



511 SF BAY  
TRANSIT DATA MANAGER  
(TDM)

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**Draft High Level System Requirements**

Version 1.0

May 22, 2015

## Document History

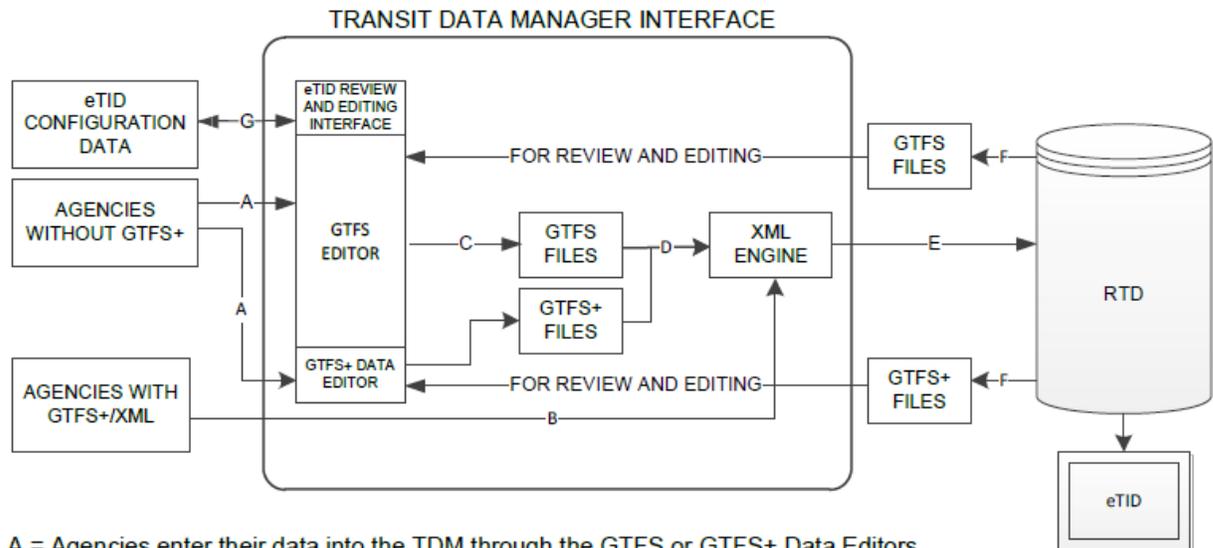
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## 1. System Definition

The following diagram shows the proposed data flows for Next Generation 511 Transit Data Manager (TDM).



A = Agencies enter their data into the TDM through the GTFS or GTFS+ Data Editors .

B = Agency data that is already in GTFS format is uploaded directly to XML engine .

C = GTFS or GTFS+ Data Editors convert files into GTFS or GTFS+ files .

D = The GTFS or GTFS+ files are processed through the XML engine .

E = The XML Engine exports the data to the RTD .

F = The RTD provides agency data back to the GTFS or GTFS+ Data Editors in the TDM for review and editing .

G = Agency can configure a hub sign. Request can be made for a message to be placed on a regional hub sign .

The XML Engine is a software tool that is able to read data in 511 Transit specific XML and GTFS+ formats, load into RTD compatible database, and write transit data in 511 Transit XML format from an RTD compatible database. Special modules of XML Engine are also maintained with select transit agencies in order to convert their special data formats into 511 Transit XML files.

## 2. System Requirements

This section presents the system requirements for the TDM, hereinafter referred to as "TDM" or "The System". These set of requirements are high-level requirements for the Transit Data Manager and associated subsystems. They are meant to guide the development of the TDM; they are not meant to be a comprehensive design document. These requirements will be updated and refined as the design process continues. The set of requirements are grouped according to the following areas.

### 1. General (GEN)

These are the requirements that relate to the system wide or high level issues.

### 2. Interface (INT)

These are the requirements that relate to the standardization of the exchange of data between the transit agencies and the 511 System.

### 3. Transit Data Manager (TDM)

These are the requirements specific to the TDM.

### 4. Electronic Transit Information Display (eTID)

These are the requirements specific to the eTID.

The System will be built using open source software and tools. Where possible, the TDM user interfaces and layouts will borrow design concepts/elements from the existing TRAMS and Transit Tracker interfaces.

<b>Table 1 – High Level Requirements</b>		
<b>ID</b>	<b>Requirement</b>	<b>Category</b>
1.0	The System shall be based on an open architecture including standardized interface definitions and communications protocols.	General
1.1	The System shall not need any special or proprietary algorithms for the exchange, interpretation and dissemination of prediction and configuration data at the interface points.	General
1.2	The System shall be developed using open source code.	General
1.3	The System shall use open source tools that can be adopted.	General
1.4	The System shall be able to operate unattended 24 hours a day, seven days a week.	General
1.5	The System shall attain a reliability of 99.9% "up time" (i.e., no more than 8.8 hours per year of unplanned downtime). Planned System maintenance downtimes should be communicated to MTC well in advance and should be done during MTC approved hours.	General
1.6	The System shall include provisions for adding in levels of redundancy including server and database failover methods and processes.	General
1.7	The System shall have data archiving capabilities.	General
1.8	Nightly backups of the data and files processed through TDM shall be performed. The nightly backups shall be done for all logs, errors and notifications for each night and kept for 90 calendar days at a minimum.	General
1.9	The System shall exchange data over the Internet between the transit agencies and the 511 System.	General
2.0	The System shall be deployed to the Amazon Cloud and will use AWS to simplify development and maintenance	Interface
2.1	TDM data maintenance and dissemination applications (import/export) will be using open source platform.	Interface

