LACDPW

Department of Public Works

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Los Angeles

Countywide Information Exchange Network

SITE INTEGRATION
TCS COMMAND/DATA INTERFACE TEST PROCEDURES

Release 1

Prepared by:

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LOS ANGELES COUNTYWIDE

INFORMATION EXCHANGE NETWORK

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REVISION HISTORY

VERSION	DATE	IEN RELEASE	DESCRIPTION
Draft	03/03/2006	1.08	Initial Version
Release 1	10/20/2006	1.08	Release 1 Version (Incorporates LA County comments on "Draft" and IEN Site Integration Tests conducted in the City of West Hollywood)

1. INTRODUCTION

1.1 PURPOSE

This document presents the LA County Information Exchange Network (IEN) Site Integration Command/Data Interface (CDI) Test Procedures. The purpose of this test is to verify the functionality of the CDI software, which bridges the IEN and a participating agency's Traffic Control System (TCS).

1.2 SCOPE

The test procedures contained within this document verify the performance and functionality of CDI software. CDI functionality is described in the *Recommendations For The Implementation Of New Traffic Control System Command/Data Interface Programs* document.

1.3 AUDIENCE

This document is intended for City/Agency personnel who are installing a CDI at their location to connect their Traffic Control System to the IEN.

1.4 REFERENCES

This document references the following materials:

- San Gabriel Valley Pilot Project Phase III Scope of Work
- San Gabriel Valley Pilot Project Acceptance Test Procedures
- IEN System Technical Reference Manual
- Recommendations For The Implementation Of New Traffic Control System Command/Data Interface Programs

1.5 DOCUMENT CONVENTIONS

The following conventions are used within this document:

CONVENTION	EXAMPLE
A mono-spaced font is used to indicate prompts and commands typed in at a computer. The bold text is text that must be typed in.	C:> **NSLOOKUP**
Text enclosed in "greater-than" and "less-than" characters indicates keystrokes.	<TAB>
Text enclosed in brackets indicates a user-supplied value. Do not enter the brackets.	C:> **PING [IP ADDRESS]**
A plus sign indicates that two keys are to be pressed simultaneously; the first key is held down while the second key is pressed.	<SHIFT>+<F1>
A capitalized word represents a command button or menu option.	SHOW DIAGRAM
Italic typeface indicates document titles or emphasis.	*Scope of Work*

2. APPROACH

The following approach will be used for the test cases within this document.

2.1 TEST STEP FORMAT

The IEN Site Integration CDI Test Procedures is comprised of a series of test cases. Each test case contains multiple steps, where each step exercises a discrete aspect of the system. The test steps in this document contain the following fields:

Table 2-1: Test Step Fields

FIELD	DESCRIPTION
Step	Identifier for the test step within the test case
Description	A description of the function or component that is being tested
Precondition	Any preconditions that must be met before the test can be performed
Input	One or more actions to be performed by the Test Conductor as part of the test
Expected Output	One or more operations or events that the system must return as a result of the input for the test to pass
Notes/Comments	An open field in which the Test Engineer and/or witnesses can log comments or information related to the test step
Pass/Fail	The result of the test (to be entered during testing)

2.2 ROLES AND RESPONSIBILITIES

The following roles are used in the CDI Test Procedure:

- **Test Conductor:** The Test Conductor is responsible for performing the test procedures and logging the results. The Test Conductor should be familiar with IEN Site Server components, CDI software, and Traffic Control System connected to the CDI that is being tested.
- **Test Witness:** Test Witnesses are responsible for observing the performance of the test and certifying the documented results. Test Witnesses can record additional notes and comments for the Test Report.

The Test Conductor and Test Witnesses are members of the stakeholder agencies and/or their representatives. At least one representative should be present from the LA County Department of Public Works and TransCore.

2.3 TEST PERFORMANCE

- The CDI Test Procedures test cases and steps are listed in Section 4 of this document. The test cases have been developed such that each test case may be run independently.

Prior to the start of the test, the Test Conductor will ensure that all Test Environment specifications are met and that Site-specific configuration has been recorded in the CDI Configuration Values Table (see Section 1).

The Test Conductor will manipulate the test environment to satisfy all preconditions for a particular step. The Test Conductor is to perform the actions specified in the Input field of each test step and then observes the behavior of the system for the criteria specified in the Expected Output fields. A test passes if the actual output meets the expected output criteria; otherwise the test fails. Additional information can be recorded in the Notes/Comments field, as needed.

Each step shall be documented as being completed with either a check mark ("√") or "P" for pass or an "X" or "F" for fail. At the conclusion of each test case, the Test Conductor, as well as any other Test Witnesses, shall log the test case results in both the Test Case Specifications and the Test Results Summary Table (see Section 5). A test case fails if any of the test steps fail. All failed test steps will be noted and System Problem/Change Request form(s) (SPCRs) (Appendix B) completed. Additional comments may be entered to document anomalies, detailed results, or redlined changes to the test steps. The Test Results Summary Table must contain an entry for each test case. The Test Case Specifications and the Test Results Summary Table are the written record of all activities that are performed as part of this integration test.

2.4 SEVERITY LEVELS

In the event that the actual results of a test step does not exactly match the stated expected results (i.e., a test step fails), the Test Conductor must rate and document the severity of the failure. Table 2.2 should be used as the guideline in this appraisal.

Table 2-2: Failure Severity

#	SEVERITY	DESCRIPTION
1	CRITICAL	Causes a system to crash.
2	SEVERE	Causes an application or user to crash and no work around is available.
3	MODERATE	Affects required functionality but a work around is available to proceed.
4	INCONVENIENCE	Inconvenient or an annoying but does not affect functionality. Documentation errors.
5	SUGGESTION	Improvement or enhancement that is outside the scope of required work.

3. TEST ENVIRONMENT SPECIFICATIONS

The CDI Test Environment consists of the following components.

