# Public Traffic Data Service

# Public Interface Specification

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# 1. INTRODUCTION

## 1.1 PURPOSE

This specification defines the communications protocol used by external entities to access the Public Interface of the Public Traffic Data service within STREAMS.

It is intended to be used by 3rd party developers developing software to interface to the Public Traffic Data service.

## 1.2 SCOPE

This document describes the Application Layer Protocol in terms of message primitives. The encoding of these primitives is performed in accordance with the encoding scheme in Appendix A.

## 1.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AM | Ante Meridiem |
| ASCII | American Standard Code for Information Interchange |
| CA | Certificate Authority |
| CRL | Certificate Revocation List |
| CSV | Comma-separated value |
| DTMR | Department of Transport and Main Roads |
| EST | Eastern Standard Time |
| HTTPS | Hyper Text Transport Protocol Secure |
| HTTPS GET | Request via HTTPS |
| ISO 8601 | A date/time formatting standard |
| LOS | Level of Service |
| SOAP | Simple Object Access Protocol |
| SSL | Secure Sockets Layer |
| STREAMS | Enterprise Transport Control System |
| TCP/IP | Transmission Control Protocol / Internet Protocol |
| URL | Universal Resource Locator |
| UTC | Coordinated Universal Time |
| NPI | National Performance Indicators |

## 1.4 REFERENCES

The following documents are referenced in this specification:

[1] Public Traffic Data Service – SRS General
svn://svn/documents/Products/SoftwareEng/Streams/srs/ptd/PTD SRS General.doc

# 2. LOWER LAYER PROTOCOLS

HTTPS will be used as the lower layer protocol for this communications interface.

## 2.1 HTTPS PROTOCOL

Data for this communications interface will be obtained from a public internet facing web server configured to use HTTPS. The SSL server certificate will be issued by Transmax which will also be the certificate authority.

Authentication with the web server will be via client certificates which will also be issued by Transmax under their own certificate authority.

The following information will be provided to external entities by Transmax on confirmation of their entrance into an agreement with the Queensland Department of Main Roads to access the service.

- Web Server URL and port
- Certificate Revocation List (CRL) for the Transmax Certificate Authority (CA)
- Client Certificate for authentication with the Web Server

# 3. APPLICATION LAYER PROTOCOL

The Application Layer Protocol for obtaining lists of information over the Public Traffic Data service external interface is defined here. Due to their anticipated size, data lists are encoded as comma-separated value (CSV) text blocks (as specified in RFC 4180).

XML encoding is not used due to the verbosity of the format, simplicity of the data and client desire for full lists each query rather than change sets. Similarly SOAP encoding is not used because the data is already encoded as CSV and there are no request parameters to be handled. Therefore SOAP would impose an implementation overhead (on both client and server) without providing any benefit.

The encoding of the typed message primitives is described in Appendix A.

## 3.1 INTERSECTION LIST

A list of all the Intersections known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Intersections. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.1.1 Protocol

An HTTPS GET request that returns a list of Intersections using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/Intersections.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Suburb>,<Description>,<Lat>,<Long>` |

### 3.1.2 Intersection Attributes

The unique identifier for an Intersection is the Id, Cluster_Id pair.

#### 3.1.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Intersections.

Domain: Integer
Range: $\geq 0$

#### 3.1.2.2 Id

The Id within a STREAMS system for the Intersection.

Domain: UniqueId

#### 3.1.2.3 Cluster_Id

The Id of the STREAMS system owning the Intersection.

Domain: UniqueId

#### 3.1.2.4 Suburb

The Suburb name (if known) of the Intersection.

Domain: Text (optional - blank if omitted)
Range: Max 40 chars

#### 3.1.2.5 Description

The description of the Intersection.

Domain: Text
Range: Max 100 chars

#### 3.1.2.6 Lat

The latitude of the Intersection.

Domain: Real Number (WGS84 Geodetic Datum)
Range: [-90, 90]
Units: Degrees (north)

#### 3.1.2.7 Long

The longitude of the Intersection.

Domain: Real Number (WGS84 Geodetic Datum)
Range: [-180, 180]
Units: Degrees (east)

### 3.1.3 Example

```
3
100031,5,"","Hawbridge St & Quantum St",-27.353297,153.012593
100037,5,"","Riesling St & Yalumba St",-27.352585,153.011875
100041,5,"","Spina Cres",-27.353685,153.011765
```

## 3.2 LINK LIST

A list of all the Links known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Links. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.2.1 Protocol

An HTTPS GET request that returns a list of Links using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL/Links.aspx |
| CSV Format | <Row_count> *(only on the first row of the list)*<br><Id>,<Cluster_Id>,<Intersection1_Id>,<Intersection2_Id>,<Length>,<Speed>,<Road>,<Suburb>,<CentrelinePolyline> |

### 3.2.2 Link Attributes

The unique identifier for a Link is the Id, Cluster_Id pair. The Cluster_Id for the Intersections is the same as the Cluster_Id for the corresponding Link.

#### 3.2.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Links.

Domain: Integer
Range: $\geq 0$

#### 3.2.2.2 Id

The Id within a STREAMS system for the Link.

Domain: UniqueId

#### 3.2.2.3 Cluster_Id

The Id of the STREAMS system owning the Link.

Domain: UniqueId

#### 3.2.2.4 Intersection1_Id

The Id of the Intersection the Link departs from.

Domain: UniqueId

#### 3.2.2.5 Intersection2_Id

The Id of the Intersection the Link arrives at.

Domain: UniqueId

#### 3.2.2.6 Length

The length of the Link.

