system where appropriate. Certificates can be printed directly from the system or typed onto the card by the examiner. All information is then uploaded to the AMCS/DIWS.

REGIONAL-AIR-SURGEON. The Federal Air Surgeon, through the FAA, employs regional air surgeons and medical certification specialists who are required to be familiar with the medical requirements and regulations of part 67 (Federal Air Regulations). They are responsible for making detailed evaluations of airmen whom AMEs have either deferred or denied certification. Their role is primarily to deal with airmen who have some condition that requires closer examination. In some ways, this may have some similarity to FMCSA's exemption and skill performance evaluation (SPE) programs. Currently, FMCSA has vision and insulin-using-diabetes exemptions, in addition to the SPE. Such drivers receive much closer examination to determine if they qualify for admission to the program and/or if they remain qualified to stay in the program.

3.1.1.4 Privacy Considerations in FAA Systems

MedXpress is a Federal system of records subject to the Privacy Act. It is operated by the FAA and is routinely searched by Personal Identification Information (PII). Thus, we assume it has an approved System of Records Notice (SORN) approved by the Office of Management and Budget (OMB).

A System of Records is a group of any records under the control of a Federal agency from which information is retrieved by the name of the individual or by some identifying number, symbol, or other identifying information particularly assigned to the individual.

A SORN informs the public of the existence of a Federal system of records and describes the type of information that an agency will be collecting, who will be collecting the information, how it will be safeguarded, the purpose for collecting such information, etc. It is an advanced notice to the public that must be given before an agency begins to collect, is given access to, or can retrieve personal information for a new system of records, and it must be published in the Federal Register after approval by the OMB.⁽¹¹⁾

AMEs import information from MedXPress into AMCS, which is the authoritative system for airmen medical certifications. Only users who have obtained authorization, an account user ID, and a password may use the AMCS. In effect, the airmen permit use of their data for FAA purposes. This data includes a completed application and the medical exam completed by an AME. New exams can be added to the airman's existing file.

Under the existing FAA system, complete prior exams can only be reviewed by the AME who performed them. Other AMEs can retrieve partial information. However, in December 2008, FAA revised Form 8500-8 (Airman Application Form) and included a new provision within the included Privacy Act Statement. It appears that the new provision was directly intended to allow such information sharing between all AMEs in the future. It reads:

“(1) Making records of past airman medical certification history data available to Aviation Medical Examiners (AMEs) on a routine basis so that AMEs may render the best medical certification decision.”⁽¹²⁾

3.1.2 Comparison of FAA System with Base Scenario and High Level Functional Requirements

3.1.2.1 Scale

FAA deals with approximately 440,000 airmen, some of whom only need to be recertified every 5 years, and has about 4,500 certified/authorized AMEs. In contrast, it is estimated that after full implementation of the medical certification reporting requirements, there will still be at least 7 million CDL drivers, most of whom must be medically recertified periodically. Since most drivers qualify for a 2-year medical certification, approximately half will need recertification each year. Thus, FMCSA estimates that at least 3.5 million exams are needed annually for current active CDL drivers and approximately 40,000 medical examiners are needed to serve this population.

3.1.2.2 Centralized vs. Distributed Relational System

FAA operates its medical certification systems as centralized Federal systems of records. FMCSA plans to implement a comparable centralized Federal system of records for information about CDL drivers regarding alcohol and controlled substances determinations, rather than using the distributed, relational structure used for CDLIS. The NRCME is similarly a centralized FMCSA database. In contrast, for CDLIS driver records, FMCSA relies on a State-operated distributed relational database system. The centralized relational index points to the distributed SDLAs as the parties responsible for recordkeeping for each CDL. Effective January 30, 2012, in compliance with the December 1, 2008 Final Rule implementing requirements in the Motor Carrier Safety Improvement Act of 1999 and SAFETEA-LU, each distributed CDLIS SDLA

became responsible for requiring a current medical certificate from most interstate CDL drivers conducting a licensing action. As of June 2013, 38 States are capable of placing the medical certification data online.

Motor carriers remain required to obtain and keep a copy of each driver's CDLIS motor vehicle record (MVR). They are also required—until January 2014—to maintain a paper copy of the driver's medical certificate (in addition to the appropriate SDLA maintaining a paper copy) *unless* the obtained MVR contains the driver's medical certification status. Additionally, drivers are required to maintain copies of their medical certifications until January 2014. Beginning in January 2014, SDLAs will be required to maintain electronic versions of commercial drivers' medical certifications in the CDLIS driver records. These electronic versions stored in the State's CDLIS driver records will become the official source for driver medical certifications, thus eliminating the need for motor carriers and drivers to maintain paper copies. Thus, commercial driver medical certifications will be maintained in a distributed fashion, as opposed to airmen certifications, which are maintained centrally in the FAA database.

For the FAA, the function of determining whether an airman meets the medical fitness-for-duty requirements is essentially made by the AME. If the AME has a reason to doubt a response to a question on the FAA medical certification form, the AME can refer that record to FAA for further investigation to determine the veracity of the airman's response. There are also a number of additional background checks performed by FAA that could preempt certification as fit-for-duty. However, they are separate from the determination of medically fit-for-duty. All data are held by FAA within its Federal integrated system. This integrated system serves as the authoritative source for responding to all inquiries.

Under the Base Scenario for CDL drivers, as defined in SAFETEA-LU, the responsibility for determining whether a driver is physically qualified—and thus the issuance of medical certification—remains entirely with the medical examiners on the NRCME. There are no review persons for CMV medical examiners to refer questionable cases. Certification data from each medical examiner for each of their examinations would be recorded in a database or databases. Status results (certification or determination of not qualified) would then be transmitted (pushed) to the distributed SDLAs for recording on the driver's CDLIS driver record. Information recorded in the database(s) would be available to assist FMCSA in its oversight of the medical examiner's performance.

3.1.2.3 Medical Examiner Requirements

In the FAA system, AMEs perform exams and record results within the integrated online system. Concerns about the quality or accuracy of exams are handled within FAA to determine which AMEs to audit using records in its database.

Under the Base Scenario for this study, the repository (or repositories) of fitness-for-duty medical examination records could support an audit alert capability similar to that used by the FAA. Conceptually, this is analogous to the targeting FMCSA already does in order to identify problem motor carriers. These carriers are identified using FMCSA's screening database of safety performance data, the Carrier Safety Management System (CSMS).

As of June 2013, the FAA is providing the examining AME with electronic access to any records originating from that AME, and to all information in the airman's record about medical conditions. This means any medical condition that the airman has admitted to previously is available to the examining AME. The Base Scenario for this study does not impose such a limitation. It is proposed that medical examiners would be able to access all complete past records for any driver that comes to them for an examination.

3.1.2.4 Airman vs. CDL Driver Requirements

Other than differences in scope of medical exams (and centralized background checks in the case of FAA), the responsibilities and rights of airmen and CDL drivers for determining if they are physically fit for duty would be similar under the FAA system and the Base Scenario. The extensive FAA background checks and the additional checks for veracity of the responses on the medical background information are unique to FAA and not currently required by FMCSA. However, note that on the FMCSA history portion of the form, the CMV driver signs the following certification on the medical examination form part 2—health history:

I certify that the above information is complete and true. I understand that inaccurate, false or missing information may invalidate the examination and my Medical Examiner's Certificate.⁽¹³⁾

Additionally, 49 CFR 383.73(g) states that the SDLA must disqualify a driver for at least 60 days if the applicant has falsified information contained in the application. There are no Federal procedures defined for how such a determination may be made. Each State follows its own laws.

3.2 OVERVIEW OF RELATED ELECTRONIC HEALTH RECORDS DEVELOPMENTS AND REQUIREMENTS

3.2.1 Overall Health Information Technology Environment

There is a substantial difference between fitness-for-duty medical examinations and health and medical records, but there also are technical overlapping influences. Thus, it is important to be aware that the topic and movement toward Electronic Health Records (EHRs) and Electronic Medical Records (EMRs) is highly visible in various portions of the health care community. In February 2009, the American Recovery and Reinvestment Act provided for an investment of billions to spur implementation of computerized medical records. The responsibility for these initiatives lies primarily in the Department of Health and Human Services (HHS), within the Office of the National Coordinator (ONC) of Health Information Technology (IT).

A key element of the Health IT initiative is an incentive for hospitals and doctors' practices to implement e-health records. The incentive is in the form of increased reimbursement through bonus Medicare and Medicaid payments. To qualify, hospitals and doctors must comply with "meaningful use" rules, including installation of certified systems that include routine security monitoring, checks on drug interactions, e-prescribing, and standardized "pathways" for treatment through computerized physician order entry systems (CPOE). Laboratory test results and all other transactions relating to the patient, the hospital, and physicians will ultimately be included in the records. Many billions in bonus payments are being made available through the ONC programs.

One of the consequences of the published meaningful-use rules is to create encouragement for vendors of health records systems, based on the new certainties the components systems must have, and the related incentives for integration of hospital and practice-related systems.

FMCSA's requirements are for fitness-for-duty and do not include the comprehensive personal health records that might be associated with medical practice patients. The fitness-for-duty medical exams are more limited and relate to determination that the driver is fit enough to safely undertake commercial driving activity.

Even so, a driver's fitness-for-duty examination is in reality part of his or her overall health information history. As the quality and utility of EHRs and EMRs rapidly evolve in the health care setting, there likely will be an increasing relationship and interchange between personal health and fitness-for-duty records. The standards and processes for gathering and recording health data and histories seem likely to become synergized between fitness-for-duty examinations and overall personal health data. There are already a variety of vendors selling either software or services for automating medical functions such as this.

The point of greatest interest to this project is that the medical professionals who seek to become certified members of the NRCME seem more likely to already, or in the near future, have an infrastructure of health information technology in their offices that should facilitate the process of electronically reporting driver fitness-for-duty information as described in this study. Most also have electronic records support for drug and alcohol testing of drivers as well. This overall setting and trend toward unified EHR provides an opportunity to blend the FMCSA records with formats and components of general EHR and EMR systems.

3.2.1.1 Coordination with Office of the National Coordinator of HHS

The researchers contacted ONC to gauge their interests and potential coordination between FMCSA and ONC efforts. At this time, it does not appear that at the Federal level these separate initiatives need coordination or close attention. However, for information systems planning purposes that may be germane to this effort, the Deputy Chief Information Officer for HHS gave a presentation to the National Information Exchange Model (NIEM) workshop in the fall of 2009. His presentation addressed how HHS was looking very closely at using NIEM to guide development of future HHS systems as part of its Enterprise Architecture.⁽¹⁴⁾ On October 25, 2010, HHS became the third Executive Branch Agency to sponsor NIEM.⁽¹⁵⁾

HHS is focused strongly on EHR interoperability standards. The ONC oversees a number of efforts to assure interoperability through various IT Standards and Policy Committees. Detailed information on these is found on the ONC Web site.

Of further potential interest to FMCSA is the Federal Health Architecture (FHA)—an e-government initiative, managed by the ONC within HHS. FHA activities are intended to increase citizen access to care, improve quality of care, and reduce costs. Under the effort, FHA coordinates national health care IT initiatives, and has included the U.S. Department of Transportation (USDOT). The focus of the FHA is on Federal agencies with health-related functions. They build software which enables Federal agencies and private-sector entities to exchange health information. This evolving IT solution will eventually become one of the

building blocks to help connect to a nationwide health information network. The ONC is now working to embrace NIEM as a part of their overall Federal health architecture.

In the event that FMCSA wishes to track the development of the health IT environment, some background on HHS activities follows.⁽¹⁶⁾

3.2.1.2 Related Third-Party Systems

In addition to contacts with the ONC, the researchers considered a sample of vendors offering software to the USDOT medical examiner market and to fleets that wish to track and document their driver medical exams. As discussed in Section 6 of this report, FMCSA should seek an implementation approach that sets overall standards for system elements and for communications requirements and protocols. It is recommended that FMCSA permit users to access the FFDS through certified third-party vendors. The purpose of this section is to describe current significant third-party offerings.

Researchers talked with three firms that offer software systems which support medical examiners in one or more parts of this process. The products from the first two firms are more encompassing. They assist the medical examiner in conducting the examination but also allow customer fleet managers to track the fitness-for-duty status reports, as well as the full medical examination “long forms.” The third firm’s software solution is focused on assisting medical examiners with carrying out the examinations. It also links the USDOT medical examination with other related health records maintained by the medical examiners for their patients. Since all are examples of third-party software providers interacting with medical examiners, they are included for informational purposes. All three of these firms, and others they are representative of, would be candidate third parties that could provide data to an FFDS.

Road Ready: The medical examination system operated by “Road Ready” provides an example of an existing commercial application being used to automate the medical examiner processes by medical examiner service groups. The Web-based system provides a fully integrated electronic data entry and document storage system that offers a method for monitoring the components of the fitness-for-duty examinations. The application allows the medical clinic and the employer to efficiently manage the medical exam records and insures that the documents are complete, legible, secure, and easily retrievable. Some of the system elements are as follows:⁽¹⁷⁾

- Logic within the system prevents a medical examiner from certifying a driver unless all required components of the medical exam form are completed.
- A medical examiner using this software can search and obtain previous medical examination information for exams performed by an examiner in the group, such as previous medical history and conditions, from their local database. This assists in pre-populating the new medical examination report, thus assisting in timely and accurate completion of the current medical examination report.
- The medical examination documents can be electronically submitted to employers and others who need to receive the data in accordance with the Base Scenario through a secure Web application.

- The system can assist employers/drivers with recordkeeping efforts by automatically providing notification when the medical certificate needs to be renewed.
- Users of the Road Ready system can generate statistical reports on all components of medical exam information and support analysis to audit performance and compliance of a clinic and/or USDOT examiner.
- The system can identify drivers who are in need of wellness intervention or education programs, allowing the driver the opportunity to correct and maintain physical requirements in order to remain medically certified under the Federal regulations.
- A network connects all clinics operated by Road Ready via its secure Web-based application for the medical exams. Physicians can share exam information and review exams simultaneously, increasing communication between multiple physicians/specialists working with a driver.

At the time this report was written, Road Ready had an agreement with the State of Indiana. The Road Ready software is an option available to participating medical examiners and drivers in Indiana. It is voluntary for the driver to use examiners that use this system. The functions described above are consistent with the extra data quality oversight that Indiana devotes to medical certification. Indiana also is a customer that receives a copy of the USDOT examinations performed using the RoadReady software. The incentive for Indiana drivers to use the RoadReady software is that their medical certification can be approved much faster.

The database of information collected in this system includes demographics, driver questionnaire responses and comments, medical examination information (height, weight, age, blood pressure, blood pressure index, vision, hearing, pulse), laboratory information, a scan of the USDOT long form, and certification status.

By maintaining a multiyear database, Road Ready provides a means to develop statistics on driver health issues such as diabetes, body mass index, hypertension, musculoskeletal conditions, and vision.

Road Ready was also engaged in a project with FMCSA to attempt a comparative analysis of FMCSA crash data with the Road Ready data in order to examine the relationship between certain medical conditions and crashes within CMV driver populations. Results support the predictable statistical outcome, namely that a local vendor with a small database does not have sufficient data to support statistically significant findings.

Transportation Safety and Compliance Group, Inc.: This company's medical examination electronic data offering is derived from the experience of another firm staffed with an occupational health physician and related medical personnel who contract with fleets to provide medical exams. The firm has expressed an objective of having its software used to support other medical examiners certified under the NRCME and to assist in ultimately linking with SDLAs to transfer fitness-for-duty status reports.

As with Road Ready, the application is Web-based.⁽¹⁸⁾ It is called TransIT PRO™, and it provides a certified medical examiner with a means to offer applicants the current FMCSA

medical examination forms and supports the exam process electronically. It allows for storage of long forms data, accessible to fleet managers and to medical examiners. To assist with fraud prevention, the TransIT PRO™ system adds a driver photo to the medical certification data and replaces the driver's paper medical examiner certificate with a durable, tamper-resistant ValiDATE® card. The card was meant under the prior rules—which changed on January 30, 2012 when the 2008 Final Rule for medical certification and CDLIS became binding for compliance—to be carried by the driver. The card indicates the driver's medical status and examination dates. The system includes support for drug and alcohol tests, and the firm suggests that continual tracking of records supports a range of analyses similar to those offered by the Road Ready system.

Occupational Health Research, Inc.: This firm is another example of a third-party provider that provides automated and electronic records support to medical examiners to facilitate the examination process. The focus of its software applications is on occupational health and the FMCSA fitness-for-duty examination forms.⁽¹⁹⁾ The drug testing-related forms are also integrated in a total practice support environment. The firm is not seeking to link its systems with SDLA systems, but it does support a range of medical examiners and occupational health clinics that work with fleets to facilitate medical examinations.

The researchers did not complete a broad search for firms similar to Occupational Health Research, Inc., but they are aware of a range of vendors that provide support to occupational health and chiropractic clinics with their software applications and are likely to include FMCSA medical exam modules in their offerings.

The systems described above respond to the needs of users (medical examiners and fleets) for efficient management of and compliance with the fitness-for-duty medical examination process. The end product of using such systems is consistent and potentially synergistic with the overall objectives of the FFDS, which is to enable elimination of the gaps that exist in the current regulatory framework in order to better assure that drivers are physically qualified to perform their jobs.

All of these systems currently lack a critical element to enable them to be truly effective. There are no standards for linking with a trusted system (like the proposed FFDS) for it in turn to fulfill the congressional intent of making CDLIS a trusted source of medical certification data on the CDLIS driver records. The architectural alternatives discussed in Sections 6 and 7 of this report address three alternatives that could provide that linkage between systems such as these and the SDLAs.

3.3 PRIVACY CONSIDERATIONS

Three alternatives for implementing the Base Scenario are identified in the following sections of this report. The three alternatives are distributed medical examiner-centric, distributed State-centric, and national-centric. The privacy considerations for the first two alternatives are already addressed to some degree by existing practices. The national-centric option as a new system does not have any privacy policy in place. Should a national-centric option qualify as a new Federal system of records, a policy would have to be published addressing the Privacy Act requirements.

Based on the existing interpretation that the Health Insurance Portability and Accountability Act (HIPAA) does not apply to the Alcohol and Controlled Substances reporting requirements of USDOT, the HIPAA requirements would not apply to the FFDS if FMCSA has comparable regulations for reporting medical certification. Details of why HIPAA does not apply are discussed below. The following discussion gives an overview of what would be required if this were a new Federal system of records alternative.

3.3.1 USDOT Privacy Impact Assessments

The USDOT Privacy Program established principles for treatment of PII by Federal information systems operated by USDOT agencies.⁽²⁰⁾

Under this program, Privacy Impact Assessments (PIA) must be conducted using a process to evaluate the collection and use of PII in Federally controlled information systems accessed by PII. The process is used to identify and address information privacy when implementing agency information management systems and integrated information systems. The results of the PIAs are definitions of security and privacy risks associated with systems that collect and use such personal identifier information. FMCSA has conducted these assessments for a number of its systems.

