511 Driving Times Data Services

API Reference

Version 4.0

March 2012

METROPOLITAN
TRANSPORTATION
COMMISSION

Table of Contents

Section 1: Introduction

Purpose

This document outlines the design and usage of the 511 Driving Times^{SM} Data Services Application Programming Interface (API). This document contains the following sections:

- **Introduction** – an overview of this document including background about the 511 service, overview of the API, a description of the intended audience, and contact information.

- **Technical Overview** – a high-level discussion of the technical implementation of the API.

- **Service Definitions** – a detailed list of the service definitions for the Driving Times API.

- **Usage Scenario** – a simple scenario-based example of how to implement and use the API.

- **Appendix** - **API Errors** – a list of errors that can be incurred upon execution of any of the services.

511 Background

511 is the San Francisco Bay Area's free traveler information service available on the phone by calling 511 and on the web at 511.org. The 511 service provides travelers with easy access to current and accurate traffic, transit, rideshare, and bicycling information. The Metropolitan Transportation Commission (MTC) operates the 511 service in partnership with the California Department of Transportation (Caltrans) District 4, the California Highway Patrol Golden Gate Division (CHP), and Bay Area transit agencies. MTC contracts with a third-party contractor ("511 Contractor") to provide the 511 service.

511 Driving Times API Overview

The 511 Driving Times API is one of several different data feeds MTC makes available free-of-charge to the general public, media, public agencies, and commercial vendors to the extent feasible within the available funding. The 511 Contractor gathers and integrates information from a variety of sources, including (1) real-time data on traffic conditions (travel time data) on the region's freeway system as collected by sensors operated by Caltrans and MTC; (2) CHP incident reports; and (3) other available sources of information. This API provides access to 511's real-time traffic data for application development. The API allows developers to create applications and tools that provide 511 Driving Times information (including trip path and incidents along the route) based on a user-selected origin and destination.

Audience

This document is intended for developers wishing to utilize the 511 Driving Times API from within their web sites and applications. It is assumed that the reader has a firm grasp of their development tools and technologies and has had some experience with web service technologies including XML. Additionally, some familiarity with security and encryption technologies may be helpful.

Contact Information

For questions concerning the 511 Driving Times API or if you create an app or tool from this data and want to showcase it on 511.org, please e-mail: developerresources@511.org.

Section 2: Technical Overview

The 511 Driving Times Data Services are a collection of individual services, each providing a specific capability related to traveler information inquiry within the 511 system. Each service is implemented using simple web pages that accept query string parameters and return plain XML documents (referred to hereafter as "POX" for "Plain Old XML").

A valid security token identifier is required to make requests to these services and must be supplied with each request. Section 3 provides a detailed overview on how to access these services. The token can be obtained at http://511.org/developer-resources_api-security-token.asp.

The services address common needs within the 511 system associated with traffic trip data management. The following table lists the service catalog items along with relevant information for each service:

Table 1 - List of 511 Driving Times Data Services

Service Name	Category	EndPoint	Description
GetOriginList	Traffic	services.my511.org/traffic/ getoriginlist.aspx	Retrieves a list of driving trip origins.
GetDestinationList	Traffic	services.my511.org/traffic/ getdestinationlist.aspx	Retrieves a list of driving trip destinations based on an origin.
GetPathList	Traffic	services.my511.org/traffic/ getpathlist.aspx	Retrieves a list of driving trip paths based on an origin/destination pair. It includes expected travel times and incidents for each path.

Section 3: Service Definitions – Driving Times

Service Name: GetOriginList

Comments & Usage:

GetOriginList returns the list of driving trip origins.

To return the origin list, go to the service URL, using a currently valid security token as the token parameter. XML will be returned as noted in the example below, providing the origins listing.