Table 3-1: Test Environment Components

COMPONENT	DESCRIPTION
Command/Data Interface	Software that connects an IEN Site Server to a TCS. This component is only required for Sites that are connecting a TCS
IEN Site Server	A Windows-based PC on which the IEN Site Server software is installed
LANs	COTS networking components that interconnect the other test environment components. These components will vary from site to site, however the following should be true: • IEN systems are isolated from other local systems • Traffic is not permitted between the IEN and other local networks with the exception of the connection between the Site Server, CDI, and TCS • The Site Server and CDI host system are connected over a 100Mbps or better network link
TCS Server	The Traffic Control System server that connects to the local IEN Site Server through the Command/Data Interface that is being tested
TCS Workstation	A system on which TCS data values may be viewed. The system will be used to verify the values reported by the CDI

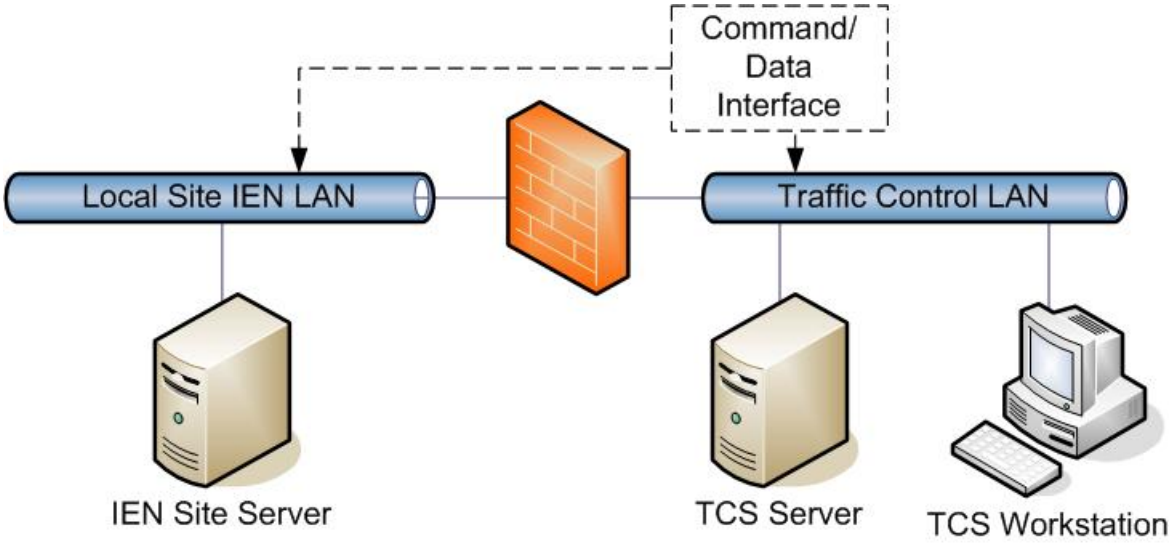
The terms *local* and *remote* are used to differentiate between components installed at the Site where the CDI is located as opposed to components installed at other Sites within the IEN.

The CDI, and its connectivity to the local Site Server and TCS, is the component being tested herein. The other components listed above support the CDI's operation. Test steps will be run on the IEN Site Server, CDI host system, and on TCS systems. Each test will identify the system on which it is to be performed as well as any user requirements. All components are to be operating "normally" unless otherwise noted in the specifications of the test case

The CDI Test Procedures rely on the availability of data from the connected Traffic Control System. Many of the tests attempt to verify the data by comparing the values that the local IEN Site Server receives with the values shown within the TCS. Appendix C – Viewing TCS Data in IEN User Interfaces lists the locations where TCS data is displayed in the IEN user interfaces. There will likely be some difference between the time a value is reported in the TCS and the time that that value is received and displayed in the CDI Test Utility. Latencies of one or more seconds are expected. Latencies greater than five seconds should be noted in the test comments.

The Test Environment is depicted in the following exhibit.

Exhibit 3-1: Test Environment



The system on which CDI software is run will vary depending on how the CDI is implemented to support a particular type of TCS. The Series 2000 and QuicNet IV CDIs both run on the TCS Server; however, this may not always be the case.

Each CDI must be configured for the Site at which it is located. In Table 3-2 below, record the appropriate values for the CDI being tested.

Table 3-2: CDI Configuration Values

PARAMETER	VALUE
Supported TCS Type	
CDI Host System Name	
CDI Host System IP Address	
Site ID Number	
Site Name	
Site Server Host Name	
Site Server IP Address(es)	

4. TEST CASES

The following sections contain the test cases of the IEN Site Integration CDI Test procedures. Each test case is written to be a standalone test and may be performed in any order.

The default test environment configuration (as specified in Section 1) will be used for each test case contained within this document unless otherwise noted within the specifications of the test case.

It is the responsibility of the Test Conductor to insure that the test results are logged for each test case and test step. It is the responsibility of Test witness(es) to sign the test results verifying Test Case completion as documented. All witnesses must be noted on the Test Results Form.

It is estimated that it will take four to six hours to set-up, perform, document, and wrap-up these CDI test cases.

4.1 VERIFY NETWORK CONNECTION

TEST CASE SPECIFICATION	
ID	CDI-1
Name	Verify Network Connection
Version	1.0.0
Description	Verifies basic network connectivity between the Site Server and CDI
Prerequisites	The IEN components being tested are configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default
Number of Steps	3
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Verify that the Site Server can ping the CDI host system.				
	ICMP (the protocol over which the "ping" tool communicates to test network connections) traffic is permitted between the Site Server and CDI host system.	Open a command prompt on the IEN Site Server and issue the following command: **PING [CDI MACHINE IP]**	The CDI host system replies to the Site Server's pings.		
2	Verify that the Site Server resolves the correct IP Address from the CDI's host name.				

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
		Open a command prompt on the IEN Site Server and issue the following command: **PING [CDI MACHINE NAME]**	The CDI host system replies to the Site Server's pings.		
3	Verify that the CDI host system can ping the Traffic Control System Server.				
	ICMP traffic is permitted between the CDI host system and the TCS Server.	From the CDI host system, ping the TCS Server by IP Address.	The TCS Server replies to the CDI's pings.		

COMMENTS:

4.2 VERIFY PUBLICATION OF CDI DATA AND COMMAND OBJECTS

TEST CASE SPECIFICATION	
ID	CDI-2
Name	Verify Publication of CDI Data and Command Objects in the Site Server's CORBA Naming Service
Version	1.0.0
Description	Verifies the publication of CDI data and command interface factory objects to the CORBA Naming Service on the IEN Site Server. The Site Server uses these object references to connect to the CDI.
Prerequisites	The IEN components being tested are configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the CDI software and the IEN Site Server and OmniNotifyDaemon services on the Site Server. Restart the TAO NT Naming Service on the Site Server. The Site Server's Naming Service should be empty. This can be confirmed by running the command **`NSLIST -ORBINITREF NAMESERVICE=CORBALOC::IIOP:[SITE SERVER HOST NAME]:14444/NAMESERVICE`**. There should be nothing below the dashed line in the command output.
Number of Steps	3
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Verify that the CDI software starts on the CDI host system.				
		Start the CDI software on the CDI host system (The CDI startup procedures will vary by TCS vendor – see CDI documentation for instructions.)	The CDI software is successfully started (this will vary by CDI type).		
2	Verify that CDI data and command objects are registered in the Site Server TAO Naming Service. CDI's must to publish these references so that the Site Server can locate where it needs to pull data from and push commands to.				
	(1) TAO NT Naming Service is started on the Site Server. (2) CDI software is running.	Open a command prompt on the IEN Site Server and run the following command: **NSLIST –ORBINITREF NAMESERVICE=CORBALOC::IIOP:[SITE SERVER HOST NAME]:14444/NAMESERVICE**	The command output shows that the following two objects have bound to the Naming Service: • `TCSCDIData[siteID](Site[siteID])` • `TCSCDICmd[siteID](Site[siteID])` (Where siteID is the ID number of the local Site within its Corridor)		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI periodically republishes its objects in the Site Server Naming Service. CDI's should republish its object references periodically. Otherwise the CDI software would need to be restarted whenever the naming service on the Site Server is restarted.				
	(1) TAO NT Naming Service is started on the Site Server. (2) CDI software is running.	(1) Open a command prompt on the IEN Site Server and run the following commands: • **NET STOP "TAO NT NAMING SERVICE"** • **NET START "TAO NT NAMING SERVICE"** (2) Wait for the CDI's configured reconnect interval (see CDI documentation). (3) Open a command prompt on the IEN Site Server and run the following command: **NSLIST -ORBINITREF NAMESERVICE=CORBALOC::IIOP:[SITESERVERNAME]:14444/NAMESERVICE**	The command output shows that the following two objects have bound to the Naming Service: • `TCSCDIData[siteID](Site[siteID])` • `TCSCDICmd[siteID](Site[siteID])` (Where siteID is the ID number of the Site within its Corridor)		

