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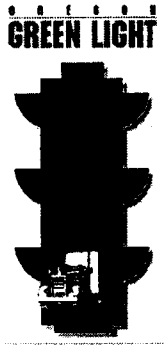
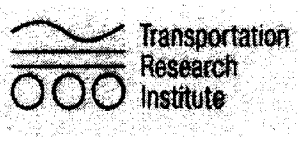


Oregon Green Light CVO Evaluation

Detailed Test Plan # 12

Measure 3.2.1 Determine attitude of agency personnel towards electronic screening, including perceived impacts

Measure 3.2.2 Determine attitude of agency personnel towards new services; e.g., selecting carriers-vehicles for inspection based on inspection and compliance status



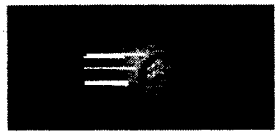


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TABLE OF EXHIBITS

1 DETAILED TEST INTRODUCTION

1.1 BACKGROUND

This Detailed Test Report is the twelfth of 14 test reports that will be submitted as part of the independent technical evaluation of the Oregon Green Light CVO project. The Oregon Department of Transportation (ODOT) is in the process of implementing their Intelligent Vehicle Highway System Strategic Plan for Commercial Vehicle Operations (now referred to as ITS/CVO). Through Green Light, Oregon is installing twenty-two mainline preclearance systems featuring weigh-in-motion (WIM) devices and automatic vehicle identification (AVI) at the major weigh stations and ports-of-entry throughout the state. In addition, certain sites will be equipped with data collection systems for use in regulatory enforcement (ITEN sites) while other sites will be equipped with safety enhancements that regulate road conditions and speed.

The purpose of these documents is to provide detail to procedures taken when testing the various measures proposed in the Green Light Evaluation. Detailed Test Reports will be generated for each of the test measures described in Exhibit 2-1 of The Oregon "Green Light" CVO Project - Evaluation Plan [1].

Each of the tests conducted by the research team for the evaluation of Green Light will address one of five goals of the evaluation as documented in the Evaluation Plan. These are:

- Assessment of Safety
- Assessment of Productivity
- Assessment of User Acceptance
- Assessment of Mainstreaming Issues
- Assessment of Non-Technical Interoperability Issues

The objectives associated with each goal are given in detail in The Oregon "Green Light" CVO Project - *Individual Test Plans* (ITP) [2]. In addition, condensed one-page tables are contained in the appendices of the ITP, outlining the measures to be conducted for each of the stated objectives. The detailed test plan documents will expand on the information provided in the ITP and provide in detail the activities carried out for each *evaluation measure* during the course of the evaluation in regards to the stated objectives.

1.2 PURPOSE AND SCOPE

This particular detailed test plan outlines the test measures employed to obtain the objective *assessing agency acceptance of Green Light,* one of two objectives in support of the goal of assessing user acceptance. Like the accompanying Detailed Test Plans, this document is not meant to be exclusive of the ITP, but rather an extension of that document to provide scope and direction for the research team.

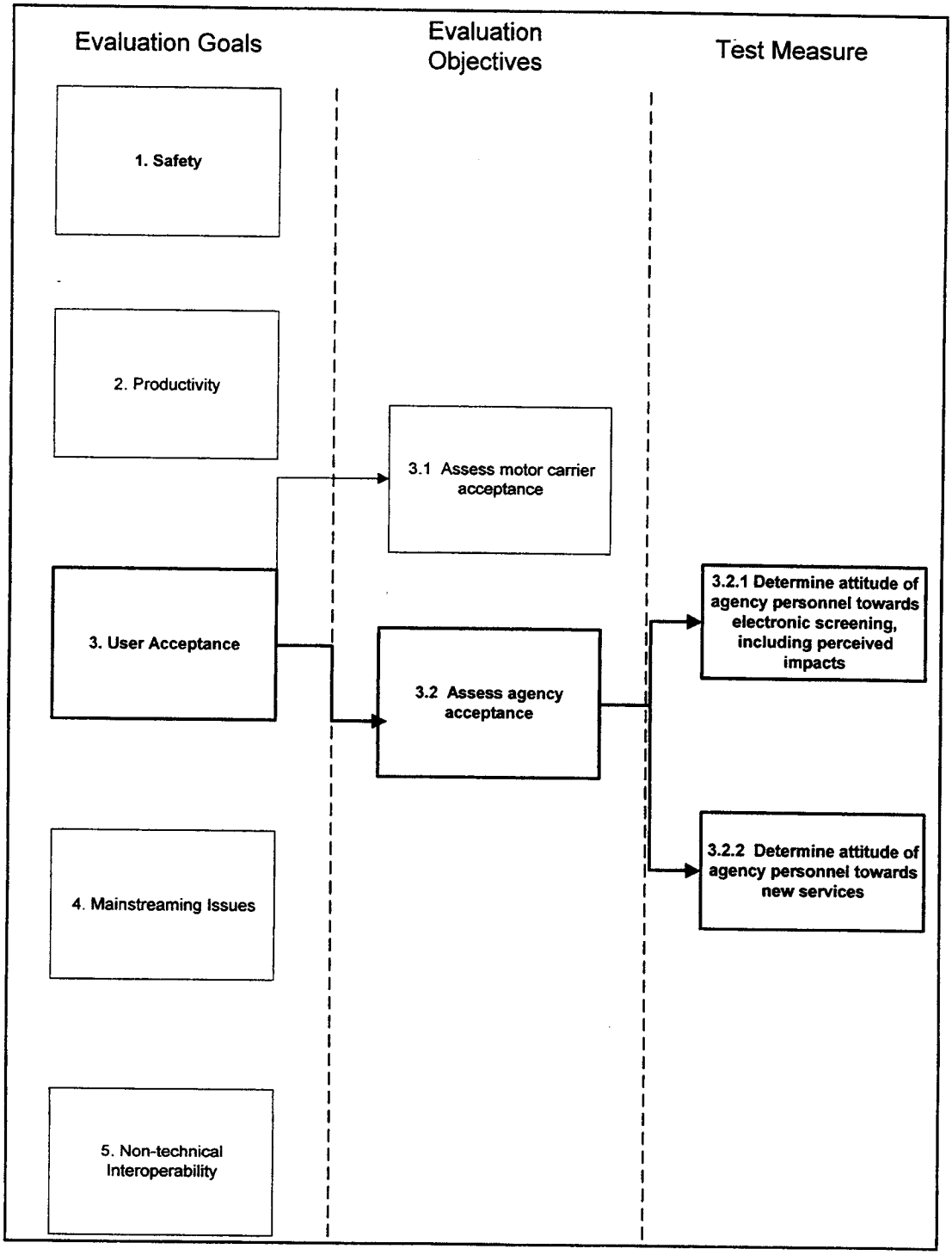
The evaluation measures used to assess agency acceptance are stated below:

- **3.2.1 Determine attitude toward electronic screening, including perceived impacts**
- **3.2.2 Determine attitude towards new services, e.g., select carriers-vehicles for inspection based on inspection and compliance status, RWIS, and DSIS**

A detailed description of the hypotheses to be tested as well as the test methodology and deliverables is described in detail in Chapter 2. Chapter 3 provides a detailed test schedule and budget for the test measure.

A summary of the detailed test plans is shown in Exhibit 1-1. The test measures outlined in this document are highlighted for reference.

Exhibit 1-1 Evaluation Goals, Objectives, and Measures



1.3 DISCUSSION

Each of the following elements of the Green Light project has the potential to affect the highway use tax collection process, the auditing process, and/or the highway use tax revenue collection rates. Each of these elements will be assessed in terms of their acceptance within ODOT.

Mainline Preclearance

Green Light will provide mainline preclearance for commercial vehicles. As a commercial vehicle approaches ports of entry and weigh stations, it is identified, weighed, checked for height violations, and classified. The identification process will include checking the carrier's safety status, credentials and permits. This information is sent to supervisory system computer (SSC).

System Development and Upgrades

The implementation of the Green Light project will require numerous hardware and software upgrades to the existing system. All software will be upgraded to the most current versions. In addition to the enhancements, several database management and developmental improvements will take place. A central database, containing all pertinent CVO data, will be refined and deployed.

Electronic Data Interchange

Electronic Data Interchange will enable commercial vehicle operators to electronically file highway use tax reports via nationally recognized data and formatting standards and existing electronic data interchange methodology.

