Land Transport Authority
We Keep Your World *Moving*

DATAMALL
an
LTA Open Data Initiative

API User Guide
& Documentation

Version 6.0
22 Aug 2024

Document Change Log

Version No.	Change Details	Release Date
1.1	First release of document, reflecting specifications for each dataset.	04 Jun 2014
1.2	Amended attributes for all datasets, and added the update frequency for each dataset in specification section.	15 Jun 2014
1.3	Inserted notes to denote fields that are new and upcoming; not yet available on the data feed.	26 Jun 2014
1.4	Minor revisions (typo errors).	10 Mar 2015
1.5	Revisions to names of datasets, and removed listing for certain attributes that are redundant at this point.	07 Apr 2015
2.0	Revised document for newly revamped DataMall. - New Categorisation of Datasets - Moved Park & Ride Location, Premium Bus Service, and Carpark Rates to Static Datasets listed on MyTransport.SG.	13 Apr 2015
2.1	Corrected reference notes for Carpark Availability and ERP Rates.	14 Apr 2015
2.2	Added Bus Arrival, and Taxi Availability APIs	19 Apr 2015
2.2.1	Amended Update Freqs for Bus Arrival and Taxi Availability	03 Jun 2015
3.0	Bus Arrival API is now enhanced! Latest ***beta*** release includes: - Additional 3rd set of ETA information - Estimated location (coordinates) of buses Look out for blue-highlights!	12 Dec 2015
3.1	**Public-Transport (Bus) Related APIs** are enhanced (version 2)! - **Bus Services** and **Bus Routes** are now consolidated across Operators, e.g. SBST routes and SMRT routes in 1 single API - Attributes are renamed to be more meaningful - **Bus Stops** now include location (lat/long) coordinates Bug for Bus Arrival #VisitNumber fixed.	08 Mar 2016
3.2	Changes to **Traffic Related APIs**: - URLs changed to point to version 2 of the APIs. - VCCType renamed to VehicleType (ERP Rates) - EstimatedTime renamed to EstTime (Estimated Travel Times) - RoadID renamed to EventID (Road Openings and Road Works) - ImageURL renamed to ImageLink (Traffic Images) - Band renamed to SpeedBand (Traffic Speed Bands)	31 Mar 2016
3.3	Changes to **API Response Size:** - **Taxi Availability API** now returns 500 records per call. - **Traffic Images API** now returns 70 records per call. - Changes are reflected on Page 6, and on respective API URLs.	08 Aug 2016
3.4	Changes to API authentication – now requiring only AccountKey.	01 Nov 2016

3.5	Updated attribute description for location coordinates of **Bus Arrival API**.	23 Nov 2016
3.6	**Traffic Images API** now returns all records per call.	14 Dec 2016
3.7	Updated guide to making API calls, using Postman.	05 Apr 2017
4.0	**Bus Arrival API** is now enhanced! Latest release includes: - New Attribute – Bus Type - Inclusion of Short Working Trip (SWT) Supplementary Services - Relegation of OriginCode and DestinationCode to vehicle level - Removal of entire response structure from API during non-operating hours - Removal of Status Attribute - Renaming of values for Load Attribute - Renaming of SubsequentBus and SubsequentBus3 subset tags - Renaming of BusStopID Parameter to BusStopCode - Removal of SST Parameter. Timestamps are now in SST by default. - Rehashed advisement on Front-End Implementation for clarity.	28 Jul 2017
4.1	Minor revisions to sample Bus Arrival API response.	08 Sep 2017
4.2	Announcement on Changes to **API Response Size** is reflected on Page 6.	15 Sep 2017
4.3	Deployment date has postponed for the increase of **API Response Size.** Please refer to Page 6 for the latest announcement.	06 Oct 2017
4.4	**Response Size for all APIs** (except Bus Arrival API) have been increased to 500 records per call.	16 Oct 2017
4.5	**Carpark Availability API** is now enhanced! Latest release includes: - Includes HDB, LTA and URA carpark availability data - New Attribute – Lot Type, Agency - Combined Attribute: Location (previously Latitude and Longitude attributes)	22 Jan 2018 (Soft released on 31 Dec 2017)
4.6	New **Train Service Alerts API** is launched! It returns detailed information on train service unavailability during scheduled operating hours, such as affected Line and Stations etc.	19 Mar 2018
4.7	**4 New Passenger Volume APIs** are launched! Aggregated passenger volume information such as number of trips, tap in and out by weekdays and weekends (inclusive of holidays) are returned. - By Bus Stops - By Origin-Destination Bus Stops - By Origin-Destination Train Stations - By Train Stations Sample output for Train Service Alerts API has been changed to Annex C.	17 Jul 2018
4.8	**Traffic Speed Band API** is now enhanced! Latest release includes: - Speeds are classified into 8 bands at 10km/h interval.	21 Sep 2018

4.9	**Bicycle Parking** is launched! This API returns the information of bicycle parking locations within a radius.	11 Feb 2019
5.0	**Taxi Stands** is launched! This API returns the detailed information of Taxi facility locations.	10 Jan 2020
5.1	**Traffic Images API** is updated! Image links will be valid for 5 mins only. **Geospatial Whole Island API** is launched! It returns the SHP files of the requested geospatial layer. Added: - **ANNEX D** (ZONE ID ATTRIBUTE TO SPECIFIC ERP GANTRY/GANTRIES FOR 2.13 ERP RATES) - **ANNEX E** (GEOSPATIAL WHOLE ISLAND LAYER ID FOR 2.23 GEOSPATIAL WHOLE ISLAND)	01 Apr 2020
5.2	**Facilities Maintenance** is launched! This API returns information on Facilities Maintenance schedule for elevators in MRT station	28 May 2020
5.3	**ANNEX E** is updated, Cycling Path Construction geospatial whole island layer has been removed from **Geospatial Whole Island API**.	19 Jan 2021
5.4	**2 New Platform Crowd Density APIs** are launched! These two APIs return real-time and forecasted platform crowdedness information for the MRT/LRT stations of a train network line.	02 Nov 2021
5.5	**Traffic Flow API** is launched! This API returns hourly average traffic volume. - Added: **ANNEX F** (DESCRIPTION OF ROAD CATEGORIES FOR TRAFFIC FLOW) **Traffic Speed Band API** is now enhanced (version 3)! Latest release includes: - Includes timestamp for last updated time - Split Attributes: StartLon, StartLat, EndLon, EndLat (Previously Location attribute) Minor revisions to **Geospatial Whole Island** API response. Updated guide to generate **Code Snippet** using Postman.	04 Apr 2023
5.5.1	**Road Openings API** is renamed to **Planned Road Openings API.** **Road Works API** is renamed to **Approved Road Works API.** API endpoints remain unchanged.	15 Mar 2024
6.0	**HTTPS is now supported for all APIs.** **Bus Arrival API** is now enhanced (version 3)! Latest release includes: - New attribute - Monitored **ANNEX G** (LOCATION DESCRIPTION OF CAMERA ID FOR TRAFFIC IMAGES) is added.	22 Aug 2024

TABLE OF CONTENTS

1. MAKING API CALLS

API calls need to be made programmatically in regular intervals to obtain the constant stream of data for your respective development or research needs. For illustration purposes, the API call below is being made via a third-party application – Postman.

Steps to making an API call:

1. Download and install the Postman from https://www.getpostman.com/. Fire it up!
2. Make sure Https method is set to GET.
3. Enter the URL (refer to subsequent pages in this document) in the field **request URL**.
4. Enter your AccountKey under **Headers**.
5. **(OPTIONAL STEP)** The "accept" header allows you to specify the response format of your API call. Default is JSON. Specify "application/atom+xml" for XML.
6. Click on the **Send** button.

Figure 2-1

Figure 2-2 below shows the JSON response of an API call made for the Traffic Incidents dataset.
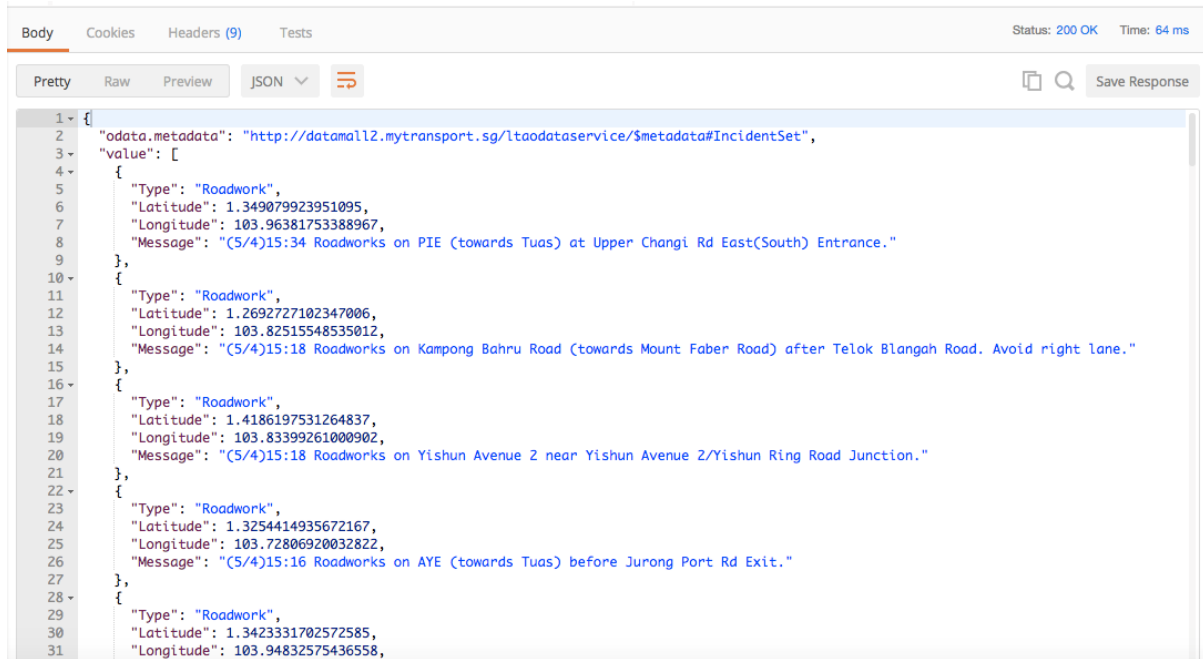
Figure 2-2: API (JSON) Response as shown on Postman.