COMMENTS:

4.3 VERIFY SYSTEM INFORMATION VALUES

TEST CASE SPECIFICATION	
ID	CDI-3
Name	Verify CDI System Information
Version	1.0.0
Description	Verify the CDI's reported System Information values.
Prerequisites	The IEN components being tested are configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	4
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the System Info test.				
		(1) Open the CDI Test Utility on the Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) Enable the "System Info" test and press the START button.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid System Version value.				
		(1) Examine the reported System Version value in the Results Summary field. (2) Record the reported System Version value in the Notes/Comments field.	The CDI reports a system version in the format [major].[minor].[revision].		
3	Verify that the CDI reports a valid Interface Version value.				
		Examine the reported Interface Version value in the Results Summary field.	The CDI reports an interface value of 2.0.1 (the current IEN IDL version).		
4	Verify that the CDI reports a valid System Status value.				
	TCS operating "normally"	Examine the reported System Status value in the Results Summary field.	The CDI reports a value of "0 (SYSTEM_NORMAL)".		

COMMENTS:

4.4 VERIFY INTERSECTION INFO VALUES

TEST CASE SPECIFICATION	
ID	CDI-4
Name	Verify Intersection Info Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_INTERSECTIONINFO event type.
Prerequisites	The IEN components being tested are configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	5
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Info test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_INTERSECTIONINFO. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Section ID value.				
	Step 1 completed	Compare the Section ID value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI either matches the value in the TCS or is "–1" ("-1" is a valid value if the Section ID is unknown or N/A in the TCS).		
3	Verify that the CDI reports a valid Polling Interval value.				

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
	Step 1 completed	Compare the Polling Interval value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS.		
4	Verify that the CDI reports a valid Controller Type value.				
	Step 1 completed	Compare the Controller Type value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports an appropriate controller type value for the intersection.		
5	Verify that the CDI reports a valid Intersection Description value.				
	Step 1 completed	Examine the Intersection Description value reported in the Results Summary field.	(1) The reported value is in the format [Main Street]@[Cross Street] (2) The value is correct for the selected intersection.		

COMMENTS:

4.5 VERIFY INTERSECTION REAL-TIME STATUS VALUES

TEST CASE SPECIFICATION	
ID	CDI-5
Name	Verify Intersection Real-Time (RT) Status Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_INTERSECTIONRTSTATUS event type.
Prerequisites	The IEN components being tested are configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	11
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection RT Status test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_INTERSECTIONRTSTATUS. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Number of Comm. Attempts value.				
	Step 1 completed	Compare the Number of Comm. Attempts value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Number of Comm. Attempts is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI reports a valid Number of Good Responses value.				
	Step 1 completed	Compare the Number of Good Responses value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Number of Good Responses is unknown or N/A in the TCS).		
4	Verify that the CDI reports a valid Number of Bad Responses value.				
	Step 1	Compare the Number of Bad Responses value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Number of Bad Responses is unknown or N/A in the TCS).		
5	Verify that the CDI reports a valid Number of No Responses value.				
	Step 1 completed	Compare the Number of No Responses value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Number of No Responses is unknown or N/A in the TCS).		
6	Verify that the CDI reports a valid Cycle Counter value.				
	Step 1 completed	Compare the Cycle Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Cycle Counter is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
7	Verify that the CDI reports a valid Time Since Reset of Attempts Counter value.				
	Step 1 completed	Compare the Seconds Elapsed Since Last Reset of Attempt Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Seconds Elapsed Since Last Reset of Attempt Counter is unknown or N/A in the TCS).		
8	Verify that the CDI reports a valid Time Since Reset of Good Response Counter value.				
	Step 1 completed	Compare the Seconds Elapsed Since Last Reset of Good Response Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Seconds Elapsed Since Last Reset of Good Response Counter is unknown or N/A in the TCS).		
9	Verify that the CDI reports a valid Time Since Reset of Bad Response Counter value.				
	Step 1 completed	Compare the Seconds Elapsed Since Last Reset of Bad Response Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Seconds Elapsed Since Last Reset of Bad Response Counter is unknown or N/A in the TCS).		
10	Verify that the CDI reports a valid Time Since Reset of No Response Counter value.				
	Step 1 completed	Compare the Seconds Elapsed Since Last Reset of Timeout Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Seconds Elapsed Since Last Reset of Timeout Counter is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
11	Verify that the CDI reports a valid Reference Cycle Counter value.				
	Step 1 completed	Compare the Reference Cycle Counter value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is "-1" ("-1" is a valid value if the Reference Cycle Counter is unknown or N/A in the TCS).		

