



Real-Time Transit Agency Interface Using Java Message Services

Acceptance Test Plan VERSION 1.3

Prepared for:

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REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE
ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

DOCUMENT HISTORY

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1. PURPOSE OF THIS DOCUMENT

This document is the Acceptance Test Plan (ATP) for the data exchange and processing of real-time predictions and configuration data as part of the Regional Real-Time Transit Information System. This document defines the general approach for executing acceptance testing for those transit agencies utilizing the Java Message Services (JMS) Interface.

This Acceptance Test plan is designed to demonstrate compliance with the System Requirements that are documented in the latest version of the *Regional Real-Time Transit Information System, System Requirements*. The test descriptions to conduct the acceptance testing are shown in Table 2, which will be used to evaluate the functions and operations of the Real-time System (**JMS only**), according to the system requirements.

It is the intent of the tests to verify the performance and data exchange of the system as it relates to the requirements. It is not the intent to validate the design or functionalities of the system. It is anticipated that the outcome of the testing will be either modifications to the requirements or the system achieving a passing score for each requirement that is met.

1.1. Test Process and Methodology

It is anticipated that prior to conducting the System Acceptance Testing, the 511 System software components will have undergone more detailed testing in a controlled environment by, i.e., integration testing, for the purpose of verifying that requirements are being met and quality software is being produced. After that initial set of testing, the acceptance testing described herein will be conducted.

1.2. Test Plan Objectives

The overall objective of this acceptance test is to allow the MTC to verify that the Real-time System will provide the functionality sufficient for the operational needs as defined in the system requirements. It should be understood that this testing will be to confirm that the actual interfaces and processing of the transit agency data is performed in accordance with the system requirements. It is not intended as a comprehensive test plan to confirm many of the existing backend functions of the 511 System as it relates to real-time transit. For the most part, this Acceptance Test Plan mainly tests performance and data exchanges between the 511 System and those transit agency systems utilizing the JMS interface.

The primary objectives of the testing activities are to:

- Confirm that the required data interfaces including any software and interfaces are provided in accordance with the requirements.
- Confirm that the System provides the ability for MTC and the transit operators the ability to exchange real-time transit predictions and static configuration data according to the system requirements.

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2. SYSTEM REQUIREMENTS

This section presents the system requirements for the System. These set of the requirements are based on the evaluation criteria developed for the selection of the architecture, discussions with MTC, the TAC and Telvent Farradyne (TF), and on the existing procedures and features of the existing real-time system. The set of requirements are grouped according to the following areas:

1. General (GEN)
2. Interface (INT)
3. Predictions (PRED)
4. Response times (TIME)
5. Configuration (CONF)
6. Logging (LOG)
7. Notifications (NOT)
8. Announcements (ANN)
9. Archiving (ARCH)
10. Security (SEC)
11. Expansion (EXPN)
12. System Backup (BACK)
13. Accuracy (ACC)
14. Regional Signs (REG)
15. Emergency (EMER)

General (GEN) - These are the requirements that relate to the system wide or high level issues.

Interface (INT) - These are the requirements that relate to the standardization of the exchange of data between the transit agencies and the 511 System.

Predictions (PRED) - These are the requirements that relate to the exchange of prediction data between the transit agencies and the 511 System. It also includes the performance metrics for the data exchange and response times between the transit agencies and 511 and internal processes within 511.

Response times (TIME) - These are the requirements that relate to the performance metrics for the 511 System and the 511 users for the real-time transit system.

Configuration (CONF) - These are the requirements that relate to the definition, exchange and processing of the static configuration data from the transit agencies.

Logging (LOG) - These are the requirements that relate to the logging of events.

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Notifications (NOT) - These are the requirements that relate to alarms and notifications for the operators to respond to.

Announcements (ANN) - These are the requirements that relate to the announcements to the 511 users under the alarm or notification scenarios.

Archiving (ARCH) - These are the requirements that relate to the archiving of data for the system.

Security (SEC) - These are the requirements that relate to network security and user access privileges.

Expansion (EXPN) - These are the requirements that relate to expansion of the system.

System Backup (BACK) - These are the requirements that relate to the backup of the system.

Accuracy (ACC) - These are the requirements that relate to the validation of the accuracy of the predictions.