The use envisioned in the Base Scenario of the drivers' personal medical certification information would be subject to requirements of Federal systems of records (i.e., subject to the Privacy Act). Thus, FMCSA would have to develop a PIA describing the PII that would be in the system. The PIA would be posted on USDOT's Web site along with all other PIA statements for records systems. Additionally, FMCSA would have to develop a SORN,⁽²¹⁾ which must be submitted to the OMB for its approval, and then published in the Federal Register.

3.3.2 HIPAA

In 2006, the USDOT's Privacy Office addressed a question related to the USDOT alcohol and controlled substances testing program that appears analogous to the below situation with fitness-for-duty records. Under the Base Scenario approach, FMCSA would similarly release medical certification status information to SDLAs, which in turn would release it to employing or prospective motor carriers. The determination in the drug and alcohol situation is that written authorization from the driver is not required for such disclosure in that program. The determination says in part:

Question: "Are employers and their service agents in the USDOT drug and alcohol program required to obtain employee written authorizations in order to disclose drug and alcohol testing information?"

Answer: They "... are not ... where disclosing the information is required by ... agency regulations for the program. The ... regulations provide for confidentiality ..."

"Even if drug and alcohol testing information is viewed as protected under the Health Insurance Portability and Accountability Act of 1996 (HIPAA) rules, it is not necessary to obtain employee written authorization where, USDOT requires the use or disclosure of otherwise protected information under ..." USDOT regulations.⁽²²⁾

Similarly, there are provisions in the HIPAA regulations allowing for research and use of the information subject to restrictions on disclosure. Those provisions may apply to use of the Base Scenario proposal for a central database of medical examinations used by FMCSA for oversight of medical examiners on the NRCME and research for revision of the fitness-for-duty regulations found in Part 391 for the medical program.

The discussion here is based on available information. The research team has not sought out formal determinations at this time within FMCSA/USDOT on how the Base Scenario would be treated under the USDOT Privacy Program or HIPAA. However, the above analysis seems to indicate HIPAA requirements would not apply and there would be procedural requirements under the Privacy Act for preparing a PIA and SORN. Those are unlikely to be obstacles that would prevent implementation of a national-centric approach. As part of the recommended rulemaking, FMCSA should consider making it clear that provision of the necessary medical information is required and, thus, is covered by the same interpretation that applies to provision of alcohol and controlled substance information.

3.3.3 FAA

As indicated above, FAA medical examiners have access to admissions of medical conditions from past history information submitted by airmen, and full examination results for examinations performed by that AME through the secure processes associated with the AMCS. The principles associated with those system architecture decisions seem likely to apply to the FMCSA considerations for a driver fitness-for-duty system.

4. POSSIBLE RELATIONSHIP OF THE PROPOSED FITNESS-FOR-DUTY ELECTRONIC RECORDS SYSTEM TO OTHER EXISTING OR PLANNED FMCSA INFORMATION TECHNOLOGY ACTIVITIES

FMCSA maintains a number of core information systems that support a variety of functions, including: safety, security, registration, licensing, and border crossings. These systems support FMCSA's mission to gather data to provide analysis and enforcement for safer motor carrier operations on the nation's highways. Integration of an FFDS with other FMCSA enterprise systems would advance this function, and consideration needs to be given to appropriately linking it with the other systems.

4.1 CURRENT CDL/MEDICAL CERTIFICATES LINKAGES

4.1.1 Overview

The CDLIS 2008 Final Rule requires all States to record medical certification status on the CDLIS driver record. At the time this report was written, most States planned to continue taking an arms-length approach. Namely, they planned to comply with the minimum requirements of the regulation to post the certification status information on the CDLIS driver record. As required by the regulation, these States planned to accept the driver-provided paper medical certification report specified in the rule. The medical examiner processes that lead to issuance of the medical certificate presented by the driver to the SDLA are being considered, in effect, a "black box."

A few States, however, already have a variety of more rigorous programs to assess, track, and enforce the data quality of medical certifications. Whether those States would want to continue their same more rigorous data quality verification programs after full implementation of the current requirement to post the medical certification data received from the driver-provided paper copy is unknown at this time.

Four examples of States with a more rigorous program for quality oversight of medical certifications are Alabama, California, Indiana, and Washington. They have review systems in place that are more advanced and stricter than merely accepting a medical certification or a driver's self-certification that the driver meets the part 391 physical requirements. For example, the California process consists of the following elements:

- California's SDLA always conducts detailed reviews of its "DLSI Long Form" (which is a detailed medical report) for medical certification.
- California is one of only a few States that, when reviewing a medical/DLSI form submittal, have SDLA staff pull the past medical/DLSI forms (for a renewal) and check for inconsistencies (e.g., high blood pressure is suddenly much lower). Sometimes the SDLA may reach a different conclusion from the medical examiner on a medical certification finding.

- For medical examiners who do not provide complete information on the form, approval is not granted, and the driver is contacted by the SDLA.
- California and Washington State have both asserted that a typical Long Form has an error rate of 25 percent (i.e., wrong and/or incomplete information). For perceived DLSI problems, the DLSI is sent to the California SDLA headquarters; the form is then reviewed and, if necessary, the office makes contact with the driver to address the problem (e.g., to have their medical examiner include the missing information).
- If the DLSI is still rejected, the driver can visit a SDLA field office to discuss the DLSI. The driver can also request a formal hearing.
- The SDLA does allow some “waivable conditions” specified in part 391 (e.g., for certain types of handicaps specified in part 391 under the SPE program). This is sometimes based on California Case Law and not Federal Regulations.
- The certification is required at least every 2 years in compliance with part 391. SDLA mails out a notice 60 days in advance. Drivers may also come to a field office.

The following observation is similar to one found in Appendix B under stakeholder comments. When stopping a vehicle, officers of the California Highway Patrol currently ask the driver to provide the medical card. The following hypothetical case was posed by one commenter in regard to California. With the California CDL good for 5 years, and the FMCSA medical certification good for a maximum of 2 years, how would the officer know what to do if the driver presents a good CDL but an expired medical card, with the driver claiming he or she qualifies but just does not have the new card with him or her?

Such a scenario after January 30, 2012, would mean either the driver or California is not in compliance with Federal Motor Carrier Safety Regulations. First, if the medical certification expires, the SDLA is required to immediately mark the CDLIS driver record as not-qualified and to downgrade the CDL within 60 days of the expiration of the medical certification. Second, for States that are in compliance with this requirement, CDL drivers are no longer required to carry a medical card. Just as with the FAA system, the electronic CDLIS check is the method of verifying the driver’s medical certification. If the driver failed to get that certification, it must be reflected on the CDLIS response, which must at minimum say not qualified. For CDL drivers licensed in States that are not in compliance, FMCSA issued a rule advising those drivers to continue carrying a valid medical certification. The above example points out that a few States, like California, provide a complex and strict system. However, most States do not have such a rigorous quality check of medical certification and enforcement process. In most States it has been relatively easy for problem drivers to engage in fraudulent activities such as fraudulently visiting multiple medical examiners (often referred to as “shopping”), not providing truthful history information, or creating a fraudulent medical certificate to subvert medical certification requirements.

4.1.2 Potential Relevance to Fitness-for-Duty System Architecture

The approach taken by the medical examination process in States like Alabama, California, Indiana, and Washington indicates that those States have undertaken implementation of functionality proposed in the Base Scenario. It raises the question of whether any of those States

with medical review systems would want to continue to review the “long forms.” If so, then the SDLA offices in those States would need access to the medical examination report data. The system laid out in the Base Scenario would need to provide the complete information from the long form currently being received by those SDLAs. The researchers point this out so that FMCSA can address this potential duplication in considering any regulations relating to the Base Scenario concept.

4.2 CDLIS MODERNIZATION

4.2.1 Overview

In 2005, Title IV (Motor Carrier Safety Reauthorization Act of 2005) of SAFETEA-LU authorized \$28 million for FMCSA to carry out a project to modernize CDLIS. The Act requires this modernization to include the following design objectives:

- Maintain current system functionality.
- Comply with applicable Federal information technology security standards.
- Support electronic exchange of all information.
- Include self-auditing features.
- Provide enhanced capability for storing names.
- Integrate the medical certificate.
- Provide enhanced inquiry capabilities.
- Provide enhanced search capabilities.

The schedule for CDLIS Modernization published on AAMVA’s Web site is reproduced as Figure 1 below.

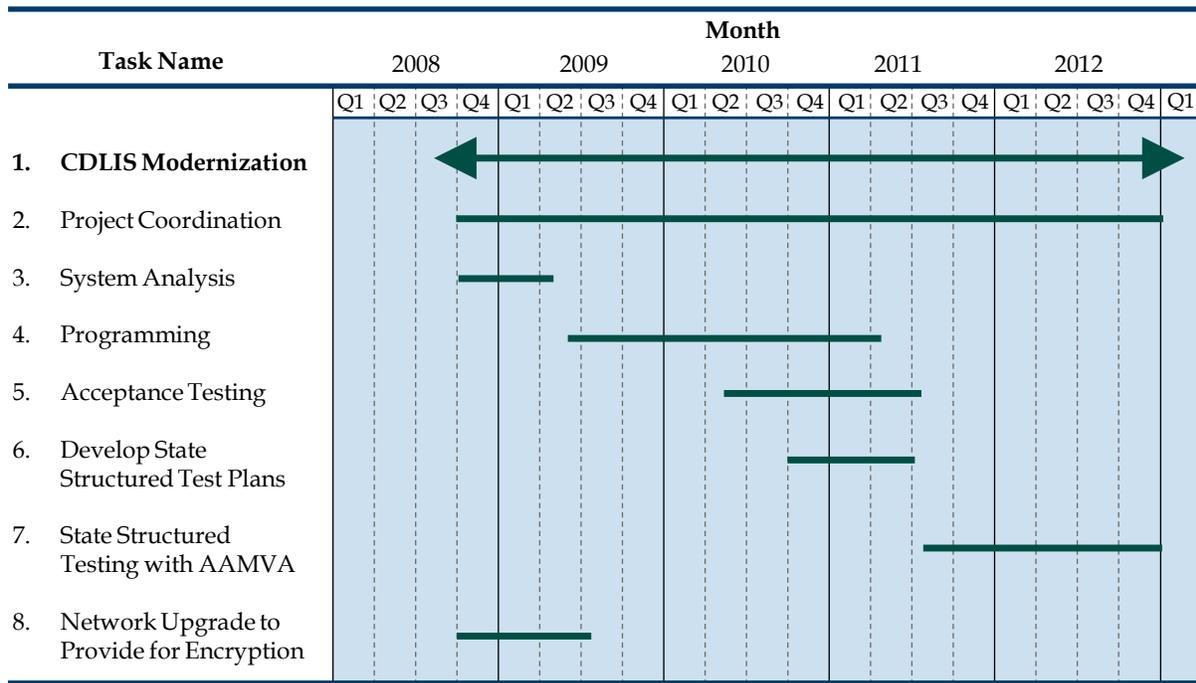


Figure 1. Chart. CDLIS Modernization Schedule.

Source: CDLIS Modernization, AAMVA—Fall Workshop, October 28, 2008, Presented by Lisa Parman—AAMVA Director, Systems Analysis (recreated by Cambridge Systematics).

An overview of the CDLIS Modernization architecture is provided in Figure 2 below.

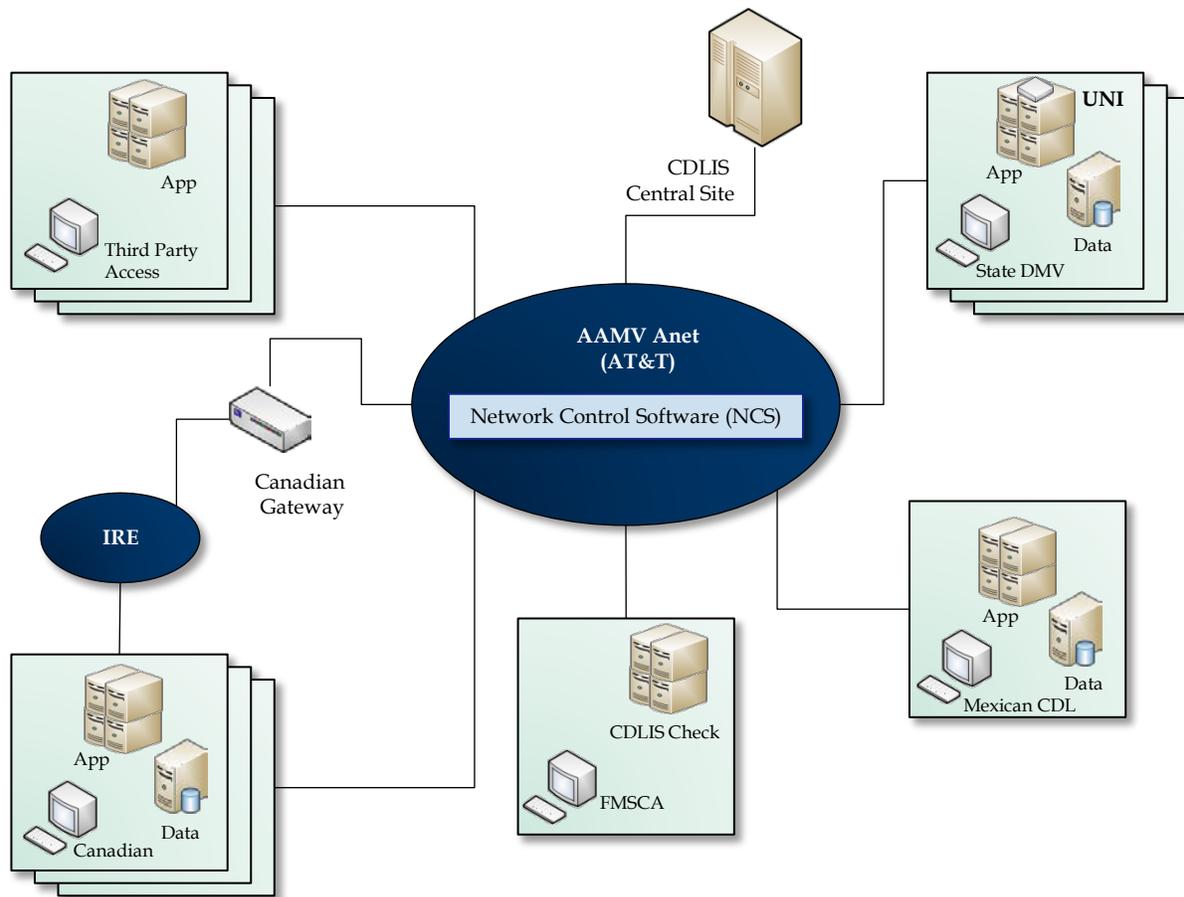


Figure 2. Illustration. CDLIS Architecture.

Source: CDLIS Modernization, AAMVA—Fall Workshop, October 28, 2008, Presented by Lisa Parman—AAMVA Director, Systems Analysis (recreated by Cambridge Systematics).

As listed above, one of the new requirements of CDLIS Modernization is to “integrate medical certificate” data. The following two tables provide some of the data fields that are to be implemented to include medical certificate information as part of all CDLIS driver records maintained by each State; these tables thus describe the data that FMCSA’s Final Rule, issued December 1, 2008, effective January 30, 2009, with a compliance date of January 30, 2012, requires jurisdictions to record and provide as part of CDLIS driver records regarding a driver’s medical status.⁽²³⁾

Table 2. Medical certificate information sent in history responses.

Data Element	Explanation
CDL Medical Self Certification Code	A driver’s self-certification of the driver’s status regarding 49 CFR § 390.3 and the type of driving
Medical Certificate Status Code	An indication of the status of a driver’s medical certification
Medical Examiner Name Group	A group of components that make up a name of a medical examiner
Medical Licensing Jurisdiction Code	A medical licensing jurisdiction is an organization with the authority to license medical practitioners, who act as medical examiners
Medical Examiner License Number	A jurisdiction assigned number used to identify the license of medical practitioner who acts as a medical examiner
Medical Examiner Telephone Number	A telephone number at which a medical examiner can be reached
Medical Examiner Specialty Code	A code indicating the specialty of the medical practitioner
Medical Certificate Issue Date	A date on which a medical practitioner performed an examination and on which a medical certificate was subsequently issued
Medical Certificate Expiration Date	A date on which a medical certificate expires
Medical Certificate Restriction Code	Up to 10 restrictions imposed on a driver by a medical examiner

Table 3. Medical variance information sent in history responses.

Data Element	Explanation
Driver Waiver/Exempt Effective Date	The start date of the most recent variance of a medical certificate, due to a waiver or exemption
Driver Waiver/Exempt Expiration Date	The expiration date of the most recent variance of a medical certificate, due to a waiver or exemption
Driver Skill Performance Evaluation Effective Date	The start date of the most recent variance of a medical certificate, due to a Skills Performance Evaluation
Driver Skill Performance Evaluation Expiration Date	The expiration date of the most recent variance of a medical certificate, due to a Skills Performance Evaluation

4.2.2 Potential Relevance of CDLIS Modernization to Fitness-for-Duty System Architecture

As detailed above, the CDLIS Modernization program is required to include data elements that must be exchanged by the States concerning the fitness-for-duty medical certification status for each interstate CDL driver and to indicate which CDL drivers are restricted to intrastate or excepted operations. Therefore, in the modernized version of CDLIS, when a CDL is electronically checked, the medical certification status, along with whether the driver is authorized to operate in interstate or is restricted to excepted or intrastate commerce, is intended to be returned as part of the response. If the driver’s medical certification lapses, the State is required to downgrade the CDL. This could be by restricting it to intrastate (if allowed by the State), or to excepted; or to remove the CDL privilege. The CDLIS Modernization is expected to result in augmentation so the exchange of CDLIS driver records will contain the required medical certification status in the change from one SDLA to another as part of the CDLIS driver record response or change in State-of-record.

The current rule specifies self-reporting by drivers of their current medical certification status (using the paper medical certificate) to their SDLA. The current rule leaves many opportunities for drivers to fraudulently “game” the system. The rule does require development of SDLA

infrastructure capabilities that move toward a more complete system within the evolving CDLIS framework. The ideas put forward in the Base Scenario for this study are extensions that presume implementation of CDLIS Modernization. The Base Scenario concepts of this study are not contained in CDLIS Modernization.

CDLIS Modernization and NRCME represent additional infrastructure steps that could be effectively linked with a trusted FFDS, as in the Base Scenario of this study, to produce an integrated linkage between these systems, from which a CDLIS-based national FFDS certification could be supported. The Base Scenario capabilities for a national FFDS could be one way to create that linkage, thus eliminating the current opportunities for CDL drivers to fraudulently game these systems.

Obvious gaps in the current system include the lack of provision for a secure electronic transfer of data between trusted sources, a medical examination repository, and support for a rigorous medical examiner assessment system to guide which medical examiners to audit. The data quality of the medical certification delivery to the SDLA is still largely uncontrolled, and the medical examiner monitoring capabilities in the NRCME are rudimentary.

4.3 FMCSA ENTERPRISE ARCHITECTURE

4.3.1 Overview

There is an FMCSA-wide initiative to leverage new technology to transform many of the information systems that FMCSA uses for business. It is designed to be compliant with an Enterprise Architecture for all the related components of the FMCSA systems to be organized as a Web service-oriented architecture.