Domain: Integer
Range: > 0
Units: Metres

#### 3.2.2.7 Speed

The average free-flow speed of the Link.

Domain: Integer
Range: > 0
Units: km/h

#### 3.2.2.8 Road

The SDRN Road Name for the road which the Link is on.

Domain: Text (mandatory)
Range: Max 40 chars

#### 3.2.2.9 Suburb

The SDRN Locality for the road which the Link is on. Only one suburb is shown when the link traverses two or more suburbs.

Domain: Text (mandatory)
Range: Max 40 chars

#### 3.2.2.10 CentrelinePolyline

The geospatial polyline representing the road centerline for the link. Represented as a sequence of Latitude and Longitude pairs ordered in the direction of traffic flow. The sequence of points is encoded into the CentrelinePolyline value as follows:

Lat1:Lon1; Lat2:Lon2; Lat3:Lon3;…;Lat*n*:Lon*n*

Where *n* is the number of points in the polyline. The CentrelinePolyline value is mandatory and must contain at least 2 lat/lon pairs where lat/lon are constrained as follows:

Lat
Domain: Real Number (WGS84 Geodetic Datum)
Range: [-90, 90]
Units: Degrees (north)

Lon
Domain: Real Number (WGS84 Geodetic Datum)
Range: [-180, 180]
Units: Degrees (east)

### 3.2.3 Example

```
3
100344,5,100266,100328,636,50,Alpha St,Beta,-27.0602:152.964;-27.0596:152.959
100348,5,100328,100266,636,50,Gamma Rd,Delta,-27.397:152.958;-27.396:152.957
100636,5,100626,100628,161,100,Omega Ave,Epsilon,-27.591502:152.924827;-27.591476:152.924815;-
27.590959:152.925129;-27.5898066135398:152.925830291867;-27.589089152.926267
```

## 3.3 LINK MEASURE LIST

A list of the current Link Measures known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Link measures. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.3.1 Protocol

An HTTPS GET request that returns a list of Link Measures using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/LinkMeasures.aspx |
| CSV Format | `<Row_count> (only on the first row of the list)`<br>`<Id>,<Cluster_Id>,<Speed>,<Travel_Time>,<Occupancy>,<LOS>,<Timestamp>,<Flow>` |

### 3.3.2 Link Measure Attributes

The unique identifier for a Link Measure is the Id, Cluster_Id pair.

#### 3.3.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Link measures.

Domain: Integer
Range: ≥ 0

#### 3.3.2.2 Id

The Id within a STREAMS system for the Link.

Domain: UniqueId

#### 3.3.2.3 Cluster_Id

The Id of the STREAMS system owning the Link.

Domain: UniqueId

#### 3.3.2.4 Speed

The current average speed of traffic along the Link. Only speeds which are known with certainty are reported (estimated speeds will be filtered out)

Domain: Integer (optional - blank if omitted)
Range: > 0

Units: km/h

#### 3.3.2.5 Travel_Time

The current average travel time along the Link.

Domain: Integer (optional - blank if omitted)
Range: > 0
Units: Seconds

#### 3.3.2.6 Occupancy

The current occupancy of the Link traffic.

Domain: Integer (optional - blank if omitted)
Range: [0, 100]
Units: Percent

#### 3.3.2.7 LOS

The current Level of Service of the Link.

Domain: Integer (optional - blank if omitted)
Range: [0, 6]

**Definition of Level of Service for Uninterrupted Flow (i.e. Motorways):**

| Value | LOS | Description |
|---|---|---|
| 0 | None | |
| 1 | A | A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Drivers have a high degree of freedom to select their desired speed and manoeuvre within the traffic stream. |
| 2 | B | Stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. |
| 3 | C | Stable flow where drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. |
| 4 | D | Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. |
| 5 | E | Unstable flow which is close to capacity. Drivers have virtually no freedom to select their desired speed or manoeuvre within the traffic stream. As the flow is unstable, minor disturbances within the traffic stream may cause flow breakdown. |
| 6 | F | A condition of flow breakdown. This occurs when the demand at the site exceeds its capacity. |

**Definition of Level of Service for Interrupted Flow (i.e. with Traffic Signals):**

Level of Service is not available for Links carrying Interrupted Flow.

#### 3.3.2.8 Timestamp

The time that the Link Measure was taken.

Domain: Time
Range: yyyyMMddHHmmss

#### 3.3.2.9 Flow

The current hourly flow of the Link (calculated using the most recent measurement).

Domain: Integer (optional - blank if omitted)
Range: > 0

### 3.3.3 Example

```
3
100072,8,,16,,0,20100902235836,
100678,8,,14,,0,20100902235836,
100702,8,,6,,0,20100902235836,
```

## 3.4 INCIDENT LIST

A list of all Incidents known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Incidents. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.4.1 Protocol

An HTTPS GET request that returns a list of Incidents using the 'text/plain' MIME type. (Note: the CSV format is line wrapped below due to space constraints and will all be one line in the result)

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/Incidents.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Type>,<Start>,<Lat>,<Long>,<Location>,<Road>,<Suburb>,`<br>`<Direction>,<Int_Id>,<Link_Id>,<Delay>,<Blockage Type>, <Classification>` |

### 3.4.2 Incident Attributes

The unique identifier for an Incident is the Id, Cluster_Id pair.

#### 3.4.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Incidents.

Domain: Integer
Range: $\geq 0$

#### 3.4.2.2 Id

The Id within a STREAMS system for the Incident.

Domain: UniqueId

#### 3.4.2.3 Cluster_Id

The Id of the STREAMS system owning the Incident.