Regional Signs (REG) - These are the requirements that relate to the regional real-time sign system. These requirements do not address the data sharing principles nor the physical requirements of the sign. Those are covered under separate documents.

Emergency (EMER) - These are the requirements that relate to the features for emergency information dissemination.

Table 2 below lists the requirements under each of the areas describe above.

3. APPROACH FOR ACCEPTANCE TESTING

The approach for the acceptance testing will be to use the existing testbed already setup by Telvent Farradyne (TF) in the Traveler Information Center (TIC) along with live data from existing transit agencies.

In order to conduct the acceptance testing, a loose approach will be utilized and will include the following activities for executing the testing.

A representative from SAIC and Kimley-Horn and Associates (KHA) will execute the tests over a period of several days, with the assistance of the 511 technical and operational staff. The scheduling of the testing will need to include a period to confirm the test readiness in the test environment (the testbed) and the final period for acceptance testing. It is anticipated that representatives from MTC will witness these tests and the test results.

3.1. Test Tools and Displays

Input: Both live and simulated (controlled input) data from the transit operators and the 511 System will be necessary, depending on the scenarios being tested. The live data will be fed to the test bed for processing and testing. Where necessary, subscriber application and publisher application tools can be utilized for the 511 System and for any simulated tests.

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Output: Some tests will be based on observing on-screen message activity and some tests will utilize output logs for more detailed data verifications. Therefore, logging will be necessary for the testing. When tests involve publishing data from the 511 System to the transit operator systems, the testbed will perform the publications through a JMS server and the transit operator systems will need to have logging enabled on their end in order to capture and analyze the data.

3.2. Testing Issue Identification and Resolution

During Acceptance Testing, all test successes, failures or other results will be reported to MTC and SAIC by the user who is conducting the tests. All tests reported as Failed, or appear to be operating differently than expected, will be verified by SAIC, compiled and reported for further review and correction as necessary. Table 1 below describes the different scenarios that could occur during acceptance testing.

Table 1 – Test Result Scenarios		
Test Result	Reason	Resolution
Pass	Software produced expected result.	Test successful and system satisfies the specific requirement.
Could not complete	Unknown or other factors prevented the completion of the test.	Problem to be explained in detail and a plan to resolve the issues to be developed including modifying the test and/or requirement, and then conduct a re-test.
Failed	Software did not produce the expected result or caused other failures or errors (e.g., system crash, unexpected error).	The problem is reported in detail and a plan developed to resolve the issue.
Accept as is	A complete verification of the requirement is not desired or cannot feasibly be attained. In this case and observation is acceptable.	As appropriate, report any concerns in detail and possibly modify the test and/or requirement.

Each requirement listed in Table 2 will be covered by one or more test setups described in Appendix B following Table 2 and are made up of several steps and includes a brief explanation of inputs and expected results.

During testing, the tester must note any problems or issues that occur in the comments section of each test form and the associated step number. If a test is executed successfully (passes), the tester must sign and date the script as shown below (the tester signature/Date fields are located at the end of each test script).

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For the initial testing:

<input type="checkbox"/>	Pass	<input type="checkbox"/>	Fail	Test ID: _____	Date: _____
<input type="checkbox"/>				Executed by: _____	Date: _____
MTC Observer Initials _____					
<input type="checkbox"/>	Could not complete	<input type="checkbox"/>	Accept as is		

Comments: _____

For any re-tests:

Retest					
<input type="checkbox"/>	Pass	<input type="checkbox"/>	Fail	Test ID: _____	Date: _____
<input type="checkbox"/>				Executed by: _____	Date: _____
MTC Observer Initials _____					
<input type="checkbox"/>	Could not complete	<input type="checkbox"/>	Accept as is		

Comments: _____

The designated tester will execute all testing in the presence of a SAIC Technical representative and an MTC representative. All test results will be reviewed on site by the SAIC Technical representative to ensure agreement with the result (pass or fail) of each test. Confirmed defects and any other issues reported by the client or observed on site, will be reported back to MTC and the SAIC Development leads. MTC, KHA or SAIC staff will have the opportunity to repeat any failed tests upon receipt of fixes to failed tests or clarification of a test script that was misinterpreted or incorrect.