It includes the FMCSA Portal,⁽²⁴⁾ which already provides secure single sign-on access to a wide variety of systems via a single password and user ID. This secure portal improves access to crucial safety information and sets the stage for further improvements in safety and operations. This portal includes:

- Direct secure socket access via the public Internet—Because a virtual private network (VPN) connection is no longer required, it makes it easier for users with Internet access to access crucial data during roadside inspections and when working from other remote locations.
- Ability to make assignments directly from the FMCSA Portal—Users can make assignments such as compliance reviews and safety audits without exiting the FMCSA Portal. All user customized prioritization lists are available in one location and can be exported into an Excel spreadsheet for additional customization.
- Presentation of motor carrier safety data on a single screen—Enforcement users have access to all company data in the same format as that seen by companies.
- A single location to view their data—Real-time access to data is improved. Carriers can generate their own safety profiles from within the FMCSA Portal at no cost and designate third-party entities as having online access to their safety and operational data.

Another part of the system is the first implementation of the Safety ENforcement TRacking and Investigation (SENTRI) module that is expected to ultimately combine the functionality from all of FMCSA's legacy field systems and streamline the Agency's existing workflow processes. It is intended to aid State enforcement and field personnel in their efforts to target unsafe carriers and drivers, and to integrate roadside inspection, investigative, and enforcement functions into a single interface. The combination of these functions should provide enforcement and field users with easier access to carrier and driver information, which is currently spread across several different safety systems.

The initial release of SENTRI includes support for safety audits in conformance with the New Entrant rulemaking requirements. The safety audit functionality implemented in SENTRI applies only to U.S. and Canadian carriers who have entered the New Entrant program after February 17, 2009. Later releases of SENTRI are planned to incorporate inspections, interventions, enforcement cases, enforcement follow-up, and reporting functionality.

4.3.2 Potential Relevance of the Enterprise Architecture to Fitness-for-Duty System Architecture

Conceptually, a SENTRI module could be used by medical examiners on the NRCME for reporting examination and certification information, and for querying driver medical histories. Support for such usage could be implemented for the monthly reporting required by the NRCME.

Based on a review of available documentation for the Enterprise Architecture at the time this research was completed, there was no core capability envisioned as part of Enterprise Architecture development that would likely address fitness-for-duty records reporting and/or editing, logistics for communication between medical examiners and SDLAs, or identification of problem medical examiners. Thus it appears that current plans for expansion of the Enterprise Architecture do not include development of any medical certification information reporting or querying functionality.

The Portal already provides access via the FMCSA CDLIS-gateway to CDLIS driver records, which regulations now require to contain the medical certification status information and whether the CDL is restricted to intrastate or excepted service operation as part of those records. As of January 30, 2012, 20 States reported that they had met this requirement. As of June 2013, 38 States had met this requirement.

FMCSA's Enterprise Architecture appears to be treating the medical program and CDL program requirements as external systems. For example, it supports retrieving data from CDLIS via the FMCSA CDLIS-Gateway, but has no integration with it. Operation of CDLIS is delegated to AAMVA, with FMCSA's CDL program performing State compliance review oversight. For medical certification requirements, it is currently the responsibility of FMCSA's Office of Medical Programs to build whatever other separate system they envision.

There have been internal discussions within FMCSA of a Web services architecture (implementing NRCME capabilities) that could be consumed by the Enterprise Architecture environment.

This design thus seems to indicate that it is proposed for medical examiners to be provided with access via the Enterprise Architecture to make their monthly reports to the NRCME. Such an approach could easily be expanded to support daily use as envisioned in the Base Scenario for this feasibility analysis. Such an expansion should be evaluated to include the capability to provide FMCSA personnel with access in order to review information related to possible problem medical examiners and to target them for audits.

4.4 RELATIONSHIP OF FFDS TO NRCME REQUIREMENTS

NRCME requirements specify functional requirements for a number of specific items including (paraphrased):

- Development by FMCSA of a repository of the approved medical examiners in the registry (must be fully operational by May 21, 2014).
- Capability for FMCSA to receive secure monthly summary certification information about all examinations conducted by each examiner that month (see Table 4 below).
- Medical examiners to send paper medical examination reports to FMCSA upon demand within 48 hours to enable an audit of the detailed examination results maintained by certified medical examiners at their offices.

Medical examiners submit the simple monthly summary certification data electronically (through a secure Web site) to FMCSA. A Web services architecture, as mentioned above, is almost certainly capable of being integrated with the proposed structures put forth by this study. The daily submission of certification information could meet all the requirements of the monthly summary reports.

Table 4. Summary data elements to be reported monthly to NRCME.

Elements in NRCME Monthly Report	Matching Elements in CDLIS
Driver name	Matching purpose
Driver identifier (CDLIS number and State)	Matching purpose
Date of exam	Yes
Determination	Yes
If certified, date of expiration of certification	Yes

Additional data elements required to be posted on the CDLIS driver record that are not contained in the monthly summary report to the NRCME are:

- Medical examiner’s name.
- Medical examiner’s phone number.
- Medical examiner’s license or certificate number and State that issued.
- NRCME identification number.
- Existence of medical variance(s).

- Any restriction(s).

Implementation of these and other NRCME requirements is expected to provide FMCSA with a number of infrastructural elements. They can be integrated in the architectural options of a system. Specifically, the following concepts are included in NRCME functional requirements:

- A unique identifier for each medical examiner.
- Availability of information about which medical examiners are certified on any particular date.
- A method by which certified examiners securely transfer the required summary certification data monthly on all examinations performed and the result [§ 391.43(g)(3)].⁽⁸⁾ (Note: This periodic reporting does not meet the performance reporting requirements of SDLAs established by the Final Rule for medical certification data as part of CDLIS and as set forth in the Base Scenario.)
- A method by which FMCSA performs audits of the medical examination reports retained by the certified examiners.

4.5 OTHER FMCSA INFORMATION SYSTEM INITIATIVES

FMCSA is also supporting implementation of other system initiatives that may impact the FFDS:

- As part of CSA, the DSMS is planned as an extension of the existing Driver Information Resource (DIR) based on information from the Motor Carrier Management Information System (MCMIS), as well as perhaps snapshots of conviction data from CDLIS driver records. The DIR is based on data obtained from roadside inspections, traffic enforcement, carrier compliance reviews, and crashes. Investigations are underway regarding adding more information from the CDLIS driver record for convictions. Medical certification data could be included at the same time, since Congress mandated that SDLAs become the source for such data.
- A Drug and Alcohol Information System would have records of adverse information that essentially would determine if the driver is not qualified to operate a CMV until having met the return-to-duty requirements. Conceptually, that status information could become another status reported to the SDLA to be recorded on the CDLIS driver record or maintained centrally by FMCSA. Thus, it could become available to motor carriers as part of the CDLIS MVR, perhaps as part of a future employer notification system or as a new system similar to PSP. Statements by FMCSA in the announcement of the Drug and Alcohol Information system in the Semiannual Regulatory Agenda do not indicate exactly what approach is contemplated.^(9,25)

4.6 DHS ANNOUNCEMENT OF HHS INTEREST IN THE NATIONAL INFORMATION EXCHANGE MODEL (NIEM)

The NIEM is a partnership of the U.S. Department of Justice, the Department of Homeland Security (DHS), and, very recently, HHS. According to the public NIEM Web site,⁽²⁵⁾ NIEM “is designed to develop, disseminate and support enterprise-wide information exchange standards and processes that can enable jurisdictions to effectively share critical information in emergency situations, as well as support the day-to-day operations of agencies throughout the nation.” As such, it is an important model to consider, given the combination of Federal and State agencies involved in the medical examination process, especially under the NRCME and its requirements.

The researchers’ review of publicly available NIEM literature found that just as its name says, NIEM is a “reference model” of what are essentially best practices in interagency exchange of critical information. NIEM now has at least 10 examples of potential implementations, including emergency management, family services, and immigration, and is rapidly growing. As a result, NIEM, as its name signifies, is a model for Extensible Markup Language (XML) schema-based services-oriented architectures for sharing information between public agencies, as well as a source of potential functional and technical requirements for scenarios such as the one researched for this report.

The services of various modules built to be compliant with the NIEM architecture are invoked by other modules when they need a function performed. As such, it is compliant with the Web services Enterprise Architecture envisioned for development throughout FMCSA’s systems. References for how HHS is interfacing with NIEM applications are given in Section 3.2. FMCSA is using a NIEM-compliant application in coordination with providing CDLIS data to The International Justice and Public Safety Network (Nlets). FMCSA’s Enterprise Architect could evaluate how NIEM might be better used within FMCSA.

The possibility of a NIEM-compliant architecture should be considered in greater detail if work progresses to detailed design.

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5. KEY REQUIREMENTS OF AN FFDS TO MEET IDENTIFIED GAPS AND STAKEHOLDER CONCERNS

Having provided the background, the next step is to return to the functional requirements for an FFDS. Appendix A contains the original “Base Scenario” utilized as the basis for informal discussions with stakeholders to obtain their feedback. In this section, an updated set of requirements developed from the Base Scenario for an FFDS is presented. The majority of the requirements are functional at this point, as many technical requirements depend on the specific architecture selected for implementation.

This analysis is not intended to portray a full Concept of Operations document, but simply a recasting of the Base Scenario, given what seems a plausible set of decisions regarding the organization of such a system. This section begins by defining 10 key elements of an FFDS, derived from both the gaps identified by groups such as the CDL Advisory Committee and results of the stakeholder analysis. More specific requirements follow, organized by each stakeholder group, as well as requirements for how the FFDS should interact with each of the three major systems initiatives identified for close coordination in the review.

5.1 KEY ELEMENTS OF A FITNESS-FOR-DUTY SYSTEM

At the highest level, the following key elements of an FFDS are as follows:

- The ability to support any examiners on the NRCME in any State in the country or the District of Columbia to conduct a medical certification examination of a driver, regardless of the reason for the examination. The system must work with any variety of situations where a fitness-for-duty examination may take place.
- The ability for an examiner to see a driver’s complete fitness-for-duty examination history. One of the elements of the assertions of medical examiner shopping is that a driver can fail (or choose not) to disclose to the examiner information of relevance that may have caused the driver to fail the examination with a previous medical examiner. An examiner should be able to obtain a driver’s complete fitness-for-duty examination history about all previous examinations, regardless of where the examination was performed or what the licensing State was at the time of that examination.
- The ability for an authorized examiner to transmit the completed medical certification report, which will be delivered to the appropriate SDLA(s) without requiring activity by the driver. Under the existing requirement of the Final Rule issued on December 1, 2008, for medical certification reporting to CDLIS, hand delivery or mailing of the paper certification report by the driver are expected to be the most common methods of delivery. Prior to that Final Rule, all drivers were required to keep a paper copy of the medical certificate for presentation to enforcement officials upon request. A small number of SDLAs, however, currently request the entire medical examination report (e.g., the “long form”) and review the information on the form.
- The ability of the current licensing SDLA to electronically receive and continue to maintain the current medical certification status for a driver. While the ability to receive

and record by the SDLAs is not a part of the FFDS, it is the responsibility of the FFDS to support timely reporting to all SDLAs for recording of all new medical certification determinations. Whatever FFDS system is adopted must support the ability of the SDLAs to receive the necessary certification status data to carry out this function.

- The ability for drivers to be able to use a module of the system to provide or to update their medical history, update their demographic profile information, and view the medical certification and medical examination reports submitted by medical examiners. The provision by the driver of updated medical history and demographic information is an important preparatory step for the actual examination. Similarly, given the financial implications to the driver, should an erroneous report be submitted by an examiner, drivers need transparency in the reporting process, as well as a process for correcting erroneous data.
- The ability for a driver's employer or prospective employer, subject to approval by the driver, to be granted read access to the driver's medical certification data. Stakeholder interviews conducted for this research project identified an interest by the motor carrier community in continuing to be able, as a condition of employment, to require drivers to authorize them to have access to the driver's medical examination reports. This item could support driver wellness programs. It cannot be a replacement for how employers obtain the driver's CDLIS driver record from the appropriate SDLA, which would contain the driver's medical certification status and is required to be placed in the driver's qualification file maintained by the employer.
- Integration with existing FMCSA efforts regarding systems development supporting the NRCME. The NRCME rule includes development of the ability to document certified examiners. The FFDS would use the NRCME to verify that an examiner is authorized to access the FFDS system and was authorized on the day of the examination. Additionally, in support of determining which medical examiners to audit, the driver medical examinations reported to the FFDS could be used (for analysis) in place of hard copies submitted by the examiner's office.
- Integration with the ongoing modernization of CDLIS. As part of the ongoing modernization, capability to store the fitness-for-duty medical certificate status is being integrated into the existing CDLIS driver record.
- Integration and compliance with NIEM to the extent that FMCSA decides to pursue such an architecture approach. In the OMB Fiscal Year 2011 Passback, OMB asked all agencies to evaluate the adoption and use of the NIEM. FMCSA is supportive of the NIEM model as being compliant with its Enterprise Architecture. While the specific details of the NIEM data model for this system cannot exist until a detailed concept of operations is developed, the architecture should be compatible with NIEM standards for the appropriate interactions between stakeholders.
- Support for analysis of relationships between medical conditions and driving safety performance. A database of medical examination reports would enable FMCSA to analyze what relationships may exist between various medical conditions identified in the medical examination reports and the safety performance data it routinely collects. This would be useful for supporting rulemakings regarding different medical conditions.

5.2 FFDS REQUIREMENTS FOR INTERACTION WITH ONGOING INITIATIVES

As discussed earlier, the current initiatives by FMCSA, SDLAs, and elements of the medical examiner community already underway would be used as cornerstones of any FFDS effort. In this section, requirements for each of these three sets of stakeholders are presented, specifically involving interaction between the FFDS and these ongoing initiatives.

5.2.1 Requirements for Interaction with the NRCME

- FMCSA is expected to continue being responsible for implementing, overseeing, and maintaining the NRCME.
- The NRCME provides a unique identifier for medical examiners, and the FFDS should utilize the same identifier.
- The FFDS would be able to query the NRCME to verify the current status of the particular examiner who wishes to submit a transaction to the FFDS. Note that the medical examiner status check would need to include the date of the examination, so that a newly registered examiner could not submit results of examinations performed before registry certification was granted.
- Subject to results of the above query, an examiner may be identified as an authorized medical examiner or an unauthorized medical examiner as of a particular date.
- The FFDS would support whatever medical examiner the driver sees from the NRCME to securely transmit the results of that examination to that driver's SDLA, which could be in any State.
- FMCSA would provide guidance to medical examiners on the NRCME regarding the appropriate protocol for the following situations:
 - Whether the medical examiner should examine previous medical examinations for a driver who has a previous conditional medical certification or was determined not to meet the medical requirements to be certified.
 - Whether medical examiners should consult with previous examining medical examiners concerning conflicting medical certification reports.
 - In the event of conflicting medical certification reports, how the current medical examiner should document the reasons for differences and include this documentation in the medical examination report.

5.2.2 Requirements for Interaction with SDLAs Regarding CDLIS Modernization

- In SAFETEA-LU, Congress essentially defined that the current CDLIS driver record is to become the functional source for CDL medical certification status information. This report assumes that the source for medical certification status would remain the SDLAs. However, the authoritative source would remain the medical examiner. The goal is to make the SDLA a trusted source.
- If a centralized receiving capability is created, it would immediately forward a secure electronic medical certification report to the appropriate SDLA using a standardized

CDLIS communication protocol and interface. The medical certification report contains the standardized driver's CDL State and license number to be used to identify the current licensing SDLA.

- The system would transmit the standardized electronic record for the medical certification report to the SDLA.
- The SDLA would update its record for the driver to contain the current medical certification report.
- Electronic receipt of a medical certification report which indicates that the driver was determined not medically certified, would require the SDLA to immediately update the medical certification status on the CDLIS driver record to show "not-qualified." It would also begin the required process to downgrade the driver's CDL within the required 60-day timeframe already specified by FMCSA.
- Drivers who wish to obtain their medical certification report would presumably continue doing so via the appropriate SDLA, as they do now for their CDLIS MVR.
- The SDLA interface to the FFDS preferably would be through the CDLIS central site for purposes of properly routing information about medical certifications to the correct current SDLA for drivers who recently changed their State of licensure.

5.2.3 Requirements for Interaction with Existing Third-Party Examiner Systems

- The FFDS needs to accept information from authorized medical examiners through a variety of user interfaces, e.g., built into the FFDS itself, FMCSA's Enterprise Architecture, and through a record transfer facilitated by a certified third-party examiner system being used by the medical examiner.
- Existing and new examiner systems will need to support the standardized electronic record format for transmitting the medical certification and examination reports. There will need to be a third-party software certification process, an example of which is envisioned for reporting Electronic Onboard Recorder (EOBR) data to FMCSA from third-party vendor software.

5.3 ADDITIONAL FFDS REQUIREMENTS

5.3.1 Requirements for Medical Examiners

- The FFDS would electronically receive and record medical examination reports from examiners.
- The FFDS would apply software-based validation of medical certification reports and medical examination reports for specific field information before accepting reports from medical examiners.
- The FFDS would send a notice to the medical examiner indicating whether the submission was successfully validated or if there is an error.

- The medical examiner would have access via the FFDS to drivers' USDOT medical examination reports, which contain each driver's history, including previous medical certification reports and medical examination reports. This includes pre-exam history reports provided by drivers.
- The system would use a standardized electronic record format for the medical examination/certification reports and accept such records from authorized medical examiners, both through a user interface and through a record transfer from certified third-party vendors' systems.
- The medical examiner would complete and transmit the standardized electronic driver fitness-for-duty medical certification report to the FFDS on the same business day as the examination, using a provided interface.
- The medical examiner's office would complete and transmit the standardized electronic medical examination report to the FFDS within 3 business days following the examination, using standard communication protocols and standard interfaces.
- The medical examiner would have access to online instructions for completing the electronic medical certification reports and medical examination reports, using FMCSA interfaces. If a third-party system is used, the instructions must be provided by that vendor.

5.3.2 Requirements for SDLAs Beyond CDLIS Modernization

- The FFDS would electronically receive medical certification reports from all medical examiners and direct the certification status information to the appropriate SDLA. The means of implementing this functionality may be different for a medical examiner-centric system than for a national-centric system, but the functionality must be satisfied.
- The FFDS would record and maintain the history of all transfers of certification results to SDLAs.
- The FFDS would accept medical examination reports. Each SDLA has the option to decide whether it wishes to have a copy of the medical examination report transmitted to the SDLA.
- The SDLA would send a notice to the FFDS if there is an error in receiving a medical certification report.
- According to the existing CDLIS requirements, the SDLA would accept medical certification reports at all times, except for periods of scheduled system maintenance.
- The FFDS would need auditing functions that allow authorized personnel to trace the flow of information involving reports submitted by medical examiners, as well as inquiries for medical examination reports by CDL drivers, authorized employers, and limited other persons (such as FMCSA oversight) with access to the system.