<b>Table 1 – High Level Requirements</b>		
<b>ID</b>	<b>Requirement</b>	<b>Category</b>
2.2	The TDM shall provide interface to eTID configuration data and GTFS+.	Interface
3.0	TDM shall only accept and export and complete GTFS/GTFS+ files sets. Partial GTFS/GTFS+ file sets will not be allowed.	TDM
3.1	TDM shall accept Excel files in a pre-defined standard format as determined by MTC and the transit agencies.	TDM
3.2	TDM shall generate GTFS and GTFS+ files for each agency that has data in the TDM.	TDM
3.3	The agencies shall be able to export their own data to either a single excel file in the pre-defined standard format and/or GTFS/GTFS+ files. The GTFS and GTFS+ shall be exported as different file sets.	TDM
3.4	If the agencies choose to export data to GTFS files, the agencies have the option to download GTFS with or without GTFS+ files.	TDM
3.5	TDM shall have a user interface for the agencies to enter, manipulate, download, upload and perform various editing functions with their own data.	TDM
3.6	TDM shall have an interface with the RTD to receive GTFS and GTFS+ files.	TDM
3.7	The TDM interface shall have an editor for agency review and editing.	TDM
3.8	TDM shall reuse the WebDMS algorithms where possible.	TDM
3.9	TDM will provide following data loading features: <ul style="list-style-type: none"> <li>a. From GTFS+ dataset on user's computer</li> <li>b. Automatically fetch GTFS+ from an agency server location</li> </ul>	TDM

<b>Table 1 – High Level Requirements</b>		
<b>ID</b>	<b>Requirement</b>	<b>Category</b>
3.10	TDM will provide system and user management functionalities (add/remove agency, user account, etc.)	TDM
3.11	The TDM shall associate user-selected information to a specified eTID and save it to the RTD.	TDM
3.12	The TDM shall have multiple levels of accounts with administrator configured security privileges.	TDM
3.13	The overall system administrator (MTC/MTC Contractor) shall assign agency administrator privileges.	TDM
3.14	The TDM shall have multiple agency user privileges. The agency administrator shall assign user privileges within the agency for editing and/or reviewing data.	TDM
3.15	The TDM shall generate reports per agency. The reports will show user log in, date and timestamp, changes that occurred, and any errors reported.	TDM
3.16	The TDM shall create alerts and reports based on agency system administrator configured parameters last date of agency login and data upload.	TDM
3.17	The TDM system shall continuously and automatically monitor and log all error notifications that are published to the MTC system administrator.	TDM
3.18	All logs of error notifications shall be kept for a minimum of 31 calendar days.	TDM
3.19	All logged events shall include date and timestamps.	TDM
3.20	The TDM system shall generate a notification and log the event automatically when a change in a transit agency's configuration data is identified.	TDM
3.21	The TDM system shall send an e-mail to the MTC system administrator and log the events within five (5) seconds upon identification of an error in messages or communications.	TDM

<b>Table 1 – High Level Requirements</b>		
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4.0	Any special data needed for eTID (to be determined) shall be maintained in the RTD.	eTID
4.1	eTID content management functionality shall allow users to add/delete routes/stops combinations, order them, change stop/station name shown for eTIDs that user is authorized to modify.	eTID
4.2	eTID shall reuse the Transit Tracker logic where possible.	eTID
4.3	The agencies shall be able to link an RSS feed for service alerts to the eTID	eTID
4.4	eTID shall allow manual or automated acceptance of RSS feed messages.	eTID
4.5	The System shall provide a mechanism for an agency to request to post an eTID regional or sub-regional message.	eTID
4.6	eTID regional and sub-regional messages shall be submitted to MTC for approval. Once approved the message will be published.	eTID
4.7	eTID content management functionality shall allow users to publish route and agency level messages to the eTIDs that a user is authorized to modify.	eTID
4.8	eTID content management system shall allow authorized users to specify eTID installations to be monitored (configuration ID and sign ID).	eTID
4.9	eTID shall send notifications via email to designated recipients as assigned by the agency system administrator.	eTID
4.10	eTID content management system shall provide the agencies with the capability to enter multiple email addresses to receive notifications.	eTID

<b>Table 1 – High Level Requirements</b>		
<b>ID</b>	<b>Requirement</b>	<b>Category</b>
4.11	The eTID notifications shall be able to be configured such that each user can be assigned to receive notifications from one or multiple eTIDs.	eTID
4.12	The interval for receiving eTID notifications (time between notifications) shall be configurable.	eTID
4.13	eTID shall perform monitoring services and send a notification in cases when an eTID installation does not request data for more than pre-defined time period.	eTID
4.14	eTID monitoring service will be updated to pick up data changes affecting each eTID dynamically.	eTID
4.15	The eTID shall save configuration data to the RTD.	eTID