Integrated Tactical Enforcement Network

Enforcement sites are to be used in the Integrated Tactical Enforcement Network (ITEN). ITEN is a collection of remote sensing devices located on the state highway system. It will serve as a management tool to more effectively utilize enforcement personnel.

Safety Enhancements

Two Downhill Speed Information Systems (DSIS) will be installed through Green Light. The purpose of these systems is to reduce the frequency and severity of downgrade truck accidents. In the case of Oregon's DSIS, a weigh-in-motion device, license plate reader and variable message sign will combine to effectively weigh a vehicle, read its OPUC plate, and rely a suggested descent speed to the driver.

Three Road Weather Information Systems (RWIS) will be installed to measure road surface conditions, wind speed and direction, dew point, and visibility. The information will then be relayed to motorists via variable message signs, information kiosks, and the Internet.

Vehicle Identification Systems

License plate readers (LPR) will be installed at Farewell Bend, Cascade Locks POE, Woodburn POE, and Woodburn Weigh Station. Plate reader records can be used to efficiently verify highway use taxes and driver hours-of-service.

2 TEST METHODOLOGY

2.1 PHYSICAL DESCRIPTION

This section discusses in detail the activities carried out in the assessment of agency acceptance of Green Light. The test will incorporate questionnaire surveys and in-depth interviews with ODOT personnel. The surveys and interviews will address mainline pre-clearance, screening of motor carriers for inspection, and the safety enhancements incorporated under Green Light such as the Road Weather Information System, and the Downhill Speed Information System , and the use of license plate readers for vehicle identification.

2.1.1 Purpose

This test will use a questionnaire survey and on-site interviews to determine agency attitudes in two distinct areas:

1. Agency attitudes toward electronic screening and its perceived impacts on ODOT
2. User attitudes towards new services such as the RWIS and DSIS technologies, license plate readers, and selecting vehicles for inspection based on inspection and compliance status

2.1.2 Hypotheses

The following hypotheses are given in support of the three measures and will be tested according to accepted statistical techniques:

3.2.1 The majority of agency personnel will have a positive attitude towards electronic screening

3.2.2 The majority of agency personnel will have a positive attitude towards new services

2.2 PRE-TEST ACTIVITIES

Pre-test activities for these measures will focus on designing the questionnaire survey, developing interview questions, and defining the target population.

1) **Questionnaire Survey and Interview Design**

   The researchers will prepare a questionnaire on agency acceptance on the various components offered through Green Light. Respondents will be asked to indicate the impact of each facet of Green Light using a 1 (low) to 5 (high) scale.

2) **Definition of Target Population**

   Participants in this activity will include key agency personnel whose everyday activities will be impacted by the implementation of Green Light. A participants list will be developed in consultation with the evaluation team and ODOT representatives.

3) **Initialize the interview guide**

   With input from the evaluation team and ODOT staff, a draft interview instrument will be designed reflecting the primary issues targeted for consideration.

4) Conduct a test interview

Once the interview instrument is reviewed and finalized for external review, a pilot field test will be performed. Modifications will be made based on the results of the pilot test. Subjects for the pilot test will be selected in consultation with members of the evaluation team and ODOT staff. The project steering committee must approve before implementing.

2.3 TEST CONDUCT ACTIVITIES

2.3.1 Descriptions/Participants

- Transportation Research Institute (Chris Bell, Paul Montagne, staff) - will conduct the research, including collection and analysis of data.
- C.M. Walton, WHM Transportation Engineering Consultants, Inc. – will provide guidance and support in the development and analysis of the test plan.

2.3.2 Procedures

Over the course of the study, the following steps will be conducted:

1) Distribute the questionnaire survey

At this point, a schedule will be structured to meet the process to be approved by the steering committee. The process may involve passive (questionnaires) and active (interviews).

2) Conduct Interviews

As previously referenced, the interview process may include active and passive procedures. With active procedures appropriate techniques will be provided to interviewers and training provided to insure a highly professional and effective process.

3) Analyze the results of the interviews

Various techniques of performance ratings and opinion based input will provide the basis of evaluating and tabulating the survey results. Several forms of displaying the findings will be considered for effectiveness and efficiency.

2.4 POST-TEST ACTIVITIES

2.4.1 Reporting Procedures for Individual Test

A report will be prepared for these test measures according to the guidelines given in the Evaluation Plan and will proceed as follows:

1. Preparation of a draft report for each test to be submitted to the steering committee (SC) for their approval.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original and ten bound copies of the report to ODOT's project management team.
5. Transmittal of the report by ODOT to FHWA.

2.4.2 *Reporting Schedule*

The reporting schedule for the individual test reports is shown below:

Exhibit 2-2 Reporting Schedule - Individual Test Reports

Deliverables	Schedule	Scheduled Due Date*
Drafts of Individual Test Reports	July 1-August 30, 1999 (60 days)	September 1, 1999
Review of Individual Test Reports by Steering Committee	September 1-30, 1999 (30 days)	October 1, 1999
Final Test Reports	October 1-November 30, 1999 (60 days)	December 1, 1999

2.4.3 *Data Retention/Archival Procedures*

Data collected and documents produced over the course of the evaluation will be archived and submitted to ODOT project management. In addition, a document summarizing the data and reports will be produced as follows:

1. Preparation of a summary document describing data analyzed and reports prepared over the course of the evaluation.
2. Submittal of a data archive containing raw data files and all reports in compressed format.

2.4.4 *Reporting Schedule for Data Retention/Archival Procedures*

The reporting schedule for the archiving of data and the preparation of a summary document is given below:

Exhibit 2-3 Reporting Schedule - Data Archiving

Deliverables	Schedule	Scheduled Due Date*
Drafts of a Data Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Data Summary Report by Steering Committee	Feb 1 - Feb 28, 2000(28 days)	March 1, 2000
Data Summary Report (Final) and Data Archive	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

2.4.5 Test Summary Report Procedures

A test summary report will be prepared highlighting findings from all of the test measures. The document will be produced as follows:

1. Preparation of a draft report summarizing the results of all the individual test reports for submittal to the SC.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test summary report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original, and ten bound copies of the summary report to ODOT's project management team.
5. Transmittal of the test reports by ODOT to FHWA.
6. Reporting Schedule for Test Summary

A reporting schedule is shown below for the test summary report:

Exhibit 2-4 Reporting Schedule - Test Summary Reports

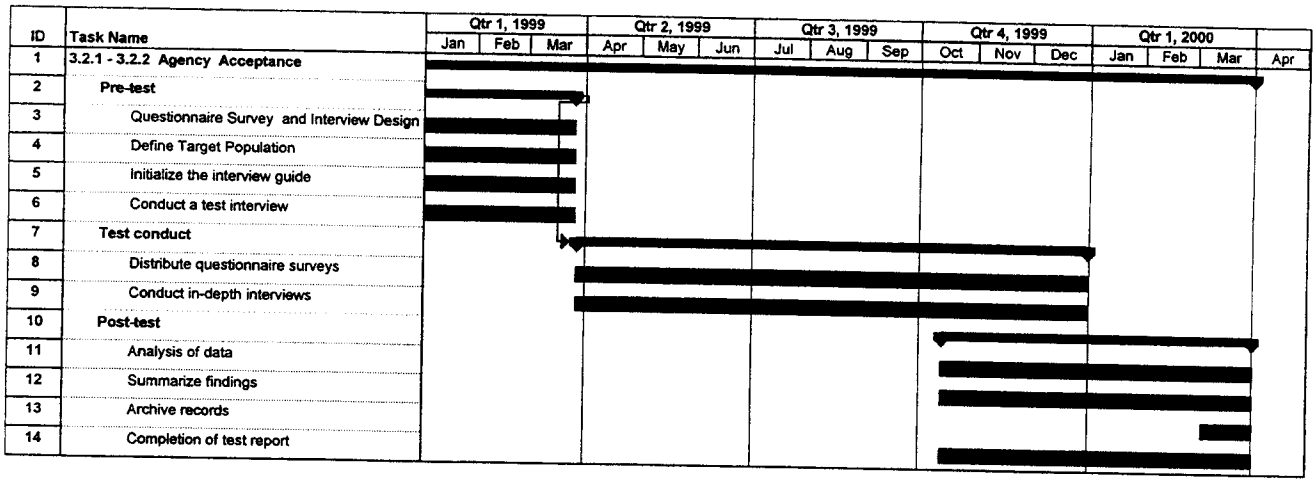
Deliverables	Schedule	Scheduled Due Date*
Drafts of Test Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Test Summary Report by Steering Committee	Feb 1 - Feb 28, 2000 (28 days)	March 1, 2000
Test Summary Report (Final)	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

3 TEST MANAGEMENT PLAN

3.1 DETAILED TEST SCHEDULE

A detailed test schedule is shown in Exhibit 3-1.