5.3.3 Requirements for Drivers

- As required by the NRCME, each CDL driver would use the unique identifier for the FFDS already used in CDLIS.
- The driver would enter identifying information and medical history required as part of the medical examination report via a process supported by the FFDS, or perhaps the IT Modernization Project (previously referred to as COMPASS) or a third-party vendor, prior to his or her medical examination.
- To support rural and mobile access, the portions of the FFDS accessible by CDL drivers must support bandwidth sufficiently low to support basic connection through either a standard computer modem connection or a basic cellular data connection. The system must also provide backup for access or submission in paper form, which could be via the medical examiner, perhaps at a higher cost to the driver.
- The drivers should have access to their medical examination reports in the FFDS.
- Appeal of a medical certification report is defined by FMCSA's regulations at § 391.47.
- The FFDS should allow motor carrier representatives authorized by the driver, such as fleet safety managers or other designated representatives, to access medical examination reports of employed or prospective drivers. (Medical certification status is part of the CDLIS driver record and therefore obtained from the current SDLA.)
- The FFDS should be able to provide drivers, upon request of the driver, with a history of inquiries to the FFDS made by motor carriers authorized by the driver.

5.3.4 Requirements for FMCSA

- FMCSA would determine if the architecture of the system should comply with the NIEM.
- The FFDS would allow FMCSA-authorized users (e.g., FMCSA staff members, their audit designees, or researchers) to retrieve the full history of medical certification reports and medical examination reports for authorized users.

5.3.5 Requirements for All Parties

- The FFDS should not be accessible to the general public. Security procedures should be in place to guard against unauthorized access to information.
- The FFDS should be able to manage "real-time/near real-time" communication.

The FFDS should operate at all times, except for periods of scheduled maintenance. Operating rules, including scheduling and duration of maintenance, would be determined by FMCSA and/or its designated contractor. An example would be coordination with the CDLIS central site schedule.

6. ARCHITECTURAL OPTIONS FOR AN FFDS SYSTEM

Given the comments from the stakeholders, the key functional and technical elements of a potential FFDS (discussed in Section 5), and an understanding of the potential challenges, the researchers identified three general candidate architectures for the system.

6.1 THREE CANDIDATE OPTIONS FOR A MEDICAL FITNESS-FOR-DUTY SYSTEM

The candidate options for a FFDS architecture are based on answers to the following questions:

- If electronic records are created for the medical certification report, what will be the authoritative source of these reports?
- If electronic records are created for the medical certification report, what will be the trusted source(s) of these reports?

The same two questions can be asked about the comprehensive medical examination reports that would be of benefit to oversight functions.

6.1.1 Authoritative Source

Authoritative source is an information systems phrase that addresses the question: Where is the one place where an interested party can obtain the data and believe the information is valid? Essentially, the authoritative source is the official keeper of the record. For example, James Q. Doe can have a Social Security Number (SSN) of 123-456-7890. James provides his SSN to various government agencies and private corporations. Credit bureaus, for example, report on James' credit based on the SSN. Nonetheless, the answer to the question of "which one place are we going to trust" concerning the veracity of the name attached to SSN 123-456-7890 would be a system somewhere at the Social Security Administration.

Similarly, a medical examiner can assert that he or she is authorized to provide medical certification reports. However, the only way that assertion can be determined to be true in the future is to check the NRCME for the examiner's status on the date of the examination.

The authorized medical examiner who performs the physical examination of the driver is traditionally considered the authoritative source for keeping that record. Currently, if a driver sees multiple medical examiners, then there would be multiple authoritative sources for the results of each of those examinations.

6.1.2 Trusted Source

Sometimes the authoritative source may not allow for quick, convenient access to the data. The example above of medical examiners keeping paper in their offices as the authoritative source of those examinations is not practical for functional access. The 2008 Final Rule specification is that the driver is responsible for providing a copy of the medical certificate to the SDLA. The driver is not a trusted source for the SDLA to obtain that data from. That leads to the question: From what trusted source or sources could the SDLAs obtain the medical certification status

information? One of the flaws with the current initiatives underway is that the SDLAs still have to accept the paper document provided by the driver, who is not a trusted source.

A trusted source essentially is as trustworthy as an authoritative source, but it may or may not be the designated authoritative keeper of the record. In the case of driver medical certification status, the congressionally-designated source for convenient access is the CDLIS driver record. Drivers and employers will obtain this data from the licensing SDLA in the form of the CDLIS MVR. The FFDS proposed in this report could establish the capability of providing the SDLAs with a trusted, secure, easy-to-access, electronic source from which they could receive the medical certification status information from the authoritative source.

For the medical examination report, there is no convenient trusted source; there is only the paper document located at the authoritative source, the medical examiner. As the medical examination report is not required or intended to be part of the CDLIS driver record, it is recommended the FFDS become the trusted source of the medical examination data to assist in the oversight functions of the certification processes.

Returning to the example at hand, James Q. Doe's medical certification status would be shared among various entities over time: the examiner, at least one SDLA (maybe more if James moves), perhaps one or more motor carrier safety officers, and possibly James himself. If the medical examiner is audited by FMCSA, or if a compliance review is conducted on a motor carrier that reviews a sample of driver records from the driver qualification file, then FMCSA as well would be provided the certification information.

Given these options, where is the appropriate place for James' medical examination and certification reports to be located as a trusted source for providing the certification status data to the licensing SDLA? There are three candidate options:

- At each SDLA.
- At each medical examiner.
- At a national location.

6.2 CANDIDATE OPTION #1: SDLA-CENTRIC ARCHITECTURE

6.2.1 Description

Note: The discussion of this and the following two options is based on the requirements identified by the stakeholders for an FFDS system that closes the loopholes in the current system and the incremental improvements underway in implementation of the Final Rule for medical certification as part of CDLIS, as well as the NRCME—not on the existing or proposed regulations.

One option is for the authoritative FFDS source to be SDLA-centric. The logic behind this architectural option is that the SDLAs are the eventual source for the medical certification status for CDL drivers, and some are already engaging in additional data quality activities by collecting

and reviewing the examination reports. Therefore, some could have a potential benefit by accepting this information electronically from medical examiners.

In an SDLA-centric architecture, each medical examiner would submit the certification results of the medical examination and the medical examination report directly to the driver's current SDLA. The medical examination data would need to be kept in a separate database from the CDLIS driver record. Figure 3 below is a graphical representation of a high-level systems overview for a SDLA-centric FFDS architecture and how it would interact with related systems.

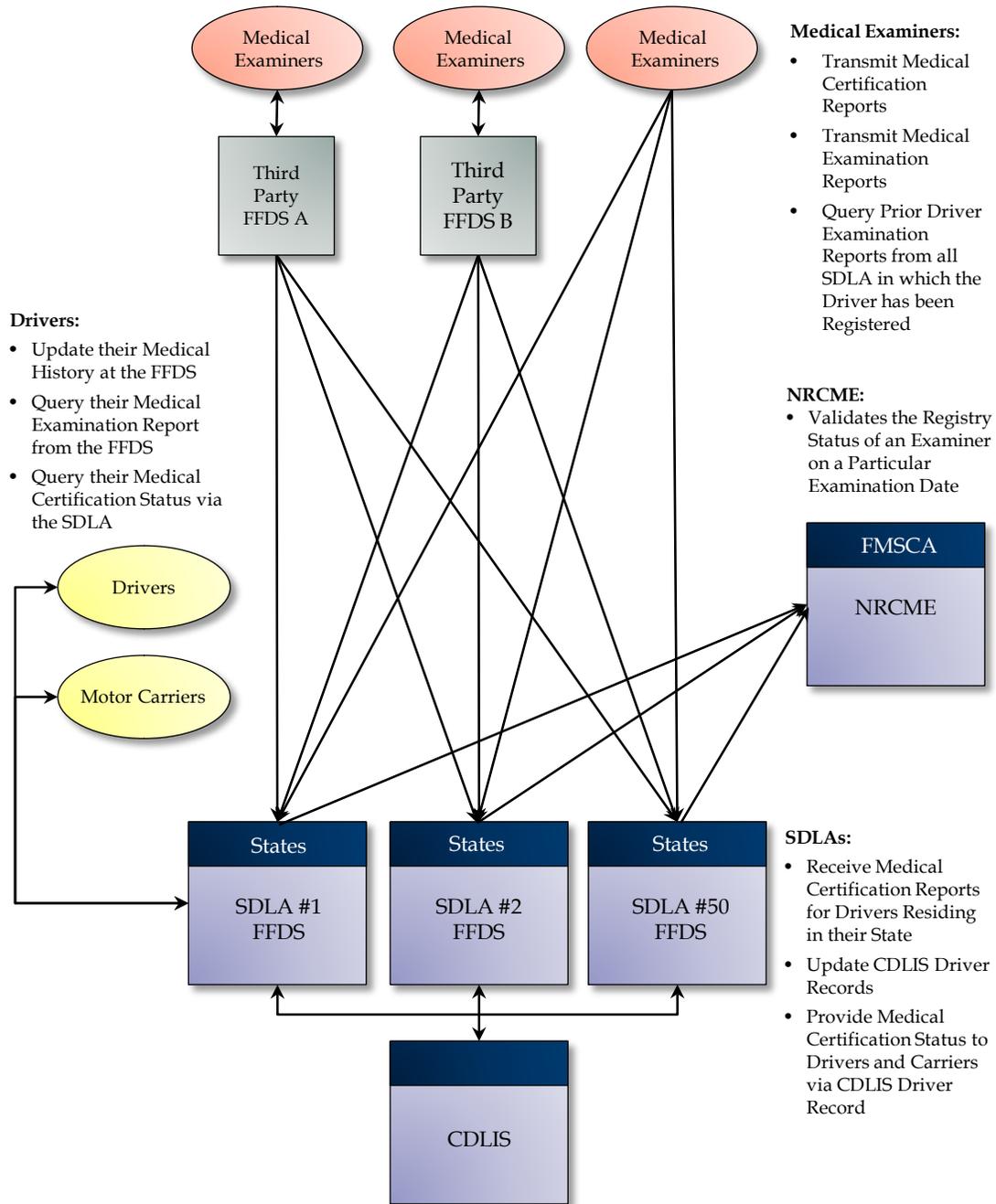


Figure 3. Chart. State-Centric FFDS Architecture.

Functionality of the State-centric FFDS concept would be distributed across each of the SDLAs. Each SDLA would need to maintain a separate, secure database to contain the medical examination report information separate from the CDLIS driver record with the certification status data.

When an examiner finishes a medical examination of a driver, the examiner would transmit both the examination and certification status data to the FFDS database in the State where the driver is licensed. Access could be direct or via a third-party examiner information management system, such as those identified in the earlier background review. The medical examiners or third-party vendors would either have to establish access via the existing CDLIS network, or each of them and each SDLA would have to build a capability to accept inputs for each of the medical examiners defined on the NRCME, presumably via a secure Internet application built and operated by each SDLA. The examiner would transfer the medical certification report and medical examination report to the SDLA, and the SDLA would update both their distributed FFDS and their CDLIS driver record with the medical certification status for their CDL-licensed driver.

Drivers would be able to access the FFDS of their State of residence, both to review the medical examination results and to update medical history prior to an examination. Examiners would be able to retrieve a driver's examination history from the FFDS of the SDLA in the State in which the driver resided at the time of the previous examination. A consequence of this approach is that in order to prepare for an examination it may require accessing more than one SDLA's FFDS to obtain historic results for drivers who have moved to another State. The distribution of driver medical examination results across SDLAs also limits the usefulness of any type of data analysis algorithms that might be developed to compare examination results for inconsistencies. The alternative would be to define a process by which each SDLA would maintain a complete history for each driver and pass it along to the new licensing SDLA as they are required to do for CDLIS driver histories.

6.2.2 Further Analysis of Strengths and Weaknesses

Some years before the NRCME concept was issued, a team partner on this research project proposed a State-centric architecture as part of a study on fitness-for-duty certification for the Indiana Department of Revenue. The study considered three tiers of State-centric functionality. The thought in that plan was that each SDLA would make its own decision about how much functionality it wished to implement. Those wishing lesser levels of functionality would have the option of a simple "accept and store" electronic delivery functionality from that SDLA's authorized medical examiners. SDLAs wishing to incorporate more functionality, including integration with specific driver appeal processes, could build more complexity around the certification report. These options generally remain true today.

However, the NRCME requirement for national standardization of medical examiners is a significant change that took place in the intervening years. Prior to the requirement to create an NRCME, if a driver moved to a new jurisdiction, a new examination with an examiner approved by *that* SDLA could be required. Therefore the certification result did not have to be portable across States.

In the NRCME environment, and with the increasing development of business coalitions of examiners, it is likely that many medical examiners would need to report to a wide variety of SDLAs, and SDLAs would have to recognize medical examiners from other States who are on the NRCME. This “many-to-many” linkage between medical examiners and SDLAs would be inefficient because it would require significant resources for each SDLA and/or medical examiner to implement. It would require development and operation by SDLAs of 51 analogous duplicate systems, increasing the overall cost.

The SDLA-centric architecture also puts the SDLA in the position of having to accept the medical examination record that most States generally do not need. Otherwise, it would deny examiners the ability to review medical examination history.

Conversations such as these are already underway. The CDL program is giving States grant funds to assist with CDLIS Modernization, and each SDLA is faced with deciding how much of those funds to dedicate to building which suboptimal, duplicative systems. FMCSA’s Division Administrator and State Program Manager from Iowa expressed a personal view that a National approach is needed to achieve standardization necessary for a more optimal solution and to maximize what can be accomplished with the available CDL grant funds for CDLIS Modernization.

6.3 CANDIDATE OPTION #2: EXAMINER-CENTRIC ARCHITECTURE

6.3.1 Description

A second option is for each NRCME examiner to maintain his or her own examination and certification results electronically as distributed components of an FFDS. This implies up to 40,000 separate systems, reduced by those who are operating in consortia with shared software. These systems would need to respond to inquiries from all other medical examiners interactively requesting the appropriate data. In this approach, when the driver is examined, the medical examiner would keep the results and transmit only the medical certification report for CDL drivers to the SDLA in the driver’s State of residence. As in the State-centric architecture, each medical examiner and SDLA would have to be able to authenticate each other and communicate directly. Such an architecture would allow each medical examiner to either develop his or her own system or combine with other examiners to use commercial or association-developed systems.

The need for interactive communications would increase the systems development and operating cost for each medical examiner. This would create a disincentive and might cause medical examiners with lower volumes to decide not to bother being a certified medical examiner on the NRCME.

Figure 4 below is a graphical representation of a high-level systems overview for an examiner-centric FFDS architecture and how it could interact with related systems. In terms of workflow, the medical examiner-centric architecture is very similar to the State-centric architecture. Two primary differences are:

- Where the secure, electronic version of the medical examination report is stored. Instead of transferring it to the current licensing SDLA's distributed FFDS for all of their drivers, it would remain distributed among many different medical examiners.
- Where the driver would have to go to update his/her medical history and review results. The driver would have to go to the specific medical examiner's system that conducted the medical examination and not the SDLA's FFDS. In addition, when a medical examiner finishes a medical examination of a driver, the medical examiner would store the medical certification report and medical examination report in his or her own distributed FFDS. Examiners could have their own FFDS or form groups of examiners utilizing commercial products. This would be an attempt to implement a system where the authoritative source—the medical examiner—is functionally able to interact with those who need access to the data, rather than making the data available to those needing it from a trusted system that is easier to implement and operate.

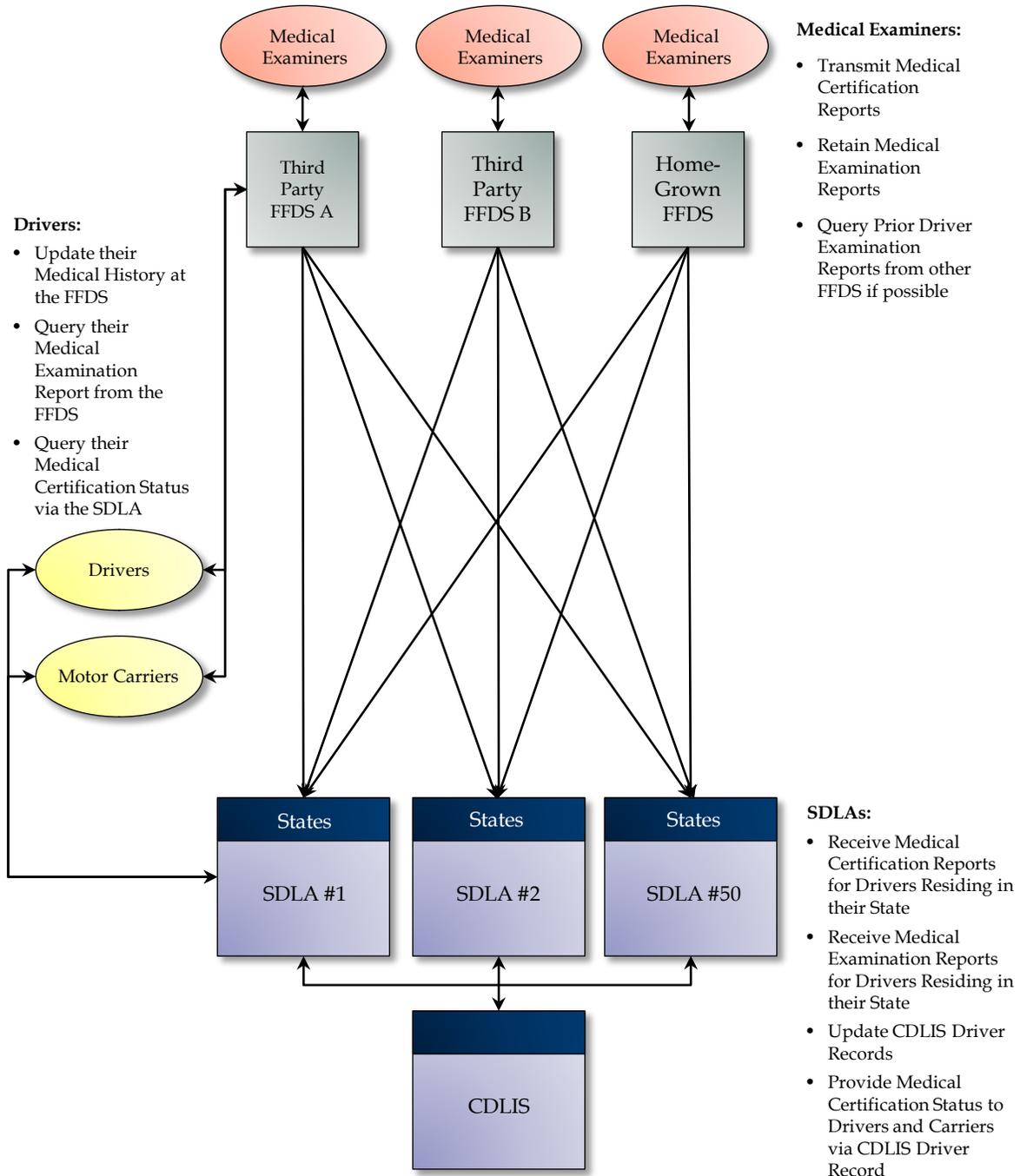


Figure 4. Chart. Examiner-Centric FFDS Architecture.

The examiner’s FFDS would therefore need to understand how to potentially transmit to every SDLA, and every SDLA would need to allow them to provide data to the SDLA as a trusted source, or in this case the authoritative source. Upon receipt of the medical certification report, the SDLA would update the CDLIS driver record with the medical certification status.