With the exception of the following Bus Arrival API listed below (see Table 1), API responses returned are limited to 500 records of the dataset per call. This number may be adjusted from time to time.

To retrieve subsequent records of the dataset, you need to append the **$skip operator** to the API call (URL). For example, to retrieve the next 500 records (501st to the 1000th), the API call should be:
http://datamall2.mytransport.sg/ltaodataservice/BusRoutes?$skip=500

To retrieve the following set of 500 records, append '*?$skip=1000*', and so on. Just remember, each URL call returns only a max of 500 records!

API	Response Size
Bus Arrival	Not Applicable. Depends on parameter supplied.
Train Service Alerts	Not Applicable. Depends on the scenario.
Passenger Volume related	Returns one record per request.
Taxi Stands	Not Applicable. Dataset is too small.

Table 1: API Response Size

Following is a guide on how you can generate sample code snippets from Postman.

1. After setting up on Postman to make an API call as per the steps in *Figure 2-1,* select the code icon </> in the right panel of the Postman application.
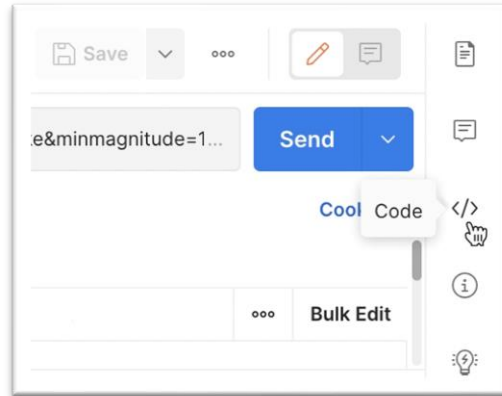
Figure 2-3

2. Use the dropdown list to select the code snippet in the desired programming language.
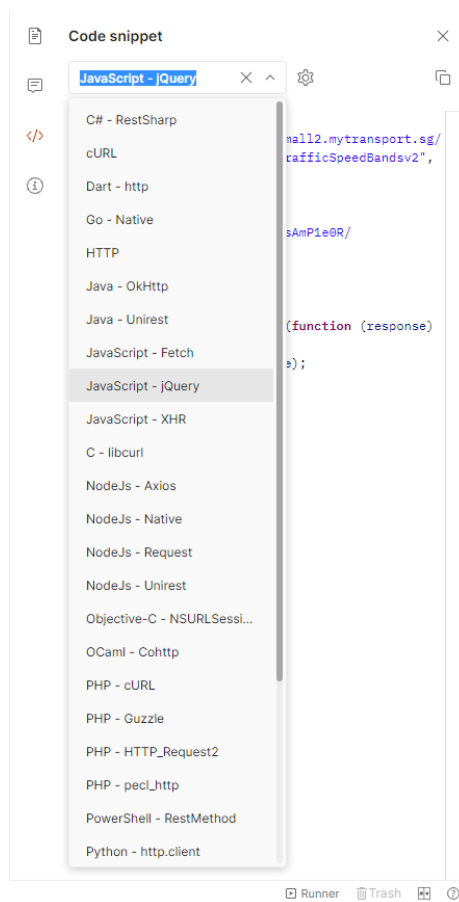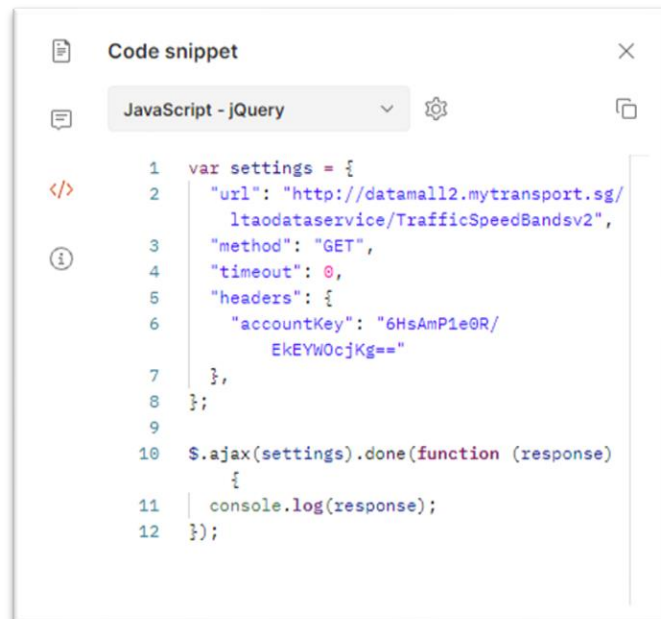
Figure 2-4

3. Code snippet will be automatically generated in the chosen programming language.


```
Code snippet                                    ×

JavaScript - jQuery          ⌄   ⚙           ⎘

1   var settings = {
2     "url": "http://datamall2.mytransport.sg/
        ltaodataservice/TrafficSpeedBandsv2",
3     "method": "GET",
4     "timeout": 0,
5     "headers": {
6       "accountKey": "6HsAmP1e0R/
          EkEYWOcjKg=="
7     },
8   };
9
10  $.ajax(settings).done(function (response)
        {
11    console.log(response);
12  });
```

Figure 2-5

2. API DOCUMENTATION

The following lists all real-time / dynamic datasets that are refreshed at regular intervals and served out via APIs. Specification for each API can be found in the rest of this document.

Note: any attributes not specified in this document but found on the data feed, <u>should be ignored.</u>

	Public-Transport Related (Total 14)	Description
1	Bus Arrival	Returns real-time Bus Arrival information for Bus Services at a queried Bus Stop, including: Estimated Time of Arrival (ETA), Estimated Location, Load info (i.e. how crowded the bus is).
2	Bus Services	Returns detailed service information for all buses currently in operation, including: first stop, last stop, peak / offpeak frequency of dispatch.
3	Bus Routes	Returns detailed route information for all services currently in operation, including: all bus stops along each route, first/last bus timings for each stop.
4	Bus Stops	Returns detailed information for all bus stops currently being serviced by buses, including: Bus Stop Code, location coordinates.
5	Passenger Volume by Bus Stops	Returns tap in and tap out passenger volume by weekdays and weekends for individual bus stop.
6	Passenger Volume by Origin Destination Bus Stops	Returns number of trips by weekdays and weekends from the origin to destination bus stops.
7	Passenger Volume by Origin Destination Train Stations	Returns number of trips by weekdays and weekends from the origin to destination train stations.
8	Passenger Volume by Train Stations	Returns tap in and tap out passenger volume by weekdays and weekends for individual train station.
9	Taxi Availability	Returns location coordinates of all Taxis that are currently available for hire. Does not include "Hired" or "Busy" Taxis.
10	Taxi Stands	Returns detailed information of Taxi stands, such as location and whether is it barrier free
11	Train Service Alerts	Returns detailed information on train service unavailability during scheduled operating hours, such as affected line and stations etc.
12	Facilities Maintenance	Returns pre-signed links to JSON file containing facilities maintenance schedules of a particular station
13	Platform Crowd Density Real-time	Returns real-time platform crowdedness level for the MRT/LRT stations of a particular train network line
14	Platform Crowd Density Forecast	Returns forecasted platform crowdedness level for the MRT/LRT stations of a particular train network line at 30 minutes interval
	Traffic Related (Total 11)	Description
15	Carpark Availability	Returns no. of available lots for HDB, LTA and URA carpark data. The LTA carpark data consist of major shopping malls and developments within Orchard, Marina, HarbourFront, Jurong Lake District.

16	ERP Rates	Returns ERP rates of all vehicle types across all timings for each zone.
17	Estimated Travel Times	Returns estimated travel times of expressways (in segments).
18	Faulty Traffic Lights	Returns alerts of traffic lights that are currently faulty, or currently undergoing scheduled maintenance.
19	Planned Road Openings	Information on planned road openings.
20	Approved Road Works	Information on approved road works to be carried out/being carried out.
21	Traffic Images	Returns links to images of live traffic conditions along expressways and Woodlands & Tuas Checkpoints.
22	Traffic Incidents	Returns incidents currently happening on the roads, such as Accidents, Vehicle Breakdowns, Road Blocks, Traffic Diversions etc.
23	Traffic Speed Bands	Returns current traffic speeds on expressways and arterial roads, expressed in speed bands.
24	VMS / EMAS	Returns traffic advisories (via variable message services) concerning current traffic conditions that are displayed on EMAS signboards along expressways and arterial roads.
25	Traffic Flow	Returns hourly average traffic flow.
Active Mobility Related (Total 1)		**Description**
26	Bicycle Parking	Returns the bicycle parking locations within a radius.
Geospatial Related (Total 1)		**Description**
27	Geospatial Whole Island	Returns the SHP files of the requested geospatial layer

2.1 BUS ARRIVAL

URL	https://datamall2.mytransport.sg/ltaodataservice/v3/BusArrival		
Description	Returns real-time Bus Arrival information of Bus Services at a queried Bus Stop, including Est. Arrival Time, Est. Current Location, Est. Current Load.		
Update Freq	1 minute		
Request			
Parameters	**Description**	**Mandatory**	**Example**
BusStopCode	Bus stop reference code	Yes	*83139*
ServiceNo	Bus service number	No	*15*
Response			
Attributes	**Description**		**Example**
ServiceNo	Bus service number		*15*
Operator	Public Transport Operator Codes: • SBST (for SBS Transit) • SMRT (for SMRT Corporation) • TTS (for Tower Transit Singapore) • GAS (for Go Ahead Singapore)		*GAS*
NextBus NextBus2 NextBus3	Structural tags for all bus level attributes^ of the next 3 oncoming buses. Note that if there is only one last bus left on the roads (e.g. at night), attributes values in NextBus2 and NextBus3 will be empty / blank.		
^ OriginCode	Reference code of the first bus stop where this bus started its service		*77009*
^ DestinationCode	Reference code of the last bus stop where this bus will terminate its service		*77131*
^ EstimatedArrival	Date-time of this bus' estimated time of arrival, expressed in the UTC standard, GMT+8 for Singapore Standard Time (SST)		*2017-04-29T07:20:24+08:00*
^ Monitored	Indicates if the bus arrival time is based on the schedule from operators. • 0 (Value from EstimatedArrival is based on schedule) • 1 (Value from EstimatedArrival is estimated based on bus location)		*1*
^ Latitude	Current estimated location coordinates of this bus at point of published data		*1.42117943692586*
^ Longitude			*103.831477233098*
^ VisitNumber	Ordinal value of the nth visit of this vehicle at this bus stop; 1=1st visit, 2=2nd visit		*1*
^ Load	Current bus occupancy / crowding level: • SEA (for Seats Available) • SDA (for Standing Available) • LSD (for Limited Standing)		*SEA*
^ Feature	Indicates if bus is wheel-chair accessible: • WAB • (empty / blank)		*WAB*
^ Type	Vehicle type: • SD (for Single Deck) • DD (for Double Deck) • BD (for Bendy)		*SD*

Please note that Bus Arrival data (i.e. all attribute-value pairs above) will only appear on the API when the buses are in service (i.e. on the roads). When not in operation, OR when the API service is undergoing maintenance and temporarily unavailable, there will be no response returned on the API (not even the attribute tags).Please refer to Advisement Pt. 1 in following section for more.