EXHIBIT 3-1 Project Timeline for Test Measures 3.2.1, and 3.2.2



3.2 COST BREAKDOWN BY MEASURE

A cost breakdown for these measures is shown below in Exhibit 3-2. These figures are only estimates and are subject to revision as the evaluation progresses.

Exhibit 3-2 Cost Breakdown for Test Measures 3.2.1 and 3.2.2

Organization: Oregon State University (TRI)					
DTP	**Measure**	**Researcher**	**Hours**	**Cost**	**Totals**
12	3.2.1	C A Bell	60	$2,550	
		P E Montagne	312	$4,992	
					$7,542
	Payroll Exp:	C A Bell	32%	$816	
		P E Montagne	37%	$1,847	
	Subtotal:				$2,663
	Supplies:			$600	
	Travel:			$600	
	Subtotal:				$1,200
	Overhead		42%		$4,790
	Total:				**$16,195**

Organization: Oregon State University (TRI)					
DTP	**Measure**	**Researcher**	**Hours**	**Cost**	**Totals**
12	3.2.2	C A Bell	60	$2,550	
		P E Montagne	312	$4,992	
					$7,542
	Payroll Exp:	C A Bell	32%	$816	
		P E Montagne	37%	$1,847	
	Subtotal:				$2,663
	Supplies:			$600	
	Travel:			$600	
	Subtotal:				$1,200
	Overhead		42%		$4,790
	Total:				**$16,195**

Exhibit 3-2 Cost Breakdown for Test Measures 3.2.1 and 3.2.2 (cont.)

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
12	3.2.1	CM Walton	20	$3,000	
					$3,000
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$1,500	
	Subtotal:				$1,500
	Overhead			n/a	
	Total:				**$4,500**

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
12	3.2.2	CM Walton	20	$3,000	
					$3,000
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$1,500	
	Subtotal:				$1,500
	Overhead			n/a	
	Total:				**$4,500**

4 REFERENCES

1. Bell, C.A., B. McCall, and, C.M. Walton, A "The Oregon 'Green Light' CVO Project, Evaluation Plan" GLEV9601, Oregon State University, Transportation Research Institute, September 1996.

2. Bell, C.A., B. McCall, and, C.M. Walton, "The Oregon 'Green Light' CVO Project, Individual Test Plan "GLEV9602, Oregon State University, Transportation Research Institute, October 1996.

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Oregon Green Light CVO Evaluation

Detailed Test Plan # 13

Measure 4.1.1 Identify, assess and document pertinent regional and national issues and assess the impacts to Green Light for customers and providers

Measure 4.2.1 Document approaches attempted to solve regional and national mainstreaming issues as they arise, and final resolutions

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TABLE OF EXHIBITS

1 DETAILED TEST INTRODUCTION

1.1 BACKGROUND

This Detailed Test Report is the thirteenth of 14 test reports that will be submitted as part of the independent technical evaluation of the Oregon Green Light CVO project. The Oregon Department of Transportation (ODOT) is in the process of implementing their Intelligent Vehicle Highway System Strategic Plan for Commercial Vehicle Operations (now referred to as ITS/CVO). Through Green Light, Oregon is installing twenty-two mainline preclearance systems featuring weigh-in-motion (WIM) devices and automatic vehicle identification (AVI) at the major weigh stations and ports-of-entry around the state. In addition, certain sites will be equipped with data collection systems for use in regulatory enforcement (ITEN sites) while other sites will be equipped with safety enhancements that regulate road conditions and speed.

The purpose of these documents are to provide detail to procedures taken when testing the various measures proposed in the Green Light Evaluation. There will be a Detailed Test Report generated for each of the test measures described in Exhibit 2-1 of The Oregon “Green Light” CVO Project - Evaluation Plan [1].

Each of the tests conducted by the research team for the evaluation of Green Light will address one of five goals of the evaluation as documented in the Evaluation Plan. These are:

- Assessment of Safety
- Assessment of Productivity
- Assessment of User Acceptance
- Assessment of Mainstreaming Issues
- Assessment of Non-Technical Interoperability Issues

The objectives associated with each goal are given in detail in The Oregon "Green Light" CVO Project - *Individual Test Plans* (ITP) [2]. In addition, condensed one-page tables are contained in the appendices of the ITP, outlining the measures to be conducted for each of the stated objectives. The detailed test plan documents will expand on the information provided in the ITP and provide in detail the activities carried out for each *evaluation measure* during the course of the evaluation in regards to the stated objectives.

1.2 PURPOSE AND SCOPE

This particular detailed test plan outlines one of two test measures employed to obtain the objective *documenting regional and national mainstreaming issues, approaches to solve them, and final resolutions.* This objective is in support of the goal of documenting regional and national mainstreaming issues. Like the accompanying Detailed Test Plans, this document is not meant to be exclusive of the ITP, but rather an extension of that document to provide scope and direction for the research team.

The evaluation measures used to reach the stated objectives are:

- **Measure 4.1.1 Identify, assess and document pertinent regional and national issues and assess the impacts to Green Light for customers and providers**
- **Measure 4.2.1 Document approaches attempted to solve regional and national mainstreaming issues as they arise, and final resolutions**

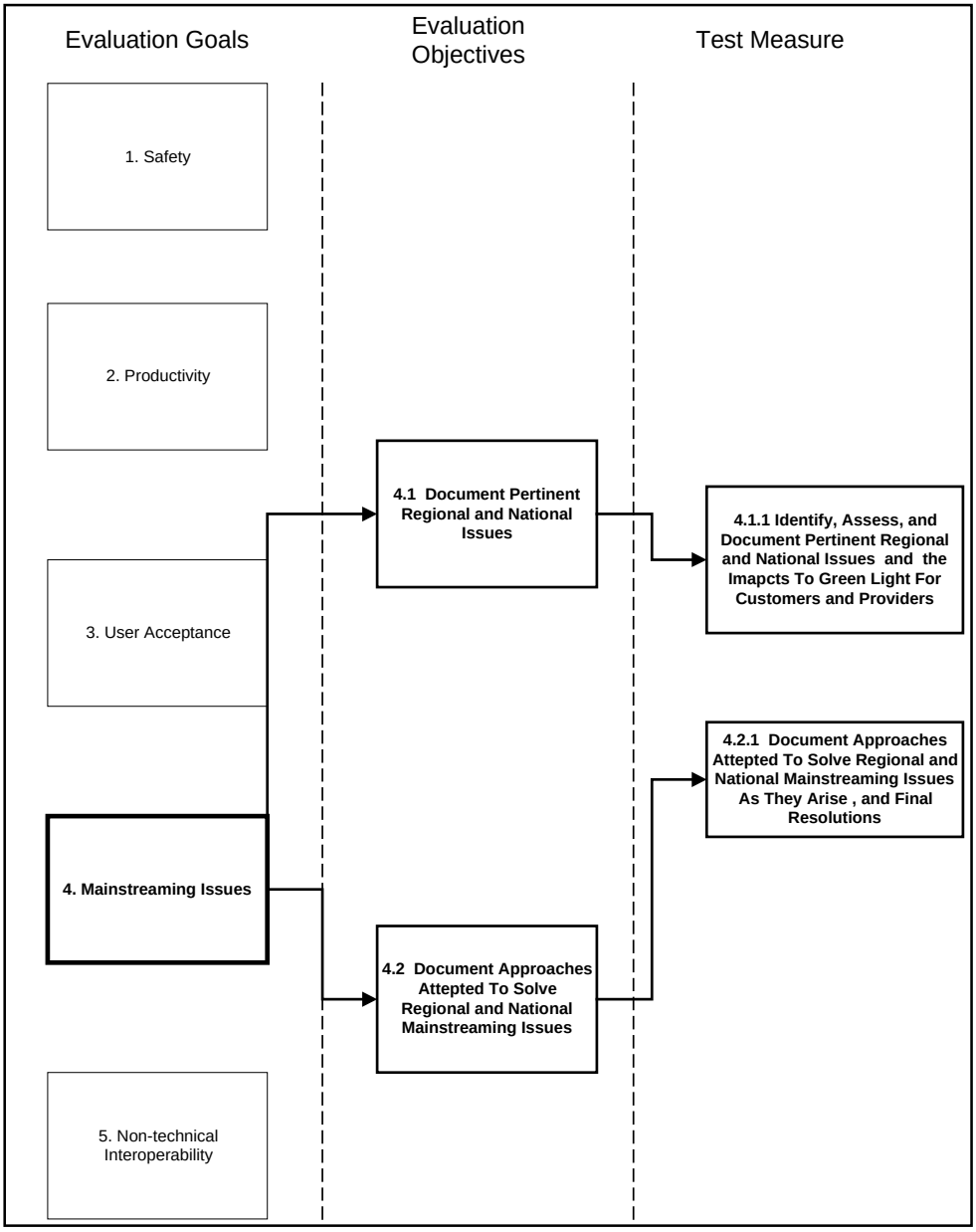
A detailed description of the hypothesis to be tested as well as the test methodology and deliverables is described in detail in Chapter 2. Chapter 3 provides a detailed test schedule and budget for the test measure.