Domain: UniqueId

#### 3.4.2.4 Type

The Type of the Incident.

Domain: Integer
Range: [1, 9]

| Value | Description |
|---|---|
| 1 | Crash |
| 2 | Stationary Vehicle |
| 3 | Hazard |
| 4 | Flood |
| 5 | Planned Incident |
| 6 | Roadworks |
| 7 | Congestion |
| 8 | Fault |
| 9 | Alert (e.g. weather warning) |

#### 3.4.2.5 Start

The time that the Incident started.

Domain: Time
Range: yyyyMMddHHmmss

#### 3.4.2.6 Lat

The latitude of the Incident.

Domain: Real Number (optional - blank if omitted) (WGS84 Geodetic Datum)
Range: [-90, 90]
Units: Degrees (north)

#### 3.4.2.7 Long

The longitude of the Incident.

Domain: Real Number (optional - blank if omitted) (WGS84 Geodetic Datum)
Range: [-180, 180]
Units: Degrees (east)

#### 3.4.2.8 Location

The location of the Incident. This field will only be populated with a textual location if the Int_Id or Link_Id fields are blank.

Domain: Text (optional - blank if omitted)
Range: Max 100 chars

#### 3.4.2.9 Road

The road that the Incident occurred on.

Domain: Text (optional - blank if omitted)
Range: Max 40 chars

#### 3.4.2.10 Suburb

The suburb that the Incident is located in.

Domain: Text (optional - blank if omitted)
Range: Max 40 chars

#### 3.4.2.11 Direction

The direction of traffic flow obstructed by the incident.

Domain: Text (optional - blank if omitted)
Range: Max 40 chars

#### 3.4.2.12 Int_Id

The Id of the Intersection the Incident is at. The Intersection Cluster_Id is the same as for the Incident.

Domain: UniqueId (optional - blank if omitted)

#### 3.4.2.13 Link_Id

The Id of the Link the Incident is on. The Link Cluster_Id is the same as for the Incident.

Domain: UniqueId (optional - blank if omitted)

#### 3.4.2.14 Delay

The expected delay caused by the incident.

Domain: Integer (optional - blank if omitted)
Range: [0, 3]

| Value | Description |
|---|---|
| 0 | Unknown Traffic Impact |
| 1 | No Delays |
| 2 | Delays |
| 3 | Long Delays |

#### 3.4.2.15 Blockage Type

The type of blockage.

Domain: Integer (optional - blank if omitted)
Range: [1, 5]

| Value | Description |
|---|---|
| 1 | Unknown |
| 2 | No Blockage |
| 3 | Partially Blocked |
| 4 | Blocked |
| 5 | Both Directions Blocked |

#### 3.4.2.16 Classification

The classification of the incident. This field acts as a subtype within the Incident type.

Domain: Text
Range: Max 40 chars

### 3.4.3 Example

```
3
100525,5,1,20100224053318,-27.50971,153.023371,"",,"","N/A",100266,0,0,0,"Single"
100887,5,8,20100226001854,-27.5064902795342,153.025167263917,"","FAIRFIELD
ROAD","FAIRFIELD","N/A",0,0,0,0,
101718,5,8,20100307005747,-25.539682,152.694603,"Inbound cnr of Fairfield Rd and
Ashby st",,"","N/A",100781,0,0,0,
```

## 3.5 MOVEMENT LIST

A list of all the Movements known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Movements. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.5.1 Protocol

An HTTPS GET request that returns a list of Movements using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/Movements.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Type>,<Description>,<From_Link_Id>,<To_Link_Id>` |

### 3.5.2 Movement Attributes

The unique identifier for a Movement is the Id, Cluster_Id pair.

#### 3.5.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Movements.

Domain: Integer
Range: ≥ 0

#### 3.5.2.2 Id

The Id within a STREAMS system for the Movement.

Domain: UniqueId

#### 3.5.2.3 Cluster_Id

The Id of the STREAMS system owning the Movement.

Domain: UniqueId

#### 3.5.2.4 Type

The Type of the Movement.

Domain: Integer
Range: [1, 15]

| Value | Description |
|---|---|
| 1 | Metered movement within an on ramp |
| 2 | Bypass movement on a metered ramp. Bus or transit (bus & HOV) movement |
| 3 | Combined entry movement (metered & bypass) at the upstream end of a metered on ramp |
| 4 | Combined merge movement (metered & bypass) at the downstream end of a metered on ramp |
| 5 | On ramp movement |
| 6 | Off ramp movement |
| 7 | Freeway movement |
| 9 | Intersection Left Turn movement |
| 10 | Intersection Right Turn |
| 11 | Intersection Through movement |
| 12 | Surface Street Link movement |
| 15 | Transit Lane movement |

#### 3.5.2.5 Description

The description of the Movement recorded in STREAMS.

Domain: Text
Range: Max 100 chars

#### 3.5.2.6 From_Link_Id

The link that the Movement starts from.

Domain: UniqueId

#### 3.5.2.7 To_Link_Id

The link that the Movement finishes on. A Movement may represent traffic flow from one link to another, or traffic flow along a single link. In the latter case, the To_Link_Id will be null.