COMMENTS:

4.6 VERIFY INTERSECTION REAL-TIME SUMMARY VALUES

TEST CASE SPECIFICATION	
ID	CDI-6
Name	Verify Intersection Real-Time Summary Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_INTERSECTIONRTSTUMMARY event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	12
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection RT Summary test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_INTERSECTIONRTSUMMARY. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Signal Control Mode value.				
	Step 1 completed	Compare the Signal Control Mode value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Control Modes enumeration for the intersection.		
3	Verify that the CDI reports a valid Intersection Signal State value.				
	Step 1 completed	Compare the Signal State value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Intersection Signal States enumeration for the intersection.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
4	Verify that the CDI reports a valid Controller Response State value.				
	Step 1 completed	Compare the Response State value reported in the Results Summary field with the corresponding value in the TCS software.	(1) If the controller is responding to TCS communication, the CDI reports the controller to be Responding. (2) If the controller is not responding to TCS communication, the CDI reports the controller to be Not Responding.		
5	Verify that the CDI reports a valid Preemption Type value.				
	Step 1 completed	For a preempted controller, compare the Preemption Type value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the Intersection Preemption Types enumeration for the intersection.		
6	Verify that the CDI reports a valid Controller Alarms value.				
	Step 1 completed	Trigger a controller alarm. Compare the Alarms value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the Intersection Controller Alarm Bit enumeration for the intersection.		
7	Verify that the CDI reports a valid Main Street Green Active value.				
	Step 1 completed	Compare the Main Street Green Active value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Main Street Green state is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
8	Verify that the CDI reports a valid Controller Communication State value.				
	Step 1 completed	Compare the Signal State value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the Intersection Controller Communication States enumeration for the intersection ("-1" is a valid value if the Signal State is unknown or N/A in the TCS).		
9	Verify that the CDI reports a valid Timing Plan ID value.				
	Step 1 completed	Compare the Timing Plan ID value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Timing Plan is unknown or N/A in the TCS).		
10	Verify that the CDI reports a valid Desired Cycle Length value.				
	Step 1 completed	Compare the Desired Cycle Length value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Desired Cycle Length is unknown or N/A in the TCS).		
11	Verify that the CDI reports a valid Desired Offset value.				
	Step 1 completed	Compare the Desired Offset value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Desired Offset is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
12	Verify that the CDI reports a valid Actual Offset value.				
	Step 1 completed	Over a period of several cycles, compare the Actual Offset value reported in the Results Summary field with the corresponding value in the TCS software.	For each cycle, the value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Actual Offset is unknown or N/A in the TCS).		

COMMENTS:

4.7 VERIFY INTERSECTION PHASE STATE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-7
Name	Verify Intersection Phase State Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_PHASE_STATEDATA event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	2
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Phase State Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_PHASE_STATEDATA. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports valid Active Phase values.				
	Step 1 completed	For the duration of a cycle, compare the Active Phase ID value(s) reported in the Results Summary field with the corresponding value(s) in the TCS software.	The values reported by the CDI matches the values in the TCS.		

COMMENTS:

4.8 VERIFY INTERSECTION PEDESTRIAN PHASE STATE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-8
Name	Verify Intersection Pedestrian Phase State Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_PEDPHASE_STATEDATA event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	2
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Pedestrian Phase State Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_PEDPHASE_STATEDATA. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports valid Active Pedestrian Phase values.				
	Step 1 completed	For the duration of a cycle, compare the Active Pedestrian Phase ID value(s) reported in the Results Summary field with the corresponding value(s) in the TCS software.	The values reported by the CDI match the values in the TCS.		

COMMENTS:

4.9 VERIFY VEHICLE CALL STATE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-9
Name	Verify Vehicle Call State Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_VEHCALL_STATEDATA event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	2
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Vehicle Call State Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_VEHCALL_STATEDATA. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports valid Vehicle Call values.				
	Step 1 completed	For the duration of a cycle, compare the Active Actuation Detector Call Phase ID value(s) reported in the Results Summary field with the corresponding value(s) in the TCS software.	The values reported by the CDI match the values in the TCS.		

COMMENTS:

4.10 VERIFY LAST CYCLE PHASE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-10
Name	Verify Last Cycle Phase Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_LASTCYCLE_PHASEDATA event.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	3
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Last Cycle Phase Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_LASTCYCLE_PHASEDATA. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Actual Cycle Length value.				
	Step 1 completed	Compare the Actual Cycle Length value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Actual Cycle Length is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI reports valid Last Cycle Phase Green Counts.				
	Step 1 completed	Over a period of several cycles, compare the Last Cycle Phase Green Time value(s) reported in the Results Summary field with the corresponding value(s) in the TCS software.	The values reported by the CDI match the values in the TCS.		

COMMENTS:

4.11 VERIFY CONTROLLER PHASE MAXIMUM GREEN TIME DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-11
Name	Verify Controller Phase Maximum Green Time Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_TP_PHASEDATA event.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	2
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Intersection Phase Maximum Green Time Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_TP_PHASEDATA. (4) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports valid Phase Max Green Time Data.				
	Step 1 completed	Compare the Max Phase Green Time value(s) reported in the Results Summary field with the corresponding value(s) in the TCS software.	The value(s) reported by the CDI matches the value(s) in the TCS.		

COMMENTS:

4.12 VERIFY DETECTOR INFO DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-12
Name	Verify Detector Info Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_DETECTORINFO event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	9
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Detector Info Data test.				
	Step 1 completed	(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_DETECTORINFO. (4) Set the Single Mode Device Type field to DETECTOR and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Detector Data Averaging Period value.				
	Step 1 completed	Compare the Detector Averaging Period value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Detector Averaging Period is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI reports a valid Detector ID.				
	Step 1 completed	Compare the Detector ID value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Detector ID is unknown or N/A in the TCS).		
4	Verify that the CDI reports a valid Detector Class value.				
	Step 1 completed	Compare the Detector Class value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI is DC_SYSTEM.		
5	Verify that the CDI reports a valid Detector Type value.				
	Step 1 completed	Compare the Detector Type value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Detector Types enumeration for the selected detector.		
6	Verify that the CDI reports a valid Detector Direction value.				
	Step 1 completed	Compare the Detector Direction value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Detector Direction enumeration for the selected detector.		
7	Verify that the CDI reports a valid Detector Lane Number value.				
	Step 1 completed	Compare the Detector Lane Number value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Detector Lane Number is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
8	Verify that the CDI reports a valid Detector Roadway value.				
	Step 1 completed	Compare the Detector Roadway value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Detector Roadway is unknown or N/A in the TCS).		
9	Verify that the CDI reports a valid Detector Weighting Factor (K) value.				
	Step 1 completed	Compare the Detector Weighting Factor (K) value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports an appropriate Weighting Factor (K) value for the selected detector.		