The scope of this detailed test plan within the context of the overall Green Light Evaluation is

shown in Exhibit 1-1. The test measures outlined in this document are highlighted for reference.

Exhibit 1-1 Evaluation Goals, Objectives, and Measures

1.3



1.3 DISCUSSION

Major changes are unfolding at the federal level of government that will greatly impact the use of highways by commercial vehicles, principally large and heavy trucks. The sea change was initiated in the Intermodal Surface Transportation Efficiency Act (ISTEA) six years ago; however, the programs are only now beginning to take effect and will be further advanced in the NEXTEA (the $175 Billion six year proposal for the reauthorization of ISTEA entitled National Economic Crossroads Transportation Efficiency Act). A primary driver within ISTEA and which will continue in NEXTEA is the national priority assigned to Intelligent Transportation Systems (ITS) and Commercial Vehicle Operations (CVO) programs. The following is a summary of a few of the milestones for ITS and CVO beginning with the end of calendar year 1995 to provide a perspective of the changes and continuing through the end of 1999:

1995

- Complete the ITS/CVO architecture design for an international “CVOnet Backbone” to support an Information Exchange System (IES) among public regulatory agencies, private trucking firms, and other stakeholders.

- Develop preliminary standards for procedures, training, data requirements, communication protocols, software, and hardware to support the deployment of ITS/CVO services—electronic clearance of safe/legal trucks, automated roadside safety inspections, electronic purchase of credentials.

- Organize the CVOnet Backbone, IES, model states, model motor carriers, existing electronic clearance projects, CVO institutional issues, and existing national safety databases for a prototype national CVO information system with priority placed on

electronic clearance of safe/legal commercial vehicles.

- Six electronic clearance sites operational on the HELP Inc. system in California.

- Equip 30 sites along the Advantage I-75 corridor and initiate the beta test of electronic clearance with 4,500 transponder equipped vehicles.

- Conduct the second round of multi-State ITS/CVO Institutional Issues projects in a total of 40 states to continue to facilitate regional: public/private forums, agreements on electronic data sharing and requirements, uniformity of regulatory requirements, etc. Use these to ensure widespread acceptance of and participation in the ITS/CVO program by the states and motor carrier industry.

- Initiate and participate with NHTSA in researching and testing on-board safety devices that monitor the safety status of trucks/buses for hazards such as fatigued drivers, vehicles with unsafe brakes, unstable cargo, etc.

- Continue efforts begun in early CY 1995 in the area of hazardous materials incident response (HMIR) specifically the Congressional mandate for a HMIR operational test with the National Institute for Environmental Response and the expansion of the DOT interagency partnership (RSPA, FRA, and FHWA) project—Operation Respond intermodal HMIR effort—from Houston, TX to Laredo, TX and other sites.

- Initiate research to identify and evaluate smart card technology applications to the ITS/CVO program. Develop a draft concept for integrating smart cards into the national CVO architecture.

- Make substantial progress (60 percent complete on deliverables) on the three operational tests for electronic one-stop purchase of motor carrier credentials and the operational test for electronic out-of-service verification.

- Complete preliminary analysis and recommendations of advanced brake testing technologies. As part of our ongoing test and evaluation program, we will continually re-evaluate our data collection requirements for each type of technology (i.e., roller dynamometer, flat-plate, torque, etc.) and proceed accordingly. For example, if sufficient data has been collected and evaluated for a particular technology during the evaluation process, we will expedite our final recommendation, and begin the integration phase of the program.

1996

- Initiate the Green Light electronic clearance project by equipping sixteen states to support electronic clearance and other applications ready for integration.

- Equip 100 Motor Carrier Safety Assistance Program (MCSAP) inspection sites with communication technologies to facilitate the periodic electronic transfer of files of interstate carrier safety data from an existing national truck/bus safety database to roadside inspection sites.

- Deploy credential/safety clearance prototype in one model State with a finite number of model motor carriers for concept and system test. This prototype will integrate the roadside safety data access projects at 100 MCSAP sites with the roadside electronic

clearing of safe/legal vehicles and with the tested technology applications for electronic one-stop purchasing of credential and out-of-service verification.

- Complete the evaluation for the application of advanced brake testing technology devices at the roadside to expedite the truck/bus inspection process and increase the total number of annual inspections. Begin integration of these technologies with the single-State prototype.

- Complete the evaluation for the three electronic one-stop purchasing of credential tests and the out-of-service test. Take the lessons learned and begin the integration of the technology applications with the single-State prototype.

1997

- Finalize standards for procedures, training, data requirements, communication protocols, software, and hardware to support the deployment of ITS/CVO services.

- Deploy prototype electronic clearance system in model states. These states will represent various regions, various levels of automation, international border crossings, HELP Inc., Advantage I-75, Green Light, and I-95.

- Equip and additional 100 MCSAP sites for a total of 200 sites, and expand the national safety database to include intrastate carriers.

- Begin integration of Smart Card technology in the ITS/CVO program if appropriate.

- Continue work on the components of the ITS/CVO program to ensure interoperability within the CVOnet and IES in model states prototype for expansion to the all volunteer states in CY 1998.

1998

- Begin the integration of all CVO components in all volunteer states and carriers. These include electronic one-stop purchase of credentials, out-of-service verification, hazardous material incident response, advanced brake testing, the 200 MCSAP sites, and (if proven feasible) Smart Card commercial drivers licenses for drivers.

- Deploy basis credential/safety clearance in all interested states.

- Achieve a 10 percent motor carrier market penetration using ITS/CVO application.

1999

- Continue deploying complete configuration in all volunteer states.

- Achieve a 20 percent motor carrier market penetration using ITS/CVO applications.

The Oregon DOT, with a business plan for CVO in place, has exhibited leadership in embracing some of the national ITS/CVO user services. The six national ITS/CVO user services are:

- Commercial Vehicle Electronic Clearance

- Automated Roadside Safety Inspections
- On-board Safety Monitoring
- Commercial Vehicle Administrative Processes
- Hazardous Material Incident Response
- Freight Mobility

Many of the components of these user services have been made elements of CVISN (commercial vehicle information systems network), a high-level infrastructure that supports the electronic exchange of CVO credentials and safety information. Oregon has teamed with Washington as a model deployment of this concept.

In essence, these activities form the mainstreaming initiative that officially began in September 1996. Oregon has teamed with California, Colorado, and Utah as a regional consortium with Oregon DOT as the lead. The primary goal is to engage in the deployment of ITS/CVO technologies nationwide. A target date of 2005 was set for accomplishing the goal.

The special objectives of mainstreaming are:

- emphasize safety, clearance, and credentials activities
- encourage automation of networks and facilities that support ITS/CVO deployment consistent with CVISN architecture
- establish the appropriate foundation for future integration and implementation of the CVISN architecture

As stated previously, Oregon has a head start in the mainstreaming initiative with an ITS/CVO business plan in place, established regional consortia via MAPS, CVISN and mainstreaming as

well as others, as an effective working relationship with motor carrier industry of the state, and has a financial program in place to support the initial phases of deployment—perhaps the only state with such a commitment at this time. Green Light is a cornerstone to the mainstreaming initiatives for Oregon.

2 TEST METHODOLOGY

2.1 PHYSICAL DESCRIPTION

This section discusses in detail the activities carried out in the documentation of regional and national mainstreaming issues and the approaches attempted to solve those issues.

2.1.1 Purpose

Mainstreaming of ITS/CVO strategies by definition is the deployment of technologies and process statewide. The activity is to consider the deployment of Green Light as a significant step in that direction as well as considering the ITS/CVO activities outside of Oregon and the effect on the Green Light.