Domain: UniqueId or Null

### 3.5.3 Example

```
3
100066,8,12,"Link MVT on Albert St SEB between Cheapside St & Pleasant St",100065,
100073,8,12,"Link MVT on Albert St NWB between Pallas St & Pleasant St",100072,
100077,8,12,"Link MVT on Albert St SEB between Pleasant St & Pallas St",100076,
```

## 3.6 MOVEMENT MEASURE LIST

A list of the current Movement Measures known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Movement measures. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.6.1 Protocol

An HTTPS GET request that returns a list of Movement Measures using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/MovementMeasures.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Timestamp>,<Volume>,<Occupancy>,<Cycle_Time>,`<br>`<Green_Time>` |

### 3.6.2 Movement Measure Attributes

The unique identifier for a Movement Measure is the Id, Cluster_Id pair.

#### 3.6.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Movement measures.

Domain: Integer
Range: ≥ 0

#### 3.6.2.2 Id

The Id within a STREAMS system for the Movement.

Domain: UniqueId

#### 3.6.2.3 Cluster_Id

The Id of the STREAMS system owning the Movement.

Domain: UniqueId

#### 3.6.2.4 Timestamp

The time that the Movement Measure was taken.

Domain: Time
Range: yyyyMMddHHmmss

#### 3.6.2.5 Volume

The number of vehicles detected on this Movement during the last measured cycle. This attribute is: blank (i.e. omitted) if there is no known value, 0 if there were no vehicles, or > 0 if there were vehicles.

Domain: Integer (optional - blank if omitted)
Range: ≥ 0

#### 3.6.2.6 Occupancy

The current occupancy of the Movement traffic. For controlled movements, this is the occupancy during the green time.

Domain: Integer (optional - blank if omitted)
Range: [0, 100]
Units: Percent

#### 3.6.2.7 Cycle_Time

The cycle time determined from the signal state/colour changes. It is the time from the previous start of red to the next start of red, in seconds.

Domain: Integer (optional - blank if omitted)
Range: > 0

#### 3.6.2.8 Green_Time

The (effective) green time determined from the signal state/colour changes. It is the time from the start of green to the end of green, adjusted to account for initial driver reaction delay, in seconds.

Domain: Integer (optional - blank if omitted)
Range: > 0

### 3.6.3 Example

```
3
240729,8,20120120013415,6,26,122,14
352599,8,20120120013349,1,5,45,10
113795,8,20120120013607,2,15,99,9
```

## 3.7 DETECTOR SITE LIST

A list of all the Detector Sites known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of Detector Sites. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.7.1 Protocol

An HTTPS GET request that returns a list of Detector Sites using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/DetectorSites.aspx |
| CSV Format | `<Row_count> (only on the first row of the list)`<br>`<Id>,<Cluster_Id>,<Movement_Id>,<Lanes>,<Distance_To_Stop_Line>,`<br>`<Distance_From_Link_Start>` |

### 3.7.2 Detector Site Attributes

The unique identifier for a Detector Site is the Id, Cluster_Id pair.

#### 3.7.2.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of Detector Sites.

Domain: Integer
Range: ≥ 0

#### 3.7.2.2 Id

The Id within a STREAMS system for the Detector Site.

Domain: UniqueId

#### 3.7.2.3 Cluster_Id

The Id of the STREAMS system owning the Detector Site.

Domain: UniqueId

#### 3.7.2.4 Movement_Id

The Id of the Movement in STREAMS that this Detector Site is associated with.

Domain: UniqueId

#### 3.7.2.5 Lanes

The number of lanes available to vehicles traversing this Movement. If the number of lanes is not known, the field will return Null.

Domain: Integer or Null

#### 3.7.2.6 Distance_To_Stop_Line

The distance from this Detector Site to the stop line, measured in metres.

Domain: Real or Null

#### 3.7.2.7 Distance_From_Link_Start

The distance from the start of the Link associated with this Detector Site to this Detector Site, measured in metres.

Domain: Real or Null

### 3.7.3 Example

```
3
100680,5,101171,1,,12
100707,5,101000,1,,12
100875,5,100960,1,,12
```

## 3.8 NPI (NATIONAL PERFORMANCE INDICATORS) LINK LIST

A list of all the NPI Links known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of NPI Links. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.8.1 Restricted Access

Special access permission is required to access NPI Link data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.8.2 Protocol

An HTTPS GET request that returns a list of Links using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL/NPILinks.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Intersection1_Id>,<Intersection2_Id>,<Description>,`<br>`<Length>,<Type>,<Road>,<Suburb>,<CentrelinePolyline>` |

### 3.8.3 NPI Link Attributes

The unique identifier for a NPI Link is the Id, Cluster_Id pair. The Cluster_Id for the Intersections is the same as the Cluster_Id for the corresponding NPI Link.

#### 3.8.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Links.

Domain: Integer
Range: ≥ 0

#### 3.8.3.2 Id

The Id within a STREAMS system for the NPI Link.

Domain: UniqueId

#### 3.8.3.3 Cluster_Id

The Id of the STREAMS system owning the NPI Link.

Domain: UniqueId

#### 3.8.3.4 Intersection1_Id

The Id of the Intersection the NPI Link departs from.

Domain: UniqueId

#### 3.8.3.5 Intersection2_Id

The Id of the Intersection the NPI Link arrives at.

Domain: UniqueId

#### 3.8.3.6 Description

The description of the NPI Link.

Domain: Text
Range: Max 100 chars

#### 3.8.3.7 Length

The length of the NPI Link.

Domain: Integer
Range: > 0
Units: Metres

#### 3.8.3.8 Type

The Type of the NPI Link.

Domain**:** Integer
Range: [0, 2]

| Value | Description |
|---|---|
| 0 | Motorway |
| 1 | Controlled |
| 2 | Transit Lane |

#### 3.8.3.9 Road

The SDRN Road Name for the road which the NPI Link is on.

