

Realtime Flow Feed Specification

Version 2.0.6



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1 Introduction

The purpose of this document is to provide a detailed specification for the Nationwide Flow TrafficML Realtime Flow data feed. The underlying format of this feed utilizes industry standards, including the eXtensible Markup Language (XML) and Hyper-Text Transfer Protocol (HTTP).

1.1 Audience

The intended audience for this document is:

- Software Developers who wish to access this feed for integration into their application.
- Technical Managers who wish to evaluate this specification for incorporating their application.
- Traffic specialists who wish to evaluate this specification.

1.2 Conventions

Bold– Element

[Bold with brackets] – Element Attribute

Normal – Description of the Text Element field

(Normal) – Text field example values

2 Summary of Changes

This feed supplies the realtime flow data on a per table basis, as opposed to the previous version based on metros. It gives current and freeflow data; it does not give any predictions. This version is an HTTP flow feed. Specific changes including moving the country code and table id fields into the root object, since they should be universal to all elements in this feed and removing the location id which can be parsed as the last 5 characters of the individual road id (TMC Code).

3 Specification

3.1 Overview

The general structure of this TrafficML feed contains the root element, **TrafficML_Realtime**, which contains 0 or 1 instance of **Roadway_Flow_Items**. **Roadway_Flow_Items** contains 1 to many instances of **Roadway_Flow_Item**.

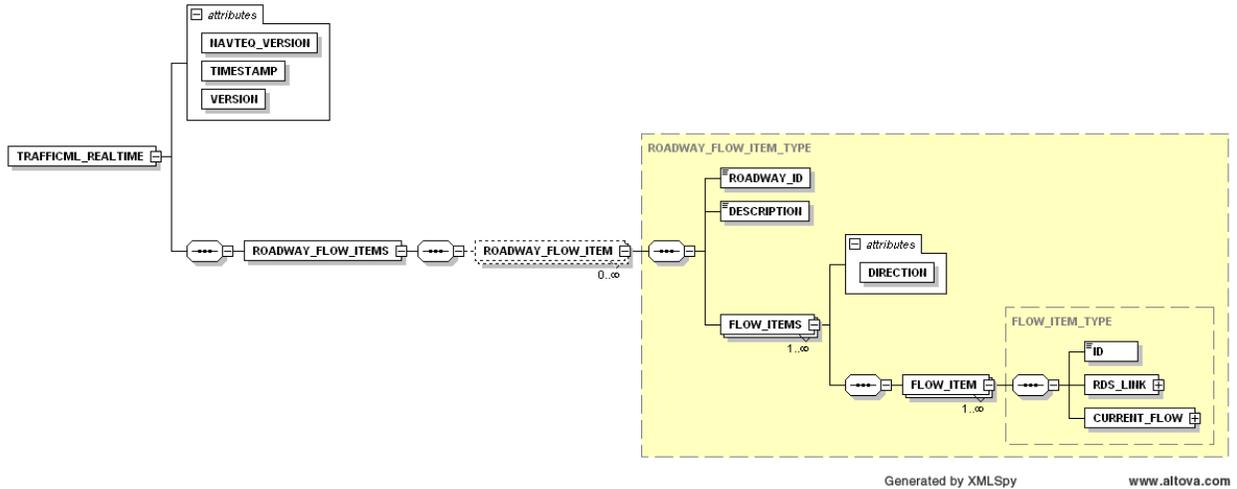
This overall structure is as follows

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<TRAFFICML_REALTIME xmlns="trafficml50_realtime" VERSION="5.0"
TIMESTAMP="03/26/2009 18:20:15 GMT" NAVTEQ_VERSION="200803">
  <ROADWAY_FLOW_ITEMS>
    <ROADWAY_FLOW_ITEM>
```