2.1.2 Hypotheses

The following hypotheses are given in support of the two measures:

4.1.1 Knowledge of pertinent regional and national issues will increase the effectiveness of the Green Light program

4.2.1 Participation in pertinent regional and national issues will contribute to the effectiveness of the Green Light program

2.2 PRE-TEST ACTIVITIES

Pre test activities are summarized below.

1) Preparation of a directory of participants

Participants in this activity will include stakeholders of the Green Light program as well as key individuals representing groups (public and private) outside of Oregon. Participants list will be developed in consultation with the evaluation team and ODOT representatives.

2) Finalize the interview guide

With input from the evaluation team and ODOT staff, a draft interview instrument will be designed reflecting the primary issues targeted for consideration. These issues will be identified from national, regional and state observations, review of secondary sources and experiences in other systems. A scaling technique will be used for a performance rating format.

3) Conduct a test interview

Once the interview instrument is reviewed and finalized for external review, a pilot field test will be performed. Modifications will be made based on the results of the pilot test. Subjects for the pilot test will be selected in consultation with members of the evaluation team and ODOT staff. The project steering committee must approve before implementing.

4) Collect, catalog and summarize existing documents

An on-going literature review of secondary sources will be part of this activity throughout the project. An annotated bibliography on key issues will be cataloged and integrated with project reports as appropriate.

2.3 TEST CONDUCT ACTIVITIES

2.3.1 Descriptions/Participants

- Gregg Dal Ponte, Oregon Motor Carrier Transportation Branch
- CM Walton, WHM Transportation Engineering Consultants, Inc.

2.3.2 Procedures

Over the course of the study, the following steps will be conducted:

1) Establish the interview schedule

1a) The list of key contacts and stakeholders for programs and organizations within the state and elsewhere will be compiled for each of the issues and activities to be explored.

1b) The process, which may involve passive and active interview procedures, may be organized to focus on issues that would require one schedule and a process focused on activities (or regional projects) may require another. At this point, a schedule will be structured to meet the process to be approved by the steering committee.

1c) The schedule will include follow-up contacts, adequate review and analysis, and process of findings.

2) Conduct Interviews

As previously referenced, the interview process may include active and passive procedures. With active procedures appropriate techniques will be provided to interviewers and training provided to insure a highly professional and effective process.

3) Analyze the results of the interviews

Various techniques of performance ratings and opinion based input will provide the basis of evaluating and tabulating the survey results. Several forms of displaying the findings will be considered for effectiveness and efficiency.

2.4 POST-TEST ACTIVITIES

2.4.1 Reporting Procedures for Individual Test

A report will be prepared for these test measures according to the guidelines given in the Evaluation Plan and will proceed as follows:

1. Preparation of a draft report for each test to be submitted to the steering committee (SC) for their approval.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original, and ten bound copies of the report to ODOT's project management team.
5. Transmittal of the report by ODOT to FHWA.

2.4.2 Reporting Schedule

The reporting schedule for the individual test reports is shown below:

Exhibit 2-1 Reporting Schedule - Individual Test Reports

Deliverables	Schedule	Scheduled Due Date*
Drafts of Individual Test Reports	July 1-August 30, 1999 (60 days)	September 1, 1999
Review of Individual Test Reports by Steering Committee	September 1-30, 1999 (30 days)	October 1, 1999
Final Test Reports	October 1-November 30, 1999 (60 days)	December 1, 1999

2.4.3 Data Retention/Archival Procedures

Data collected and documents produced over the course of the evaluation will be archived and submitted to ODOT project management. In addition, a document summarizing the data and reports will be produced as follows:

1. Preparation of a summary document describing data analyzed and reports prepared over the course of the evaluation.
2. Submittal of a data archive containing raw data files and all reports in compressed format.

2.4.4 Reporting Schedule for Data Retention/Archival Procedures

The reporting schedule for the archiving of data and the preparation of a summary document is given below:

Exhibit 2-2 Reporting Schedule - Data Archiving

Deliverables	Schedule	Scheduled Due Date*
Drafts of a Data Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Data Summary Report by Steering Committee	Feb 1 - Feb 28, 2000(28 days)	March 1, 2000
Data Summary Report (Final) and Data Archive	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

2.4.5 Test Summary Report Procedures

A test summary report will be prepared highlighting findings from all of the test measures. The document will be produced as follows:

1. Preparation of a draft report summarizing the results of all the individual test reports for submittal to the SC.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test summary report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original, and ten bound copies of the summary report to ODOT's project management team.
5. Transmittal of the test reports by ODOT to FHWA.
6. Reporting Schedule for Test Summary

A reporting schedule is shown below for the test summary report:

Exhibit 2-3 Reporting Schedule - Test Summary Reports

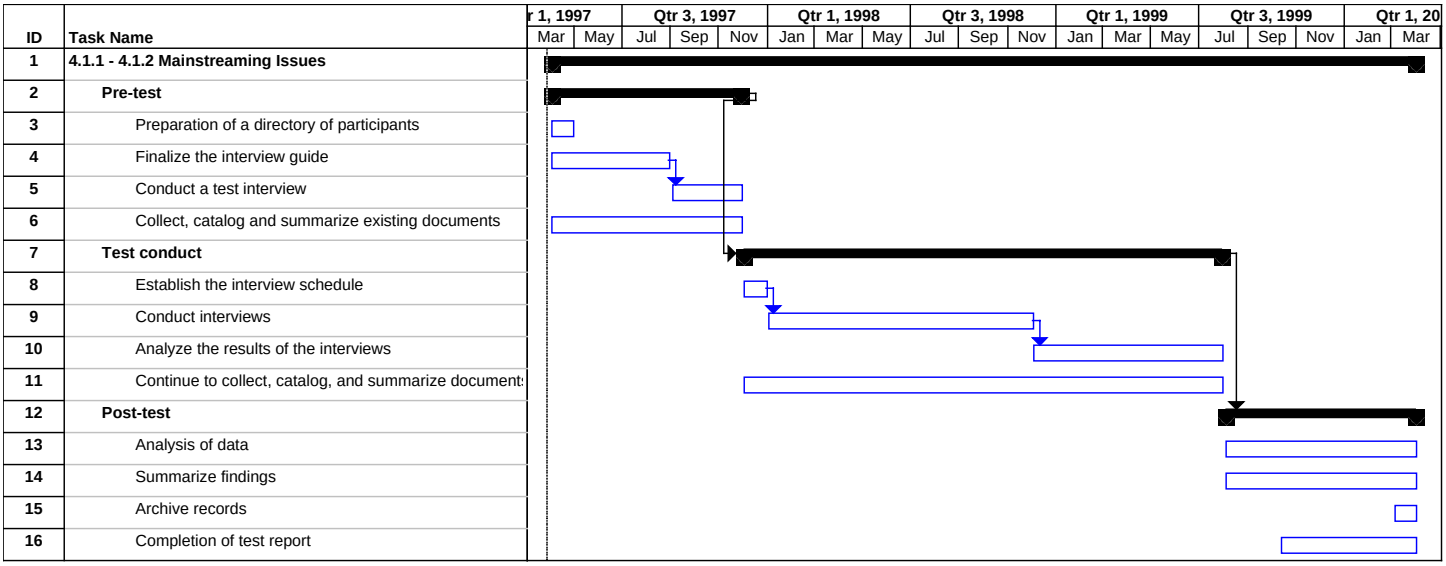
Deliverables	Schedule	Scheduled Due Date*
Drafts of Test Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Test Summary Report by Steering Committee	Feb 1 - Feb 28, 2000 (28 days)	March 1, 2000
Test Summary Report (Final)	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

3 TEST MANAGEMENT PLAN

3.1 DETAILED TEST SCHEDULE

A sample detailed test schedule is shown in Exhibit 3-1.

Exhibit 3-1 Project Timeline for Test Measures 4.1.1 and 4.2.1



3.2 COST BREAKDOWN BY MEASURE

A cost breakdown for these measures is shown below in Exhibit 3-2. These figures are only estimates and are subject to revision as the evaluation progresses.