COMMENTS:

4.13 VERIFY DETECTOR STATE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-13
Name	Verify Detector State Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_DETECTORSTATE event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	10
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Detector State Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_DETECTORSTATE. (4) Set the Single Mode Device Type field to DETECTOR and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid “last uploaded” Volume value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Current Cycle Volume value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Current Cycle Volume is unknown or N/A in the TCS). (2) The value is reported in vehicles per hour.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI reports a valid Average Volume value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Average Cycle Volume value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Average Cycle Volume is unknown or N/A in the TCS). (2) The value is reported in vehicles per hour.		
4	Verify that the CDI reports a valid “last uploaded” V+KO value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Current V+KO value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Current V+KO is unknown or N/A in the TCS). (2) The value is reported in vehicles per hour.		
5	Verify that the CDI reports a valid Average V+KO value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Average V+KO value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Average V+KO is unknown or N/A in the TCS). (2) The value is reported in vehicles per hour.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
6	Verify that the CDI reports a valid Detector Status value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Detector Status value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Detector Status enumeration for the selected detector.		
7	Verify that the CDI reports a valid “last uploaded” Speed value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Current Cycle Speed value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Current Cycle Speed is unknown or N/A in the TCS). (2) The value is reported in miles per hour.		
8	Verify that the CDI reports a valid Average Speed value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Average Speed value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Average Speed is unknown or N/A in the TCS). (2) The value is reported in miles per hour.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
9	Verify that the CDI reports a valid “last uploaded” Occupancy value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Current Occupancy value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Current Occupancy is unknown or N/A in the TCS). (2) The value is reported in percent.		
10	Verify that the CDI reports a valid Average Occupancy value.				
	Step 1 completed	Over the period of several detector data uploads, compare the Average Occupancy value reported in the Results Summary field with the corresponding value in the TCS software.	(1) The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Average Occupancy is unknown or N/A in the TCS). (2) The value is reported in percent.		

COMMENTS:

4.14 VERIFY SECTION INFO DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-14
Name	Verify Section Info Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_SECTIONINFO event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	2
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Section Info Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_SECTIONINFO. (4) Set the Single Mode Device Type field to SECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports valid Member Intersection values.				
	Step 1 completed	Compare the Member Intersection values reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Member Intersection values are unknown or N/A in the TCS).		

COMMENTS:

4.15 VERIFY SECTION STATE DATA VALUES

TEST CASE SPECIFICATION	
ID	CDI-15
Name	Verify Section State Data Values
Version	1.0.0
Description	Verify that the CDI returns valid data for the IEN_SECTIONSTATE event type.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	3
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Open the CDI Test Utility and run the Section State Data test.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Set the Single Mode Tests field to IEN_SECTIONSTATE. (4) Set the Single Mode Device Type field to SECTION and enter a valid device ID (one that is defined within the TCS). (5) Press the START button to run the test.	The test is run with results shown in the Result Summary field.		
2	Verify that the CDI reports a valid Section Control Mode value.				
	Step 1 completed	Compare the Section Control Mode value reported in the Results Summary field with the corresponding value in the TCS software.	The CDI reports the appropriate value from the IEN Section Control Mode enumeration for the selected section or is “-1” ("-1" is a valid value if the Section Control Mode is unknown or N/A in the TCS).		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI reports a valid Section Timing Plan value.				
	Step 1 completed	Compare the Section Timing Plan value reported in the Results Summary field with the corresponding value in the TCS software.	The value reported by the CDI matches the value in the TCS or is “-1” ("-1" is a valid value if the Section Timing Plan is unknown or N/A in the TCS).		

COMMENTS:

4.16 VERIFY DATA INTERFACE PERFORMANCE

TEST CASE SPECIFICATION	
ID	CDI-16
Name	Verify Data Interface Performance
Version	1.0.0
Description	Verify that the CDI meets performance targets.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default Stop the IEN Site Server Windows Service on the local Site Server.
Number of Steps	1
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Run the Data Interface Performance test and examine the resulting performance statistics[1].				

[1] Calculation of interface performance statistics:

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
		(1) On the Site Server, select START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI. (2) In the CDI Test Utility, set the Site ID to the assigned ID number for the Site and set the test Duration to 60 seconds. (3) In the Process mode tests frame, enable the Performance test and click START.	(1) The average response time is less than .5 seconds. (2) The response payload is less than the available bandwidth of the connection between the CDI server and the Site Server. (3) The Percent Full Return is 100%.		

COMMENTS:

1. Average CDI response time (millisecond) = (Σresponse_time_per_request)/total_request_made
2. Average Pay Load (bytes) = (Σtotal_byte_per_retured_eventseq)/total_request_made
3. Percentage of full data request response = (Σcorrectly_returned_full_request)/total_device_data_full_request*100%
4. Percentage of changed only request response = (Σreturned_change_request)/total_device_data_change_request*100%

4.17 VERIFY SUPPORT FOR IEN INTERSECTION COMMANDS

TEST CASE SPECIFICATION	
ID	CDI-17
Name	Verify Support for IEN Intersection Commands
Version	1.0.0
Description	Verify that the CDI receives IEN intersection commands and implements the commands in the TCS.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default. Stop the IEN Site Server Windows Service on the local Site Server. Note: Commands should be issued to test devices that are not deployed in the field.
Number of Steps	7
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Verify that the CDI supports IEN Manual Timing Plan commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_SET_PLAN, enter a plan number, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION, enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to the selected timing plan.	(1) The CDI commands the selected device to the specified timing plan. (2) The device implements the specified timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
2	Verify that the CDI supports IEN Central Time-Of-Day Mode commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to TOD, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to run the timing plan selected by the central scheduler.	(1) The CDI commands the selected controller to TOD (run the timing pattern selected by the central TOD schedule). (2) The device implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI supports IEN Normal Mode commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to NORMAL, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to run the timing plan selected by the central system.	(1) The CDI commands the selected controller to NORMAL (run the timing pattern selected by the controller's section or system). (2) The device implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
4	Verify that the CDI supports IEN Traffic Responsive Mode commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to RESPONSIVE, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to run the timing plan selected by the TCS traffic responsive functions.	(1) The CDI commands the selected controller to RESPONSIVE (run the timing pattern selected by a traffic responsive algorithm). (2) The device implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
5	Verify that the CDI supports IEN Free Mode commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to FREE, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to run FREE.	(1) The CDI commands the selected controller to FREE. (2) The device implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
6	Verify that the CDI supports IEN Local Time-Of-Day Mode commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to LOCAL_TOD, and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the controller to run the timing plan selected by its local scheduler.	(1) The CDI commands the selected controller to LOCAL_TOD (run the timing pattern selected by the controller's local TOD schedule). (2) The device implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
7	Verify that the CDI supports IEN Release Control commands for intersections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_RELEASE_CTLR and press OK. (5) Set the Single Mode Device Type field to INTERSECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to end IEN control of the selected device.	The CDI releases IEN control of the selected controller.		