SAMPLE API CALL & RESPONSE

API Call:
https://datamall2.mytransport.sg/ltaodataservice/v3/BusArrival?BusStopCode=83139

API Response:
```
{
    "odata.metadata": "https://datamall2.mytransport.sg/ltaodataservice/v3/BusArrival",
    "BusStopCode": "83139",
    "Services": [
        {
            "ServiceNo": "15",
            "Operator": "GAS",
            "NextBus": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2024-08-14T16:41:48+08:00",
                "Monitored": 1,
                "Latitude": "1.3154918333333334",
                "Longitude": "103.9059125",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB",
                "Type": "SD"
            },
            "NextBus2": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2024-08-14T16:49:22+08:00",
                "Monitored": 1,
                "Latitude": "1.3309621666666667",
                "Longitude": "103.9034135",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB",
                "Type": "SD"
            },
            "NextBus3": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2024-08-14T17:06:11+08:00",
                "Monitored": 1,
                "Latitude": "1.344761",
                "Longitude": "103.94022316666667",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB",
                "Type": "SD"
            }
        },
```

```json
{
    "ServiceNo": "150",
    "Operator": "SBST",
    "NextBus": {
        "OriginCode": "82009",
        "DestinationCode": "82009",
        "EstimatedArrival": "2024-08-14T16:55:22+08:00",
        "Monitored": 0,
        "Latitude": "0.0",
        "Longitude": "0.0",
        "VisitNumber": "1",
        "Load": "SEA",
        "Feature": "WAB",
        "Type": "SD"
    },
    "NextBus2": {
        "OriginCode": "82009",
        "DestinationCode": "82009",
        "EstimatedArrival": "2024-08-14T17:15:22+08:00",
        "Monitored": 0,
        "Latitude": "0.0",
        "Longitude": "0.0",
        "VisitNumber": "1",
        "Load": "SEA",
        "Feature": "WAB",
        "Type": "SD"
    },
    "NextBus3": {
        "OriginCode": "",
        "DestinationCode": "",
        "EstimatedArrival": "",
        "Monitored": 0,
        "Latitude": "",
        "Longitude": "",
        "VisitNumber": "",
        "Load": "",
        "Feature": "",
        "Type": ""
    }
},
{
    "ServiceNo": "155",
    "Operator": "SBST",
    "NextBus": {
        "OriginCode": "52009",
        "DestinationCode": "84009",
        "EstimatedArrival": "2024-08-14T16:45:23+08:00",
        "Monitored": 1,
        "Latitude": "1.3183185",
        "Longitude": "103.9003205",
        "VisitNumber": "1",
        "Load": "SEA",
        "Feature": "WAB",
        "Type": "SD"
    },
    "NextBus2": {
        "OriginCode": "52009",
        "DestinationCode": "84009",
```

```
                "EstimatedArrival": "2024-08-14T17:01:38+08:00",
                "Monitored": 1,
                "Latitude": "1.3254035",
                "Longitude": "103.88185066666667",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB",
                "Type": "SD"
            },
            "NextBus3": {
                "OriginCode": "52009",
                "DestinationCode": "84009",
                "EstimatedArrival": "2024-08-14T17:12:38+08:00",
                "Monitored": 1,
                "Latitude": "1.3282046666666667",
                "Longitude": "103.8799955",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB",
                "Type": "SD"
            }
        }
    ]
}
```

ADVISEMENT ON FRONT-END IMPLEMENTATION (BUS APPS)

1. **[EstimatedArrival] Display of Advisement Messages when there is <u>NO Bus Arrival Data</u>**

   In the event where data is not available (be it in partial or in full) on the API, you may want to display some form of 'status texts' to advise your app users on what's going on, as far as bus service availability is concerned. To do this, you will need to take reference from two data points – (1) the presence or **absence** of Arrival data itself, and (2) the **bus service operating hours at each bus stop** which you need to obtain via the **Bus Routes API**.

   With those two data points gathered, you will arrive at the following possible scenarios:

#	Operation Status	Data Availability	Advisement Message
a.	Bus is in operation	Arrival data is available	(none required)
b.	Bus is in operation	Arrival data is NOT available	*"No Est. Available"*
c.	Bus is NOT in operation	Arrival data is NOT available	*"Not In Operation"*
d.	Bus is NOT in operation	Arrival data is available	(none required)

   For scenarios (b) and (c), you may display advisement messages like those suggested in the table above, or any other user-friendly and appropriate variants at your discretion.

   Next, you should note that Arrival data may be available on the API even when bus services are supposedly NOT in operation (as per scheduled operating hours) – reflected as scenario (d) in the table above. This happens,

   a. before first bus(es) begin their service from Bus Interchanges / Depots in the mornings, and,
   b. when last bus(es) at night are running behind schedule; slightly past operating hours.

   Therefore, the general logic to be applied, is to **always <u>first</u> display the Arrival data if it's available on the API**, irrespective of the scheduled operating hours. Advisement messages like "*No Est. Available*" and "*Not In Operation*" are applicable ONLY when there is no Arrival data on the API.

2. **[EstimatedArrival] Rounding of Seconds**

All derived bus arrival duration should be rounded down to the nearest minute.

Derived duration:	3:49 mins
Display duration:	"3 min"

Derived duration:	2:07 mins
Display duration:	"2 min"

Derived duration:	1:59 mins
Display duration:	"1 min"

Derived duration:	0:59 mins
Display duration:	"Arr"

3. **[Load] Colour Scheme Adoption**

You may adopt this colour scheme to serve as visual indicators for the various loading values:

- [Green] Seats Available
- [Amber] Standing Available
- [Red] Limited Standing

You are given the flexibility for the manner in which you display the colours, i.e. colour bars, coloured timings, and accompanied with legends where appropriate and/or necessary.

4. **[Feature] Wheelchair Accessible Buses**

You are given the flexibility to display any symbols or labels ♿ to denote oncoming buses that are wheelchair accessible.

5. **[Feature] Schedule Indicator**

You are given the flexibility to display any symbols or labels 🕐 to indicate if the bus arriving times are based on the schedule from operators and may be subject to changes.

ADDITIONAL NOTE ON LOOP SERVICES THAT RUNS BOTH DIRECTIONS

Please note that some Loop Services are appended with **'G'** or **'W'** to denote their direction of travel. You should account for and display these services individually – 225G, 225W, 243G, 243W, 410G, 410W.

2.2 BUS SERVICES

URL	https://datamall2.mytransport.sg/ltaodataservice/BusServices
Description	Returns detailed service information for all buses currently in operation, including: first stop, last stop, peak / offpeak frequency of dispatch.
Update Freq	Ad hoc

Response		
Attributes	**Description**	**Sample**
ServiceNo	The bus service number	*107M*
Operator	Operator for this bus service	*SBST*
Direction	The direction in which the bus travels (1 or 2), loop services only have 1 direction	*1*
Category	Category of the SBS bus service: EXPRESS, FEEDER, INDUSTRIAL, TOWNLINK, TRUNK, 2 TIER FLAT FEE, FLAT FEE $1.10 (or $1.90, $3.50, $3.80)	*TRUNK*
OriginCode	Bus stop code for first bus stop	*64009*
DestinationCode	Bus stop code for last bus stop (similar as first stop for loop services)	*64009*
AM_Peak_Freq	Freq of dispatch for AM Peak 0630H - 0830H (range in minutes)	*14-17*
AM_Offpeak_Freq	Freq of dispatch for AM Off-Peak 0831H - 1659H (range in minutes)	*10-16*
PM_Peak_Freq	Freq of dispatch for PM Peak 1700H - 1900H (range in minutes)	*12-15*
PM_Offpeak_Freq	Freq of dispatch for PM Off-Peak after 1900H (range in minutes)	*12-15*
LoopDesc	Location at which the bus service loops, empty if not a loop service.	*Raffles Blvd*

2.3 BUS ROUTES

URL	https://datamall2.mytransport.sg/ltaodataservice/BusRoutes
Description	Returns detailed route information for all services currently in operation, including: all bus stops along each route, first/last bus timings for each stop.
Update Freq	Ad hoc

Response		
Attributes	**Description**	**Sample**
ServiceNo	The bus service number	*107M*
Operator	Operator for this bus service	*SBST*
Direction	The direction in which the bus travels (1 or 2), loop services only have 1 direction	*1*
StopSequence	The i-th bus stop for this route	*28*
BusStopCode	The unique 5-digit identifier for this physical bus stop	*01219*
Distance	Distance travelled by bus from starting location to this bus stop (in kilometres)	*10.3*
WD_FirstBus	Scheduled arrival of first bus on weekdays	*2025*
WD_LastBus	Scheduled arrival of last bus on weekdays	*2352*
SAT_FirstBus	Scheduled arrival of first bus on Saturdays	*1427*
SAT_LastBus	Scheduled arrival of last bus on Saturdays	*2349*
SUN_FirstBus	Scheduled arrival of first bus on Sundays	*0620*
SUN_LastBus	Scheduled arrival of last bus on Sundays	*2349*