Service URL:

http://services.my511.org/traffic/getoriginlist.aspx

Schema Location:

http://services.my511.org/schemas/getoriginlist.xsd

Query Parameters:

- token – the valid security token used for making service calls

Example Usage:

http://services.my511.org/traffic/getoriginlist.aspx?token=123-456-789

Returns:

List of driving trip origins

Example XML Returned:

```xml
<?xml version="1.0"?>
<origins cachestamp="2009-08-23T04:25:46.686-07:00">
      <origin>
            <city>Alameda</city>
            <mainRoad>29TH AVE</mainRoad>
            <crossRoad>I-880</crossRoad>
            <node>1265</node>
      </origin>
      <origin>
            <city>Alamo</city>
            <mainRoad>I-680</mainRoad>
            <crossRoad>STONE VALLEY RD</crossRoad>
            <node>1162</node>
      </origin>
      <origin>
            <city>Alamo</city>
            <mainRoad>I-680 N</mainRoad>
            <crossRoad>STONE VALLEY RD</crossRoad>
            <node>1162</node>
      </origin>
      <origin>
            <city>Alamo</city>
            <mainRoad>I-680 S</mainRoad>
            <crossRoad>STONE VALLEY RD</crossRoad>
            <node>1162</node>
      </origin>
```

```xml
<origin>
        <city>Albany</city>
        <mainRoad>BUCHANAN ST</mainRoad>
        <crossRoad>I-80</crossRoad>
        <node>168</node>
</origin>
<origin>
        <city>Albany</city>
        <mainRoad>I-580 E</mainRoad>
        <crossRoad>Golden Gate Fields</crossRoad>
        <node>168</node>
</origin>
.
.
.
</origins>
```

Exceptions & Errors:
- Invalid credentials passed in with service URL (see Appendix 1 for errors)

Service Name: GetDestinationList

Comments & Usage:
GetDestinationList returns the list of driving trip destinations based on a provided origin.

To return the destination list, go to the service URL, using a currently valid security token and the origin node derived from the GetOriginList service as the token parameters. XML will be returned as noted in the example below, providing the destinations listing for the origin provided.

Service URL:
http://services.my511.org/traffic/getdestinationlist.aspx

Schema Location:
http://services.my511.org/schemas/getdestinationlist.xsd

Query Parameters:
- token – the valid security token used for making service calls
- o – origin node provided by GetOriginList. Valid parameter values are available through the GetOriginList service.

Example Usage:
http://services.my511.org/traffic/getdestinationlist.aspx?token=123-456-789&o=1265

Returns:
List of driving trip destinations

Example XML Returned:
```xml
<?xml version="1.0"?>
<destinations originNode="1265" timestamp="2009-08-23T04:29:00.813-07:00">
        <destination>
                <city>Alamo</city>
                <mainRoad>I-680</mainRoad>
                <crossRoad>STONE VALLEY RD</crossRoad>
                <node>1162</node>
        </destination>
```

```xml
        <destination>
                <city>Alamo</city>
                <mainRoad>I-680 N</mainRoad>
                <crossRoad>STONE VALLEY RD</crossRoad>
                <node>1162</node>
        </destination>
        <destination>
                <city>Alamo</city>
                <mainRoad>I-680 S</mainRoad>
                <crossRoad>STONE VALLEY RD</crossRoad>
                <node>1162</node>
        </destination>
        <destination>
                <city>Albany</city>
                <mainRoad>BUCHANAN ST</mainRoad>
                <crossRoad>I-80</crossRoad>
                <node>168</node>
        </destination>
</destinations>
```

Exceptions & Errors:
- Invalid credentials passed in with service URL (see Appendix 1 for errors)
- Invalid origin node passed in with service URL (see Appendix 1 for errors)

Service Name: GetPathList

Comments & Usage:

GetPathList returns the list of possible driving trip paths between an origin and destination, including incident and expected travel times.

To return the path list, go to the service URL, using a currently valid security token, the origin node derived from the GetOriginList service and the destination node derived from the GetDestinationList service as the token parameters. XML will be returned as noted in the example below, providing the paths listing for the origin and destination provided.

The incident information shown below is for example purposes only and may not match links on the given origin and destination pair.

Service URL:

http://services.my511.org/traffic/getpathlist.aspx

Schema Location:

http://services.my511.org/schemas/getpathlist.xsd

Query Parameters:
- token – the valid security token used for making service calls
- o – origin node provided by GetOriginList. Valid parameter values are available through the GetOriginList service.
- d – destination node provided by GetDestinationList. Valid parameter values are available through the GetDestinationList service.

Example Usage:

http://services.my511.org/traffic/getpathlist.aspx?token=123-456-789&o=1162&d=1265

Returns:

List of driving trip paths, including estimated travel time and incidents for each path.