COMMENTS:

4.18 VERIFY SUPPORT FOR IEN SECTION COMMANDS

TEST CASE SPECIFICATION	
ID	CDI-18
Name	Verify Support for IEN Section Commands
Version	1.0.0
Description	Verify that the CDI receives IEN section commands and implements the commands in the TCS.
Prerequisites	The IEN Workstation being tested is configured as specified in the *IEN System Technical Reference Manual* and connected to the other Test Environment components.
Environment	Default. Stop the IEN Site Server Windows Service on the local Site Server. Note: Commands should be issued to test devices that are not deployed in the field.
Number of Steps	7
TEST CASE ACCEPTANCE	
Acceptance Targets	n/a
Acceptance Criteria	All test steps must pass
TEST CASE EXECUTION	
Software version/date	
Test start date/time	
Test end date/time	
Total Pass/Fail	

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
1	Verify that the CDI supports IEN Manual Timing Plan commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_SET_PLAN, enter a plan number, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to the specified timing plan.	(1) The CDI commands the selected section to the specified timing plan. (2) The section implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
2	Verify that the CDI supports IEN Central Time-Of-Day Mode commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to TOD, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to timing plan specified by the central scheduler.	(1) The CDI commands the selected section to TOD (run the timing pattern selected by the central TOD schedule). (2) The section implements the selected control mode.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
3	Verify that the CDI supports IEN Normal Mode commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to NORMAL, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to the timing plan specified by the central system.	(1) The CDI commands the selected section to NORMAL (run the timing pattern selected by the system). (2) The section implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
4	Verify that the CDI supports IEN Traffic Responsive Mode commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to RESPONSIVE, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to the timing plan specified by the TCS Traffic Responsive functions.	(1) The CDI commands the selected section to RESPONSIVE (run the timing pattern selected by a traffic responsive algorithm). (2) The section implements the selected timing plan.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
5	Verify that the CDI supports IEN Free Mode commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to FREE, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to FREE.	The CDI commands the selected section to FREE.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
6	Verify that the CDI supports IEN Local Time-Of-Day Mode commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (3) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (4) In the Set CDI Command dialog, set the Command Type field to CT_CHANGE_MODE, set control mode to LOCAL_TOD, and press OK. (5) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (6) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to command the section to Local TOD mode.	(1) The CDI commands the selected section to LOCAL_TOD (member controllers should run the timing pattern selected by their local TOD schedules). (2) The section implements the selected control mode.		

STEP	DESCRIPTION				P/F
	PRECONDITION	INPUT	EXPECTED OUTPUT	NOTES/COMMENTS	
7	Verify that the CDI supports IEN Release Control commands for sections.				
		(1) Open the CDI Test Utility on the local Site Server (START > ALL PROGRAMS > INFORMATION EXCHANGE NETWORK > TEST TOOLS > CDI TEST UI). (2) In the CDI Test Utility, select CONFIGURATION > TEST MODE > SINGLE COMMAND MODE. (1) Select 0-IEN_COMMANDRETURN in the Single Mode Tests field. (2) In the Set CDI Command dialog, set the Command Type field to CT_RELEASE_CTLR and press OK. (3) Set the Single Mode Device Type field to SECTION and enter a valid device ID. (4) Press the START button. (7) Verify that the CDI receives the command from the Site Server and causes the TCS to end IEN control of the selected section.	The CDI releases IEN control of the selected section.		

COMMENTS:

5. TEST RESULTS FORM

Test Date _____

Test Location _____

Test Name/ID _____

The undersigned verify that this test was conducted as redlined in the test cases and/or documented in the Test Result Summary Table (see Table 5.2).

Table 5-1: Test Witness Signatures

	Name (Printed)	Signature	Date
Test Conductor			
Test Recorder			
Client Witness			
Other Witness			

Table 5-2: Test Results Summary Table

TEST CASE	DATE	START TIME	END TIME	PASS/FAIL	FAILED STEPS	SPCRS #'S	REMARKS

6. APPENDICES

6.1 APPENDIX A – ACRONYMS AND DEFINITIONS

TERM	DEFINITION
ATMS	Advanced Traffic Management System
COTS	Commercial Off the Shelf Software
CDI	Command and Data Interface. Software that connects an IEN Site Server to a Traffic Control System.
DNS	Domain Name Service
DPW	(Los Angeles County) Department of Public Works
ICMP	Internet Control Message Protocol, the protocol over which the “ping” tool communicates to test network connections
IEN	Information Exchange Network
IMS	Incident Management System
IP	Internet Protocol
LAN	Local Area Network
MTA (Metro)	(Los Angeles County) Metropolitan Transportation Authority
SPCR	System Problem/Change Request form
TCS	Traffic Control System

6.2 APPENDIX B – SOFTWARE PROBLEM/CHANGE REQUEST FORM

SPCR Report Identifier: _____ Suggested Priority (1-5) _____

Reported By: _____ Date _____
Organization: _____ Phone _____

Problem Title: _____
Project _____
Component/Program Unit _____ Version _____

Description (Be concise, include equipment involved and location. Attach additional sheets or supporting information as necessary)

_____
_____
_____
_____
_____
_____
_____

Test Step/Scenario _____
Repeatable (Check One) Always ( ) Frequently ( ) Rarely ( ) Unable to Repeat ( )

Phase Found _____
Requirement(s) Affected (Reference Document and Paragraph) _____
_____

Initially Assign To _____

Priority Legend

#	PRIORITY	DESCRIPTION
1	CRITICAL	Causes a system to crash.
2	SEVERE	Causes an application or user to crash and no work around is available.
3	MODERATE	Affects required functionality but a work around is available to proceed.
4	INCONVENIENCE	Inconvenient or an annoying but does not affect functionality. Documentation errors.
5	SUGGESTION	Improvement or enhancement that is outside the scope of required work.

6.3 APPENDIX C – VIEWING TCS DATA IN IEN USER INTERFACES

6.3.1 Intersection Data

The following table indicates where TCS intersection data is displayed in the IEN:

Table 6-1: IEN Intersection Data Displays

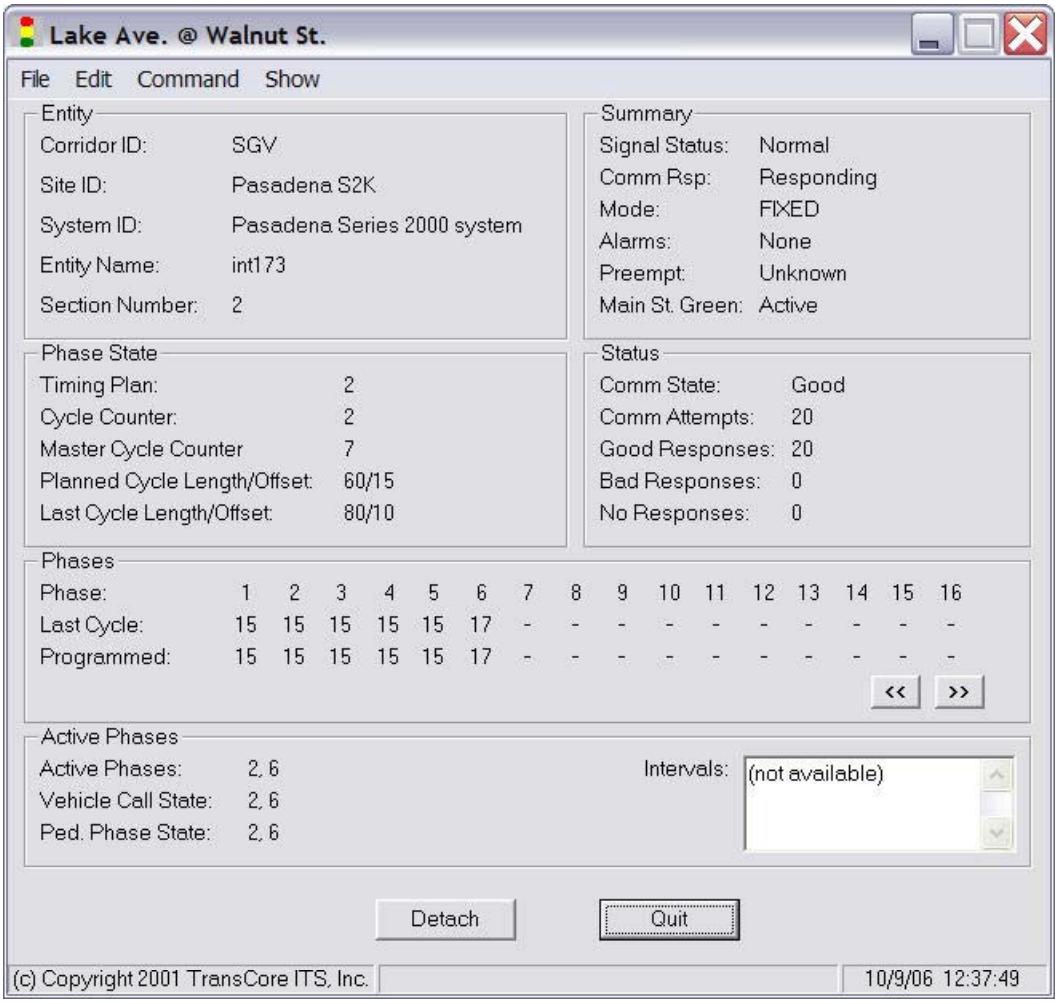
DATA	WHERE DISPLAYED
IEN_INTERSECTIONINFO	
Intersection ID number	Intersection detail screen (entity frame), Intersection header control
ID number of section containing this intersection	Intersection detail screen (labeled “Section Number” in the entity frame), Intersection header control
Seconds between poll attempts to the intersection controller	Currently not displayed in the IEN user interfaces.
Controller type	Currently not displayed in the IEN user interfaces.
Description of the intersection controller	Currently not displayed in the IEN user interfaces.
IEN_INTERSECTIONRTSTATUS	
# of communication attempts to the intersection controller	Intersection detail screen (status frame), Intersection header control, Intersection status text control
# of good responses received from the intersection controller	Intersection detail screen (status frame), Intersection header control, Intersection status text control
# of bad responses received from the intersection controller	Intersection detail screen (status frame), Intersection header control, Intersection status text control
# of timeouts waiting for responses from the intersection controller	Intersection detail screen (labeled “No Responses” in the status frame), Intersection header control, Intersection status text control
Cycle counter, seconds since start of cycle	Intersection detail screen (phase state frame), Intersection header control, Intersection status text control
Time in seconds since reset of attempts counter	Intersection status text control
Time in seconds since reset of good responses counter	Intersection status text control
Time in seconds since reset of bad responses counter	Intersection status text control
Time in seconds since reset of timeout counter	Intersection status text control
Reference cycle counter for the intersection	Intersection detail screen (labeled “Master Cycle Counter” in the phase state frame), Intersection status text controls

DATA	WHERE DISPLAYED
IEN_INTERSECTIONRTSUMMARY	
Signal control mode	Intersection detail screen (labeled “Mode” in the summary frame), Intersection header control, Intersection status text control, intersection controls on the map
Intersection signal state	Intersection detail screen (labeled “Signal Status” in the summary frame), Intersection header control, Intersection status text control, intersection controls on the map
Controller response state	Intersection detail screen (labeled “Comm Rsp” in the summary frame), Intersection header control, Intersection status text control, intersection controls on the map
Preemption type	Intersection detail screen (labeled “Preempt” in the summary frame), Intersection header control, Intersection status text control, intersection controls on the map
Controller alarms	Intersection detail screen (labeled “Alarms” in the status frame), Intersection header control, Intersection status text control, intersection controls on the map
Main street green active	Intersection detail screen (labeled “Main St. Green” in the status frame), Intersection header control, Intersection status text control, intersection controls on the map
Communication state for the intersection controller	Intersection detail screen (labeled “Comm State” in the status frame), Intersection header control, Intersection status text control, intersection controls on the map
Timing plan ID number	Intersection detail screen (phase state frame), Intersection header control, Intersection status text control, intersection controls on the map (tool tip)
Desired cycle length	Intersection detail screen (the first value of the “Planned Cycle Length/Offset” pair in the phase state frame), Intersection header control, Intersection status text control
Desired offset	Intersection detail screen (the second value of the “Planned Cycle Length/Offset” pair in the phase state frame), Intersection header control, Intersection status text control
Actual offset	Intersection detail screen (the second value of the “Last Cycle Length/Offset” pair in the phase state frame), Intersection header control, Intersection status text control, intersection controls on the map (tool tip)
IEN_PHASE_STATEDATA	
Active green phases	Intersection detail screen (labeled “Active Phases” in the active phases frame), Intersection header control, Intersection status text control, green arrow control
IEN_PEDPHASE_STATEDATA	
Active pedestrian phases	Intersection detail screen (labeled “Ped. Phase State” in the active phases frame), Intersection header control, Intersection status text control, pedestrian control

DATA	WHERE DISPLAYED
IEN_VEHCALL_STATEDATA	
Active actuation phases	Intersection detail screen (labeled “Vehicle Call State” in the active phases frame), Intersection header control, Intersection status text control, vehicle call control
IEN_LASTCYCLE_PHASEDATA	
Length of last cycle	Intersection detail screen (the first value of the “Last Cycle Length/Offset” pair in the phase state frame), Intersection header control
Total green time for each active phase in the controller's last cycle.	Intersection detail screen (labeled “Last Cycle” in the phases frame), Intersection header control
IEN_TP_PHASEDATA	
Maximum permissible green time for each phase of the active timing plan.	Intersection detail screen (labeled “Programmed” in the phases frame), Intersection header control

With the exception of “Seconds between poll attempts to the intersection controller”, “Controller type”, and “Description of the intersection controller” values, all intersection data may be viewed on the intersection detail screen.

Figure 6-1: IEN Intersection Detail Screen



To open the intersection detail screen, right-click an intersection control within the map or ATMS Explorer diagram and select MONITOR.