2.4 BUS STOPS

URL	https://datamall2.mytransport.sg/ltaodataservice/BusStops
Description	Returns detailed information for all bus stops currently being serviced by buses, including: Bus Stop Code, location coordinates.
Update Freq	Ad hoc
Response	

Attributes	Description	Sample
BusStopCode	The unique 5-digit identifier for this physical bus stop	*01012*
RoadName	The road on which this bus stop is located	*Victoria St*
Description	Landmarks next to the bus stop (if any) to aid in identifying this bus stop	*Hotel Grand Pacific*
Latitude	Location coordinates for this bus stop	*1.29685*
Longitude		*103.853*

2.5 PASSENGER VOLUME BY BUS STOPS

URL	https://datamall2.mytransport.sg/ltaodataservice/PV/Bus		
Description	Returns tap in and tap out passenger volume by weekdays and weekends for individual bus stop		
Update Freq	By 15th of every month, the passenger volume for previous month data will be generated		
Request			
Parameters	**Description**	**Mandatory**	**Example**
Date	Request for files up to last three months	No	*Date=201803*
Response			
Attributes	**Description**		**Example**
Link	- Link for downloading this file. - Refer to sample output on <u>Annex A</u> for reference - Link will expire after 5 minutes		*https://ltafarecard.s3.amazonaws.com/201803/transport_node_bus_201803.zip?x-amz-security-token=FQoDYXdzEOf%2F%2F%2F%2F%2F%2F%2F%2F%2F%...*

2.6   PASSENGER VOLUME BY ORIGIN DESTINATION BUS STOPS

URL	https://datamall2.mytransport.sg/ltaodataservice/PV/ODBus		
Description	Returns number of trips by weekdays and weekends from origin to destination bus stops		
Update Freq	By 15th of every month, the passenger volume for previous month data will be generated		
Request			
Parameters	Description	Mandatory	Example
Date	Request for files up to last three months	No	*Date=201804*
Response			
Attributes	Description		Example
Link	• Link for downloading this file. • Refer to sample output on Annex B for reference • Link will expire after 5 minutes		*https://ltafarecard.s3.amazonaws.com/201804/origin_destination_bus_201804.zip?x-amz-security-token=FQoDYXdzEOf%2F%2…*

2.7 PASSENGER VOLUME BY ORIGIN DESTINATION TRAIN STATIONS

URL	https://datamall2.mytransport.sg/ltaodataservice/PV/ODTrain
Description	Returns number of trips by weekdays and weekends from origin to destination train stations
Update Freq	By 15th of every month, the passenger volume for previous month data will be generated
Request	

Parameters	Description	Mandatory	Example
Date	Request for files up to last three months	No	*Date=201803*

Response			

Attributes	Description		Example
Link	- Link for downloading this file. - Refer to sample output on <u>Annex B</u> for reference - Link will expire after 5 minutes		*https://ltafarecard.s3.amazonaws.com/201803/origin_destination_train_201803.zip?x-amz-security-token=FQoDYXdzEOf%2F%2F%...*

2.8   PASSENGER VOLUME BY TRAIN STATIONS

URL	https://datamall2.mytransport.sg/ltaodataservice/PV/Train		
Description	Returns tap in and tap out passenger volume by weekdays and weekends for individual train station		
Update Freq	By 15th of every month, the passenger volume for previous month data will be generated		
Request			
Parameters	**Description**	**Mandatory**	**Example**
Date	Request for files up to last three months	No	*Date=201805*
Response			
Attributes	**Description**		**Example**
Link	- Link for downloading this file. - Refer to sample output on <u>Annex A</u> for reference - Link will expire after 5 minutes		*https://ltafarecard.s3.amazonaws.com/201805/transport_node_train_201805.zip?x-amz-security-token=FQoDYXdzEOf%2F%2F%2F2F...*

2.9   TAXI AVAILABILITY

URL	https://datamall2.mytransport.sg/ltaodataservice/Taxi-Availability
Description	Returns location coordinates of all Taxis that are currently available for hire. Does not include "Hired" or "Busy" Taxis.
Update Freq	1 min
Response	

Attributes	Description	Sample
Latitude	Latitude location coordinates.	*1.35667*
Longitude	Longitude location coordinates.	*103.93314*

2.10 TAXI STANDS

URL	https://datamall2.mytransport.sg/ltaodataservice/TaxiStands
Description	Returns detailed information of Taxi stands, such as location and whether is it barrier free.
Update Freq	Monthly

Response		
Attributes	**Description**	**Sample**
TaxiCode	Code representation of Taxi facility.	*A01*
Latitude	Latitude map coordinates for the start point of this road incident.	*1.303980684*
Longitude	Longitude map coordinates for the start point of this incident.	*103.9191828*
Bfa	Indicate whether the Taxi stand is barrier free.	*Yes*
Ownership	Indicate the owner of the Taxi stand. LTA – Land Transport Authority CCS – Clear Channel Singapore Private – Taxi facilities that are constructed and maintained by private entities (e.g. developers/owners of shopping malls, commercial buildings).	*LTA* *CCS* *Private*
Type	Stand - allows Taxis to queue in the taxi bays and wait for passengers. Stop - allow Taxis to perform immediate pick up and drop off of passengers.	*Stand* *Stop*
Name	Name of Taxi facility.	*Orchard Rd along driveway of Lucky Plaza*

2.11 TRAIN SERVICE ALERTS

URL	https://datamall2.mytransport.sg/ltaodataservice/TrainServiceAlerts
Description	Returns detailed information on train service **unavailability** during scheduled operating hours, such as affected line and stations etc.
Update Freq	Ad hoc

Request			
Parameters	**Description**	**Mandatory**	**Example**
(none)	-	-	-

Response		
Attributes	**Description**	**Example**
Status	Indicates if train service is unavailable: • 1 (for Normal Train Service) • 2 (for Disrupted Train Service)	*2*
Line	Train network line affected: • CCL (for Circle Line) • CEL (for Circle Line Extension – BayFront, Marina Bay) • CGL (for Changi Extension – Expo, Changi Airport) • DTL (for Downtown Line) • EWL (for East West Line) • NEL (for North East Line) • NSL (for North South Line) • PEL (for Punggol LRT East Loop) • PWL (for Punggol LRT West Loop) • SEL (for Sengkang LRT East Loop) • SWL (For Sengkang LRT West Loop) • BPL (for Bukit Panjang LRT)	*NEL*
Direction	Indicates direction of service unavailability on the affected line: • Both • (towards station name)	*Punggol*
Stations	Indicates the list of affected stations on the affected line.	*NE1,NE3,NE4,NE5,NE6*
FreePublicBus	Indicates the list of affected stations where free boarding onto **normal public bus services** are available. • (station code) • Free bus service island wide	*NE1,NE3,NE4,NE5,NE6*
FreeMRTShuttle	Indicates the list of affected stations where **free MRT shuttle services^** are available. • (station code) • EW21|CC22,EW23,EW24|NS1, EW27;NS9,NS13,NS16,NS17|CC15; EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1*****	*NE1,NE3,NE4,NE5,NE6*

MRTShuttleDirection	Indicates the direction of free MRT shuttle services available: • Both • (towards station name)	*Punggol*
Message	Travel advisory notification service for train commuters, published by LTA. This notice is also broadcasted to commuters via the Find-My-Way module in MyTransport mobile app. • Content • CreatedDate	*1710hrs: NEL – No train service between Harbourfront to Dhoby Ghaut stations towards Punggol station due to a signalling fault. Free bus rides are available at designated bus stops.* *2017-12-01 17:54:21*

Note:
- This API relies on the static master list of Train Station Codes, Train Line Codes and Train Shuttle Service Direction which can be obtained on DataMall Portal .
  - The Train Station Codes and Train Line Codes files are under Public Transport section.
  - The Train Shuttle Service Direction information can be found in Train Line Codes file.
- During train unavailability, following attributes will be mandatory.
  - Status
  - Line
  - Direction
  - Stations
- Each line that is affected will be published as separate clusters within the single API response. Refer to sample output on Annex C for reference.
- **^**Free MRT Shuttle services will ferry commuters from station to station along the affected stretch.
- *****There are scenarios which MRT Shuttle services do not run along the affected stretch but along four predefined areas in both directions
  - Bouna Vista, Clementi, Jurong East and Boon Lay
  - Woodlands, Yishun, Ang Mo Kio, Bishan
  - Paya Lebar, Bedok, Tampines
  - Jurong East, Choa Chu Kang
  - "|" delimiter to denote an interchange station
  - ";" delimiter to denote end of an area

2.12 CARPARK AVAILABILITY

URL	https://datamall2.mytransport.sg/ltaodataservice/CarParkAvailabilityv2		
Description	Returns no. of available lots for HDB, LTA and URA carpark data. The LTA carpark data consist of major shopping malls and developments within Orchard, Marina, HarbourFront, Jurong Lake District. *(Note: list of LTA carpark data available on this API is <u>subset</u> of those listed on One.Motoring and MyTransport Portals)*		
Update Freq	1 minute		

Response				
Attributes	**Description**	**LTA Sample**	**URA Sample**	**HDB Sample**
CarParkID	A unique code for this carpark	*1*	*A0007*	*KB7*
Area	Area of development / building: • Orchard • Marina • Harbfront • JurongLakeDistrict	*Marina*	*(blank)*	*(blank)*
Development	Major landmark or address where carpark is located	*Suntec City*	*ANGULLIA PARK OFF STREET*	*BLK 69 GEYLANG BAHRU*
Location	Latitude and Longitude map coordinates.	*1.29375 103.85718*	*1.305328… 103.82957…*	*1.32158.. 103.87047…*
AvailableLots	Number of lots available at point of data retrieval.	*352*	*0*	*18*
LotType	Type of lots: • C (for Cars) • H (for Heavy Vehicles) • Y (for Motorcycles)	*C*	*Y*	*C*
Agency	Agencies: • HDB • LTA • URA	*LTA*	*URA*	*HDB*

Respective agencies are responsible for the accuracy of the carpark data. If there is any data related issue, you may contact the agency directly. There may be empty values if data is not available (e.g. Area for HDB and URA data is unavailable hence blank value is expected).