Example XML Returned:

```xml
<?xml version="1.0"?>
<paths>
        <path>
        <currentTravelTime>21</currentTravelTime>
        <typicalTravelTime>21</typicalTravelTime>
        <miles>22.4</miles>
        <segments>
                <segment>
                  <road>I-680 N</road>
                </segment>
                <segment>
                  <road>I-680 N-CA-24 W Ramp</road>
                </segment>
                <segment>
                  <road>CA-24 W</road>
                </segment>
                <segment>
                  <road>I-980 W</road>
                </segment>
        </segments>
        <incidents>
                <incident>
                Overturned vehicle &amp; Accident on I-680 N Northbound after Montague
Expy (Milpitas) Right shoulder blocked Expect delays
                </incident>
                <incident>
                High winds on I-580 E Eastbound on Richmond San Rafael Bridge (Richmond)
All lanes Affected Traffic Advisory in effect
                </incident>
        </incidents>
        </path>
        .
        .
        .
     </paths>
```

Exceptions & Errors:

- Invalid credentials passed in with service URL (see Appendix 1 for errors)
- Invalid origin node (see Appendix 1 for errors)
- Invalid destination node (see Appendix 1 for errors)
- No origin or destination node passed (see Appendix 1 for errors)

Section 4: Usage Scenario

This section provides a usage scenario for retrieving driving times data with the services. This scenario is not intended to provide guidance on application development topics such as programming language selection or application logic. Instead, it is intended to present the service ordering which is required to achieve the desired end data result.

Driving Times Scenario

1. Retrieve the driving trip origin list using the GetOriginList service, passing in your valid security token as the "token" parameter.

2. Present the resulting cities, main roads, and cross roads to the user.

3. Retrieve the "node" ID for the user-selected origin city/main road/cross road combination (e.g. node ID 168 for Albany / I-80 W / Golden Gate Fields).

4. Retrieve the driving trip destination list using the GetDestinationList service, passing in your valid security token as the "token" parameter and the "node" ID from step 3 as the "o" parameter.

5. Present the resulting cities, main roads, and cross roads to the user.

6. Retrieve the "node" ID for the user-selected origin city/main road/cross road combination (e.g. node ID 1265 for Alameda / 29th AVE / I-880).

7. Retrieve the driving time information for the given path(s) using the GetPathList service, passing in your valid security token as the "token" parameter, the "node" ID from step 3 as the "o" parameter and the "node" ID from step 6 as the "d" parameter.

8. Present the path information (including driving times and incidents) to the user in a suitable format.

Appendix 1 – API Errors

Below are the possible errors that can be incurred upon execution of any of the services described above.

Invalid credentials passed in with service URL:

```
<trafficServiceError>
Invalid credentials. :::    at Traffic_GetDestinationList.Page_Load(Object sender,
EventArgs e) in d:\WebSites\my511services\Traffic\GetDestinationList.aspx.cs:line 21
</trafficServiceError>
```

Invalid origin node passed

```
XML Parsing Error: not well-formed
Location: http://services.my511.org/traffic/getdestinationlist.aspx?token=123-456-
789&o=1162sf
Line Number 1, Column 188:<?xml version="1.0" encoding="UTF-
8"?><trafficServiceError>Input string was not in a correct format. :::    at
System.Number.StringToNumber(String str, NumberStyles options, NumberBuffer& number,
NumberFormatInfo info, Boolean parseDecimal)
--------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------
------------^
```

Invalid destination node passed

```
XML Parsing Error: not well-formed

Location: http://services.my511.org/traffic/getpathlist.aspx?token=123-456-
789&o=1162&d=12sdfsd

Line Number 1, Column 150:<trafficServiceError>Input string was not in a correct format.
:::    at System.Number.StringToNumber(String str, NumberStyles options, NumberBuffer&
number, NumberFormatInfo info, Boolean parseDecimal)
-------------------------------------------------------------------------------------
-------------------------------------------------------------^
```

No origin or destination node passed

```
XML Parsing Error: not well-formed

Location: http://services.my511.org/traffic/getpathlist.aspx?token=123-456-789

Line Number 2, Column 110:Parameter name: String :::    at
System.Number.StringToNumber(String str, NumberStyles options, NumberBuffer& number,
NumberFormatInfo info, Boolean parseDecimal)
------------------------------------------------------------------------------------
--------------------^
```