```

...
</ROADWAY_FLOW_ITEM>
<ROADWAY_FLOW_ITEM>
...
</ROADWAY_FLOW_ITEM>
...
</ROADWAY_FLOW_ITEMS>
</TRAFFICML_REALTIME>

```



3.2 TRAFFICML_REALTIME

This is the root element of the feed.

Item Name	Type	Req	Description
[TIMESTAMP]	String	Yes	The timestamp of the feeds creation. Format: (MM/DD/YYYY hh:mm:ss zzz). This timestamp will always be in GMT
[VERSION]	String	Yes	This is the version of the feed. It directly correlates to the version of the spec used to define the feed.
[NAVTEQ_VERSION]	String	Yes	This is the version of the feed for Navteq. Format: (YYYY/MM).
ROADWAY_FLOW_ITEMS/ROADWAY_FLOW_ITEM	Complex	No	This is the section where all flow items are located. See section 3.3 for details.

3.3 ROADWAY_FLOW_ITEM

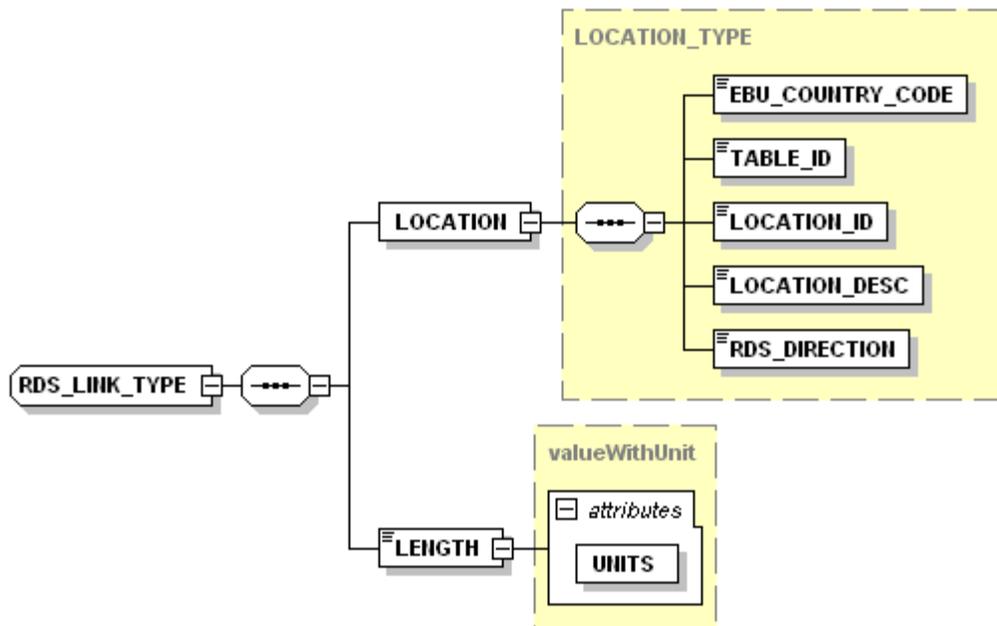
This is the composite item for flow across an entire roadway. There would exist one roadway item for each roadway with traffic flow information available.

Item Name	Type	Req	Description
ROADWAY_ID	String	Yes	Unique identifier for this Linear
DESCRIPTION	String	Yes	Roadway description (I-76)
FLOW_ITEMS	Complex	Yes	List of flow items, one list for each direction of

FLOW_ITEMS/[DIRECTION]	String	Yes	the roadway (1-many) This represents the travel direction of traffic in positive or negative notation based on the TMC Location Tables (+, -). If the direction of travel is Eastbound, the queuing direction will be Westbound. (+, -)
FLOW_ITEMS/FLOW_ITEM	Complex	Yes	Entry for each Flow item in the specified direction. See Section 3.3.1

3.3.1 FLOW_ITEM

This is the main item that incorporates flow information for a single location from real-time traffic services. It describes all of the current flow information in terms of travel times and speeds for a metropolitan area based on NAVTEQ location codes. This section includes the current, real-time flow as well as freeflow data.



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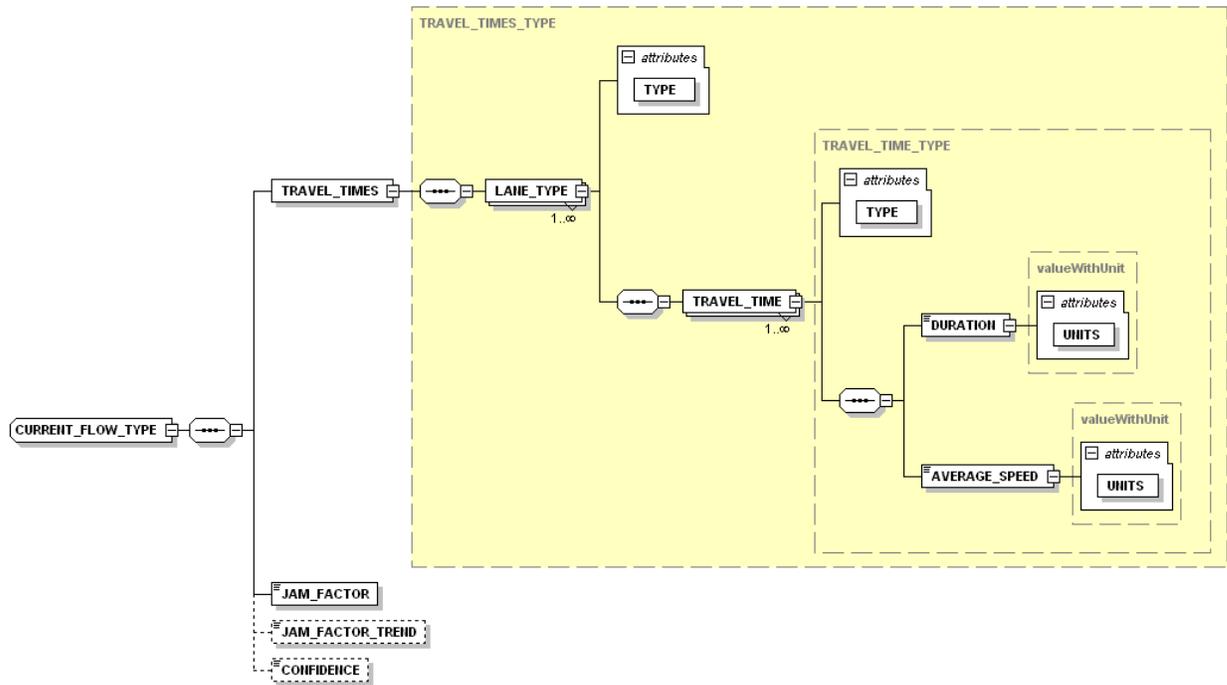
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Item Name	Type	Req	Description
ID	String	Yes	Unique ID for this Flow Item. This ID can be used as a unique identifier and it is recommended that the RDS_Link information be used for details about this Flow Item.
RDS_LINK	Complex	Yes	Item which details all of the information for the link
RDS_LINK/LOCATION	Complex	Yes	This is the NAVTEQ defined location code based on the NAVTEQ Traffic Tables
RDS_LINK/LOCATION/EBU_CO	String	Yes	Country code identifier (e.g. '1' for the U.S.,

UNTRY_CODE			'D' for Germany)
RDS_LINK/LOCATION/TABLE_ID	String	Yes	NAVTEQ regional table identifier.
RDS_LINK/LOCATION/LOCATION_ID	String	Yes	Unique location identifier within a table.