2.13 ERP RATES

URL	https://datamall2.mytransport.sg/ltaodataservice/ERPRates
Description	Returns ERP rates of all vehicle types across all timings for each zone.
Update Freq	Ad hoc
Response	
Attributes	**Description**	**Sample**

Attributes	Description	Sample
VehicleType	Classification types: • Passenger Cars • Motorcycles • Light Goods Vehicles • Heavy Goods Vehicles • Very Heavy Goods Vehicles • Taxis	*Passenger Cars/Light Goods Vehicles/Taxis*
DayType	Available types: - Weekdays - Saturdays	*Weekdays*
StartTime	Start time for this ERP rate	*08:00*
EndTime	End time for this ERP rate	*08:05*
ZoneID	Zone for this ERP rate For mapping this attribute to specific ERP Gantry/Gantries, please refer to **ANNEX D**.	*AY1*
ChargeAmount	Chargeable amount	*0.5*
EffectiveDate	Rate is effective as of this date (in YYYY-MM-DD format)	*2016-02-01*

2.14 ESTIMATED TRAVEL TIMES

URL	https://datamall2.mytransport.sg/ltaodataservice/EstTravelTimes
Description	Returns estimated travel times of expressways (in segments).
Update Freq	5 minutes

Response		
Attributes	**Description**	**Sample**
Name	Expressway	*AYE*
Direction	Direction of travel: 1 – Travelling from east to west, or south to north. 2 – Travelling from west to east, or north to south.	*1*
FarEndPoint	The final end point of this whole expressway in current direction of travel	*TUAS CHECKPOINT*
StartPoint	Start point of this current segment	*AYE/MCE INTERCHANGE*
EndPoint	End point of this current segment	*TELOK BLANGAH RD*
EstTime	Estimated travel time in minutes	*2*

2.15 FAULTY TRAFFIC LIGHTS

URL	https://datamall2.mytransport.sg/ltaodataservice/FaultyTrafficLights
Description	Returns alerts of traffic lights that are <u>currently</u> faulty, or <u>currently</u> undergoing scheduled maintenance.
Update Freq	2 minutes – whenever there are updates
Response	

Attributes	Description	Sample
AlarmID	Technical alarm ID	*GL703034136*
NodeID	A unique code to represent each unique traffic light node	*703034136*
Type	Type of the technical alarm • 4 (Blackout) • 13 (Flashing Yellow)	*13*
StartDate	YYYY-MM-DD HH:MM:SS.ms	*2014-04-12 01:58:00.0*
EndDate	YYYY-MM-DD HH:MM:SS.ms (empty field if this is not a scheduled maintenance)	
Message	Canning Message	*(23/1)8:58 Flashing Yellow at Bedok North Interchange/Bedok North Street 1 Junc.*

2.16 PLANNED ROAD OPENINGS

URL	https://datamall2.mytransport.sg/ltaodataservice/RoadOpenings	
Description	Information on planned road openings.	
Update Freq	24 hours – whenever there are updates	
Response		
Attributes	**Description**	**Sample**
EventID	ID for this road opening event	*RMAPP-201603-0900*
StartDate	Start date for works to be performed for this road opening (in YYYY-MM-DD format)	*2016-03-31*
EndDate	End date for works to be performed for this road opening (in YYYY-MM-DD format)	*2016-09-30*
SvcDept	Department or company performing this road work	*SP POWERGRID LTD - CUSTOMER PROJ (EAST)*
RoadName	Name of new road to be opened	*AH SOO GARDEN*
Other	Additional information or messages	*For details, please call 62409237*

2.17 APPROVED ROAD WORKS

URL	https://datamall2.mytransport.sg/ltaodataservice/RoadWorks
Description	Information on approved road works to be carried out/being carried out.
Update Freq	24 hours – whenever there are updates

Response		
Attributes	**Description**	**Sample**
EventID	ID for this road work	*RMAPP-201512-0217*
StartDate	Start date for the works performed for this road work (in YYYY-MM-DD format)	*2015-12-14*
EndDate	End date for works performed for this road work (in YYYY-MM-DD format)	*2016-07-31*
SvcDept	Department or company performing this road work	*SP POWERGRID LTD - REGIONAL NETWORK CENTRAL*
RoadName	Name of road where work is being performed.	*ADAM DRIVE*
Other	Additional information or messages.	*For details, please call 67273085*

2.18 TRAFFIC IMAGES

URL	https://datamall2.mytransport.sg/ltaodataservice/Traffic-Imagesv2
Description	Returns links to images of live traffic conditions along expressways and Woodlands & Tuas Checkpoints.
Update Freq	1 to 5 minutes

Response		
Attributes	**Description**	**Sample**
CameraID	A unique ID for this camera For mapping this attribute to specific location descriptions, please refer to **ANNEX G**.	*5795*
Latitude	Latitude map coordinates	*1.326024822*
Longitude	Longitude map coordinates	*103.905625*
ImageLink	• Link for downloading this image. • Link will expire after 5 minutes	*https://dm-traffic-camera-itsc.s3.amazonaws.com/2020-04-01/09-24/1001_0918_20200401092500_e0368e.jpg?x-amz-security-token=IQoJb3JpZ2luX2VjEBkaDmFwL...*

2.19 TRAFFIC INCIDENTS

URL	https://datamall2.mytransport.sg/ltaodataservice/TrafficIncidents
Description	Returns incidents currently happening on the roads, such as Accidents, Vehicle Breakdowns, Road Blocks, Traffic Diversions etc.
Update Freq	2 minutes – whenever there are updates

Response		
Attributes	**Description**	**Sample**
Type	Incident Types: • Accident • Road Works • Vehicle Breakdown • Weather • Obstacle • Road Block • Heavy Traffic • Misc. • Diversion • Unattended Vehicle	*Vehicle Breakdown*
Latitude	Latitude map coordinates for the start point of this road incident	*1.30398068448214*
Longitude	Longitude map coordinates for the start point of this incident	*103.919182834377*
Message	Description message for this incident	*(29/3)18:22 Vehicle breakdown on ECP (towards Changi Airport) after Still Rd Sth Exit. Avoid lane 3.*

2.20 TRAFFIC SPEED BANDS

URL	https://datamall2.mytransport.sg/ltaodataservice/v3/TrafficSpeedBands
Description	Returns current traffic speeds on expressways and arterial roads, expressed in speed bands.
Update Freq	5 minutes

Response		
Attributes	**Description**	**Sample**
LinkID	Unique ID for this stretch of road	*103046935*
RoadName	Road Name	*SERANGOON ROAD*
RoadCategory	A – Expressways B – Major Arterial Roads C – Arterial Roads D – Minor Arterial Roads E – Small Roads F – Slip Roads G – No category info available	*B*
SpeedBand	Speed Bands Information. Total: 8 1 – indicates speed range from 0 < 9 2 – indicates speed range from 10 < 19 3 – indicates speed range from 20 < 29 4 – indicates speed range from 30 < 39 5 – indicates speed range from 40 < 49 6 – indicates speed range from 50 < 59 7 – indicates speed range from 60 < 69 8 – speed range from 70 or more	*2*
MinimumSpeed	Minimum speed in km/h	*10*
MaximumSpeed	Maximum speed in km/h	*19*
StartLon	Longitude map coordinates for start point for this stretch of road.	*103.86246461405193*

StartLat	Latitude map coordinates for start point for this stretch of road.	*1.3220591510051254*
EndLon	Longitude map coordinates for end point for this stretch of road.	*103.86315591911669*
EndLat	Latitude map coordinates for start point for this stretch of road.	*1.3215993547809128*

2.21 VMS / EMAS

URL	https://datamall2.mytransport.sg/ltaodataservice/VMS
Description	Returns traffic advisories (via variable message services) concerning current traffic conditions that are displayed on EMAS signboards along expressways and arterial roads.
Update Freq	2 minutes

Response		
Attributes	**Description**	**Sample**
EquipmentID	EMAS equipment ID	*amvms_v9104*
Latitude	Latitude map coordinates of electronic signboard.	*1.3927176306916775*
Longitude	Longitude map coordinates of electronic signboard.	*103.82618266340947*
Message	Variable Message being displayed on the EMAS display.	*VEH BREAKDOWN SH,AFT U.THOMSON*

2.22 BICYCLE PARKING

URL	https://datamall2.mytransport.sg/ltaodataservice/BicycleParkingv2
Description	Returns bicycle parking locations within a radius. The default radius is set as 0.5km
Update Freq	Monthly

Request			
Parameters	**Description**	**Mandatory**	**Example**
Lat	Latitude map coordinates of location	Yes	*1.364897*
Long	Longitude map coordinates of location	Yes	*103.766094*
Dist	Radius in kilometre	No	*Default is 0.5*

Response		
Attributes	**Description**	**Example**
Description	Brief description of bicycle parking location.	*Bus Stop 43267*
Latitude	Latitude map coordinates of bicycle parking location.	*1.3927176306916775*
Longitude	Longitude map coordinates of bicycle parking location.	*103.82618266340947*
RackType	Type of bicycle parking facility.	*Racks or Yellow Box*
RackCount	Total number of bicycle parking lots.	*10*
ShelterIndicator	Indicate whether the bicycle parking lots are sheltered.	*Y*

2.23 GEOSPATIAL WHOLE ISLAND

URL	https://datamall2.mytransport.sg/ltaodataservice/GeospatialWholeIsland
Description	Returns the SHP files of the requested geospatial layer
Update Freq	Ad hoc
Request			
Parameters	**Description**	**Mandatory**	**Example**
ID	Name of Geospatial Layer. Refer to **ANNEX E** for the list of Geospatial layers (Case Sensitive, omit space.)	Yes	*ArrowMarking*
Response		
Attributes	**Description**	**Example**
Link	• Link for downloading this file. • Link will expire after 5 minutes	*https://dmgeospatial.s3.ap-southeast-1.amazonaws.com/ArrowMarking.zip?X-Amz-Security-Token=IQoJb3JpZ2luX2VjEG*