6.3.2 System Detector Data

The following table indicates where TCS system detector data is displayed in the IEN:

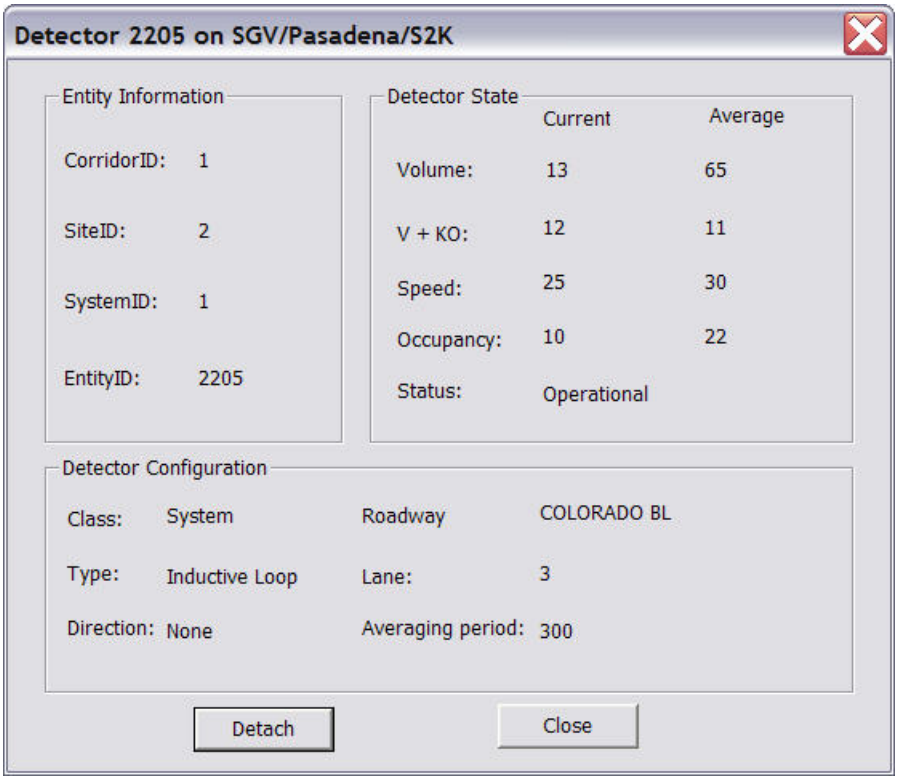
Table 6-2: IEN System Detector Data Displays

DATA	WHERE DISPLAYED
IEN_DETECTORINFO	
Detector data averaging period	System detector detail screen (detector configuration frame), System detector status text control
Detector ID	System detector detail screen (entity information frame), System detector status text control

DATA	WHERE DISPLAYED
Detector class	System detector detail screen (detector configuration frame), System detector status text control
Detector type	System detector detail screen (detector configuration frame), System detector status text control
Direction of traffic flow over the detector	System detector detail screen (detector configuration frame), System detector status text control
Lane number for traffic passing over the detector	System detector detail screen (detector configuration frame), System detector status text control
Name of the roadway that contains the detector	System detector detail screen (detector configuration frame), System detector status text control
Weighting factor (K) for volume + weighted occupancy calculations	System detector status text control
IEN_DETECTORSTATE	
Volume from the most recent upload, in vehicles per hour	System detector detail screen (labeled “current volume” in the detector state frame), System detector status text control
Average volume, in units of vehicles per hour	System detector detail screen (detector state frame), System detector status text control
Volume, in vehicles per hour + weighted occupancy, for volume and occupancy from the most recent upload.	System detector detail screen (labeled “current V+ KO” in the detector state frame), System detector status text control
Average volume, in vehicles per hour + weighted occupancy, for volume and occupancy in the averaging period.	System detector detail screen (labeled “average V + KO” in the detector state frame), System detector status text control
Detector status	System detector detail screen (detector state frame), System detector status text control
Speed data from the most recent upload, in miles per hour	System detector detail screen (labeled “current speed” in the detector state frame), System detector status text control
Average speed, in miles per hour	System detector detail screen (detector state frame), System detector status text control
Occupancy data from the most recent upload, in percent	System detector detail screen (labeled “current occupancy” in the detector state frame), System detector status text control
Average occupancy, in percent	System detector detail screen (detector state frame), System detector status text control

With the exception of the “Weighting factor (K)”, all detector data may be viewed on the system detector detail screen.

Figure 6-2: IEN System Detector Screen



To open the system detector detail screen, right-click a system detector control within an ATMS Explorer diagram and select MONITOR.

6.3.3 Section Detail Screen

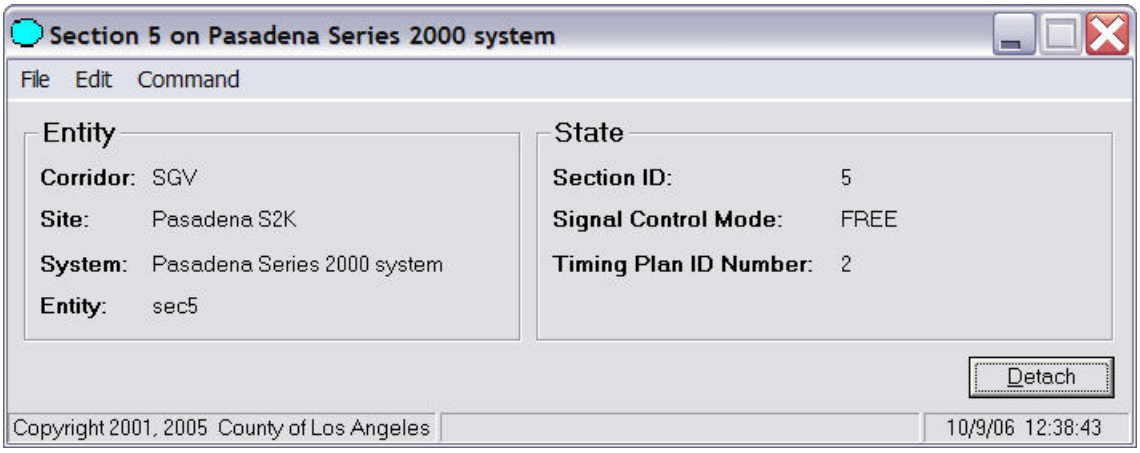
The following table indicates where TCS section data is displayed in the IEN:

Table 6-3: IEN Section Data Displays

DATA	WHERE DISPLAYED
IEN_SECTIONINFO	
List of member intersections	Currently not displayed in the IEN user interfaces.
IEN_SECTIONSTATE	
Section control mode	Section detail screen (state frame), Section status text control
Section timing plan	Section detail screen (state frame), Section status text control

Section control mode and timing plan values may be viewed on the section detail screen.

Figure 6-3: IEN Section Detail Screen



To open the section detail screen, right-click a section control within an ATMS Explorer diagram and select MONITOR.