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Upon mutual agreement between SAIC and MTC, test items may be deferred and/or test procedures or expected test results may be modified while conducting the acceptance test. The reason for any deferral and the terms for any modifications shall be documented by KHA and will become a part of the final test results.

4. ACCEPTANCE TEST SETUP

The setup of the acceptance testing will involve the use of the existing testbed. Any and all tests that involve the Real-time System will run through this test bed. For the acceptance testing, a data feed of prediction and configuration data will be required using the Test Client Application. This Test Client Application will provide the predictions to the Transit Data Interface, which is the link to the 511 Test bed Servers. It is anticipated that for certain tests, live data from an agency or agencies will be required. The live data is necessary for the performance tests that involve system and network latency measurements.

Agencies wishing to provide data to the Real-Time Transit system via JMS must adhere to the standards in the latest version of the document titled 'Extensible Markup Language (XML) Document Type Definitions (DTDs) for JMS Implementation.' This document contains specifications for providing prediction, configuration, and arrival status data.

The transit agency system will need to have logging enabled to generate logs for the following:

- Log of 511 requests and transit agency responses including date and timestamps;
- Log of sending arrived status data to 511;
- Log of prediction and configuration data for up to two weeks.

4.1. Responsibilities/Resources

The following individuals will be involved with the acceptance test effort at various times, as required.

Consultant Technical Advisor	Execute (or assist with) carrying out the acceptance testing with the test scripts.
Transit Agency Representative	Sets up the agency system for acceptance testing. Participates directly in the acceptance testing as the resource responsible for executing and observing the behaviors of the system. The "user" in this case will be the Consultant or other designated technical personnel assigned by the transit agency. This person should be familiar with the transit agency's systems that feed data to the 511 systems.
SAIC System/Network Engineer	Provides the test environment and equipment specified in this acceptance test plan. Set up related environment components; network, hardware, software and database configuration (including appropriate database population and simulator) in preparation for acceptance testing.

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SAIC Technical Representative	Monitor activities associated with the acceptance test. Document and maintain a list of discrepancies occurring on site as well as, during testing. Report Software Change Requests (SCRs) as necessary. Report confirmed discrepancies to SAIC development or system engineering staff.
SAIC Software Lead and Software Developers	Perform debugging and make coding changes as approved by the SCCB.
SAIC Project Manager	Monitor activities associated with the acceptance test.
Lead MTC Representative	Review and approve Acceptance Test Plan. As appropriate, witness test execution, and accept the system. Provide signatory for system acceptance (Final Acceptance Signature Sheet).

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APPENDIX A – ACCEPTANCE TEST EVALUATION MAPPING MATRIX

The following matrix contains an extract of the Regional Real-time Transit Information System Requirements for Transit Agency only functions. This matrix, which is in System Requirement Number order, decomposes (as necessary) many of the original requirement descriptions into testable or verifiable components in order to properly map to appropriate test scripts.

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Table 2. Acceptance Test Descriptions

The requirements listed in Table 1 below will be verified by review of system design documentation, observation, and or other reference material.

Note: All requirements that appear grayed-out are not considered by this Acceptance Test Plan as they are not applicable for JMS or are not able to be tested using formal test scripts;

<i>TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY</i>				
ID	Requirements	Allocation	Description	ATP Test Script
G-004	The system shall attain a reliability of 99.9% "up time" when predictions are being received by the 511 System from the transit agency systems (i.e., no more than 88 hours per year of downtime).	GEN	Need to track the hours that the system is unavailable for 511 users and for updating/transferring of prediction and/or configuration data. This data transfer should be tracked on an agency basis. Downtime is when the system is not available to 511 users for real-time predictions, i.e., the 511 system is unable to provide any predictions for any agency.	AccTst-001
I-001	Data exchange between the transit agency systems and 511 shall be performed using Java Messaging Service (JMS) unless the transit agency obtains MTC approval to use Web Services instead.	INT	The default data exchange mechanism will be JMS using a publish/subscribe model. The exception is to use bundling of predictions (see P-004)	N/A
I-002	If an agency uses JMS, MTC will provide the JMS client, which shall reside in an agency-owned workstation located on the agency's premises.	INT	The agency is still responsible for providing the prediction and configuration data to the JMS client.	By observation