RDS_LINK/LOCATION/LOCATION_DESC	String	No	A text description of this location
RDS_LINK/LOCATION/RDS_DIRECTION	String	Yes	This represents the queuing direction of traffic in positive or negative notation. Therefore, if the direction of travel is Eastbound (+), the queuing direction will be Westbound (-). (+, -)
RDS_LINK/LENGTH	Decimal as a String	Yes	This is the length of the link
RDS_LINK/LENGTH/[UNITS]	String	Yes	This attribute specifies the units for the length as either "mi" or "km"
CURRENT_FLOW	Complex	Yes	This represents the current flow conditions of this location. See section 3.3.1.1 below

3.3.1.1 CURRENT_FLOW

This represents the complex data type for all flow elements. It contains the travel time, speed and jam factor data.



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Item Name	Type	Req	Description
TRAVEL_TIMES/LANE_TYPE	Complex	Yes	1 or more Travel Time instances organized by

			lane type. See section 3.3.1.2 below.
JAM_FACTOR	Decimal as a String	Yes	The number between 0.0 and 10.0 indicating the expected quality of travel. When there is a road closure, the Jam Factor will be 10. As the number approaches 10.0 the quality of travel is getting worse. -1.0 indicates that a Jam Factor could not be calculated
JAM_FACTOR_TREND	Decimal as a String	No	The number between -1.0 and +1.0 indicating the trend of the jam factor over a period of time. As the number approaches +1.0 the jam factor is getting worse.
CONFIDENCE	Decimal as a String	No	This indicates the level of confidence that Navteq has in the flow data. The normal value will be a value from 0.0 to 1.0 where 1.0 is the highest level of confidence (i.e. dense sensor coverage) and 0.0 is the lowest level of confidence (i.e. completely estimated). A confidence value of -1 indicates that the confidence could not be calculated.

3.3.1.2 LANE_TYPE

The travel times for a specific lane type.

ITEM NAME	Type	Req	Description
[TYPE]	String	Yes	THRU lanes are normal traffic lanes. If it is a RAMP, the Lane_Type will be RAMP. If it is a HOV, the Lane_Type will be HOV.
TRAVEL_TIME	Complex	Yes	1 or more Travel_Time instances. Each represents different travel time calculations. The first 2 supported calculations are Current and Free Flow. See Travel_Time Section 3.3.1.3 below.

3.3.1.3 TRAVEL_TIME

Travel time references will be conveyed in the following structure.

Item Name	Type	Req	Description
[TYPE]	String	Yes	One of "current" or "free flow". Current refers to the current conditions as they are at the time of the request. Free flow refers to the conditions as they are based on speed limits.