2.24 FACILITIES MAINTENANCE

URL	https://datamall2.mytransport.sg/ltaodataservice/FacilitiesMaintenance
Description	Returns pre-signed links to JSON file containing facilities maintenance schedules of a particular station
Update Freq	Ad hoc

Request			
Parameters	**Description**	**Mandatory**	**Example**
StationCode	Station Code of train station (Case Sensitive, omit space.)	Yes	*NS1*

Response		
Attributes	**Description**	**Example**
Link	• Link for downloading this file. • Link will expire after 5 minutes	*https://mtmfacilitiesmaintenance.s3.ap-southeast-1.amazonaws.com/EW11.json?X-Amz-Security-Token=IQoJb3JpZ2luX2VjE…*

2.25 PLATFORM CROWD DENSITY REAL TIME

URL	https://datamall2.mytransport.sg/ltaodataservice/PCDRealTime		
Description	Returns real-time platform crowdedness level for the MRT/LRT stations of a particular train network line		
Update Freq	10 minutes		
Request			
Parameters	**Description**	**Mandatory**	**Example**
TrainLine	Code of train network line. Train lines supported: • CCL (for Circle Line) • CEL (for Circle Line Extension – BayFront, Marina Bay) • CGL (for Changi Extension – Expo, Changi Airport) • DTL (for Downtown Line) • EWL (for East West Line) • NEL (for North East Line) • NSL (for North South Line) • BPL (for Bukit Panjang LRT) • SLRT (for Sengkang LRT) • PLRT (for Punggol LRT)	Yes	*EWL*
Response			
Attributes	**Description**		**Example**
Station	Station code		EW13
StartTime	The start of the time interval		2021-09-15T09:40:00+08:00
EndTime	The end of the time interval		2021-09-15T09:50:00+08:00
CrowdLevel	The crowdedness level indicates: • l: low • h: high • m: moderate • NA		l

2.26 PLATFORM CROWD DENSITY FORECAST

URL	https://datamall2.mytransport.sg/ltaodataservice/PCDForecast
Description	Returns forecasted platform crowdedness level for the MRT/LRT stations of a particular train network line at 30 minutes interval
Update Freq	24 hours
Request	

Parameters	Description	Mandatory	Example
TrainLine	Code of train network line. Train lines supported: • CCL (for Circle Line) • CEL (for Circle Line Extension – BayFront, Marina Bay) • CGL (for Changi Extension – Expo, Changi Airport) • DTL (for Downtown Line) • EWL (for East West Line) • NEL (for North East Line) • NSL (for North South Line) • BPL (for Bukit Panjang LRT) • SLRT (for Sengkang LRT) • PLRT (for Punggol LRT)	Yes	*NSL*

Response		

Attributes	Description	Example
Date	Midnight of the forecasted date	2021-09-15T00:00:00+08:00
Station	Station code	NS1
Start	The start of the time interval	2021-09-15T00:00:00+08:00
CrowdLevel	The crowdedness level indicates: • l: low • h: high • m: moderate • NA	l

2.27 TRAFFIC FLOW

URL	https://datamall2.mytransport.sg/ltaodataservice/TrafficFlow
Description	Returns hourly average traffic flow, taken from a representative month of every quarter during 0700-0900 hours.
Update Freq	Quarterly

Response		
Attributes	**Description**	**Example**
Link	• Link for downloading this file. • Link will expire after 5 minutes	*https://dm-traffic-flow-data.s3.ap-southeast-1.amazonaws.com/trafficflow.json?X-Amz-Security-Token=IQoJb3JpZ2luX2VjE...*

ANNEX A

SAMPLE OUTPUT FOR 2.5 PASSENGER VOLUME BY BUS STOPS AND 2.8 PASSENGER VOLUME BY TRAIN STATIONS

The batch file follows a variant of the generic comma-separated-values (CSV) format.

SYNTAX
YEAR_MONTH, DAY_TYPE, TIME_PER_HOUR, PT_TYPE, PT_CODE, TOTAL_TAP_IN_VOLUME, TOTAL_TAP_OUT_VOLUME \n

DELIMITERS

  ,   common delimiter to separate values

  \n   not a delimiter, but the 'next line' character to denote the end of a record

SAMPLE FOR BUS
2018-05, WEEKDAY, 20, BUS, 50199, 853, 834
2018-05, WEEKENDS/HOLIDAY, 20, BUS, 50199, 459, 297

SAMPLE FOR TRAIN
2018-05, WEEKDAY, 15, TRAIN, EW14-NS26, 56019, 37614
2018-05, WEEKENDS/HOLIDAY, 15, TRAIN, EW14-NS26, 13385, 10878

Note
- Explanation of the sample **Bus** record: For all weekdays in May 2018, from 2000hrs to 2059hrs, at Bus Stop 50199, Opp Shaw Plaza, the total passenger volume of tap in and tap out are 853 and 834 respectively.
- TIME_PER_HOUR refers to the hour of the day. E.g. 15 = 1500hrs to 1559hrs
- For some Train interchanges, the station codes will be merged and considered as one station (E.g. EW14-NS26 refers to Raffles Place station)
- To find out more information about bus stops, please refer to **Bus Stop API.**
- To find out more information about train stations, please refer to **Train Station Codes and Chinese Names.csv** in [DataMall Portal](#) under Public Transport section.

ANNEX B

SAMPLE OUTPUT FOR 2.6 PASSENGER VOLUME BY ORIGIN DESTINATION BUS STOPS AND 2.7 PASSENGER VOLUME BY ORIGIN DESTINATION TRAIN STATIONS

The batch file follows a variant of the generic comma-separated-values (CSV) format.

SYNTAX
YEAR_MONTH, DAY_TYPE, TIME_PER_HOUR, PT_TYPE, ORIGIN_PT_CODE, DESTINATION_PT_CODE, TOTAL_TRIPS \n

DELIMITERS

,   common delimiter to separate values
\n   not a delimiter, but the 'next line' character to denote the end of a record

SAMPLE FOR BUS
2018-05, WEEKDAY, 16, BUS, 28299, 28009, 63
2018-05, WEEKENDS/HOLIDAY, 16, BUS, 28299, 28009, 103

SAMPLE FOR TRAIN
2018-05, WEEKDAY, 17, TRAIN, CC28, CC1-NE6-NS24, 111
2018-05, WEEKENDS/HOLIDAY, 17, TRAIN, CC28, CC1-NE6-NS24, 39

Note
- Explanation of the sample **Train** record: For all weekdays in May 2018, from 1700hrs to 1759hrs, the total number of passenger trips made from CC28, Telok Blangah station, to CC1-NE6-NS24, Dhoby Ghaut station, are 111.
- TIME_PER_HOUR refers to the hour of the day. E.g. 16 = 1600hrs to 1659hrs
- For some Train interchanges, the station codes will be merged and considered as one station (E.g. CC1-NE6-NS24 refers to Dhoby Ghaut station)
- To find out more information about bus stops, please refer to **Bus Stop API.**
- To find out more information about train stations, please refer to **Train Station Codes and Chinese Names.csv** in DataMall Portal under Public Transport section.

ANNEX C

SAMPLE SCENARIOS FOR 2.11 TRAIN SERVICE ALERTS API

Once the train is unavailable, you may expect the Train Service Alert API response to be displayed according to the steps below.

1. Activate contingency mode
2. Publish message
3. Edit activated contingency mode (optional)
4. Publish new message (optional)
5. Train Service Recover
6. Publish recover message (optional)

During normal scenario (No train Disruption)

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": []
    }
}
```

Sample Scenario #1 - Single Line affected

This scenario depicts

    a.   NEL – Boon Keng to Dhoby Ghaut, towards Harbourfront station

    b.   Free public bus services and free MRT shuttle (towards Harbourfront station)

Step 1: Activate contingency mode - NEL – Boon Keng to Dhoby Ghaut, towards Harbourfront station

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "NE9,NE8,NE7,NE6",
                "FreePublicBus": "",
                "FreeMRTShuttle": "",
                "MRTShuttleDirection": ""
            }
        ],
        "Message": []
    }
}
```

Step 2: Publish new message

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "NE9,NE8,NE7,NE6",
                "FreePublicBus": "",
                "FreeMRTShuttle": "",
                "MRTShuttleDirection": ""
            }
        ],
        "Message": [
            {
                "Content": "1657hrs : NEL - Additional travelling time of 20 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault.",
                "CreatedDate": "2017-12-11 16:57:25"
            }
        ]
    }
}
```

Step 3: Edit activated contingency mode – Free Public Bus Service and free MRT Shuttle Service (towards HarbourFront)

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "NE9,NE8,NE7,NE6",
                "FreePublicBus": "NE9,NE8,NE7,NE6",
                "FreeMRTShuttle": "NE9,NE8,NE7,NE6",
                "MRTShuttleDirection": "HarbourFront"
            }
        ],
        "Message": [
            {
                "Content": "1657hrs : NEL - Additional travelling time of 20 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault.",
                "CreatedDate": "2017-12-11 16:57:25"
            }
        ]
    }
}
```

Step 4: Publish new message

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "NE9,NE8,NE7,NE6",
                "FreePublicBus": "NE9,NE8,NE7,NE6",
                "FreeMRTShuttle": "NE9,NE8,NE7,NE6",
                "MRTShuttleDirection": "HarbourFront"
            }
        ],
        "Message": [
            {
                "Content": "1711hrs : NEL - Additional travelling time of 40 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault. Free bus rides available at designated stops towards HarbourFront station.",
                "CreatedDate": "2017-12-11 17:11:27"
            },
            {
                "Content": "1657hrs : NEL - Additional travelling time of 20 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault.",
                "CreatedDate": "2017-12-11 16:57:25"
            }
        ]
    }
}
```

Step 5: Train service recover with Free Public Bus and MRT shuttle still available

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "",
                "FreePublicBus": "NE9,NE8,NE7,NE6",
                "FreeMRTShuttle": "NE9,NE8,NE7,NE6",
                "MRTShuttleDirection": "HarbourFront"
            }
        ],
        "Message": [
            {
                "Content": "1711hrs : NEL - Additional travelling time of 40 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault. Free bus rides available at designated stops towards HarbourFront station.",
                "CreatedDate": "2017-12-11 17:11:27"
            },
            {
                "Content": "1657hrs : NEL - Additional travelling time of 20 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault.",
                "CreatedDate": "2017-12-11 16:57:25"
            }
        ]
    }
}
```