Exhibit 3-2 Cost Breakdown for Test Measures 4.1.1 and 4.2.1

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
13	4.1.1	CM Walton	50	$7,500	
					$7,500
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$2,500	
	Subtotal:				$2,500
	Overhead			n/a	
	Total:				**$10,000**

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
13	4.2.1	CM Walton	50	$7,500	
					$7,500
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$2,500	
	Subtotal:				$2,500
	Overhead			n/a	
	Total:				**$10,000**

Organization:Iowa State University (CTRE)						
DTP	**Measure**	**Researcher/Personnel**	**Hours**	**Cost**	**Fringe Benefits**	**Totals**
13	4.1.1	T Maze	8	$507	$125	$632
		B McCall	36	$1,613	$497	$2,110
		M Nelson	42	$865	$266	$1,131
		Student	52	$839	$127	$966
		Subtotals	214	$3,824	$1,015	$4,839
		Other Personnel	36	$612	$224	$836
	Equipment:			$0		
	Supplies:			$111		
	Travel:			$0		
	Subtotal:					$111
	Overhead					$2,546
	Total:					**$8,331**

4 REFERENCES

1. Bell, C.A., B. McCall, and, C.M. Walton, A “The Oregon ‘Green Light’ CVO Project, Evaluation Plan” GLEV9601, Oregon State University, Transportation Research Institute, September 1996.

2. Bell, C.A., B. McCall, and, C.M. Walton, AThe Oregon >Green Light CVO Project, Individual Test Plan AGLEV9602, Oregon State University, Transportation Research Institute, October 1996.

3. Oregon Department of Transportation, “Oregon Green Light CVO Project Overview and Phase III Funding Work Plan” January 1997.

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Oregon Green Light CVO Evaluation

Detailed Test Plan # 14

Measure 5.1.1 Identify, assess and document pertinent non-technical interoperability issues as they arise, and final resolutions

Measure 5.2.1 Document approaches attempted to solve non-technical interoperability issues as they arise, and final resolutions

TABLE OF CONTENTS

TABLE OF EXHIBITS

1 DETAILED TEST INTRODUCTION

1.1 BACKGROUND

This Detailed Test Report is the last of 14 test reports that will be submitted as part of the independent technical evaluation of the Oregon Green Light CVO project. The Oregon Department of Transportation (ODOT) is in the process of implementing their Intelligent Vehicle Highway System Strategic Plan for Commercial Vehicle Operations (now referred to as ITS/CVO). Through Green Light, Oregon is installing twenty-two mainline preclearance systems featuring weigh-in-motion (WIM) devices and automatic vehicle identification (AVI) at the major weigh stations and ports-of-entry around the state. In addition, certain sites will be equipped with data collection systems for use in regulatory enforcement (ITEN sites) while other sites will be equipped with safety enhancements that regulate road conditions and speed.

The purpose of these documents are to provide detail to procedures taken when testing the various measures proposed in the Green Light Evaluation. There will be a Detailed Test Report generated for each of the test measures described in Exhibit 2-1 of The Oregon “Green Light” CVO Project - Evaluation Plan [1].

Each of the tests conducted by the research team for the evaluation of Green Light will address one of five goals of the evaluation as documented in the Evaluation Plan. These are:

- Assessment of Safety
- Assessment of Productivity
- Assessment of User Acceptance
- Assessment of Mainstreaming Issues
- Assessment of Non-Technical Interoperability Issues

The objectives associated with each goal are given in detail in The Oregon “Green Light” CVO Project - *Individual Test Plans* (ITP) [2]. In addition, condensed one-page tables are contained in the appendices of the ITP, outlining the measures to be conducted for each of the stated objectives. The detailed test plan documents will expand on the information provided in the ITP and provide in detail the activities carried out for each *evaluation measure* during the course of the evaluation in regards to the stated objectives.

1.2 PURPOSE AND SCOPE

This particular detailed test plan outlines one of two test measures employed to obtain the following objectives:

5.1 Documenting non-technical interoperability issues,

5.2 Documenting approaches attempted to solve non-technical interoperability and final resolutions

These objectives are in support of the goal of documenting non-technical interoperability issues. Like the accompanying Detailed Test Plans, this document is not meant to be exclusive of the ITP, but rather an extension of that document to provide scope and direction for the research team.

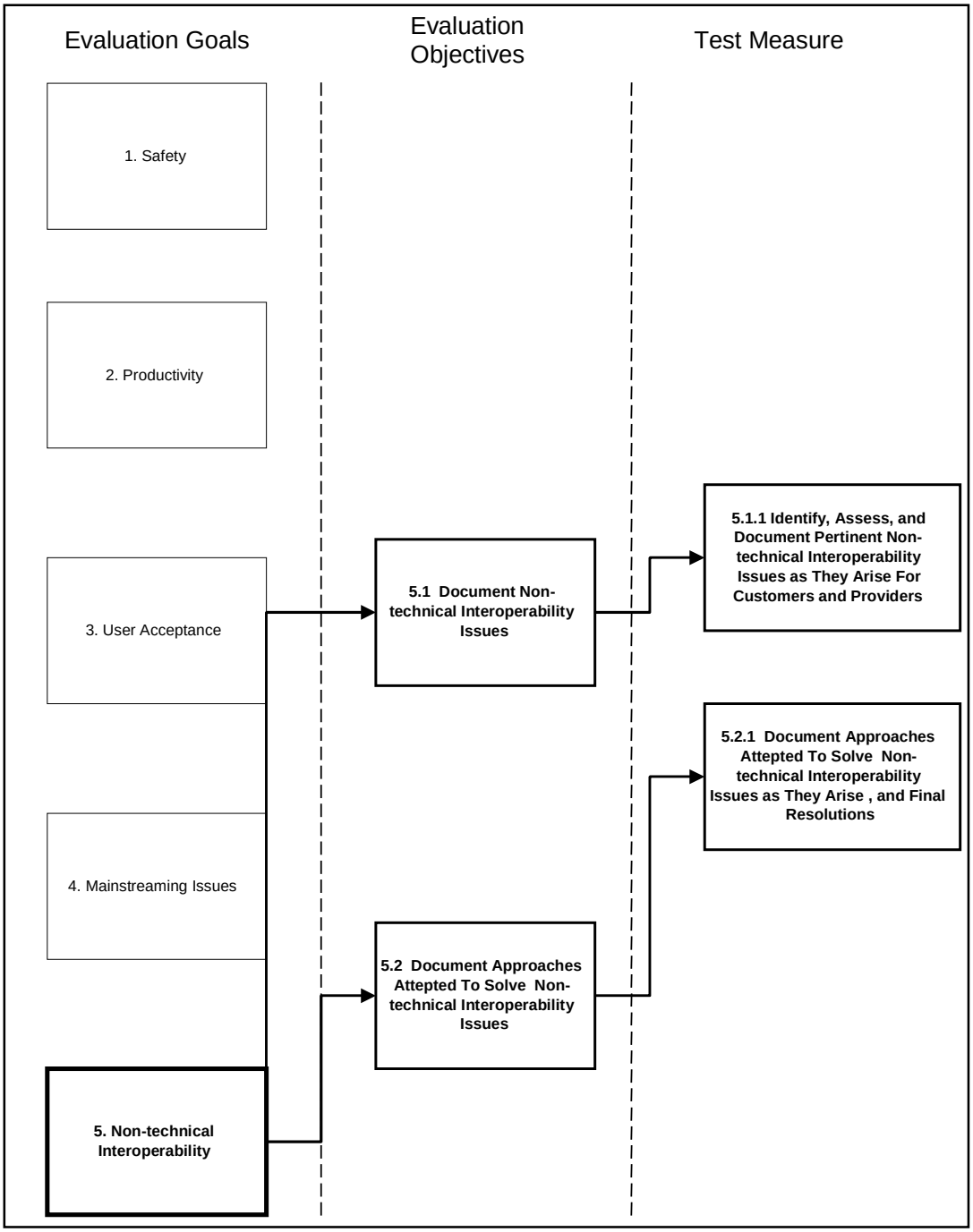
The evaluation measures used to reach the stated objectives are:

- **Measure 5.1.1 Identify, assess and document pertinent non-technical interoperability issues as they arise for customers and providers**
- **Measure 5.2.1 Document approaches attempted to solve non-technical interoperability issues as they arise, and final resolutions**

A detailed description of the hypothesis to be tested as well as the test methodology and deliverables is described in detail in Chapter 2. Chapter 3 provides a detailed test schedule and

cost breakdown for the test measure. The scope of this detailed test plan within the context of the overall Green Light Evaluation is shown in Exhibit 1-1. The test measures outlined in this document are highlighted for reference.