DURATION	Decimal as a String	Yes	The time, in [Units] to traverse this route. -1.0 indicates that the duration could not be calculated.
DURATION/[UNITS]	String	Yes	Unit of measurement for the time. One of ("hour", "min", "sec")
AVERAGE_SPEED	Decimal as a String	Yes	This is the average speed, in [Units] that traffic is traveling. -1.0 indicates that the average speed could not be calculated.
AVERAGE_SPEED/[UNI]	String	Yes	Unit of measurement for the speed. One of "mph", "kph"

4 Communications/Data Transfer

By default all requests will be performed using pull oriented HTTP requests from the client to the Navteq servers. The specific HTTP parameters are currently client specific. These requests may be performed on a mutually agreeable interval. Navteq may pre-render the XML document prior to the request on an interval basis also. In addition, alternative request methods (i.e., push via FTP, etc), may be made available on a case-by-case basis.

All security measures are at Navteq's discretion and may be enhanced over time. Measures include, but are not limited to, specific client IP access to information, credential verification and secure sockets layers to access XML.

5 Backward Compatibility

Navteq will support backward compatibility of the feed for 1 full Navteq release cycle unless otherwise noted. TrafficML version 2.0 is not backward compatible with version 0.1 and previous as this is a major release. Backward compatibility will be maintained until the next major release. The insertion of new elements will be considered backward compatible so clients should be sure to use parsing techniques that ignore tags they are not familiar with. In this way new tags will not affect their programs. As a result and due to XML schema constraints clients should not validate the document against a static version of the schema because the insertion of new tags will cause validation against older schema to fail.

Also, where the schema allows for a multiplicity of a particular element meant to be discriminated by an attribute, the inclusion of additional instances of the element with different discriminator values will be considered backward compatible. For example:

Where previously the document contained elements of the form:

```
<TRAVEL_TIME TYPE="current"> ... </TRAVEL_TIME>
```

The addition of more TRAVEL_TIME elements of a different "type" will be considered backward compatible. E.g.:

```
<TRAVEL_TIME TYPE="current"> ... </TRAVEL_TIME>  
<TRAVEL_TIME TYPE="freeflow"> ... </TRAVEL_TIME>
```

Client programs should be sure to use the discriminator even when there is currently only one possibility in order to work with future updates that Navteq considers backward compatible.