Domain: Text (mandatory)
Range: Max 40 chars

#### 3.8.3.10 Suburb

The SDRN Locality for the road which the NPI Link is on. Only one suburb is shown when the link traverses two or more suburbs.

Domain: Text (mandatory)
Range: Max 40 chars

#### 3.8.3.11 CentrelinePolyline

The geospatial polyline representing the road centerline for the NPI Link. Represented as a sequence of Latitude and Longitude pairs ordered in the direction of traffic flow. The sequence of points is encoded into the CentrelinePolyline value as follows:

Lat1:Lon1; Lat2:Lon2; Lat3:Lon3;…;Lat*n*:Lon*n*

Where *n* is the number of points in the polyline. The CentrelinePolyline value is mandatory and must contain at least 2 lat/lon pairs where lat/lon are constrained as follows:

Lat
Domain: Real Number (WGS84 Geodetic Datum)
Range: [-90, 90]
Units: Degrees (north)

Lon
Domain: Real Number (WGS84 Geodetic Datum)
Range: [-180, 180]
Units: Degrees (east)

### 3.8.4 Example

```
3
102438,5,101903,101892,"Prospect Rd SB between Prince St & Crana St",50,1,-27.0602:152.964;-
27.0596:152.959
101711,5,100922,100918,"Uc_loop1, Uc_loop4 NB between Uc_loop4 & Uc_loop1",203,0,-
27.397:152.958;-27.396:152.957
101712,5,100974,100978,"Uc_dl2, Uc_dl3 SB between Uc_dl2 & Uc_dl3",179,0,-27.591502:152.924827;-
27.591476:152.924815;-27.590959:152.925129;-27.5898066135398:152.925830291867;-
27.589089:152.926267
```

## 3.9 NPI LINK MEASURE LIST

A list of the current NPI Link Measures known to the Public Traffic Data service.

*Note: The first row of the list displays the number of rows of data returned by the PTD service external interface for the list of NPI Link measures. If no rows of data are returned, 0 will be displayed in the first row of the list.*

### 3.9.1 Restricted Access

Special access permission is required to access NPI Link Measure data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.9.2 Protocol

An HTTPS GET request that returns a list of NPI Link Measures using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/NPILinkMeasures.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<Id>,<Cluster_Id>,<Speed>,<Travel_Time>,<Volume>,<Occupancy>,`<br>`<Cycle_Time>,<Green_Time>,<Timestamp>` |

### 3.9.3 NPI Link Measure Attributes

The unique identifier for a NPI Link Measure is the Id, Cluster_Id pair.

#### 3.9.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Link measures.

Domain: Integer
Range: $\geq 0$

#### 3.9.3.2 Id

The Id within a STREAMS system for the NPI Link.

Domain: UniqueId

#### 3.9.3.3 Cluster_Id

The Id of the STREAMS system owning the NPI Link.

Domain: UniqueId

#### 3.9.3.4 Speed

The current average speed of traffic along the NPI Link. Only speeds which are known with certainty are reported (estimated speeds will be filtered out)

Domain: Integer (optional - blank if omitted)
Range: > 0
Units: km/h

#### 3.9.3.5 Travel_Time

The current average travel time along the NPI Link.

Domain: Integer (optional - blank if omitted)
Range: > 0
Units: Seconds

#### 3.9.3.6 Volume

The number of vehicles detected on this NPI Link during the last measured cycle. This attribute is: blank (i.e. omitted) if there is no known value, 0 if there were no vehicles, or > 0 if there were vehicles.

Domain: Integer (optional - blank if omitted)
Range: ≥ 0

#### 3.9.3.7 Occupancy

The current occupancy of the NPI Link traffic.

Domain: Integer (optional - blank if omitted)
Range: [0, 100]
Units: Percent

#### 3.9.3.8 Cycle Time

The length of the relevant movement cycle at the downstream intersection for Controlled NPI Link only.

Domain: Integer (optional - blank if omitted)
Range: > 0
Units: Seconds

#### 3.9.3.9 Green Time

The duration of the green time for the relevant NPI link movement during the cycle for Controlled NPI Link only.

Domain: Integer (optional - blank if omitted)
Range: (0, Cycle Time]
Units: Seconds

#### 3.9.3.10 Timestamp

The time that the NPI Link Measure was taken.

Domain: Time
Range: yyyyMMddHHmmss

### 3.9.4 Example

```
1
102695,7,10,32,1,25,112,45,20100714023500
```

## 3.10 CONTROLLED INTERSECTIONS LIST

A list of the current Controlled Intersections known to the Public Traffic Data service.

### 3.10.1 Restricted Access

Special access permission is required to access Controlled Intersections List data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.10.2 Protocol

An HTTPS GET request that returns a list of Controlled Intersections List using the 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/ControlledIntersections.aspx |
| CSV Format | <Row_count> (only on the first row of the list)<br><IntersectionControllerId>,<ClusterId>,<IntersectionNumber>,<FpConnectedTo>,<br><ControllerType>,<DefaultIG>,<Description>,<Enabled>,<KeepWithNeighbour>,<br><MinCycleTime>,<MaxCycleTime>,<IntersectionName>,<Notes>,<Organisation_Name>,<br><Port>,<SoftwareVersion>,<SoftwareRevision>,<Traffic_System_Name>,<br><UBDReference>,<X>,<Y>,<CurrentChecksum>,<ExpectedChecksum>,<DataState>,<br><TimeSettingState>,<TransCycleMinState> |

### 3.10.3 Control Intersection Attributes

The unique identifier for a Controlled Intersection is the ControllerId, ClusterId pair.