Step 6: Publish new message

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [
            {
                "Line": "NEL",
                "Direction": "HarbourFront",
                "Stations": "",
                "FreePublicBus": "NE9,NE8,NE7,NE6",
                "FreeMRTShuttle": "NE9,NE8,NE7,NE6",
                "MRTShuttleDirection": "HarbourFront"
            }
        ],
        "Message": [
            {
                "Content": "1714hrs : NEL - Train service resumes. Free bus rides available at designated stops towards HarbourFront station."
                ,
                "CreatedDate": "2017-12-11 17:14:14"
            },
            {
                "Content": "1711hrs : NEL - Additional travelling time of 40 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault. Free bus rides available at designated stops towards HarbourFront station.",
                "CreatedDate": "2017-12-11 17:11:27"
            },
            {
                "Content": "1657hrs : NEL - Additional travelling time of 20 minutes between Boon Keng and Dhoby Ghaut stations towards
                    HarbourFront station due to a signal fault.",
                "CreatedDate": "2017-12-11 16:57:25"
            }
        ]
    }
}
```

Step 7: After bus rides are ceased (no new published message)

```json
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": []
    }
}
```

Sample Scenario #2 - Multi Lines affected

This scenario depicts 3 lines: North South Line, East West Line, and Downtown Line are down.

    a.   North South Line – between Bishan and Woodlands, towards Jurong East Station

    a.   East West Line – between Paya Lebar and Pasir Ris, both direction

    b.   MRT Shuttle Services that run along four predefined areas in both directions

    c.   Downtown Line – between Downtown and Beauty World, both directions

    d.   Free Bus Island-wide

Step 1: Activate contingency mode – North South Line down with new message published

```json
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "NSL",
                "Direction": "Jurong East",
                "Stations": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "FreePublicBus": "",
                "FreeMRTShuttle": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "MRTShuttleDirection": "Jurong East"
            }
        ],
        "Message": [
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 2: Edit activated contingency mode –East West Line and North South line are down with new message published

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "EWL",
                "Direction": "Both",
                "Stations": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreePublicBus": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreeMRTShuttle": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "NSL",
                "Direction": "Jurong East",
                "Stations": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "FreePublicBus": "".
                "FreeMRTShuttle":       NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "MRTShuttleDirection": "Jurong East"
            }
        ],
        "Message": [
            {
                "Content": "1811hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train
                    fault at Paya Lebar station. 1811hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East
                    station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:12:06"
            },
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal
                    fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 3: Edit activated contingency mode - Activate MRT shuttle services to run along four predefined areas in both directions (no new message published)

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "EWL",
                "Direction": "Both",
                "Stations": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreePublicBus": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "NSL",
                "Direction": "Jurong East",
                "Stations": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "FreePublicBus": "",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            }
        ],
        "Message": [
            {
                "Content": "1811hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train
                    fault at Paya Lebar station. 1811hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East
                    station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:12:06"
            },
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal
                    fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 4: Edit activated contingency mode – In addition to North South, East West lines, Downtown line is also down with new message published

```json
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "DTL",
                "Direction": "Both",
                "Stations": "DT5,DT6,DT7,DT8,DT9,DT10,DT11,DT12,DT13,DT14,DT15,DT16,DT17",
                "FreePublicBus": "DT5,DT6,DT7,DT8,DT9,DT10,DT11,DT12,DT13,DT14,DT15,DT16,DT17",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "EWL",
                "Direction": "Both",
                "Stations": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreePublicBus": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "NSL",
                "Direction": "Jurong East",
                "Stations": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "FreePublicBus": "",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            }
        ],
        "Message": [
            {
                "Content": "1815hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault. 1815hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at Paya Lebar station. 1815hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:15:12"
            },
            {
                "Content": "1811hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at Paya Lebar station. 1800hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:12:06"
            },
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 5: Edit activated contingency mode –Activate Free bus service island-wide with new message published

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "DTL",
                "Direction": "Both",
                "Stations": "DT5,DT6,DT7,DT8,DT9,DT10,DT11,DT12,DT13,DT14,DT15,DT16,DT17",
                "FreePublicBus": "Free bus service island-wide",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "EWL",
                "Direction": "Both",
                "Stations": "EW8,EW7,EW6,EW5,EW4,EW3,EW2,EW1",
                "FreePublicBus": "Free bus service island-wide",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            },
            {
                "Line": "NSL",
                "Direction": "Jurong East",
                "Stations": "NS17,NS16,NS15,NS14,NS13,NS11,NS10,NS9",
                "FreePublicBus": "Free bus service island-wide",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            }
        ],
        "Message": [
            {
                "Content": "1818hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault. 1818hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at Paya Lebar station. 1818hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus rides are available island-wide.",
                "CreatedDate": "2017-12-11 18:18:40"
            },
            {
                "Content": "1815hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault. 1815hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at Paya Lebar station. 1815hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:15:12"
            },
            {
                "Content": "1811hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at Paya Lebar station. 1800hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:12:06"
            },
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 6: Train service recover – North South and East West line recover with new message published

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 2,
        "AffectedSegments": [
            {
                "Line": "DTL",
                "Direction": "Both",
                "Stations": "DT5,DT6,DT7,DT8,DT9,DT10,DT11,DT12,DT13,DT14,DT15,DT16,DT17",
                "FreePublicBus": "Free bus service island-wide",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            }
        ],
        "Message": [
            {
                "Content": "1822hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault.
                    1822hrs: EWL - Train service resumes. 1822hrs: NSL -  Train service resumes. Free bus rides are still available island
                    -wide.",
                "CreatedDate": "2017-12-11 18:22:07"
            },
            {
                "Content": "1818hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault.
                    1818hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at
                    Paya Lebar station. 1818hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due
                    to a signal fault. Free bus rides are available island-wide.",
                "CreatedDate": "2017-12-11 18:18:40"
            },
            {
                "Content": "1815hrs: DTL - No train service between Downtown and Beauty World stations in both direction due to signal fault.
                    1815hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train fault at
                    Paya Lebar station. 1815hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due
                    to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:15:12"
            },
            {
                "Content": "1811hrs: EWL - Additional travelling time of 30 minutes between Paya Lebar and Pasir Ris stations due to a train
                    fault at Paya Lebar station. 1800hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East
                    station due to a signal fault. Free bus rides are available at designated bus stops.",
                "CreatedDate": "2017-12-11 18:12:06"
            },
            {
                "Content": "1756hrs: NSL - No train service between Bishan and Woodlands stations towards Jurong East station due to a signal
                    fault. Free bus shuttle are available at designated bus stops.",
                "CreatedDate": "2017-12-11 17:56:50"
            }
        ]
    }
}
```

Step 7: Train service recover – Downtown line recovers, free public bus service and MRT shuttle are still available with new message published

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [
            {
                "Line": "",
                "Direction": "",
                "Stations": "",
                "FreePublicBus": "Free bus service island-wide",
                "FreeMRTShuttle": "EW21|CC22,EW23,EW24|NS1,EW27;NS9,NS13,NS16,NS17|CC15;EW8|CC9,EW5,EW2;NS1|EW24,NS4|BP1",
                "MRTShuttleDirection": "Both"
            }
        ],
        "Message": [
            {
                "Content": "1825hrs: All train service resume. Free bus rides are still available island-wide.",
                "CreatedDate": "2017-12-11 18:25:24"
            }
        ]
    }
}
```

Step 8: Train service recover – Free public bus service and MRT shuttle have ceased

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": [
            {
                "Content": "1827hrs: All train service resume. Free bus rides island-wide have ceased.",
                "CreatedDate": "2017-12-11 18:27:06"
            },
            {
                "Content": "1825hrs: All train service resume. Free bus rides are still available island-wide.",
                "CreatedDate": "2017-12-11 18:25:24"
            }
        ]
    }
}
```

Step 9: Train service recover - After message has expired

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": []
    }
}
```

2.2 Train Delay

This scenario depicts there is a delay at Seng Kang West LRT (West Loop).

Step 1: New message published (Contingency mode is not activated)

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": [
            {
                "Content": "Test : 1457hrs: SWL - Additional travelling time of 15 minutes on Seng Kang West LRT (West Loop).",
                "CreatedDate": "2017-11-16 14:58:08"
            }
        ]
    }
}
```

Step 2: Train Service Resumes

```
{
    "odata.metadata": "http://datamall2.mytransport.sg/ltaodataservice/$metadata#TrainServicesAlerts",
    "value": {
        "Status": 1,
        "AffectedSegments": [],
        "Message": []
    }
}
```

ANNEX D

ZONE ID ATTRIBUTE TO SPECIFIC ERP GANTRY/GANTRIES FOR 2.13 ERP RATES

Zone ID	ERP Gantry No.	ERP Gantry Location
BMC	1	Victoria Street
BMC	2	Nicoll Highway
CBD	3	Eu Tong Sen Street
OC1	4	Orchard Link
CBD	5	Lim Teck Kim Road
CBD	6	Anson Road
CBD	7	Tanjong Pagar Road
BMC	9	Bencoolen Street
BMC	10	Queen Street
BMC	11	North Bridge Road
OC1	12	Oxley Road
OC1	13	Orchard Road
OC1	14	Orchard Turn
OC1	15	Killiney Road
BMC	16	Beach Road
BMC	17	Temasek Boulevard
BMC	18	Republic Boulevard
CBD	19	Havelock Road/Clemenceau Ave
CBD	20	Havelock Road/CTE Exit
OC1	21	Buyong Road
OC1	22	Kramat Road
BMC	23	River Valley Road
CBD	24	Merchant Road/Clemenceau Ave
CBD	25	Merchant Road/CTE Exit
OC1	26	Clemenceau Ave
OC1	27	Cairnhill Road
CBD	28	Central Boulevard
CBD	29	Slip Road from Westbound MCE towards Maxwell Road
EC1	30	ECP to City
CT1	31	CTE after Braddell Road
PE1	32	PIE after Kallang Bahru on Woodsville Flyover