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
I-003	If using JMS or web services, the JMS client or agency web server located at each transit agency’s facilities shall utilize an existing Internet connection at the transit agency’s facilities that is able to handle the transfer of prediction and configuration data to 511 for that agency.	INT	Should the existing Internet connection be deemed inadequate for the requirements set forth herein (i.e., due to data transmission latencies or bandwidth), a dedicated private wide area connection shall be used instead for the exchange of data between that specific transit agency’s real-time system and the 511 System.	AccTst-001 AccTst-002
I-004	With Java Messaging Service (JMS), all prediction data shall be exchanged using a publish/subscribe model. The data exchange for configuration and arrived status data shall use a request/reply model.	INT	Configuration data and arrived status data will be requested of each agency at most once per day. Thus, this data can be exchanged using a request/reply model.	AccTst-001
I-005	If a transit agency uses JMS, the system shall comply with the specifications as defined in the latest version of the JMS Document Type Definitions (DTD) (reference: Extensible Markup Language (XML) Document Type Definitions (DTDs) for Java Message Service (JMS) Implementation)	INT		AccTst-001 AccTst-002
I-006	If using web services, all data (predictions, configuration data, and arrived status) shall be exchanged using a request/reply model.	INT	This requirement is intended to keep the transfer of configuration data, which are larger data files, away from the peak periods of usage of the 511 System.	N/A

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
I-007	If an agency uses web services, the agency's system shall comply with the specifications defined in the latest version of the Extensible Markup Language (XML) Document Type Definitions (DTD) for Web Service Implementation.	INT		N/A
I-008	Agency shall synchronize its system time clock with a reliable internet time source, such as time.windows.com. The time source shall synchronize the system clock at a minimum rate of once per day.	INT	The internet time source time.windows.com is preferred as it is the source with which the 511 system is synchronized.	AccTst-001
P-003	With publish/subscribe, the transit agency systems shall publish any and all generated predictions to 511 within five (5) seconds of the predictions being generated.	PRED	This is intended to minimize the time from when a prediction is generated by the transit agency to when 511 updates the predictions.	AccTst-001
P-004	With publish/subscribe, bundling of predictions to send together will be allowed, if necessary, based on the transit agency's system. Predictions can be bundled and sent every thirty (30) seconds but not to exceed one minute.	PRED	There may be some cases where an agency will only be able to send a few predictions within a short time window. Thus, it may be more efficient to gather a few more predictions in longer time slices.	AccTst-001
P-005	With request/reply, the transit agency systems shall send any and all generated predictions within five (5) seconds of the receipt of a data request from the 511 System.	PRED	This is intended to minimize the time between a request by 511 and a reply by the agencies.	N/A

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
P-006	All generated predictions shall be published/sent to 511 whether or not the actual predictions have changed.	PRED	<p>The 511 System will perform the filtering of predictions when they are received by each agency.</p> <p>The 511 System takes the predictions and checks whether each prediction has changed. If a prediction has not changed, the time of update is changed based on the prediction timestamp. If a prediction has changed, the prediction and the time of update are both changed.</p> <p>511 views prediction updates on a route basis, not on a vehicle basis. Therefore, all predictions need to be sent so they stay in the same order in the data transfer file.</p>	AccTst-002
P-013	All predictions published or sent from a transit agency to 511 shall be compressed (zipped).	PRED	<p>The file(s) shall be zipped to minimize the size of the data to be transferred. The zipping of the files shall be the last action prior to the data transfer.</p>	AccTst-002
P-014	All prediction and configuration data that are published/sent from the transit agencies shall be delivered, received, processed, and made available to the 511 users by the 511 System in twenty (20) seconds or less; including all communications and processing time.	PRED	<p>This time for the data transfer shall account for the zipping of files.</p>	AccTst-001

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
C-001	<p>The process for the implementation of major updates to an agency’s configuration data shall conform to the following:</p> <ol style="list-style-type: none"> 1. The agency designates a single point of contact to coordinate with on any questions about proposed changes to the configuration data. 2. The agency contact will copy the MTC contact on the e-mails that are being sent back and forth between the agency and their real-time vendor (if applicable) when going through the process of the getting ready for signups. 3. The agency will notify the MTC contact when a test server (if applicable) is ready to be queried for updated configuration data transfer. 4. MTC will query a test server (if applicable) to transfer the configuration data and compare the new configuration data with the existing configuration data and identify any changes. If a test server is not available, then the agency shall send a file containing the configuration data to MTC. 5. The transit agency and/or its real-time vendor will address and fix any questions or issues with the configuration data and proposed changes that will have substantial impacts on the 511 system. These fixes shall be done in a timely manner – see C-002. 	CONF		N/A