Another cost of the medical examiner-centric approach would be the additional requirement that the medical examiner’s systems have a way to securely determine which drivers could be

allowed to access the examiner's FFDS, both to review the medical examination results and to update medical history prior to an examination. Examiners would be able to obtain medical examination records from their own FFDS to review a driver's examination history. If the driver changed examiners, however, the examination history would be distributed across multiple examiners' systems. If the examiner FFDS market were to consolidate around a few key vendors willing to exchange such information, the severity of this issue could be reduced.

6.3.2 Additional Analysis of Strengths and Weaknesses

The last point above regarding drivers changing examiners is a matter of substantial concern. One can envision scenarios where a driver insists he or she does not (or chooses not to) remember his prior examiner, i.e., simply decides perhaps for fraudulent reasons to omit mentioning a prior examination. With a distributed State-centric approach across 50 States and the District of Columbia or with national-centric architecture, an examiner concerned about a driver's veracity could either search via brute force across all State-centric FFDS implementations or access the index of the national-centric system. With a distributed medical examiner-centric FFDS across up to 40,000 medical examiners, it is functionally impossible to ensure such "hidden" previous medical examination results could be found, unless a central index comparable to that used by the National Driver Register's Problem Driver Pointer System or CDLIS were developed.

Another problem with this approach is appropriate oversight to reasonably ensure that each medical examiner is providing quality data. While the examiners may be on the registry, SDLAs must have a reasonable expectation that the information they receive from a wide variety of examiner systems is robust, complete, and not compromised.

The architecture could work for the types of companies described in Section 3.2.1.2, which are building systems designed to capture examination data. However, it would require the SDLAs to provide them with an electronic interface with the SDLA for the examiner system's information. It suffers from a similar limitation to the State-centric approach in that it requires each examiner's system to implement up to 51 different points of connectivity to all the SDLAs in order to allow the medical examiner to provide the data to the SDLAs to update the appropriate CDLIS record. It also requires the SDLAs to put forth more quality assurance in accepting the data.

Additionally, this architectural alternative appears to be disadvantageous to the small independent examiner. Such independent medical examiners would have to build linkages with all the SDLAs for which they wish to examine drivers. A low-volume examiner may be able to build a linkage to a single SDLA in their State of residence, but otherwise examiners would be driven to consider commercial systems.

6.4 CANDIDATE OPTION #3: NATIONAL-CENTRIC ARCHITECTURE

6.4.1 Description

A third option is for a designated national entity (not necessarily a Federal entity) to take on the responsibility for the system concept, either alone or in conjunction with one or more public or private third-party organization(s), using a centralized FFDS approach. In this approach, the

examiner would transmit the examination and certification results for all CDL drivers to a single national FFDS. The FFDS would then automatically and securely transmit certification status information for CDL drivers to the current SDLA.

Since transmission of the certification data would be automated, it can be expected to have substantially fewer operational costs compared to the other two candidate architectures. Figure 5 is a graphical representation of the high-level systems overview for a national-centric FFDS architecture and how it would interact with related systems.

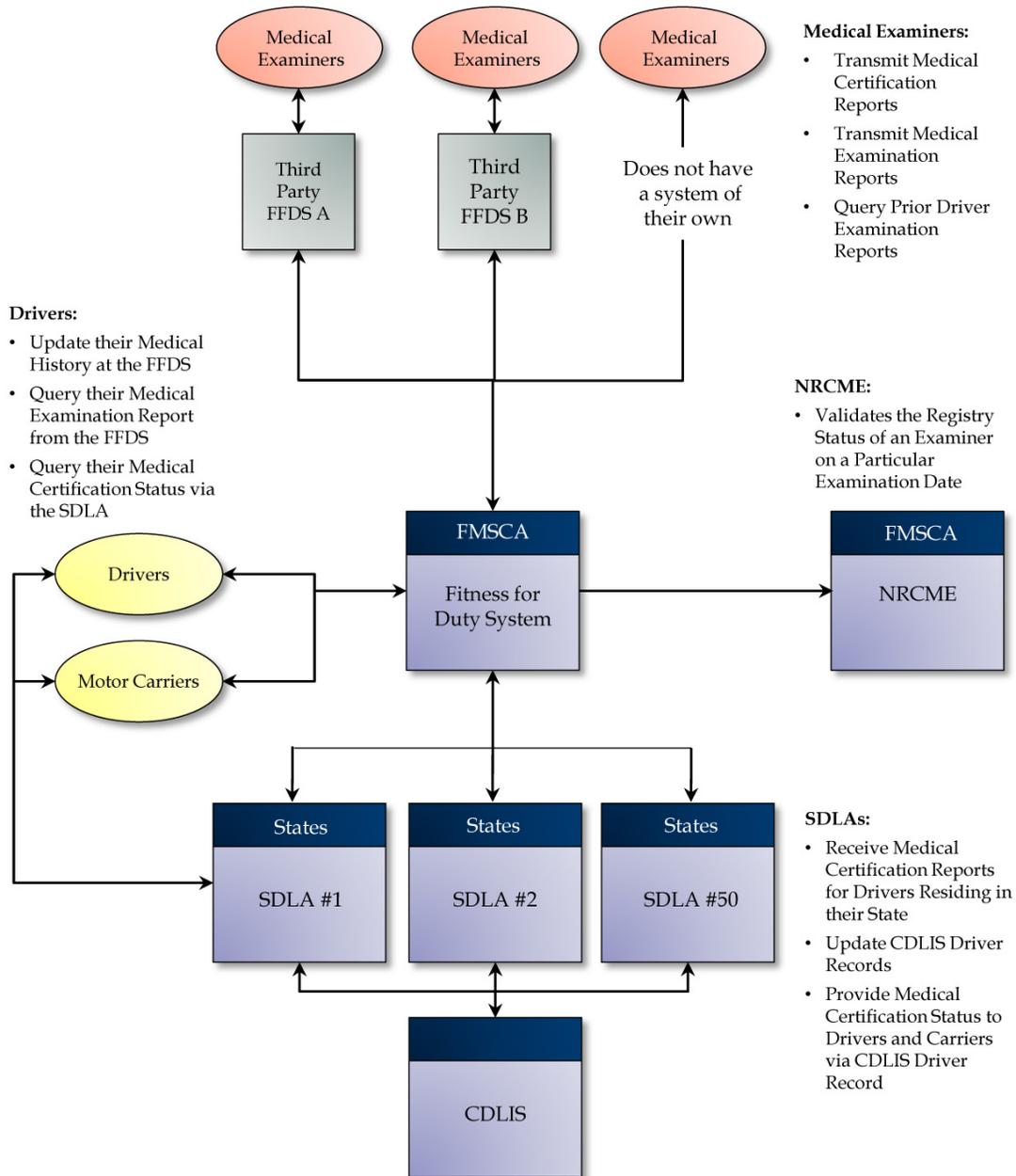


Figure 5. Chart. Nationally-centralized FFDS Architecture.

When a medical examiner finishes a medical examination of a driver, the medical examiner would transmit the results to the centralized FFDS, regardless of the State in which the driver is licensed. Access could be direct or via a third-party examiner information management system, such as those identified in the earlier background review. The examiner would transfer the medical certification report and medical examination report to the centralized FFDS.

The centralized FFDS would record the medical examination report, becoming the trusted source for such reports. The medical certification report, however, would be transmitted electronically by the FFDS to the appropriate SDLA; the SDLA would then update the CDLIS driver record with the medical certification status.

Drivers would be able to access the centralized FFDS both to review the medical examination results and to update medical history prior to an examination. Examiners would be able to retrieve a driver's complete examination history from the centralized FFDS regardless of the history of States in which the driver has resided or the list of examiners by whom the driver has been examined.

6.4.2 Additional Analysis of Strengths and Weaknesses

The functional strength of the centralized FFDS architecture is that it would preclude a driver from cheating the process by omitting a previous examiner or a previous State of residence. This architecture of the FFDS presumably would take advantage of the CDLIS central site that already maintains a history of changes in State of licensure. The original CDLIS kept a history going back three States. The CDLIS Modernization increased this to 10. This ability would be much more difficult to implement in either the examiner-centric option or the State-centric option. The technical strength of the centralized FFDS structure is the ability to simplify the access requirements for the examiners. Instead of having potentially dozens of SDLA connections to maintain, only one connection is required. The approach can include third-party examiner systems providers, but it would place standards on them for connectivity, data fields, and security.

Another advantage of this approach is how the information can be delivered to the SDLA. FMCSA already requires that the medical certification status information must be recorded by SDLAs on the CDLIS driver record. Design and testing support for that requirement is planned as part of CDLIS Modernization. The important thing that would be changed by implementation of this option for an FFDS is how the information gets delivered for inclusion on the CDLIS driver record. Thus, a logical solution is to use a new CDLIS transaction to transmit it to the SDLAs. FMCSA is already connected to CDLIS, and there already is a model for an analogous unsolicited reporting of conviction data to SDLAs via CDLIS.

Furthermore, using CDLIS as a transmission model would augment the ability of the FFDS to use read-only access to verify information about a driver, such as spelling of the name, date of birth, etc., to ensure proper matching of medical certification with the correct driver. This would help detect the inaccuracies that are inevitable with data input by large numbers of people.

Additionally, this edit function comparing the input data from the CDLIS index could be included in a user interface of the FFDS as part of the driver providing the history information. The reader may question why only CDLIS-based transmission is considered for this architecture

option. In the other architectures, the transmission is from a private-sector party (an examiner) to an SDLA. In those architectures, therefore, it is more appropriate to consider using the Internet instead of CDLIS as a transmission network. The CDLIS transmission is another strength of the national-centric approach.

Using CDLIS as a transmission model, however, should not be assumed to be the only approach for a national-centric architecture. A third-party systems approach could also be used to create the “hub” of the connectivity to link with multiple examiners and with multiple SDLAs. Such systems exist as “clearinghouses” for transaction management, such as those developed for the International Registration Plan and International Fuel Tax Agreement programs. However, such a non-CDLIS approach may impose greater systems development and operational costs on the States because those systems were set up as a design and ownership structure by each of those applications. Additionally, Congress has already defined the CDLIS driver record to be the source for providing the medical certification status information as part of the CDLIS driver record.

The national-centric architecture addresses the core issues encountered with the first two architectures. It could, however, create some new issues. One issue of concern to the Medical Programs staff at FMCSA is whether there is a possible responsibility that might be placed on FMCSA if the medical examination records are received and stored as part of an FFDS. Whether it is an FMCSA-owned or maintained system, would FMCSA then assume the responsibility for reviewing the quality and impact of the certification data once it has been recorded in the central FFDS?

The researchers make the following observations regarding this concern. There are other programs within FMCSA where information or a credential is received by an FMCSA system, and no responsibility is established for the specific individual record. This is unlike the FAA, where they have individual responsibility to review that data specifically forwarded to them about an airman that the AME feels is questionable.

It is true that NTSB recommendation H-01-18 does include use of the words “and reviewed.” As stated earlier, that could be interpreted to mean they had the FAA model in mind for individually reviewing questionable CDL driver medical certifications. However, the meaning of “and reviewed” likely is now defined by what Congress established in SAFETEA-LU as an oversight of medical examiners on the NRCME, not an examination review function.

It appears SAFETEA-LU only creates a requirement for FMCSA to exercise oversight and enforcement over the performance of medical examiners, i.e., whether they are qualified to get onto the NRCME and whether they should be removed from it. There does not appear to be a requirement for FMCSA to intervene at the individual medical examination report level for every possible individual driver.

Another advantage of the national-centric approach is that software edits can more readily be incorporated into the system to cross-check information contained in the medical examination report. These would look for logical inconsistencies or out of bound readings that should be cause for a determination of “not qualified.” Thus, it can raise “red flags” for medical examiners that appear to be making an incorrect determination. Such red flagged submissions can be

automatically sent back to the medical examiner with an explanation that based on the data it appears that driver should not be determined as qualified.

If FMCSA had access to such medical examination data, it would immensely increase the ability of FMCSA to carry out its required oversight/review of the medical examiners and to more knowledgeably target potential problem medical examiners for attention. The Agency would also have detailed medical examination data available electronically for an immediate detailed audit of a medical examiner's determinations, without having to request it from the medical examiner, thus being able to respond more quickly.

The selection of the name of the architecture as "national-centric" is an acknowledgment that "national" does not necessarily mean "FMCSA" or even "Federal." The researchers envision potential scenarios where FMCSA's role in a national-centric FFDS is in the establishment of standards, oversight that the standards are being complied with, and perhaps initial funding, but not necessarily in ownership or daily operations.

However, since information receipt was a concern of FMCSA's medical staff, verification of whether the researchers' interpretation of the responsibilities for FMCSA is correct would need to be reviewed by Chief Counsel to verify whether the above interpretation on responsibilities is supported by legislation.

Additional strengths of this approach include:

- It would remove all requirements for States to maintain manual operations for data entry of the medical certification status data from the medical certificates currently required to be provided to the SDLAs. This data entry from medical certificates would otherwise be a continuing operational cost to the SDLAs.
- It minimizes imposing any additional systems development and operational cost on the SDLAs, other than that already required by current regulations, which would occur under the State-centric or medical examiner-centric alternatives.
- It would take advantage of the existing design of CDLIS, which has been working for many years to refine the processes used for receiving data from other States. The analogy is the receiving and recording of traffic convictions from other States where the driver was convicted.

6.4.3 Relationship to NTSB Recommendations

In Section 1.1, a number of NTSB recommendations for a medical examination system are listed. Below is a short overview of how the national-centric FFDS relates to those recommendations.

- (H-01-18). A tracking mechanism is established which ensures that every prior application by an individual for medical certification is recorded and reviewed.
Every medical examination report would be recorded in the FFDS. This would enable subjecting every examination report to data quality screening to ensure completeness and consistency. It would also enable analysis to determine patterns of data quality of each medical examiner and whether he or she appears to be in compliance with the

requirements of the NRCME. This would enable medical examiners to obtain the full histories given by the driver to any medical examiner and, thus, to detect when the driver may be omitting information. It would also show any pattern of driver visits for examinations with medical examiners (i.e., medical examiner shopping).

- (H-01-21). The review process prevents, or identifies and corrects, the inappropriate issuance of medical certification.

Documenting every medical examination report to the FFDS would enable FMCSA to have current data for every medical examiner and information on how each is performing in order to identify when it is appropriate to schedule a medical examiner for an audit based on his or her detailed data. Also, all data for the audit would already be in FMCSA's FFDS database, and the audit could be performed at any time without delay. This would support identifying problem medical examiners based on algorithmic analysis of their data, leading to prompt removal from the NRCME. Further, under authority of § 391.45(c), FMCSA should be able to require the current employer or perhaps the SDLA of the driver to require the driver to have another physical examination by a different medical examiner on the NRCME to determine if he or she is physically qualified. The result of that examination would be reported and placed on the CDLIS driver record, which could lead to the driver being declared "not-qualified." As part of the recommended rulemaking to implement an FFDS, FMCSA should explore whether any clarification is needed in § 391.45(c) to allow FMCSA to require a driver to obtain another physical examination by another medical examiner on the NRCME.

- (H-01-22). Enforcement authorities can identify invalid medical certification during safety inspections and routine stops.

The FFDS would forward the medical certification status data to the current CDL SDLA using a new CDLIS transaction for posting on the CDLIS driver record. These data are already required to be provided electronically to all authorized enforcement personnel enforcing FMCSA regulations and using FMCSA-provided systems. FMCSA would have to work with the police system, the International Justice and Public Safety Network (Nlets), and each State's police system to be sure the medical information is delivered to those needing it who use that network, rather than FMCSA-provided software that operates over a secure Internet connection.

- (H-01-23). Enforcement authorities can prevent an uncertified driver from driving until an appropriate medical examination takes place.

The reporting of the medical certification status data to the licensing SDLA via a CDLIS transaction would enable the SDLA to implement the requirements of the December 2008 Final Rule for placing medical certification status data on the CDLIS driver record. That rule requires the SDLA, upon the driver becoming "not-qualified," to immediately update the CDLIS driver record to show a status of "not-qualified" and to downgrade the CDL within 60 days. Thus, immediately upon receiving a status of "not qualified," the roadside enforcement authorities would have documentation that would allow them to prevent that driver from driving until recertified.

- (H-01-24). Mechanisms for reporting medical conditions to the medical certification and reviewing authority and for evaluating these conditions between medical certification

exams are in place; individuals, health care providers, and employers are aware of these mechanisms.

Each medical examination would result in a report of a medical certification status to the licensing SDLA, the keeper of the CDLIS driver record for that driver. Section 391.45(c) is commonly interpreted as requiring the employer to require the driver to obtain a new medical examination if there is doubt the driver is physically qualified. Each such examination would be reported, and that report would cause an update of the current medical certification status on the CDLIS driver record.

These mechanisms, together as a system of systems, could produce quite a robust medical certification system for CDL drivers.

6.4.4 Third-Party Implementation Approaches to a Nationally-Centralized FFDS

One advantage of a national-centric FFDS is that it inserts a value-added intermediate FFDS into what, in the two alternatives above, are exchanges of information between two parties: a medical examiner and an SDLA.

One alternative for this approach is for FMCSA not to take on the system ownership itself but instead take the leadership role in specifying the standards surrounding a centralized FFDS and administering the oversight of the eventual provider of such a system. There are a variety of systems where FMCSA or other USDOT administrations have taken a leadership role in specification while leaving implementation to the market.

One of the most recent FMCSA examples of this approach involves the standards for EOBRs for commercial vehicles. In 49 CFR part 395, FMCSA developed a number of specification components, including:

- A data elements dictionary.
- Communications standards for the transmittal of data between the recorder and FMCSA.
- Self-certification standards, including outcome-based performance requirements.

Another example is the Pre-employment Screening Program (PSP). FMCSA specified the terms under which motor carriers can access this data for pre-employment screening. It also established the price that could be charged for providing the data, and provides the underlying data from MCMIS to the vendor selling the service.

Using this type of specifications approach, FMCSA could define a set of requirements specific enough to ensure the quality and security of the medical certification information, while allowing the medical examiners and SDLAs to develop the best approaches for their own specific implementations. As for the centralized FFDS itself, similar specification approaches can be developed to allow a solution to emerge.

Another example of where FMCSA developed standards for third parties is in the area of State credential exchange via the Commercial Vehicle Information Systems and Networks (CVISN) program. In that program, State agencies involved in various motor carrier and CMV credentials,

exchange information with other States via the FMCSA-managed Safety and Fitness Electronic Records (SAFER) system. The connectivity to the system, however, is a standards-based approach where individual States decide the best way for their State to manage the connection, based on standards published and managed by FMCSA. The result has been a mix of solutions, as some States built their own systems, some States combined resources to build publicly available systems, and private vendors developed systems and sold them to multiple States.

Considering these three examples as a whole, one can begin to envision scenarios where FMCSA can establish a centralized FFDS architecture while determining the Agency's appropriate level of daily involvement with the FFDS operations.

6.5 EVALUATION MATRIX FOR THE THREE ALTERNATIVES

Table 5 below identifies the effectiveness of the 3 candidate options in addressing the key elements of an FFDS as identified in Section 6.1.