#### 3.10.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Link measures.

Domain: Integer
Range: ≥ 0

#### 3.10.3.2 IntersectionControllerId

The Id within a STREAMS system for the Controlled Intersection.

Domain: UniqueId

#### 3.10.3.3 ClusterId

The Id of the STREAMS system owning the Controlled Intersection.

Domain: UniqueId

#### 3.10.3.4 IntersectionNumber

Intersection Number (IEN) used to identify each intersection.

Domain: Integer
Range: > 0

#### 3.10.3.5 FpConnectedTo

The field processor or local controller that the intersection is connected to.

Domain: UniqueId

#### 3.10.3.6 ControllerType

The type of the Intersection Controller for the intersection

Domain**:** Integer
Range: {0, 1, 2, 7, 16, 17, 18, 19, 24, 29}

| Value | Description |
|---|---|
| 0 | Not Specified |
| 1 | DELTA3 |
| 2 | PTF3 |
| 7 | PSC |
| 16 | WinTraffSingle |
| 17 | DTC 2000 |
| 18 | QTC3264 |
| 19 | ALPHA 16 |
| 24 | Eclipse |
| 29 | ATSC4 |

#### 3.10.3.7 DefaultIG

The default Intersection Group for the intersection.

Domain: UniqueId

#### 3.10.3.8 Description

A detailed description for the item. Values for this column are generally intersecting road names, with major roads first.

Domain: Text
Range: Max 100 chars

#### 3.10.3.9 Enabled

Indicates the enabled status of the item.

Domain**:** Boolean
Range: [True, False]

#### 3.10.3.10 KeepWithNeighbour

"True" if the intersection should always be kept with one of its neighbours when intersection groups are being formed, regardless of disparity in required cycle times. Otherwise, this is "False".

Domain**:** Boolean
Range: [True, False]

#### 3.10.3.11 MinCycleTime

The minimum cycle time (in seconds) for the Intersection.

Domain: Integer
Range: > 0
Units: Seconds

#### 3.10.3.12 MaxCycleTime

The maximum cycle time (in seconds) for the Intersection.

Domain: Integer
Range: > 0
Units: Seconds

#### 3.10.3.13 IntersectionName

A unique short name for the intersection

Domain: Text
Range: Max 100 chars

#### 3.10.3.14 Notes

Additional details or any unique information about the intersection.

Domain: Text
Range: Max 8000 chars

#### 3.10.3.15 Organisation_Name

The name of the owning organisation.

Domain: Text
Range: Max 40 chars

#### 3.10.3.16 Port

The port number on the FP to which the controller of the intersection is connected.

Domain: Integer
Range: > 0

#### 3.10.3.17 SoftwareVersion

The version number of the Controller software for the Intersection.

Domain: Real
Range: >0 or Null

#### 3.10.3.18 SoftwareRevision

The version of the Controller software for the Intersection.

Domain: Integer
Range: > 0 or Null

#### 3.10.3.19 Traffic_System_Name

The name of the traffic system.

Domain: Text
Range: Max 40 chars

#### 3.10.3.20 UBDReference

A UBD reference for this column (if specified)

Domain: Text
Range: Max 16 chars or Null

#### 3.10.3.21 X

The longitude for the intersection (in degrees)

Domain: Real
Range: [-180, 180]
Units: Degrees

#### 3.10.3.22 Y

The latitude for the intersection (in degrees)

Domain: Real
Range: [-90, 90]
Units: Degrees

#### 3.10.3.23 CurrentChecksum

A checksum for basic information about the intersection (as received from the Intersection Controller).

Domain: Text
Range: Max 32 chars

#### 3.10.3.24 ExpectedChecksum

A checksum for basic information about the Intersection (as stored in STREAMS).

Domain: Text
Range: Max 32 chars

#### 3.10.3.25 DataState

Indicates whether Controller Data is loaded.

Domain**:** Integer
Range: {0, 1, 2, 3, 4}

| Value | Description |
|---|---|
| 0 | Unknown |
| 1 | Not Loaded |
| 2 | Loading |
| 3 | Loaded |
| 4 | Fault |

#### 3.10.3.26 TimeSettingState

Indicates whether Time Settings are loaded into the controller data.

Domain**:** Integer
Range: {0, 1, 2, 3, 4}

| Value | Description |
|---|---|
| 0 | Unknown |
| 1 | Not Loaded |
| 2 | Loading |

| Value | Description |
|---|---|
| 3 | Loaded |
| 4 | Fault |

### 3.10.3.27 TransCycleMinState

Indicates whether Transition Cycle Minimums are loaded into the controller data (or not).

Domain**:** Integer
Range: {0, 1, 2, 3, 4}

| Value | Description |
|---|---|
| 0 | Unknown |
| 1 | Not Loaded |
| 2 | Loading |
| 3 | Loaded |
| 4 | Fault |

## 3.11 VEHICLE DETECTOR LIST

Detailed vehicle detector configuration data.

### 3.11.1 Restricted Access

Special access permission is required to access Vehicle Detector List data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.11.2 Protocol

An HTTPS GET request that returns a list of 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/VehicleDetectors.aspx |
| CSV Format | <Row_count> *(only on the first row of the list)*<br><DetectorId>,<ClusterId>,<Build_Stats>,<Classification_Enabled>,<Comm_Settings>,<br><Description>,<Distance_Normalisation>,<Driver>,<External_Id>,<FP_Id>,<br><Instantaneous_Enabled>,<Length_Alert_Threshold>,<Length_Normalisation>,<br><Monitoring_Enabled>,<Name>,<Notes>,<Occupancy_Used>,<Operating_Mode>,<br><Organisation_Name>,<Remote_Id>,<Speed_Alert_Threshold>,<Speed_Calibration_Factor>,<br><Traffic_System_Name>,<Hardware_Type> |

### 3.11.3 Vehicle Detector Attributes

The unique identifier for a Vehicle Detector is the DetectorId, ClusterId pair.