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
C-002	The procedures called for under C-001 shall begin at least two weeks before a transit agency’s sign-up or software change goes live to the public to ensure that new configuration data is ready for implementation on 511 a minimum of 48 hours prior to the changes going live by the agency.	CONF	This requirement is intended to have the 511 System Integrators verify the data formats of the configuration data in advance so should there be a need to make any modifications, these modifications can be completed and ready to go prior to the agency’s changes going live.	N/A
C-003	When requested by the 511 System, the transit agency systems shall send the most current set of configuration data.	CONF		AccTst-001 AccTst-002
C-004	The format of the configuration data, including any use of patterns, shall comply with the specifications as defined in the latest versions of the: Extensible Markup Language (XML) Document Type Definitions (DTDs) for Java Message Service (JMS) Implementation and the Extensible Markup Language (XML) Document Type Definitions (DTD) for Web Service Implementation)	CONF	Two types of direction keys will be allowed, direction names or patterns. For those agencies that use patterns, they must also provide a mapping table to allow MTC to map from the pattern to a direction name that will be reported to the 511 users. The required mapping table format is referenced in the two documents referenced in requirement C-004.	AccTst-002
C-005	All stop names provided to 511 from transit agencies shall not contain any non-alphanumeric characters. Permitted characters are alphabets, numbers, and underlines. Symbols are not permitted, such as “&”.	CONF		AccTst-002

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
C-006	Arrived status data for designated stops from a transit agency shall be provided once per day to the 511 System.	CONF		AccTst-001
C-007	Transit agencies shall use their internal numeric stop IDs as the real-time transit system stop ID for all public stop locations. For those agencies that use non-numeric characters for stop IDs for public stop locations, they shall convert these non-numeric stop IDs to numerics only. In the event an agency uses non-numeric stop IDs for non-production stops (stops that are not used by the public), these can be sent to the 511 System.	CONF		AccTst-002
C-008	Transit agencies shall utilize the real-time transit system for all stop ID postings at transit stops, other public notifications (e.g., websites) or marketing efforts.	CONF		N/A
C-009	The 511 System shall perform quality control checks on the stop names and stop IDs provided by the transit agencies. The quality checks shall compare the existing and new set of stop names and stop IDs and identify any changes or differences. Any changes or differences shall be logged (see L-003).	CONF		N/A

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
C-011	<p>In the event that a transit agency provides the 511 System with duplicate stop IDs (same numeric value) for the same or different stop names, the 511 System shall flag these occurrences immediately during nightly configuration updates. MTC will work with the transit agency to resolve any such problems. The transit agency shall resolve the differences and provide the resolution to MTC at least 48 hours before a transit agency sign-up or within 48 hours if the configuration data is already live.</p>	CONF		N/A
C-012	<p>The transit agencies' configuration data shall be made available to the 511 System's testbed server prior to going live with the data for each sign-up. (see C-009)</p>	CONF	<p>This requirement will enable MTC to conduct tests on the new configuration data prior to going live.</p>	N/A
C-013	<p>The 511 System shall filter out all non-numeric stop IDs for non-production stops (stops not used by the public) and discard them.</p>	CONF		AccTst-002
C-015	<p>All stop IDs provided to 511 system shall be of two numerical digits or more.</p>	CONF		AccTst-002

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TABLE 2 – SYSTEM REQUIREMENTS AND TEST SCRIPT TRACEABILITY

ID	Requirements	Allocation	Description	ATP Test Script
L-006	Transit agencies shall provide the capability to log the configuration, prediction, and arrived status data requests received from, and sent to the 511 System. Each log file entry shall be time stamped containing the date, hour, minute and seconds (optionally fractions of a second). Due to log file size concerns, agencies shall only be required to log requests and responses on an as-needed basis.	LOG		AccTst-001 AccTst-002
Se-001	The system shall exchange data over secure network connections between the transit agencies and the 511 System.	SEC	If an Internet connection is utilized, a secure connection such as a virtual private network shall be used. Also the connections should be routed through agency firewalls and DMZs as deemed necessary by the agency for data security purposes.	N/A
E-002	The system shall be designed such that the system can be expanded to include the collection of data for continuous real-time reporting of transit vehicle position.	EXPN	This requirement will potentially include AVL data for transit vehicle tracking.	AccTst-002

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APPENDIX B – ACCEPTANCE TEST SCRIPTS

This section includes all the “Test Scripts” referenced from Appendix A and the traceability matrices.