Each option has been evaluated (and rated positive, neutral, or negative) for each functional and technical element. The ratings are defined as follows:

- **Positive:** the implementation of the candidate option does not impede the ability of that functional or technical criterion in any meaningful way.
- **Neutral:** the implementation of the candidate option does not prevent the functional or technical criterion, but it would likely have an inefficiency in the process, such as the requirement for a greater number of interfaces.
- **Negative:** the functional or technical requirement cannot be implemented in a realistic manner.

Out of 30 rating components, there are 7 neutral and 6 negative ratings. The national-centric architecture received positive ratings for all elements. The other two architectures merited both neutral and negative ratings for some elements. The neutral ratings generally concern connectivity and standards issues arising from the State- and examiner-centric architectures.

The six negative ratings are as follows:

- Negative ratings for both the State-centric and examiner-centric architectures because of the limitation regarding previous examination history. A driver wishing to deceive an examiner can omit mention of a previous examination occurring in either a different State (for the State-centric architecture) or by a different examiner (for the examiner-centric architecture). There is no practical way for the examiner to know where to search for other unmentioned examinations. Although the SDLA would have received medical certification status data for each of the examinations, the usual design of the CDLIS driver record is to maintain only the most recent status.
- A negative rating for the examiner-centric architecture for the impact on the driver's ability to interact with different systems to report medical history prior to an examination. A driver may have to learn how to use a different examiner's distributed FFDS each time

he/she changes examiners, and the driver's information is distributed across a variety of systems.

- A negative rating for the examiner-centric architecture for the impact on the ability to integrate 40,000 distributed systems that are in compliance with a standard set by FMCSA, which could be NIEM-based.
- Negative ratings for both the State-centric and examiner-centric architectures for the limitation regarding FMCSA's ability to support analyzing medical conditions and safety performance by having access to medical examination reports for comparison with safety performance data.

Table 5. Option evaluations for each functional and technical element.

Evaluation Criterion	National-Centric	State-Centric	Examiner-Centric
1. The ability for examiners on the NRCME to conduct an examination of a driver, regardless of the reason for the examination.	Positive	Positive	Positive
2. The ability for an examiner to obtain all fitness-for-duty examination records for a driver, regardless of the cooperation of the driver in disclosing previous examinations.	Positive	Negative	Negative
3. The ability for the registered examiner to transmit the completed medical certification report and medical examination report to the appropriate SDLA(s) without requiring activity by the driver.	Positive	Neutral	Positive
4. The ability for the current licensing SDLA to maintain the current medical certification status for a driver.	Positive	Positive	Positive
5. The ability for drivers to use the system to provide or to update their medical history, update their demographic profile information, and view the medical certification and medical examination reports submitted by medical examiners.	Positive	Neutral	Negative
6. The ability for a driver's employers (approved by the driver) to have the appropriate visibility of the driver's data.	Positive	Neutral	Neutral
7. Integration with efforts underway by FMCSA regarding systems development supporting the NRCME.	Positive	Neutral	Neutral
8. Integration with the ongoing modernization of CDLIS.	Positive	Positive	Positive
9. Integration and compliance with the NIEM to the extent that FMCSA decides to pursue such an architecture approach.	Positive	Neutral	Negative
10. Examination reports to support analyzing medical conditions and safety performance	Positive	Negative	Negative
Total Ratings (Positive, Neutral, Negative)	10, 0, 0	3, 5, 2	4, 2, 4

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7. CONCLUSIONS PRESENTED TO FMCSA BRIEFING

The purpose of this study was to examine the research question:

Would mandating electronic reporting of every fitness-for-duty medical examination for every commercial motor vehicle (CDL) driver by medical examiners listed on the National Registry of Certified Medical Examiners (NRCME) provide a mechanism to effectively address gaps in the physical qualification programs for CDL drivers?

The research team believes the answer to this research question is an unequivocal “yes.”

The researchers’ process for examining this question involved a mix of review of the historical context, interviews with key stakeholders regarding what they recommend, analysis of the gap consequences of *not implementing* an electronic FFDS, and development of three alternative technical architectures to evaluate. The research considered technical, organizational, and systems aspects, as well as incorporating attention to current initiatives underway at the Federal, SDLA, and private-sector levels.

The findings indicate that, without requiring electronic reporting of every fitness-for-duty medical examination for every interstate CDL driver, FMCSA would not be able to successfully address either the problems identified by the CDL Advisory Task Force (or other concerned institutions such as the NTSB) or the gaps identified by this analysis.

The solution to implementing such a capability should consider the ability to facilitate the exchange of medical examination (e.g., “long form”) information about a driver between the various different medical examiners who likely would examine the driver over a period of time. It should also consider the value of this information for research to support rulemaking.

As a result of the feedback received on the Base Scenario, the researchers developed three architectural options that could support the electronic reporting of certification and examination results. Each of the three options have different strengths and weaknesses.

In the introduction to this report, Table 1 set out an analysis of how the 2008 FMCSA Final Rule for Medical Certification status as part of the CDLIS driver record, CDLIS Modernization, and NRCME initiatives do, or do not, address the gaps in the physical qualification programs for CDL drivers. Table 6, below, expands that information to consider the potential impact of implementing one of the three architectural options for the FFDS considered in Section 6.1.

Table 6. Closing Gaps in the CDL Driver Physical Qualification Programs with an FFDS

Gap	FMCSA Final Rule (2008)/ CDLIS Modernization Initiative	NRCME Initiative	SDLA-Centric Architectural Option	Examiner-Centric Architectural Option	National-Centric Architectural Option
Near Real-Time, Electronic Communication of Medical Certification Results by Medical Examiner	Not required	Not included	Yes	Yes	Yes
Standardized Electronic Population of CDLIS Record with Certification Status Results	Not included	Not included	Yes	Partially provided	Yes
Linked Medical Certification Status and CDLIS Driver Record	Poorly	Not included	Yes	Partially provided	Yes
Single Source for All Driver's Medical History and Examinations for Medical Examiner Use	Not included	Not included	No	No	Yes
Consistent Medical Examiner Protocols and Standards for Medical Certification	Not included	Yes	Uses NRCME Standard	Uses NRCME Standard	Uses NRCME Standard
Consistent Medical Examiner Protocols and Standards for Completing Records and Forms	Not included	Partially provided	Yes	Yes	Yes
Auditing Functions for Medical Examiner Performance Reviews, User Access, and Information Tracking	Not included	Limited, but partially provided	Partially provided	Partially provided	Yes
Examination Reports to Support Analyzing Medical Conditions and Safety Performance	Not included	Not included	No	No	Yes

A centralized approach for an FFDS architecture has significantly more promise (see Table 5). Such an architectural direction is the only one that could cover all the gaps identified by the researchers. It enables medical examiners to view all previous examinations regardless of the driver's previous examiners or previous States of licensure; enables identification of medical examiner shopping; provides the greatest information for targeting potential problem medical examiners for auditing; has the potential for the tightest integration with the ongoing CDLIS Modernization efforts, and does not require the SDLAs to implement any capabilities beyond those already required in the final 2008 Medical Certification and CDL rule.

The strengths of a national-centric architecture include the following:

- It minimizes the number of system connections required between the examiners and the SDLAs, improving the probability of eventual successful deployment.
- It could allow all examiners to have access (when required) to the complete histories of previous examinations for a particular driver, regardless of the examiners the driver had previously visited or the States in which the driver has previously been licensed.
- It provides a potential single point of contact for drivers to both electronically update their history prior to examinations and to retrieve information about what has been submitted by examiners.
- It provides the best linkages to SDLA CDLIS Modernization efforts while still enabling the opportunity for third-party examiner services to innovate and be certified.

The national-centric architecture requires FMCSA, at a minimum, to take a leadership position in setting the standards for how such a centralized system would operate. The medical records market, however, includes third-party services and systems vendors, as identified in Section 3. In Section 6, examples were identified of how centralized architectures can be developed in a manner where third-party services are able to meet requirements and be participants. It is clear that scenarios exist where FMCSA's leadership in setting standards could facilitate development of market-based solutions for an ongoing centralized FFDS.

The researchers suggest that a logical means to accomplish an evaluation of the recommended national-centric architecture is through a demonstration testing process that could involve the following elements:

- An experimental design framework, including realistic hypotheses for evaluation, sample size required, participation inducements, and methods of measuring potential "success."
- A plan for recruiting examiners, SDLAs, and drivers to participate in the research.
- An approach for prototyping or mimicking the architectural components to a level where the research hypotheses can be properly considered, without developing entire systems on speculation.
- An analysis of key institutional, technology, and governance issues that could otherwise confound the process, as well as approaches for mitigation.

Appendix C outlines a high-level action plan for how the demonstration process could be advanced. The researchers are confident that an architectural solution exists as an integrated approach with much of what is already underway. This solution could advance the state of the practice in this area and improve the quality and availability of information in the physical qualification program for interstate CDL drivers—and potentially for all CMV drivers.

8. REVISED RECOMMENDATIONS BASED ON FEEDBACK TO DRAFT FINAL REPORT PRESENTATION

A briefing on this project was given to interested persons within FMCSA, including field personnel with direct involvement and interest in the topic.

8.1 FMCSA PRINCIPAL CONCERNS

The feedback recommendations from that briefing are grouped into two functional groups.

- **Partial Fraud Prevention.** A national-centric FFDS limited to reporting medical certifications only could enable detection of medical examiner shopping (e.g., detecting multiple certifications in a short period with different dispositions). This would also replace the opportunity for drivers to provide fraudulent certificates by delivery of a paper medical certification report to the State agencies with a near real-time electronic delivery of the report, pushed to the State driver CDLIS record. It would not provide any assistance in preventing fraud by the drivers in misrepresenting their medical history to medical examiners.
- **Enhancement of Examination Quality and Research.** NTSB recommendation H-01-18 explicitly recommends recording every medical examination report. NTSB recommendation H-01-21 is for a review process to detect and prevent inappropriate certifications, i.e., fraud by the driver as to their medical history. The proposed FFDS, with a repository of “long form” reports, could enable medical examiners to use the continuum of medical information in the driver’s multiple examinations. This has the potential to further improve the ability via past medical histories to detect when a driver has dropped previous medical history, perhaps with the intention of fraud. It would also enable FMCSA to analyze relationships of specific medical conditions to safety performance. It would enable FMCSA to automatically apply software verifications that could automatically return questionable certifications to the examiner with a note on what seems questionable. The researchers believe FMCSA under § 391.45(c) may already have the authority to require the driver to get a second opinion from a different medical examiner. It would also greatly enhance FMCSA’s ability to identify medical examiners that appear to have performance problems for intervention and possible removal from the NRCME.

Representatives of SDLAs indicated at association meetings in 2010 that their principal concern was not related to their CDLIS information system implementation. Their principal concern was to remove the requirement for them to hire and maintain a staff of data entry personnel. Thus, what they want is to have access electronically to near-real-time operational medical certification data from a trusted source.

The means envisioned in this report for establishing a trusted source is for all medical examiners around the country authorized by the operator of the NRCME to electronically transmit data to an FMCSA system. That system will take advantage of the information in the CDLIS index to ensure the relevant certification status data is forwarded to the current licensing SDLA.

FMCSA staff noted there likely would be greater public acceptance if FMCSA initially received and data warehoused only medical certification reports and leave reporting of medical examination reports for later consideration. The essence of the feedback within FMCSA was that the Agency might be better served by first concentrating on implementation of a system based on medical certification data, because these reports are already defined as available to authorized persons.

While transmitting the secured medical examination reports to FMCSA could allow providing any medical examiner in the country access to the history of medical examinations, thus making it harder for a driver to commit medical history fraud by omitting previously observed medical condition(s), and allow FMCSA to conduct meaningful research on the relationships between various medical conditions and safety performance of drivers, it was thought it might be a harder sell. Thus, although this would not fully satisfy the NTSB recommendations, and would weaken what oversight of medical examiners FMCSA could provide, it might be politically better to wait to undertake transmission of medical examination reports to FMCSA as a future development.

8.2 RELATED STATE IT IMPLEMENTATION REQUIREMENTS

FMCSA has three requirements that all do, or will, require compliance by the States as of January 30, 2012. They are:

- The December 2008 rule requiring States to place medical certification data on the CDLIS driver record.
- Implementation of CDLIS Modernization.
- The rule requires States to have procedures comparable to those in the approved AAMVA July 2010 version of the State Procedures Manual which spells out details of what is required by CDLIS Modernization, including the medical certification on the CDLIS driver record.

A related requirement is the NRCME. It requires medical examinations for CMV drivers whose certifications expire after May 21, 2014 to be performed by medical examiners on the NRCME. Thus, there is a requirement for the State components of the CDLIS data system to develop an operational capability for maintaining medical certification status data. As of January 30, 2012, 20 States were in compliance with that requirement, and by June 2013 there were 38.

8.2.1 Final Decision by the Secretary

The Secretary decided that the date of January 30, 2012 for the States to begin accepting and posting medical certification data would remain the requirement. States not in compliance with the requirement on January 31, 2012, have been sent warning letters that they are not in compliance and that they must provide an acceptable Action Plan or they will be scheduled to begin having Highway Trust Funds withheld. As of June 2013, 38 States were in compliance with the regulatory requirement to accept the medical certificates and post status data to their CDLIS component database.

However, two things were changed: 1) If a motor carrier does not receive medical certification status data on the CDLIS MVR from the driver's SDLA, then the motor carrier must continue obtaining from such drivers a copy of the medical certificate and maintain it in the motor carrier's driver qualification file. 2) Drivers from States that have not implemented medical certification status on their CDLIS driver records are to continue carrying a copy of their medical certificate through January 30, 2014. That may have to be extended.

8.2.2 Potential Tradeoffs for Implementing FFDS in Phases

Restricting initial implementation of the recommended FFDS to providing just medical certification information electronically on a near-real-time basis via a secure connection from the trusted sources (medical examiners on the NRCME) would address some of the very important gaps identified in this analysis. Good examples are that it would address medical examiner shopping and prevent drivers from fraudulently generating or altering paper medical certificates.

It would also be possible to begin two parallel efforts at the same time. Thus, implementing Phase I for transmitting certifications only could be done with the intention that it should be fully operational faster. It would also be possible to implement Phase II for transmitting medical examinations, with the intention that it will become available whenever it can be brought online.

Table 7 illustrates the gaps that could be addressed by an initial FFDS implementation of just daily electronic reporting of medical certification data to the SDLAs.

Table 7. Gaps that could be addressed just by certificate data.

Gap	FMCSA Final Rule (2008)/ CDLIS Modernization Initiative	NRCME Initiative	Fitness-for-Duty System (Certification Only) National-Centric Initiative
Near-real-time, Electronic Communication of Medical Certification Results by Medical Examiner	Not included	Not included	Yes
Standardized Electronic Population of CDLIS Driver Record with Certification Status Results	Not included	Not included	Yes
Linked Medical Certification Status and CDLIS Driver Record	Poorly	Not included	Yes
Single Source for All Driver's Medical History and Examinations for Medical Examiner Use	Not included	Not included	Not included
Consistent Medical Examiner Protocols and Standards for Medical Certification	Not included	Yes	Uses NRCME Standard
Consistent Medical Examiner Protocols and Standards for Completing Records and Forms	Not included	Partially provided	Could partially provide for the certificates
Auditing Functions for Medical Examiner Performance Reviews, User Access, and Information Tracking	Not included	Limited, but partially provided	Better than NRCME, but would still only partially provide
Examination Reports to Support Analyzing Medical Conditions and Safety Performance	Not included	Not included	Not included

8.3 NEXT STEPS

If FMCSA chooses to pursue implementation of an FFDS as outlined above, it would be prudent to begin development of the technical details for a Phase I FFDS as soon as possible, and possibly with implementation of a Phase II FFDS following, so the necessary functionality can be implemented within a schedule that allows for prompt implementation.

The researchers believe that the national-centric alternative still makes the most sense for a two-phased implementation process, even if medical examinations are not included in the initial process.

APPENDIX A—BASE SCENARIO OF REQUIRING ELECTRONIC MEDICAL FITNESS-FOR-DUTY REPORTS

Note: This base scenario document is in the language originally developed and used in discussions to elicit feedback from stakeholders. The contents of the scenario below have since been superseded by the requirements and analyses found in Sections 6 through 8.

BASE SCENARIO AND HIGH-LEVEL FUNCTIONAL REQUIREMENTS

Base Scenario

CMV drivers must have the fitness-for-duty medical examination required by 49 CFR 391.45 performed by a medical examiner as defined in 49 CDR 390.5. FMCSA has created the NRCME, and that medical examiners who perform the required medical examination and driver fitness-for-duty certification must be in that registry.

This feasibility analysis is examining the concept of requiring the medical examiner to transmit a standardized electronic medical certification status report to a fitness-for-duty repository the day of the examination. The medical examiner would complete a standardized electronic medical examination report and transmit it to the repository within 3 business days after the day of the examination. For drivers who have, or who are applying for a CDL, SDLAs would be provided with the electronic certification status report to record on the CDLIS driver record and to verify that the physical qualification requirement for that driver's CDL is satisfied. States would have the option of also receiving the certification status report to record on the driver record for non-CDL CMV drivers required to have a medical certification. All drivers and medical examiners would have unique identifiers.

Functional Requirements for SDLAs

- SDLA agents processing CDL applications (new, renewal, or upgrades) would check the status of the medical certification on the CDLIS driver record in the fitness-for-duty repository as part of processing the action.
- If a current positive certification status report is not on the CDLIS driver record in the repository, the SDLA would not process the application, or would remove the CDL if the certification status report had expired or is determined to have become negative.
- For already licensed CDL drivers, SDLAs, upon receipt of a certification status report indicating a medically unqualified status, must initiate action to downgrade or remove the CDL privilege.
- Certification status reports would include the reason(s) provided by the medical examiner for a negative or conditional status.
- SDLA-specific administrative processes, such as administrative hearings for medical qualification, are left to the specific process requirements of each SDLA.

Functional Requirements for Medical Examiners

- Medical examiners must be listed on the NRCME to participate.
- Before performing a medical examination on a CMV driver, the medical examiner shall retrieve all previous certification status reports for that driver.
- If all previous certification status reports are positive, the medical examiner may, but is not required to examine the previous medical examination reports.
- If there are any conditional and/or negative certification status reports from previous fitness-for-duty physical qualification examinations for a driver, the medical examiner shall obtain and examine each corresponding medical examination report.
- If certification status reports by two different medical examiners for the same driver are conflicting, the last examining medical examiner may consult with the previous examining medical examiner and must document a medically valid reason for differences at the time of the examination, and include the documentation in the medical examination report.
- Medical examiners shall transmit the completed standardized electronic certification status report for each examination to the fitness-for-duty repository in a specified electronic format the same business day of the examination. The standardized electronic medical examination report supporting the basis for the certification status shall be transmitted to the repository within 3 business days after the examination.

Functional Requirements for CMV Drivers

- All drivers will have a unique identifier.
- Drivers will be required, utilizing the repository, to enter basic information, including medical history related to fitness for duty, prior to the actual exam.
- Drivers would not be required to use the same examiner over time.
- Drivers will be provided access to their personal certification status and medical examination reports.
- Drivers may appeal status reports through specified administrative processes.
- Drivers may request notification of inquiries that fleet safety managers have made of the driver's certification status reports.