Exhibit 1-1 Evaluation Goals, Objectives, and Measures



1.3 DISCUSSION

Major changes are unfolding at the federal level of government that will greatly impact the use of highways by commercial vehicles, principally large and heavy trucks. The sea change was initiated in the Intermodal Surface Transportation Efficiency Act (ISTEA) six years ago; however, the programs are only now beginning to take effect and will be further advanced in the NEXTEA (the $175 Billion six year proposal for the reauthorization of ISTEA entitled National Economic Crossroads Transportation Efficiency Act). A primary driver within ISTEA and which will continue in NEXTEA is the national priority assigned to Intelligent Transportation Systems (ITS) and Commercial Vehicle Operations (CVO) programs. The following is a summary of a few of the milestones for ITS and CVO beginning with the end of calendar year 1995 to provide a perspective of the changes and continuing through the end of 1999:

1995

- Complete the ITS/CVO architecture design for an international “CVOnet Backbone” to support an Information Exchange System (IES) among public regulatory agencies, private trucking firms, and other stakeholders.

- Develop preliminary standards for procedures, training, data requirements, communication protocols, software, and hardware to support the deployment of ITS/CVO services—electronic clearance of safe/legal trucks, automated roadside safety inspections, electronic purchase of credentials.

- Organize the CVOnet Backbone, IES, model states, model motor carriers, existing electronic clearance projects, CVO institutional issues, and existing national safety

databases for a prototype national CVO information system with priority placed on electronic clearance of safe/legal commercial vehicles.

- Six electronic clearance sites operational on the HELP Inc. system in California.

- Equip 30 sites along the Advantage I-75 corridor and initiate the beta test of electronic clearance with 4,500 transponder equipped vehicles.

- Conduct the second round of multi-State ITS/CVO Institutional Issues projects in a total of 40 states to continue to facilitate regional: public/private forums, agreements on electronic data sharing and requirements, uniformity of regulatory requirements, etc. Use these to ensure widespread acceptance of and participation in the ITS/CVO program by the states and motor carrier industry.

- Initiate and participate with NHTSA in researching and testing on-board safety devices that monitor the safety status of trucks/buses for hazards such as fatigued drivers, vehicles with unsafe brakes, unstable cargo, etc.

- Continue efforts begun in early CY 1995 in the area of hazardous materials incident response (HMIR) specifically the Congressional mandate for a HMIR operational test with the National Institute for Environmental Response and the expansion of the DOT interagency partnership (RSPA, FRA, and FHWA) project—Operation Respond intermodal HMIR effort—from Houston, TX to Laredo, TX and other sites.

- Initiate research to identify and evaluate smart card technology applications to the ITS/CVO program. Develop a draft concept for integrating smart cards into the national

CVO architecture.

- Make substantial progress (60 percent complete on deliverables) on the three operational tests for electronic one-stop purchase of motor carrier credentials and the operational test for electronic out-of-service verification.

- Complete preliminary analysis and recommendations of advanced brake testing technologies. As part of our ongoing test and evaluation program, we will continually re-evaluate our data collection requirements for each type of technology (i.e., roller dynamometer, flat-plate, torque, etc.) and proceed accordingly. For example, if sufficient data has been collected and evaluated for a particular technology during the evaluation process, we will expedite our final recommendation, and begin the integration phase of the program.

1996

- Initiate the Green Light electronic clearance project by equipping sixteen states to support electronic clearance and other applications ready for integration.

- Equip 100 Motor Carrier Safety Assistance Program (MCSAP) inspection sites with communication technologies to facilitate the periodic electronic transfer of files of interstate carrier safety data from an existing national truck/bus safety database to roadside inspection sites.

- Deploy credential/safety clearance prototype in one model State with a finite number of model motor carriers for concept and system test. This prototype will integrate the

roadside safety data access projects at 100 MCSAP sites with the roadside electronic clearing of safe/legal vehicles and with the tested technology applications for electronic one-stop purchasing of credential and out-of-service verification.

- Complete the evaluation for the application of advanced brake testing technology devices at the roadside to expedite the truck/bus inspection process and increase the total number of annual inspections. Begin integration of these technologies with the single-State prototype.

- Complete the evaluation for the three electronic one-stop purchasing of credential tests and the out-of-service test. Take the lessons learned and begin the integration of the technology applications with the single-State prototype.

1997

- Finalize standards for procedures, training, data requirements, communication protocols, software, and hardware to support the deployment of ITS/CVO services.

- Deploy prototype electronic clearance system in model states. These states will represent various regions, various levels of automation, international border crossings, HELP Inc., Advantage I-75, Green Light, and I-95.

- Equip and additional 100 MCSAP sites for a total of 200 sites, and expand the national safety database to include intrastate carriers.

- Begin integration of Smart Card technology in the ITS/CVO program if appropriate.

- Continue work on the components of the ITS/CVO program to ensure interoperability within the CVOnet and IES in model states prototype for expansion to the all volunteer states in CY 1998.

1998

- Begin the integration of all CVO components in all volunteer states and carriers. These include electronic one-stop purchase of credentials, out-of-service verification, hazardous material incident response, advanced brake testing, the 200 MCSAP sites, and (if proven feasible) Smart Card commercial drivers licenses for drivers.

- Deploy basis credential/safety clearance in all interested states.

- Achieve a 10 percent motor carrier market penetration using ITS/CVO application.

1999

- Continue deploying complete configuration in all volunteer states.

- Achieve a 20 percent motor carrier market penetration using ITS/CVO applications.

The Oregon DOT, with a business plan for CVO in place, has exhibited leadership in embracing some of the national ITS/CVO user services. The six national ITS/CVO user services are:

- Commercial Vehicle Electronic Clearance
- Automated Roadside Safety Inspections
- On-board Safety Monitoring
- Commercial Vehicle Administrative Processes
- Hazardous Material Incident Response
- Freight Mobility

Many of the components of these user services have been made elements of CVISN (commercial vehicle information systems network), a high-level infrastructure that supports the electronic exchange of CVO credentials and safety information. Oregon has teamed with Washington as a model deployment of this concept.

In essence, these activities form the mainstreaming initiative that officially began in September 1996. Oregon has teamed with California, Colorado, and Utah as a regional consortium with Oregon DOT as the lead. The primary goal is to engage in the deployment of ITS/CVO technologies nationwide. A target date of 2005 was set for accomplishing the goal.

The special objectives of mainstreaming are:

- emphasize safety, clearance, and credentials activities
- encourage automation of networks and facilities that support ITS/CVO deployment consistent with CVISN architecture
- establish the appropriate foundation for future integration and implementation of the CVISN architecture

As stated previously, Oregon has a head start in the mainstreaming initiative with an

ITS/CVO business plan in place, established regional consortia via MAPS, CVISN and mainstreaming as well as others, as an effective working relationship with motor carrier industry of the state, and has a financial program in place to support the initial phases of deployment—perhaps the only state with such a commitment at this time. Green Light is a cornerstone to the mainstreaming initiatives for Oregon.

A series of non-technical interoperability issues has surfaced from time to time that require appropriate consideration. Whether institutional, financial, legal, political, bearing on the customer or public, acceptance of these issues must be placed in perspective and effectively resolved. It has proven to be an important effort for successful programs but requires an on-going effort throughout the life of the project.

2 TEST METHODOLOGY

2.1 PHYSICAL DESCRIPTION

This section discusses in detail the activities carried out in the documentation of non-technical interoperability issues and the approaches attempted to solve those issues.

2.1.1 Purpose

The identification, definition and evaluation of non-technical interoperability issues is the purpose of this task. Included is the documentation of the issues, outcomes, and implications.

2.1.2 Hypothesis

The following hypothesis is given in support of the two measures:

5.1.1 Knowledge of pertinent non-technical interoperability issues will increase the effectiveness of the Green Light program

5.2.1 Documentation of participation in, and approaches used to resolve pertinent non-technical interoperability issues will contribute to the effectiveness of the Green Light program

2.2 PRE-TEST ACTIVITIES

Pre test activities are summarized below:

1) Preparation of a directory of participants

Participants in this activity will include stakeholders of the Green Light program as well as key individuals representing groups (public and private) outside of Oregon. Participants list will be developed in consultation with the evaluation team and ODOT representatives.

2) Initialize the interview guide

With input from the evaluation team and ODOT staff, a draft interview instrument will be designed reflecting the primary issues targeted for consideration. These issues will be identified from national, regional and state observations, review of secondary sources and experiences in other systems. A scaling technique will be used for a performance rating format.

3) Conduct a test interview

Once the interview instrument is reviewed and finalized for external review, a pilot field test will be performed. Modifications will be made based on the results of the pilot test. Subjects for the pilot test will be selected in consultation with members of the evaluation team and ODOT staff. The project steering committee must approve before implementing.