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Test Script #: Acc-Tst 001

Test Title: Verify The 99.9% Up-Time Requirement for 511 System and Transit Agency's System When Receiving and Distributing Prediction Data

Description: This test procedure verifies that the 511 System and Transit Agency's System were both operational and that the Transit Agency successfully provided prediction data to the 511 System, as expected for a two week period. (Req. ID: G-004, I-003, I-004, I-005, I-008, C-003, C-006, L-006, P-003, P-004, P-014)

Step#	Procedure	Expected Result
1.	Verify that the 511 System is fully operational and that logging is activated and set to the DEBUG level for the voice interface server.	The 511 System is fully operational.
2.	Compare the times displayed by the 511 system clock and the transit agency system time clock.	Times on transit agency system clock and 511 system clock are within 30 seconds of each other. If this fails, testing shall stop and agency must ensure that it meets Requirement I-008. Also, testers will determine if the two system clocks provide slightly different times and if so, will use the difference to help calculate whether the data transfer was within the required timeframe.
3.	Verify that the transit agency's system is fully operational and note the current time to indicate the start of the test.	The transit agency's system is fully operational and the current start time is noted.
4.	Initiate a request for configuration and prediction data from the 511 system.	The request for configuration and prediction data is initiated from the 511 system.
5.	Verify that the transit agency received the request for configuration data and provides its configuration data to the 511 system	The transit agency's system provides configuration data to the 511 system.
6.	Initiate a request for arrived status data from the 511 system.	The request for arrived status data is initiated from the 511 system.
7.	Verify that the transit agency received the request for arrived status data and provides its arrived status data to the 511 system	The transit agency's system provides arrived status data to the 511 system.
8.	Observe that the transit agency is generating prediction data and providing it to the 511 system	The transit agency's system is generating prediction data and the prediction data is being distributed to the 511 system.
9.	Observe that the transit agency is continuously generating prediction	The transit agency's system is generating prediction data and providing it to the 511

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Step#	Procedure	Expected Result
	data and providing its data to the 511 system at a regular interval.	system at a regular interval of no more than 60 seconds and no less than 30 seconds.
10.	Observe that the 511 system is receiving prediction data from the specific transit agency being monitored.	The 511 system is receiving prediction data from the specific transit agency being monitored.
11.	Verify that the transit agency is providing prediction data to the 511 system within 5 seconds of the request	The transit agency's system is providing prediction data to the 511 system within 5 seconds
12.	Wait the two week interval.	The elapse time expires.
13.	Review the system logs for both the 511 system and transit agency to make sure no application failures or unexpected interruption occurred during the monitoring period.	No application failures or unexpected interruptions were recorded.
14.	Review the system logs for the 511 system to verify that prediction data was received and processed at the proper interval, as expected.	The log indicates that prediction data was received and processed at the proper interval as expected.
15.	Review the system logs for the transit agency voice interface server to verify that the 511 system acknowledge receipt of the prediction data within 20 seconds of when it was initially generated.	The log indicates that the 511 system acknowledged receipt of received the prediction data within 20 seconds.
16.	Review the system of the transit agency to verify that Arrived Status Data was distributed to the 511 system once per day.	The log indicates that Arrived Status Data was distributed to the 511 system once per day during the monitoring period.
17.	End test	

Comments: _____

REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE
ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	Executed by: _____	Date: _____
		MTC Observer Initials _____	Date: _____
<input type="checkbox"/> Could not complete	<input type="checkbox"/> Accept as is		

Retest Comments: _____

Retest		Executed	
<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	by: _____	Date: _____
		MTC Observer Initials _____	Date: _____
<input type="checkbox"/> Could not complete	<input type="checkbox"/> Accept as is		

REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE

ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

Test Script #: Acc-Tst 002

Test Title: Verify Transit Agencies Data Sent to the 511 System

Description: This test procedure verifies configuration, prediction and Arrived Status data generated by a transit agency's system and distributed to the 511 System. (Req. ID: I-003, I-005, P-006, P-013, C-003, C-004, C-005, C-007, C-013, C-015, L-006)

Step#	Procedure	Expected Result
1.	Verify that the 511 System is fully operational.	The 511 System is fully operational.
2.	Verify that the transit agency's system is fully operational.	The transit agency's system is fully operational.
3.	Initiate a request for configuration data from the 511 system.	The request for configuration data is initiated from the 511 system.
4.	Verify that the transit agency received the request for configuration data and provides its configuration data to the 511 system	The transit agency's system provides configuration data to the 511 system.
5.	Verify that the configuration data contains unique numeric stop IDs with minimum two digits for all public stops that are specific to the transit agency being monitored.	The configuration data contains unique numeric stop IDs that are specific to the transit agency being monitored. It is noted that if any stop IDs contain non-numeric character, they will be ignored by the 511 System
6.	Compare the existing stop IDs with the stop IDs received in the update, identify and log all changes and/or differences.	Stop IDs are compared with the existing stop IDs and the changes and/or differences identified and logged. No non-numeric stop IDs will be in the output log files
7.	Verify that the configuration data does not contain stop names that have non-alpha-numeric characters other than "-", which is allowed.	The configuration data does not contain any disallowed non-alphanumeric characters.
8.	Compare the existing stop names with the stop names received in the update, identify and log all changes and/or differences.	Stop names are compared with the existing stop names and the changes and/or differences identified and logged.
9.	Verify that all stop names for a route and direction are unique and have a unique associated stop ID	All stop names for a route and direction are unique and have a unique associated stop ID.
10.	Observe that the transit agency is generating prediction data and providing it to the 511 system	The transit agency's system is generating prediction data and the prediction data is being distributed to the 511 system.
11.	Observe that the 511 system is receiving prediction data from the specific transit agency being monitored.	The 511 system is receiving prediction data from the specific transit agency being monitored.

REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE
ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

Step#	Procedure	Expected Result
12.	Verify that the format of the files provided by the transit agency system is in conformance with the latest version of the JMS document (reference: Extensible Markup Language (XML) Document Type Definitions (DTD) for JMS Implementation).	The transit agency system's input files are in compliance.
13.	Verify that the content of the prediction data contains data collected for up to the next four predictions based on route/direction/stop combination.	The prediction data content contains no more than 4 predictions based on route/direction/stop combination.
14.	Verify that the predictions are not greater than 90 minutes from the time initially generated.	The predictions are not greater than 90 minutes.
15.	Verify that the content of the prediction data contains data collected for tripID and vehicle location (Latitude and Longitude) information for that prediction time.	The prediction data content contains tripID and Vehicle Latitude and Longitude whenever data is available.
16.	End test	

Comments: _____

<input type="checkbox"/>	Pass	<input type="checkbox"/>	Fail	Executed by: _____	Date: _____
				MTC Observer Initials _____	Date: _____
<input type="checkbox"/>	Could not complete	<input type="checkbox"/>	Accept as is		

Retest Comments: _____

REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE
ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

Retest	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	Executed	Date: _____
			by: _____	
			MTC Observer Initials _____	Date: _____
<input type="checkbox"/> Could not complete	<input type="checkbox"/> Accept as is			

REGIONAL REAL-TIME TRANSIT AGENCY INTERFACE ACCEPTANCE TEST PLAN (JMS) – VERSION 1.3

APPENDIX C – FINAL ACCEPTANCE SIGNATURE SHEET

Confirm that the Regional Real-Time Information System, Transit Agency Interface functionality, as designed, meets the operation needs of the Regional Real-Time Transit Information System and 511 Enhanced Data Dissemination system specified by the 511 Project and complies with the system requirements as described in *Appendix A – Acceptance Test Evaluation Mapping Matrix* section of this Acceptance Test Plan.

▶ Yes ▶ No

Comments: _____

The following signatures indicate acceptance of the Regional Real-Time Information System, Transit Agency Interface (final delivery) that was developed for the MTC.

MTC Representative

Date

SAIC

Date