Functional Requirements for Fleets

As a condition of employment:

- Fleet safety managers, or employer "designated representatives" may access certification status reports from the repository for verified employed drivers.
- Fleet safety managers or employer "designated representatives" may refer employed drivers to a medical examiner at any time, as specified in 49 CFR 391.45(c).

Functional Requirements for the Fitness-for-Duty Repository

- The repository will electronically receive and record the certification status and medical examination reports.
- The repository will immediately electronically forward certification status reports to the indicated SDLA.
- The repository will include appropriate notification processes to record changes and inconsistencies in certification status.

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APPENDIX B—STAKEHOLDER RESPONSES TO BASE SCENARIO

The researchers sought out views of key stakeholders on the Base Scenario and High Level Functional Requirements (Appendix A). They were seeking to discover if there were other issues that might lead to possible modifications in the Base Scenario that would influence development of revisions in the scenario to be presented to FMCSA. Some were found, and the Base Scenario presented in Appendix A incorporates those updates.

The Stakeholder Input Process is described in Section 2.2, and a general summary of the input is presented there. The following are the detailed comments from each group of stakeholders for each functional requirement. Stakeholder points of concern or suggestions are listed first under each bullet, followed by researcher annotations, which offer perspective or clarification in italics.

Following the process for stakeholder input, views of the FMCSA Medical Office were also sought. A summary of the Medical Office comments follows the stakeholder input discussion and is set out in the same format as described above, with researcher comments italicized.

SDLA FUNCTIONAL REQUIREMENTS

Medical certification status checks in processing all CDL applications (new, renewal, upgrades, and transfers). *This requirement is contained in the Final Rule with the compliance date of January 30, 2012.*

SDLA/CVSA Comments:

- Such a capability should tie in with CDLIS Modernization process, implementation can be swifter. *Section 4.2 of this report details the plans put forth by AAMVA for CDLIS Modernization for including medical certification status information on the CDLIS driver record. The added functionalities investigated by this research study are not included as part of CDLIS Modification.*
- Should tie in directly with reporting of medical certification status results to SDLAs—the sooner the States know what approach FMCSA is going to take the sooner it can help their planning. *Given the lead times for systems approval and implementation, it was not possible to fully implement a system as proposed by this study prior to the compliance date of January 30, 2012.*
- Should be able to integrate with the potential differences in SDLA business processes for how new drivers obtain their first fitness-for-duty medical examination prior to their first CDL or CDL learner's permit. *This presumably would require the driver to already have a non-CDL record that could be converted to an eligible or not-eligible CDL record by the current SDLA and add the medical status information.*
- Effective January 30, 2012, the Final Rule for Medical Certification as part of the CDL implements the congressional requirement that the CDLIS driver record maintained by the driver's SDLA become the official, authoritative record of CDL medical certification

status. That is a significant shift of responsibility from the current recordkeeping system that has driver accountability for providing a copy of a paper certificate to the employing motor carriers for inclusion in the driver qualification file, and the driver carrying a copy when driving. *Under the new system, paper provided by the driver is still the source of the information, and employing motor carriers are still required to keep documentation of medical certification. However, the motor carrier's form of documentation is changed to be a copy of the official CDLIS driver record in the form of the CDLIS MVR containing the medical certification status. Enforcement would have access by electronic inquiry to CDLIS. There is the temporary deviation for States that do not yet provide the medical certification status data as of January 30, 2012. Those carriers must still obtain and keep a copy of the paper certificate.*

- SDLAs observed that the concept being discussed in the Base Scenario somewhat duplicates current manual processes in the few States that have implemented more sophisticated reviews of the medical examination reports—a few States review and audit long forms. *The system concept put forward in the Base Scenario would provide States with the opportunity to rely on electronically receiving the status report from a trusted source as a CDLIS system function.*
- Commenters raised questions as to how this system would support roadside enforcement activities. Should they just trust the fact that a CDL is in place, and would be automatically linked with the medical exam? *The capabilities required in the Final Rule mean that roadside officers would begin electronically receiving the medical certification status and type of driving certification data as part of the CDLIS data implemented by CDLIS Modernization. The rule also requires that loss of medical certification must be recorded and provided as part of the CDLIS driver record and that SDLAs must downgrade the CDL privilege within 60 days if it lapses.*
- System needs to “push” medical status information updates to SDLAs. *The push process envisioned by this study presumably would use a process comparable to that now used by CDLIS to provide notification of out-of-State convictions to the CDLIS State-of-record.*
- There are privacy concerns relating to data for drivers and medical examiners. *Such potential issues must be dealt with under the potential FFDS. One possible alternative for implementing the capabilities of the Base Scenario could turn out to be a Federal system of records. As such, it would be subject to the Privacy Act requirements.*
- Questions were raised about the implications of implementing such a capability for CMV drivers who do not need a CDL to operate the CMVs they drive, but still are required to have regular medical examinations. *Although consideration of reporting medical certification for CMV drivers for non-CDL CMVs to SDLAs is not part of this study, such reporting by medical examiners on the NRCME could readily be included in reporting by the contemplated electronic reporting system. This is because it is proposed for medical examiners to electronically report the results of all fitness-for-duty determinations. What is done with the information for non-CDL drivers, or even for intrastate CDL drivers, presumably would be a State option they could choose. Those States that wish to put medical certification data on non-CDL driver records for CMV drivers would be free to do so. The proposed system could electronically push that information to them. However, there is no requirement for the States to do anything with such medical certification data.*

- Some commentators recommended that the law should be changed so that there is no distinction between CDL and other CMV drivers.

Trade Associations:

- Need for uniform, simple system. Concerns were raised about relative sophistication of States' procedures.
- Strong overall support for electronic processing and integration of various processes, given potential for more accurate information and removal of paper processes.
- Need to integrate NRCME processes as well as other driver-related systems. The examples of the PSP system based on FMCSA data from MCMIS and the proposed Drug and Alcohol clearinghouse were offered.⁽¹⁹⁾ *Other driver information systems that could be added to this list include obtaining CDLIS MVRs, a proposed employer notification system for conviction data being researched by FMCSA, and a proposed alcohol and drug information system.*

Medical Examiners:

- Overall, their comments regarding the basic approach were positive.
- Suggested that medical examiners should be involved in development of system design and testing, because they would be significant data providers, plus would be users to obtain past data from certifications and possibly examinations as part of performing medical certification determinations. *The researchers support this recommendation.*

Status reports of “Not Medically Qualified” or “Expired” lead to non-issuance or downgrade of CDL.

SDLA/CVSA Comments:

- An SDLA suggested a 45–90 day notice period for driver downgrade situations. *The time period for this function is specified in the Final Rule effective January 30, 2009. Unless changed in a subsequent rulemaking, it will remain 60 days. During those 60 days, the CDLIS driver record must show the medical certification status as “not-certified.”*
- Request that information be “pushed” to SDLAs automatically. *The only information that would need to be pushed would be whether a new certification was issued. If a driver drops out and does not get a new certification, the States already have on the driver record the date the current certification expires and are required to act when it expires. The other possibility is a driver could fail a USDOT medical examination. This could happen at any time during an otherwise “certified” period that should immediately become “not-certified.” The Base Scenario contemplates that such new information would be pushed to the current CDLIS State-of-record.*
- States with field offices will require access at that level. *Such capability should already exist within State driver licensing systems that support field offices in issuing CDLs by providing access to the CDLIS driver record, or via the CDLIS network if the driver is licensed in another State and is moving his or her CDL to the new State.*

- CVSA wanted to be sure the January 30, 2012 deadline specified in the Final Rule for certification status would apply to the concept in the Base Scenario and that information about medical certification status would be incorporated and communicated to enforcement personnel as envisioned in the CDLIS responses already being received at roadside. *As explained above, the concepts in the Base Scenario are not part of CDLIS Modernization. This report does advocate for implementation of at least a Phase I capability by spring 2015 when NRCME is expected to be fully applicable.*

SDLAs initiate action to downgrade or remove CDL when “Not Medically Qualified” status report is received.

SDLA/CVSA Comments:

- For some States, it was thought this might create added cost over and above current systems. *There are two points. 1) This is not a proposal of the Base Scenario but a requirement of the Final Rule for placing medical certification data on the CDLIS driver record. 2) No details were provided on how this would increase costs any differently from any other required removal of driver license privilege. Most States handle such removals by mailing an automated notice to the driver at the official address required to be on file with the SDLA, and updating the driver record to show the downgrade or removal as of the specified date. If the State has a required hearing process, that process would be applied. No further expenses are required by this proposal.*
- Question on timing of process and responsibility for notification of “Not Medically Certified” status, and how that would be made available to roadside enforcement personnel. *This concern is commented on above.*

Certification status reports include medical examiner reasons for “Not Medically Qualified” or “Conditional” status.

SDLA/CVSA Comments

- Most States are only interested in performing the function of CDLIS driver record keeper. Therefore, they are not interested in receiving reasons for the medical certification status determination, but just a determination by the medical examiner of “go” or “no go.”
- There are a few States that already review the “long form” and thus might want the proposed new enhanced system of systems to give them the option to continue doing so. *The medical certification report is defined in FMCSA’s regulations. It does not contain any reasons for the determination. The reasons information is contained on the medical examination report, are also defined in FMCSA’s regulations. It would be technically possible for the potential FFDS system, after a proposed Phase II implementation of receiving medical examination data, to provide medical examination reports to interested States. That would be a topic of policy and design.*

Administrative process for appeals left to each SDLA.

- Consistency across States is critical to avoid drivers fraudulently “gaming the system.” *The minimum standards for States recording medical certification status information are*

already established in the Final Rule that must be complied with by January 30, 2012. The Base Scenario of this study is a concept for how those minimum standards could be extended to include integration of this data from a trusted source, empowering a more rigorous systems approach. It would enable the information to originate from the medical examiners for each examination performed on a driver. Availability of such data would enable implementation of system alerts when driver medical examiners' exam patterns indicate possible medical examiner shopping.

- *Should this be a Federal rather than a State process? It is already determined by SAFETEA-LU and the 2008 Final Rule that the medical certification status must go on the CDLIS driver record. FMCSA has historically addressed this issue within the CDL program by issuing minimum standards and checking whether States are in compliance with those standards. Essentially the Base Scenario assumes a similar approach would continue to be taken in the envisioned enhanced system of systems for transmitting the medical certification status data. The appeal process is not specified in detail for determining whether the driver is physically qualified. Unless changed, that process is specified by § 391.47, Resolution of Conflicts of Medical Evaluation. Some suggestions are provided in the Base Scenario for how the States might approach a more uniform national process. The NRCME is envisioned as a Federal system of records. The monthly reporting included in the NRCME already assists in identifying possible medical examiners associated with a pattern of medical examiner shopping. Detailed medical examiner reports entered into a system of records, as proposed in the Base Scenario, could better enable FMCSA to more promptly identify problem patterns other than shopping, audit the medical examiners' reasons for certifying the driver, as well as perform research on the fitness-for-duty information provided.*
- *Concerns about differences in appeal processes in different jurisdictions, and the potential need for "long form" information. State hearing processes are State-determined and, per se, are not an appeal process for overruling a properly made fitness-for-duty determination by a certified medical examiner on the NRCME. FMCSA does not require such a hearing process for States to make a CDL downgrade determination. FMCSA's rules put the onus with the driver and the certified medical examiner(s). Additionally, as noted above, some States do their own review of "long form" information for potential inconsistencies. FMCSA views the conflict resolution process as currently specified in § 391.47 as a federally-based process, but strongly encourages resolution without having to resort to Federal intervention. If this specification is to be changed in the future, then the usual public comment process would take place as part of a rulemaking. For interstate CDL drivers, the States are required to immediately record on the CDLIS driver record when the driver's medical certification status becomes "not qualified." The State is required to downgrade the CDL within 60 days.*

MEDICAL EXAMINER FUNCTIONAL REQUIREMENTS

FMCSA requires that medical examiners be listed on NRCME. *This is a rulemaking separate from this study.*

Medical Examiner Comments:

- Overall, strong support.
- Seen as upgrading overall quality of examinations.
- Could result in fee increases given time and other investments in certification. *Medical examiner certification is a requirement for the NRCME. That consideration is separate from the focus of this analysis for how electronic transmission of information by the medical examiners could benefit the functionality.*
- Questions as to how medical examiners tend to organize themselves in different geographic regions of the country, and concern over potential implications for implementation. The perception was presented that there may be differences in the mix of smaller practices versus larger occupational health-specific practices in different States, and that any new system had to consider all types of examiners. *While this comment is appreciated and insightful, the rulemaking process for the NRCME is proceeding separately within the normal rulemaking process. The comment period on the NPRM closed, and comments to the docket have already been considered in development of the Final Rule. The particular interest from the perspective of this study is how to expand on the planned capabilities of NRCME and CDLIS to create a complete linkage between trusted systems that addresses gaps in the existing and planned systems. If implementation along the lines of the Base Scenario is undertaken, then the concern of how to most effectively communicate with such disparate organizational structures would be germane. This is discussed further below under reporting by medical examiners.*

Each medical examiner must retrieve all previous certification status reports for that driver as part of performing each medical certification.

Medical Examiner Comments:

- Generally positive.
- Concern about retrieval time and convenience in examining room. *A concept is to treat this process as analogous to requiring advance lab work, i.e., must be accomplished prior to the examination and is provided as part of the “patient” files made available to the medical examiner at the time of the examination. This could imply a need for scheduled examinations rather than walk-in examinations. More specifically, the data is envisioned as being online and thus retrieval time should be negligible. The issue of convenience in the examining room raises a possible concern. One of the responsibilities of the medical examiner is to consider information from outside the examining room to evaluate whether the driver is attempting to “game the system.” This requires the examiner to consider the pattern of previous certification reports and hopefully (eventually) any pattern of change in reported medical history.*

- Format should be clear and logical. *It was proposed above that medical examiners be part of developing any such system, presumably to address such concerns. This also relates to communicating with a variety of private vendor systems discussed below.*
- Look-back time should be limited, perhaps to 7 years.
- Question as to how to validate previous exams that were accessed, if required. Namely, how would the system ensure the medical examiner obtained this information? *This concern implies there is a possible requirement for the FFDS to be able to request previous medical examination reports performed by other MEs in order for the current ME to be able to validate the medical history of the driver.*

Medical examiners may examine previous medical examination reports (“long form”) if past results indicated continuous medical certification.

Medical Examiner Comments:

- “Access is critical, discretion is important.”
- Allows trending and continuum of conditions analysis—“patients are bad historians.” *It would be in the best interest of the medical examiner to obtain the medical examination information to detect drivers who may be medical examiner shopping. Otherwise, the medical examiner runs the risk of FMCSA auditing them for possibly abetting medical examiner shopping. This is discussed below.*
- Generally well-accepted concept.
- Question as to how to validate previous exams that were accessed, if required. Namely, how would the system ensure the medical examiner obtained this information? *This has implications for what type of system is more functionally able to support providing and tracking provision of the previous medical examination to the medical examiner needing it. It also might have an implication for start-up of how much historical data is added into the system. Presumably, this system would log all transactions as a control for enforcing only proper access to this driver information.*

Medical examiners MUST obtain and examine past medical examination reports if medical certification status reports were conditional or applicant did not meet requirements for certification.

Medical Examiner Comments:

- Burdensome, but needs to happen for safety.
- Report accessibility, speed of access and format is of strong interest and concern.
- Look-back period needs to be rationalized and defined . . . distinguish between easily correctable or chronic problems. *This has implications for what alternative is most likely to meet this requirement.*
- Data quality in past paper forms may not be good until records are “typed” or electronic. *The practice used in implementation of CDLIS was the States began inputting*

information in CDLIS for each new CDL issued. They did this for drivers who had not yet been through the testing processes to obtain a CDL. They did not go back and input information for drivers required to have a CDL. They input the information when the driver came in to get their CDL. That approach allowed the driver data in the CDLIS relational index to grow with operations and minimized implementation costs. A similar approach for implementing electronic fitness-for-duty reports would not capture history prior to implementation of such a system. That would minimize initial implementation costs, and the value of the historic data would rapidly grow via operations. Within 2 years, every existing CDL driver required to be medically certified would have at least one fitness-for-duty determination on file.

If there are conflicting status reports by two medical examiners for same driver, then the last examining medical examiner may consult with the previous medical examiner and must document medical reason for difference.

This approach could be part of State processes to minimize the need to fall back to the § 391.47 procedures. If so, there might be a need to amend the procedures in § 391.47.

SDLA/CVSA Comments:

- Need clarity on how this would work; who would be responsible and accountable for process and timing requirements.
- Can drivers' personal medical history be integrated in some way? *If this is referring to medical records kept by personal physicians separate from the fitness-for-duty determinations, FMCSA does not have the authority to require such. It could also insert considerable detail beyond that defined in FMCSA's regulations. There is no FMCSA standard established for handling such data. The only medical history information FMCSA has authority over is that already available on the medical examination report (long form). Depending on policy decisions by FMCSA, it may or may not be part of the fitness-for-duty information reported by the medical examiner.*
- Questions were raised about whether many drivers who fail an examination under this Base Scenario would challenge their examination result. Therefore, is the examination ("long form") detail that important as part of the proposed Base Scenario? *This question presumes the only reason a "long form" is needed is to support dealing with driver challenges to medical examiner determinations. There are many other functions the medical examination data serves, including FMCSA's ability to rank whether the medical examiner appears to be making appropriate determinations as part of medical examiner performance monitoring; use for later examinations of this driver with another medical examiner to detect changed health history as part of possible fraudulent shopping; being able to research how FMCSA's rules should be revised to better direct medical examiners in making determinations, etc.*

Medical Examiner Comments:

- Agreed a more standardized process is needed for appeals or for restoring drivers who were previously determined "not qualified" to a "qualified" status.

- Agreed that the current ability for drivers to self report different health history information to different medical examiners as part of fraudulent examiner shopping is a gap that needs to be addressed.
- Irreconcilable differences would likely be rare. Thus a fall back to Federal arbitration under § 391.47 probably should be preserved for those rare cases. It should otherwise be replaceable with some other process such as outlined in the Base Scenario.
- May require more clearly-defined thresholds for medical determinations. *This is more of a rulemaking comment than being relevant to this study. However, the researchers point out that data that could be gathered from all the proposed medical examinations may begin to provide FMCSA with a rich source of information for developing such better defined thresholds.*
- Suggestion that last or last two exams only be included in this requirement. *This is substantially at odds with the suggestion above for limiting looking back to 7 years.*

Certification status report to be filed same day, and examination report within 3 business days.