4) Collect, catalog and summarize existing documents

An on-going literature review of secondary sources will be part of this activity throughout the project. An annotated bibliography on key issues will be cataloged and integrated with project reports as appropriate.

5) Identification and Discussion of Non-technical Issues

The primary and secondary data (prior studies, existing documents and survey results) provide the basis for this task. A typology approach will be used to array the issues and their evaluation.

2.3 TEST CONDUCT ACTIVITIES

Below are the steps to be taken out in the evaluation of the non-technical interoperability issues for customers and providers of Green Light.

2.3.1 Descriptions/Participants

- Gregg Dal Ponte, Oregon Motor Carrier Transportation Branch
- CM Walton, WHM Transportation Engineering Consultants, Inc.

2.3.2 Procedures

Over the course of the study, the following steps will be conducted:

1) Establish the interview schedule

1a) The list of key contacts and stakeholders for programs and organizations within the state and elsewhere will be compiled for each of the issues and activities to be explored.

1b) The process, which may involve passive and active interview procedures, may be organized to focus on issues that would require one schedule and a process focused on activities (or regional projects) may require another. At this point, a schedule will be structured to meet the process to be approved by the steering committee.

2) Conduct Interviews

As previously referenced, the interview process may include active and passive procedures. With active procedures appropriate techniques will be provided to interviewers and training provided to insure a highly professional and effective process.

3) Analyze the results of the interviews

Various techniques of performance ratings and opinion based input will provide the basis of evaluating and tabulating the survey results. Several forms of displaying the findings will be considered for effectiveness and efficiency.

4) Listing and priority ranking of non-technical issues

A set of raking criteria will be developed as appropriate for placing in perspective the rank order of non-technical issues. The criteria and procedure will be developed with input from the evaluation team and steering committee. The evaluation process will be performed by the project staff and presented to the steering committee as deemed appropriate.

5) Preparation of Strategy Document

Documentation of the issues, their definition and implication, consequences, and resolution (successful, attempted or failed) will be the product of this task. The product will be of high utility in shaping subsequent internal programs and in guiding national efforts.

2.4 POST-TEST ACTIVITIES

2.4.1 Reporting Procedures for Individual Test

A report will be prepared for these test measures according to the guidelines given in the Evaluation Plan and will proceed as follows:

1. Preparation of a draft report for each test to be submitted to the steering committee (SC) for their approval.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original, and ten bound copies of the report to ODOT's project management team.
5. Transmittal of the report by ODOT to FHWA.

2.4.2 Reporting Schedule

The reporting schedule for the individual test reports is shown below:

Exhibit 2-1 Reporting Schedule - Individual Test Reports

Deliverables	Schedule	Scheduled Due Date*
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2.4.3 Data Retention/Archival Procedures

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1. Preparation of a summary document describing data analyzed and reports prepared over the course of the evaluation.
2. Submittal of a data archive containing raw data files and all reports in compressed format.

2.4.4 Reporting Schedule for Data Retention/Archival Procedures

The reporting schedule for the archiving of data and the preparation of a summary document is given below:

Exhibit 2-2 Reporting Schedule - Data Archiving

Deliverables	Schedule	Scheduled Due Date*
Drafts of a Data Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Data Summary Report by Steering Committee	Feb 1 - Feb 28, 2000(28 days)	March 1, 2000
Data Summary Report (Final) and Data Archive	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

2.4.5 Test Summary Report Procedures

A test summary report will be prepared highlighting findings from all of the test measures. The document will be produced as follows:

1. Preparation of a draft report summarizing the results of all the individual test reports for submittal to the SC.
2. Approval of the SC at a scheduled meeting.
3. Preparation of a final test summary report, incorporating SC recommendations.
4. Submittal of 1 hardcopy original, 1 electronic original, and ten bound copies of the summary report to ODOT's project management team.
5. Transmittal of the test reports by ODOT to FHWA.
6. Reporting Schedule for Test Summary

A reporting schedule is shown below for the test summary report:

Exhibit 2-3 Reporting Schedule - Test Summary Reports

Deliverables	Schedule	Scheduled Due Date*
Drafts of Test Summary Report	Dec 1, 1999 - Jan 30, 2000 (60 days)	February 1, 2000
Review of Test Summary Report by Steering Committee	Feb 1 - Feb 28, 2000 (28 days)	March 1, 2000
Test Summary Report (Final)	Mar 1 - Mar 30, 2000 (30 days)	April 1, 2000

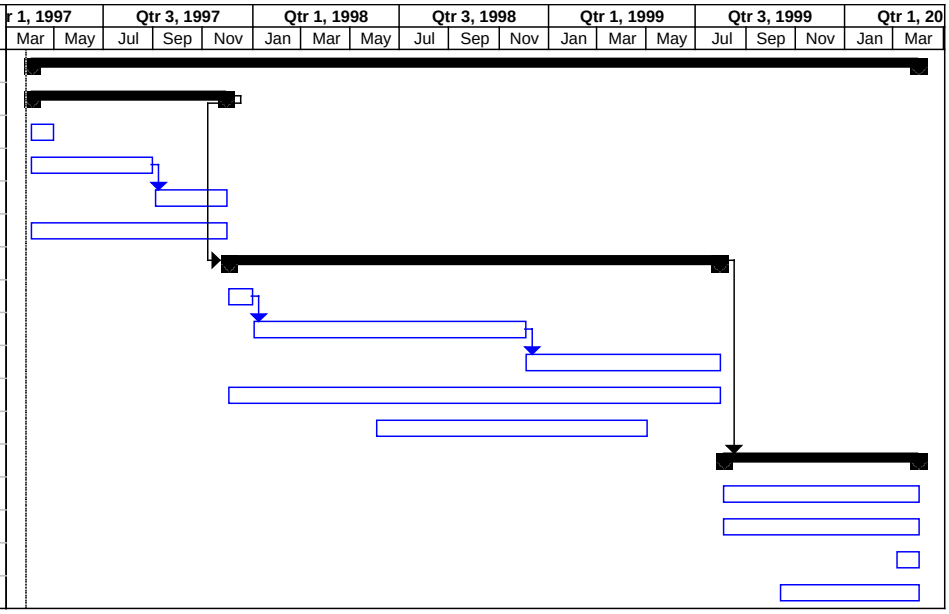
3 TEST MANAGEMENT PLAN

3.1 DETAILED TEST SCHEDULE

A sample detailed test schedule is shown in Exhibit 3-1.

Exhibit 3-1 Project Timeline for Test Measures 5.1.1 and 5.2.1

ID	Task Name
1	**4.1.1 - 4.1.2 Mainstreaming Issues**
2	**Pre-test**
3	Preparation of a directory of participants
4	Finalize the interview guide
5	Conduct a test interview
6	Collect, catalog and summarize existing documents
7	**Test conduct**
8	Establish the interview schedule
9	Conduct interviews
10	Analyze the results of the interviews
11	Listing and priority ranking of non-technical issues
12	Preparation of Strategy Document
13	**Post-test**
14	Analysis of data
15	Summarize findings
16	Archive records
17	Completion of test report



3.2 COST BREAKDOWN BY MEASURE

A cost breakdown for these measures is shown below in Exhibit 3-2. These figures are only estimates and are subject to revision as the evaluation progresses.

Exhibit 3-2 Cost Breakdown for Test Measures 4.1.1 and 4.2.2

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
14	5.1.1	CM Walton	40	$6,000	
					$6,000
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$2,000	
	Subtotal:				$2,000
	Overhead			n/a	
	Total:				**$8,000**

Organization: WHM Transportation Engineering (WHM)					
DTP	Measure	Researcher	Hours	Cost	Totals
14	5.2.1	CM Walton	40	$6,000	
					$6,000
	Payroll Exp:	n/a			
		n/a			
	Supplies:			n/a	
	Travel:			$2,000	
	Subtotal:				$2,000
	Overhead			n/a	
	Total:				**$8,000**

4 REFERENCES

1. Bell, C.A., B. McCall, and, C.M. Walton, A “The Oregon ‘Green Light’ CVO Project, Evaluation Plan” GLEV9601, Oregon State University, Transportation Research Institute, September 1996.

2. Bell, C.A., B. McCall, and, C.M. Walton, AThe Oregon >Green Light CVO Project, Individual Test Plan AGLEV9602, Oregon State University, Transportation Research Institute, October 1996.

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