#### 3.11.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Link measures.

Domain: Integer
Range: $\geq 0$

#### 3.11.3.2 DetectorId

The Id within a STREAMS system for the Vehicle Detector.

Domain: UniqueId

#### 3.11.3.3 ClusterId

The Id of the STREAMS system owning the Vehicle Detector.

Domain: UniqueId

### 3.11.3.4 Build_Stats

Indicates whether 15-minute statistics are to be generated for this vehicle detector.

Domain**:** Boolean
Range: [True, False]

### 3.11.3.5 Classification_Enabled

True if the detector is to be gathering vehicle classifications; False otherwise.
*Note: The value of the attribute in this column can only be true while the vehicle detector is associated with a speed detector.*

Domain**:** Boolean
Range: [True, False]

### 3.11.3.6 Comm_Settings

The communication settings for the Vehicle Detector - taken from specified data in the Communication Setting part of the property page. For example, MMS Vehicle Detectors has the Address, Port Number, Section, Site and Lane details listed in this column; Nortech/Excel Vehicle Detectors list the Port Number and Unit Input number details.

Domain**:** Text
Range: Max 1326 chars

### 3.11.3.7 Description

A detailed description for the item.

Domain**:** Text
Range: Max 80 chars

### 3.11.3.8 Distance_Normalisation

An indication of whether the Loop Distance Normalisation is being applied to the Minute Volume and Minute Occupancy measurements. This normalises the measurements to the location of the stop line.

Domain**:** Boolean
Range: [True, False]

### 3.11.3.9 Driver

The driver used by the Vehicle Detector.

Domain: Text
Range: Max 40 chars

#### 3.11.3.10 External_Id

An Id used to identify the Vehicle Detector from external systems.

Domain: Text
Range: Max 12 chars

#### 3.11.3.11 FP_Id

The field processor or local controller that the Vehicle Detector is connected to.

Domain: UniqueId

#### 3.11.3.12 Instantaneous_Enabled

True only if the detector is to be gathering instantaneous measurements; False otherwise.

Domain**:** Boolean
Range: [True, False]

#### 3.11.3.13 Length_Alert_Threshold

If Instantaneous Enabled is true, this indicates the minimum length of vehicles to be detected by this Vehicle Detectors. This column is blank otherwise.

Domain**:** Integer
Range: > 0 or Null

#### 3.11.3.14 Length_Normalisation

An indication of whether the Loop Length Normalisation is being applied to the Minute Occupancy measurement. This normalises the measurements to a point loop (i.e. zero-length loop).

Domain**:** Boolean
Range: [True, False]

#### 3.11.3.15 Monitoring_Enabled

An indication of whether the detector is to be monitored for hardware faults. Possible values are "Statistical", "Force OK' and "Force Failed".

Domain**:** Integer
Range: [0, 2]

| Value | Description |
|---|---|
| 0 | Force OK |
| 1 | Statistical |
| 2 | Force Fail |

### 3.11.3.16 Name

A unique name for the Vehicle Detector.

Domain: Text
Range: Max 100 chars

### 3.11.3.17 Notes

The user-entered notes recorded for the Vehicle Detector.

Domain: Text
Range: Max 8000 chars

### 3.11.3.18 Occupancy_Used

True if the Occupancy measurements for the Vehicle Detector are to be used in adaptive algorithm calculations; False otherwise.

Domain**:** Boolean
Range: [True, False]

### 3.11.3.19 Operating_Mode

Indicates whether the detector operates in Presence mode (the detector produces a continuous output while the vehicle is in the detection zone) or Passage (the detector produces a short, constant-duration pulse, which is independent of the length of time the vehicle is in the detection zone).

Domain**:** Integer
Range: [0, 1]

| Value | Description |
|---|---|
| 0 | Presence |
| 1 | Passage |

### 3.11.3.20 Organisation_Name

The name of the owning organisation.

Domain: Text
Range: Max 40 chars

### 3.11.3.21 Remote_Id

The remote Id for external system which the Vehicle Detector of External type is connected to.

Domain: Text

Range: Max 255 chars

### 3.11.3.22 Speed_Alert_Threshold

If Instantaneous Enabled is true, this indicates the minimum speed for vehicles to be detected by this Vehicle Detectors. This column is blank otherwise.

Domain**:** Integer
Range: > 0 or Null

### 3.11.3.23 Speed_Calibration_Factor

The coefficient used in for estimating the average speed over the detector from one-minute volume and occupancy measurements (if any).

Domain**:** Real
Range: > 0

### 3.11.3.24 Traffic_System_Name

The traffic system that the Vehicle Detector is associated with.

The name of the traffic system.

Domain: Text
Range: Max 40 chars

### 3.11.3.25 Hardware_Type

The type of the Vehicle Detector hardware implemented by the vehicle detector.

Domain**:** Integer
Range: {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

| Value | Description |
|---|---|
| 0 | SCATS |
| 1 | Contact Closure (Digital) |
| 2 | Tyco (Serial) |
| 3 | Nortech (Serial) |
| 4 | External |
| 5 | RTMS (Serial) |
| 6 | MMS (External) |
| 7 | Sensys Stud |
| 8 | - |
| 9 | Excel (Serial) |

## 3.12 VEHICLE DETECTOR FIVE MINUTE VOL OCC LIST

Aggregated five-minute values for volume and occupancy for each vehicle detector for the last 24 hours.