Trade Associations:

- Must be day of exam.
- Can the medical examination report (“long form”) be mandated as a condition of employment? *The regulation at § 390.3(d) essentially says that the FMCSRs do not preempt employers from having additional employment requirements beyond the minimums required by the FMCSRs. The terms of what can be mandated by an employer as a condition of employment are governed by statutory laws and practices. A number of motor carriers have had specific conditions of employment for many years and remain free to do so, subject to the statutory constraints of what constitutes acceptable practices. One example is employers requiring the driver to go to an examiner specified by the employer, regardless of whether the driver already has a medical certificate.*
- How would past paper reports be imported? *As commented above, if the practice used for implementing CDLIS were followed, they probably would not be. A possible exception might be for drivers with known medical problems. However, this is likely moot. Such data for drivers with medical problems may be scattered among an unknown number of possible medical examiners the driver may have seen.*

Medical Examiners

- Some prefer submitting both the status and “long form” within 24 hours. *Since the “long form” contains the certification data, if the medical examiner were to submit the “long form” the same day, it could be used to meet the need for the status data, i.e., both would not need to be submitted. As examiner offices become more automated as a result of the national push for such movement in health records, it may become trivial for examiners to submit the medical examination report the same day and the separate medical certification would be system-generated or disappear as a no-longer-needed thing.*

- Input for “long form” could be through an online form process, and thus in real time. Careful consideration needs to be given to the entry process, especially in relation to avoiding interference with the exam itself, and to the ease of data entry.
- Questions were raised concerning how communications between medical examiners and the proposed system could work with the different systems being developed and deployed to medical examiners. *This topic is discussed in this report as a separate section considering the implications of developments in EHR systems. FMCSA is aware there are privately-implemented systems being used by persons performing USDOT fitness-for-duty examinations for CMV drivers and issuing medical certifications. The research team believes they can readily be interfaced with. A model of how FMCSA is doing just that is with privately-developed EOBR systems, which FMCSA specified as a communications interface in the EOBR rulemaking that each manufacturer’s product must meet.*
- Additional time may be needed if a driver needs to provide additional documentation of information, and in this case the status report and exam would be put on hold until the information is provided. *There is no conflict. The exam and determination process is not complete until all information is received by the medical examiner and a determination is made. This is the same as having to wait for laboratory test results ordered by the examiner.*
- There was concern that 3 days for the medical examination report might allow the driver to medical examiner shop and thus avoid the reconciliation process for conflicting exams. *The medical certification report (or the “long form” in place thereof) is due the same day, i.e., creating a reporting of all examinations performed that day. Thus the proposed system should be able to detect any “shopping” documented in the data. There is an unaddressed issue of what action can be taken against the driver for such shopping. Who should be responsible for detecting? Who should be responsible for taking any action? At present, the only existing requirement on the SDLA is if a driver is determined to have committed fraud as part of the application process, then the SDLA must suspend for 60 days. Who determines fraud by the driver? How long does that process take? What role should be required of the SDLA, if any?*

CMV DRIVER FUNCTIONAL REQUIREMENTS

All drivers to have a unique identifier.

SDLA/CVSA Comments:

- How does this relate to CDLIS identifier? *CDLIS already uses two unique identifiers (driver license number plus State, and Social Security number), augmented by a third identifier (name and date of birth) that is not absolutely unique, but in combination with one of the previous two almost certainly is. It is not yet determined if a new identifier in addition to these is needed. The NRCME is planning to use driver license number and State as its unique identifier for drivers reported by medical examiners.*
- Drivers need to know how to obtain the unique ID . . . jurisdictions would be asked. *As stated above, the unique ID is already known. The driver does not need another one.*

Trade Associations:

- Explore using an approach like Ontario and many States that use a 2D bar code on the driver license. *AAMVA has advocated the adoption of 2D bar codes on driver licenses for many years. Thus, many CDLs already have 2D bar codes. However, that is not an area that FMCSA proposes to regulate.*

Drivers can enter basic information online prior to exam.

Trade Associations:

- Concern about online access. *At this point in time, presumably a system similar to the one used by FAA would be used. Namely, drivers who are technically savvy would find a way to do so. Others would continue using paper as they do now. A service that medical examiners could offer to a driver is to provide a printed copy of their previous medical history for them to update on that printout.*
- Kiosks at truck stops suggested, or a call center.

FLEET FUNCTIONAL REQUIREMENTS

Trade Associations:

- Consider integration with industry approaches for self policing . . . fleet management of driver records. *Congress mandated two things. One is that this information about medical certification status be made available to the industry via CDLIS MVRs. Congress also mandated a study of an Employer Notification System. FMCSA is performing that study. Fleets are required to use the CDLIS MVR within their employment decision programs. Thus they will also have access to the current medical certification data as part of those records.*
- Should also relate to wellness promotion and programs—consider fleet manager and safety manager interaction with medical examiners. *FMCSA is supportive of such programs. If data from CDLIS MVRs are not sufficient, the employer always has the option of making additional requirements of the drivers as a condition of employment.*
- Should interim medical examination information (driver or fleet-initiated examinations with personal physicians) be mandated for inclusion in this reporting? *By regulatory requirement, if the medical examiner in question is on the NRCME, they would be required to report. The NRCME requires that only medical examiners on the NRCME be allowed to medically certify drivers for fitness for duty and, per the Base Scenario, would be required to report every such examination, which would be posted to the CDLIS driver record.*
- Motor carriers may wish to have certification status reports for pre-employment screening. *These are essentially already required by § 391.23(m)(1). The motor carrier must obtain the medical certificate prior to allowing the driver to operate a CMV for that motor carrier. Beginning January 30, 2012, § 391.23(m)(2)(i) applies, which requires the motor carrier to obtain the CDLIS MVR and place it in the driver qualification file with*

the medical certification status prior to allowing the driver to operate a CMV. The motor carrier has the option of obtaining that information before making a job offer. Many motor carriers do exactly that. The additional requirement imposed since the 2008 Final Rule is that for States that do not provide the medical certification status on the CDLIS MVR, the motor carrier must also obtain a copy of the paper medical certificate from the driver and place it in the driver qualification file.

- Access to medical examination reports could be a condition of employment. *This is true according to § 390.3(d) but will likely be restricted to first obtaining driver authorization.*

FMCSA MEDICAL OFFICE INPUT

- The NRCME requires that medical examiners electronically submit monthly summary certification data for all examinations performed. *The daily reporting of certification determinations recommended in this analysis would meet the existing proposed monthly monitoring functions of the NRCME, plus would give FMCSA even better monitoring capabilities. Thus, it would be possible for FMCSA to relieve medical examiners of having to submit the monthly data.*
- There is a need to evaluate whether implementing a database of medical examination data would create a legal liability for FMCSA. *This concern has many aspects, which are explored separately in the following points.*
- What differences exist in authority of FAA and FMCSA regarding fitness-for-duty determinations to issue a certificate to an airman versus a CMV driver? *FAA has the authority to change a determination made by an AME. FMCSA does not have the authority to change a determination made by a medical examiner. However, the provision at § 391.45(c) allows for requiring the driver to have another medical examination. It is not clear whether FMCSA has the authority to require another examination or if, perhaps, only the employing or prospective motor carrier has that authority. If FMCSA has the authority to require another medical examination, it is still the medical examiner who makes the determination, not FMCSA.*

Under the NRCME, and any new rule issued implementing an FFDS as proposed in the Base Scenario, if FMCSA had a copy of the medical examination for a driver who was inappropriately certified by a medical examiner, FMCSA would have authority under the NRCME to audit that medical examiner for possible removal from the registry (or perhaps for mandatory remedial training) if the medical examiner is not in compliance with the requirements of the registry. The logs of health history data that would be submitted by the driver under the Base Scenario may enable FMCSA to assist the States in identifying when a driver has committed fraud on submission of his or her health history. In such a case, the medical certification could be invalidated, thus making the driver not qualified to operate a CMV.

- What differences exist in how FAA staff interacts with available detailed information? *FAA staff reviews all applications for certification where the AME either deferred making a certification determination or determined the airman should not be certified. In*

2007, FAA's DIWS system identified 34,590 applications as high priority to be processed by FAA staff. That review process has a goal of being completed within 30 days. As of 2008, it was averaging approximately 24 days. FMCSA has no such program. Instead, a CMV driver whom medical examiners determine does not qualify for certification may apply for a vision or diabetes exemption or for a skill performance evaluation dealing with limb functions.

- What differences exist in how FAA conducts quality assurance? FAA has two quality assurance programs. One manually evaluates samples of medical examinations submitted by AMEs. The other evaluates samples of determinations by FAA personnel who handle the deferral and denials. FMCSA does not have such programs. Congress could establish such programs for FMCSA to carry out, but thus far has not shown any inclination to do so.
- What would be required if Congress wanted FMCSA to undertake quality assurance programs comparable to those of FAA? The full-time equivalent (or contractor) volume issues are well documented. FAA has approximately 4,500 AMEs. It is projected that FMCSA could need more than 40,000 medical examiners, or almost nine times as many as FAA. FAA has approximately 300 staff involved in processing the AME deferral and denials. The FAA program annually processes approximately 450,000 airmen's applications for certification. FMCSA estimates it will have to support applications for approximately 3.5 million medical certifications annually. This implies FMCSA could need eight times as many staff members for processing deferrals and denials, or approximately 2,400 such employees to perform such functions. That number of new employees would more than double FMCSA's current staffing, and it seems questionable whether such a Federal expansion would be approved. Congress might consider a State grant function comparable to MCSAP for such a review function, but even that seems a larger expenditure than is likely.
- There is no requirement for FMCSA to perform the FAA-type background checks of CMV drivers. The FMCSA program as currently constituted by Congress is focused on whether the driver meets the fitness-for-duty requirements of the medical regulations found in 49 CFR 391.41. That dramatically narrows the issues FMCSA needs to address to those dealing only with medical fitness for duty.
- Any proposed system enhancement in FMCSA information systems supporting medical certification must improve the ability of FMCSA to perform oversight functions. The NRCME continues the FMCSA program definition that it is the medical examiner who is the trusted authority for determining whether the CMV driver meets the fitness-for-duty requirements. The medical examiners make the decision whether the drivers are compliant with the regulations and guidance regarding fitness for duty. The more data FMCSA collects from the medical examiners, the more metrics FMCSA can apply using computer software to analyze the quality performance of those medical examiners to identify performance patterns that would benefit from detailed analysis by a limited staff, for possible removal from the NRCME.
- Any system proposed must be clearly based on the fact that the only oversight responsibilities of FMCSA are to ensure that: medical examiners on the NRCME meet the certification requirements; to the extent reasonably determinable from data available

to FMCSA, medical examiners are not engaging in a pattern of noncompliant practices; medical examiners are only removed after an audit determines they are not compliant with requirements of the NRCME, and drivers who appear to have engaged in medical examiner shopping are required to obtain an independent medical examination report from a medical examiner authorized to perform such examinations.

Thus, there are two categories of oversight FMCSA needs to address:

- *Are the medical examiners in compliance with their requirements as medical examiners?*
- *Are the drivers in compliance with their requirements?*
 - *The NRCME has a rudimentary process for identifying potential problem medical examiners. FMCSA's enforcement process for medical examiners is planned to be via removal of problem medical examiners from the registry, after an audit of the medical examiner to determine if he or she is noncompliant with requirements of the NRCME.*
 - *The primary plan for auditing medical examiners is based on random selection. Selected medical examiners would be directed to send their medical examination reports within 48 hours.*
 - *The NRCME Final Rule also requires that examiners report summary certification data for all determinations made for all drivers they examined once a month. From that, FMCSA can determine if there is any pattern of drivers who are failed by other medical examiners being systematically certified by some other medical examiner. Such a pattern could be a reason for identifying that medical examiner for an audit.*
- FMCSA would benefit from having a capability to systematically identify medical examiners for audit. Detailed information from the medical examinations would enable FMCSA to more explicitly determine if medical examiners are not following requirements.
 - *Under the Base Scenario proposal of electronically reporting medical examination data, that information would become available to FMCSA for systematic software screening to identify questionable behavior patterns of medical examiners. For example, the computer software analysis could determine what reasons are being cited by an examiner to justify certifying drivers who were failed by other examiners.*
 - *This would enable FMCSA to target potential problem medical examiners that should be audited.*
 - *The NRCME Final Rule contains a requirement for medical examiners to report summary certification data for all examinations performed on a monthly basis. From that data, FMCSA can build a rudimentary system for identifying if a driver may have engaged in medical examiner shopping. FMCSA would be able to tell from analysis of the monthly*

reports that a driver appears to have gone to another medical examiner and obtained certification after having earlier failed.

- *From a safety perspective it is more valuable to determine the same day that a driver may have engaged in medical examiner shopping to obtain a certification. This raises the issue of what can be done for a driver that appears to have engaged in medical examiner shopping. Can FMCSA or the SDLA require the driver to obtain another examination from a specified medical examiner as an independent evaluator of the determination?*
- The NRCME does not provide an ability for medical examiners to detect a driver who may be engaging in medical examiner shopping.
 - *The proposed Base Scenario would provide medical examiners access to previous medical certification data, which would help them detect that a driver has seen a different medical examiner previously and failed. However, even more valuable data would be for the medical examiner to have access to the health history the driver gave to the previous medical examiner and the health history the driver gave to the prospective medical examiner. If information has disappeared or changed from one to the next it would be an indicator the driver may be trying to fraudulently game the medical examiner.*
- FMCSA needs to be aware of other system development efforts within the Agency dealing with driver data and make sure they are appropriately coordinated. Two efforts were pointed out.
 - Intended development of the DSMS as an extension of the existing DIR based on information from MCMIS.
 - Development of a Drug and Alcohol Information System.

The DIR is based on data obtained from roadside inspections, traffic enforcement, carrier compliance reviews, and crashes. Investigations are underway regarding occasionally adding information from the CDLIS driver record for convictions. Medical certification data could occasionally be included from the CDLIS driver record at the same time, since Congress mandated the CDLIS driver record become the trusted source for such data.

The FMCSA Drug and Alcohol Information System is planned to have records of adverse information that essentially would determine the driver is not qualified to operate a CMV until having met the return-to-duty requirements. Conceptually that information could become another status reported to the SDLA to be recorded on the CDLIS driver record, and thus could be available to motor carriers as part of the CDLIS MVR, or perhaps as part of a future employer notification system. The current FMCSA notice in the Regulatory Agenda seems to indicate that this is not the access method contemplated for this data.⁽²⁶⁾

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APPENDIX C—SAMPLE ACTION PLAN FOR DEVELOPING A RESEARCH DEMONSTRATION

OVERVIEW

Before a system with the complexity of the proposed centralized FFDS concept can be fully implemented, it is often prudent to develop and implement a research demonstration to evaluate the recommended alternative architecture in a structured experimental design. This appendix outlines a potential action plan for such a research demonstration, after describing a recent FMCSA pilot test of a different system's concept.

EXAMPLE OF A RESEARCH DEMONSTRATION: EMPLOYER NOTIFICATION SERVICE

A recently completed FMCSA-sponsored field operational test related to CDLs (and some of the same user groups) provides a useful analogy to the approach that could be taken for the electronic FFDS development. The Employer Notification Service (ENS) was evaluated between 2005 and 2008 and focused on testing the following:

- A nationwide system that would allow a State DMV to post a notice that a change occurred in a driver history record to a national pointer system was tested. That system would in turn direct the notice to the driver's employer if registered with the pointer system. Notices would be provided for both in-State and out-of-State data posted to the driver's record.
- Jurisdictions continued maintaining control of their CDL data files and all associated information as the authoritative source. They simply post notice of change of status to the national pointer that services the registered employers.
- It used a single portal for motor carrier registration with nationwide coverage. Motor carriers could register with the national program and could receive driver violation notifications from the selected pilot States through the service.

Similar to the electronic FFDS approach analyzed in this report, the ENS concept of operations employed tailored connections to CDLIS and involved third-party systems connectivity over secure Internet links. The following information on the scope of the service test project may provide a good starting point for "sizing" a potential electronic FFDS field operations test and would be one of the data points utilized in development of an action plan.

- Two States participated in the test (Colorado and Minnesota).
- More than 700 drivers across multiple trucking fleets in the two States participated in the test.
- The test period was 18 months; the system development and recruitment phase took more than a year prior to the test period.

- The contractor team consisted of a mix of private-sector and nongovernmental organizations.
- The final budget for the test was approximately \$1,800,000, in addition to approximately \$200,000 for an independent evaluation.

POTENTIAL ACTION PLAN SEQUENCE FOR A FITNESS-FOR-DUTY PILOT

An action plan for testing the FFDS concept could be implemented in three phases: technology and institutional factors review, implementation plan development, and implementation and demonstration.

Phase I: Review Technological and Institutional Factors of Desired Alternative(s)

The first phase requires the development of additional technological and institutional materials regarding the desired alternative(s) to be tested. These materials should consist of:

- An experimental design framework, including realistic hypotheses for evaluation, sample size required, participation inducements, and methods of measuring potential “success.”
- A plan for recruiting examiners, SDLAs, and drivers to participate in the research. This could logically be coordinated with progress on development of the NRCME.
- An approach for prototyping or mimicking the architectural components to a level where the research hypotheses can be properly considered, without developing entire systems on speculation.
- An analysis of key institutional, technology, and governance issues that could confound the process, as well as approaches for mitigation.

Phase II: Develop Implementation Plan for Research Demonstration

Table 8 summarizes the high-level tasks the research team believes would need to be pursued in Phase II (with an estimated time of 1 calendar year), as well as the decisions that FMCSA will need to make over the course of the year.

Table 8. Research Activities and FMCSA Decisions

Primary Activities	FMCSA Decisions to be Made
<ul style="list-style-type: none"> • Recruitment of AAMVA, States and Examiners to Participate in the Demonstration Project. • Detailed Functional and Technical Requirements and State-Specific CDLIS Workflows. • Detailed Concept of Operations for the Demonstration Project. • Refine Experimental Design to Develop Specific Data to be Collected and Protocols to be Used for Each State. • Planning and Technical Assistance to Participating States, AAMVA and Examiners. • Training Plan for the Demonstration Project. • Outreach Materials for Stakeholders and Decisionmakers. • Evaluation Plan for Measuring Performance, Benefits, and Issues with the Pilot Test Effort. • Program Support as Requested by FMCSA. 	<ul style="list-style-type: none"> • Physical Location for the FFDS. • Technical Methodology for FFDS Design and Development, e.g., Web services. • Funding Mechanism for State Development of Required Interfaces. • Legal and Regulatory Items with Respect to States and Credentials. • Selection of a Development Team for the Research Demonstration’s FFDS. • Selection of an Evaluation Team to Assess the Performance of the Pilot Test.

Phase III: Execute and Evaluate Pilot Demonstration

After the conclusion of Phase II, a pilot demonstration could begin. It is currently unclear whether the entire FFDS would need to be developed to support the research demonstration, or a partial prototype of the FFDS would suffice. FMCSA may need to provide grant funds to participating pilot State agencies and AAMVA to build the CDLIS interfaces necessary between agency CDLIS processes and the FFDS, as well as having negotiated draft standards with any third-party service providers developing prototype interfaces.

The focus during the early part of Phase III would be on the long-term implementation of the program should the demonstration document the success predicted by this report’s analysis. The lessons learned during the pilot preparation phase should be used to assist the development of a roadmap document for moving the FFDS concept into full operations. This should be done as soon as possible, in conjunction with the NRCME, upon completion of a successful pilot. Topics to be addressed during this phase of the plan likely would expand upon those in the pilot implementation plan to reflect the challenges of rolling out a plan nationwide, including considering potential rulemaking, legislative, and funding issues.

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