CT1	33	CTE from Serangoon Road
CT1	34	CTE from Balestier Road
CT4	35	CTE before Braddell Road
AY1	36	AYE to City before Alexandra Road
PE2	37	PIE to Changi after Adam Road Exit
PE2	38	PIE to Changi / Whitley Road
THM	39	Thomson Road after Toa Payoh Rise
OR1	40	Bendemeer Road
AYT	41	AYE to Tuas Before Clementi Road
PE3	42	PIE into CTE
DZ1	43	Dunearn Road / Wayang Satu Flyover
DZ1	44	Dunearn Road / Whitley Road
PE1	45	PIE slip road to Bendemeer Road
CT5	46	CTE Northbound after PIE
OC2	47	Orchard Road after YMCA
OC3	48	Orchard Road after Handy Road
OC2	49	Fort Canning Tunnel
KP2	50	KPE Southbound after Defu Flyover
CT6	51	CTE Northbound before exit to PIE
AYC	52	Clementi Avenue 6 into AYE (City)
AYC	53	Clementi Avenue 2 into AYE (City)
BKE	54	Bt Timah Expressway (Sb betw Dairy Farm Rd and PIE)
UBT	55	Upper Bt Timah Rd Southbound after Hume Ave
TPZ	56	Toa Payoh Lorong 6
KBZ	57	Kallang Bahru
GBZ	58	Geylang Bahru
BKZ	59	Upper Boon Keng Road
SR2	60	Eu Tong Sen Street at Central
SR1	61	New Bridge Road before Upper Circular Road
SR1	62	South Bridge Road before Upper Circular Road
SR2	63	Fullerton Road eastbound at Fullerton Hotel
SR1	64	Fullerton Road westbound at One Fullerton
PE4	65	PIE westbound before Eunos Link
SR2	66	Bayfront Avenue towards Raffles Avenue
CT5	67	PIE to CTE Northbound before Braddell Road
CT2	68	CTE slip road to PIE (Changi) / Serangoon Road
SR1	69	Bayfront Avenue Towards Marina Boulevard
KAL	70	Geylang Road
OR1	71	Woodsville Tunnel
CBD	72	Sheares Avenue towards Sheares Link
EC3	73	ECP eastbound before exit to KPE

AYC	74	AYE to City Before Clementi Avenue 6
KP1	80	KPE Southbound exit to ECP (City)
MC1	90	MCE westbound exit to Marina Coastal Drive
MC1	91	MCE westbound before exit to Maxwell Road
MC2	92	Marina Boulevard to MCE eastbound
MC2	93	MCE eastbound before exit to Central Boulevard

ANNEX E

GEOSPATIAL WHOLE ISLAND LAYER ID FOR 2.23 GEOSPATIAL WHOLE ISLAND

S/No	Geospatial Whole Island Layers	ID
1.	Arrow Marking	ArrowMarking
2.	Bollard	Bollard
3.	Bus Stop Location	BusStopLocation
4.	Control Box	ControlBox
5.	Convex Mirror	ConvexMirror
6.	Covered Link Way	CoveredLinkWay
7.	Cycling Path	CyclingPath
8.	Detector Loop	DetectorLoop
9.	ERP Gantry	ERPGantry
10.	Footpath	Footpath
11.	Guard Rail	GuardRail
12.	Kerb Line	KerbLine
13.	Lamp Post	LampPost
14.	Lane Marking	LaneMarking
15.	Parking Standards Zone	ParkingStandardsZone
16.	Passenger Pickup Bay	PassengerPickupBay
17.	Pedestrain Overheadbridge / Underpass	PedestrainOverheadbridge_UnderPass
18.	Rail Construction	RailConstruction
19.	Railing	Railing
20.	Retaining Wall	RetainingWall
21.	Road Crossing	RoadCrossing
22.	Road Hump	RoadHump
23.	Road Section Line	RoadSectionLine
24.	School Zone	SchoolZone
25.	Silver Zone	SilverZone
26.	Speed Regulating Strip	SpeedRegulatingStrip
27.	Street Paint	StreetPaint
28.	Taxi Stand	TaxiStand
29.	Traffic Light	TrafficLight
30.	Traffic Sign	TrafficSign
31.	Train Station	TrainStation
32.	Train Station Exit	TrainStationExit
33.	Vehicular Bridge / Flyover / Underpass	VehicularBridge_Flyover_Underpass
34.	Word Marking	WordMarking

ANNEX F

DESCRIPTION OF ROAD CATEGORIES FOR TRAFFIC FLOW

S/No	Road Category	Description
1.	CAT1	Expressways Form the primary network where all long-distance traffic movements should be directed. It is planned to optimise long distance mobility from one part of the island to another
2.	CAT2	Major Arterials Predominantly carry through traffic from one region to another, forming principal avenues of communication for urban traffic movements. It interconnects expressways and minor arterial as well as with other major arterial roads
3.	CAT3	Minor Arterials Distribute traffic within the major residential and industrial areas. It is planned to optimise circulation within the area and facilitate through traffic between adjacent towns
4.	CAT4	Primary Accesses Form the link between local accesses and arterial roads. It provides access to developments and through traffic is discouraged. However, where a development is also accessible by a local access road, the access shall be located at the local access road
5.	CAT5	Local Accesses Give direct access to buildings and other developments and should connect only with primary access
6.	SLIP_ROAD	Slip Roads Connect roads to allow motorists to change roads without entering an intersection

ANNEX G

LOCATION DESCRIPTION OF CAMERA ID FOR TRAFFIC IMAGES

Camera ID	Location Description
1111	TPE(PIE) - Exit 2 to Loyang Ave
1112	TPE(PIE) - Tampines Viaduct
1113	Tanah Merah Coast Road towards Changi
1701	CTE (AYE) - Moulmein Flyover LP448F
1702	CTE (AYE) - Braddell Flyover LP274F
1703	CTE (SLE) - Blk 22 St George's Road
1704	CTE (AYE) - Entrance from Chin Swee Road
1705	CTE (AYE) - Ang Mo Kio Ave 5 Flyover
1706	CTE (AYE) - Yio Chu Kang Flyover
1707	CTE (AYE) - Bukit Merah Flyover
1709	CTE (AYE) - Exit 6 to Bukit Timah Road
1711	CTE (AYE) - Ang Mo Kio Flyover
2701	Woodlands Causeway (Towards Johor)
2702	Woodlands Checkpoint
2703	BKE (PIE) - Chantek F/O
2704	BKE (Woodlands Checkpoint) - Woodlands F/O
2705	BKE (PIE) - Dairy Farm F/O
2706	Entrance from Mandai Rd (Towards Checkpoint)
2707	Exit 5 to KJE (towards PIE)
2708	Exit 5 to KJE (Towards Checkpoint)
3702	ECP (Changi) - Entrance from PIE
3704	ECP (Changi) - Entrance from KPE
3705	ECP (AYE) - Exit 2A to Changi Coast Road
3793	ECP (Changi) - Laguna Flyover
3795	ECP (City) - Marine Parade F/O
3796	ECP (Changi) - Tanjong Katong F/O
3797	ECP (City) - Tanjung Rhu
3798	ECP (Changi) - Benjamin Sheares Bridge
4701	AYE (City) - Alexander Road Exit
4702	AYE (Jurong) - Keppel Viaduct
4703	Tuas Second Link
4704	AYE (CTE) - Lower Delta Road F/O
4705	AYE (MCE) - Entrance from Yuan Ching Rd
4706	AYE (Jurong) - NUS Sch of Computing TID
4707	AYE (MCE) - Entrance from Jln Ahmad Ibrahim
4708	AYE (CTE) - ITE College West Dover TID
4709	Clementi Ave 6 Entrance
4710	AYE(Tuas) - Pandan Garden
4712	AYE(Tuas) - Tuas Ave 8 Exit

4713	Tuas Checkpoint
4714	AYE (Tuas) - Near West Coast Walk
4716	AYE (Tuas) - Entrance from Benoi Rd
4798	Sentosa Tower 1
4799	Sentosa Tower 2
5794	PIEE (Jurong) - Bedok North
5795	PIEE (Jurong) - Eunos F/O
5797	PIEE (Jurong) - Paya Lebar F/O
5798	PIEE (Jurong) - Kallang Sims Drive Blk 62
5799	PIEE (Changi) - Woodsville F/O
6701	PIEW (Changi) - Blk 65A Jln Tenteram, Kim Keat
6703	PIEW (Changi) - Blk 173 Toa Payoh Lorong 1
6704	PIEW (Jurong) - Mt Pleasant F/O
6705	PIEW (Changi) - Adam F/O Special pole
6706	PIEW (Changi) - BKE
6708	Nanyang Flyover (Towards Changi)
6710	Entrance from Jln Anak Bukit (Towards Changi)
6711	Entrance from ECP (Towards Jurong)
6712	Exit 27 to Clementi Ave 6
6713	Entrance From Simei Ave (Towards Jurong)
6714	Exit 35 to KJE (Towards Changi)
6715	Hong Kah Flyover (Towards Jurong)
6716	AYE Flyover
7791	TPE (PIE) - Upper Changi F/O
7793	TPE(PIE) - Entrance to PIE from Tampines Ave 10
7794	TPE(SLE) - TPE Exit KPE
7795	TPE(PIE) - Entrance from Tampines FO
7796	TPE(SLE) - On rooflp of Blk 189A Rivervale Drive 9
7797	TPE(PIE) - Seletar Flyover
7798	TPE(SLE) - LP790F (On SLE Flyover)
8701	KJE (PIE) - Choa Chu Kang West Flyover
8702	KJE (BKE) - Exit To BKE
8704	KJE (BKE) - Entrance From Choa Chu Kang Dr
8706	KJE (BKE) - Tengah Flyover
9701	SLE (TPE) - Lentor F/O
9702	SLE(TPE) - Thomson Flyover
9703	SLE(Woodlands) - Woodlands South Flyover
9704	SLE(TPE) - Ulu Sembawang Flyover
9705	SLE(TPE) - Beside Slip Road From Woodland Ave 2
9706	SLE(Woodlands) - Mandai Lake Flyover