### 3.12.1 Restricted Access

Special access permission is required to access Vehicle Detector Five Minute Vol Occ data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.12.2 Protocol

An HTTPS GET request that returns a list of 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/VehicleDetectorFiveMinuteVolOcc.aspx |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<DetectorId>,<ClusterId>,<StartTime>,<Volume>,<Occupancy>` |

### 3.12.3 Vehicle Detector Five Minute Vol Occ Attributes

The unique identifier for a Vehicle Detector Five Minute Vol Occ is the DetectorId, ClusterId pair.

#### 3.12.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Link measures.

Domain: Integer
Range: ≥ 0

#### 3.12.3.2 DetectorId

The Id within a STREAMS system for the Vehicle Detector.

Domain: UniqueId

#### 3.12.3.3 ClusterId

The Id of the STREAMS system owning the Vehicle Detector.

Domain: UniqueId

#### 3.12.3.4 StartTime

Date/time of the 5-minute period.

Domain: Time
Range: yyyyMMddHHmmss

#### 3.12.3.5 Volume

Number of cars that passed over the detector during the 5-minute period.

Domain: Integer
Range: ≥ 0 or Null

#### 3.12.3.6 Occupancy

Total time that the detector was occupied as a percentage of the 5 minutes.

Domain: Integer
Range: [0, 100] or Null
Units: Percent

## 3.13 VEHICLE DETECTOR FIVE MINUTE VOL OCC HISTORY

This interface allows the client to retrieve historical aggregated vehicle detector five-minute volume and occupancy. This interface is intended for retrieving missing data from previous days. For normal operation, please use the standard vol occ interface (above) which returns all data for the previous 24 hours.

### 3.13.1 Restricted Access

Special access permission is required to access Vehicle Detector Five Minute Vol Occ History data. Permission is approved by DTMR and on DTMR's request configured by TRANSMAX Technical Support.

### 3.13.2 Protocol

An HTTPS GET request that returns a list of 'text/plain' MIME type.

| Part | Format |
|---|---|
| URL | https://<Web-Server-URL>/VehicleDetectorFiveMinuteVolOccHistory.aspx |
| Query Params | FirstStartTime: Time of start of the first five minute data point requested.<br>LastStartTime: Time of start of the last five minute data point requested.<br>*Both parameters must be supplied. The maximum range allowed in one request is 24 hours. Times are represented as UTC and encoded according to Appendix A.* |
| CSV Format | `<Row_count>` *(only on the first row of the list)*<br>`<DetectorId>,<ClusterId>,<StartTime>,<Volume>,<Occupancy>` |

### 3.13.3 Vehicle Detector Five Minute Vol Occ History Attributes

The unique identifier for a Vehicle Detector Five Minute Vol Occ History is the DetectorId, ClusterId pair.

#### 3.13.3.1 Row_count

The number of rows of data returned by the PTD service external interface for the list of NPI Link measures.

Domain: Integer
Range: ≥ 0

#### 3.13.3.2 DetectorId

The Id within a STREAMS system for the Vehicle Detector.

Domain: UniqueId

#### 3.13.3.3 ClusterId

The Id of the STREAMS system owning the Vehicle Detector.

Domain: UniqueId

#### 3.13.3.4 StartTime

Date/time of the 5-minute period.

Domain: Time
Range: yyyyMMddHHmmss

#### 3.13.3.5 Volume

Number of cars that passed over the detector during the 5-minute period.

Domain: Integer
Range: ≥ 0 or Null

#### 3.13.3.6 Occupancy

Total time that the detector was occupied as a percentage of the 5 minutes.

Domain: Integer
Range: [0, 100] or Null
Units: Percent

## 3.14 ERROR RESPONSE

If the client makes a bad request (for example incorrect query parameters), the response is a standard HTTP 400 (Bad Request Error) response.

If an internal error occurs during a request for any of the lists, the response is a standard HTTP 500 (Internal Server Error) response.

# APPENDIX A. MESSAGE PRIMITIVE ENCODING

Messaging consist of HTTPS GET requests returning 'text/plain' content. The content begins with one line indicating the number of lines to follow, then CSV text in accordance with RFC 4180 containing the requested data. The encoding of data type primitives in the CSV text is described below.

## Integer

Integers are represented in decimal format with an optional sign character preceding the digits. It is assumed that all integers will be readable as a 32-bit signed integer unless explicitly stated otherwise.

## Real Numbers

Real numbers are represented in the format:

```
[+|-]d{d}[.d{d}[[e|E][+|-]d{d}]
```

where [] – enclose optional values
*d* – represents a single digit
{} – enclose zero or more iterations
| – 'exclusive or' operator

Real numbers will not exceed the capacity of the 64-bit 'double precision' data type in C unless explicitly stated otherwise.

## Text

Strings are sent as their ASCII representation enclosed in double-quotes. ASCII characters outside the range 33 – 127 shall not be transmitted. Any double-quotes appearing inside a string will be escaped by preceding it with another double-quote (in accordance with RFC 4180).

## Time

Time values are represented as UTC.

| | |
|---|---|
| yyyy | Year as a four-digit number. |
| MM | Month, from 01 through 12. |
| dd | Day of the month, from 01 through 31. |
| HH | Hour, using a 24-hour clock from 00 to 23. |
| mm | Minute, from 00 through 59. |
| ss | Second, from 00 through 59. |