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DataMall @ MyTransport.sg ™
Your Transport Companion

an LTA Open Data Initiative

API User Guide
& Documentation

Version 4.9
11 February 2019

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. 1. By Bus Stops 2. By Origin-Destination Bus Stops 3. By Origin-Destination Train Stations 4. 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:	21 Sep 2018

	- Speeds are classified into 8 bands at 10km/h interval.	
4.9	**Bicycle Parking** is launched! This API returns the information of bicycle parking locations within a radius.	11 Feb 2019

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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 Http 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.
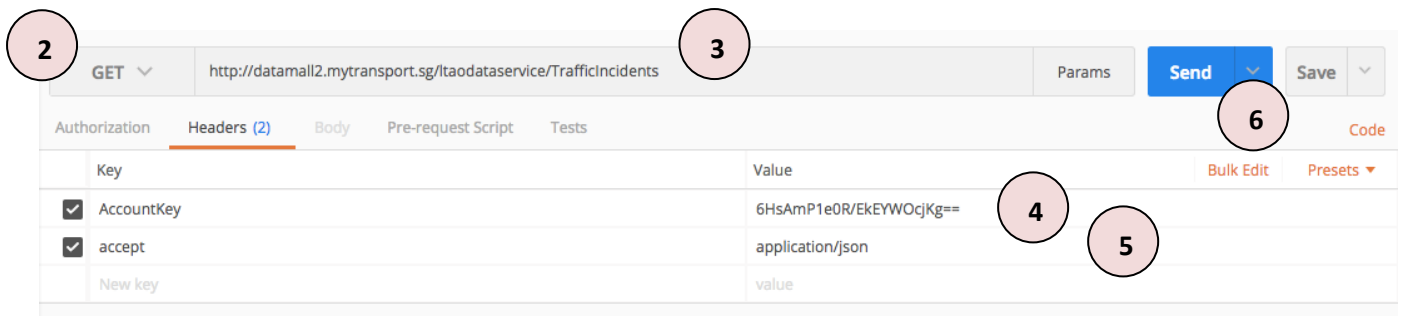
Figure 2-1

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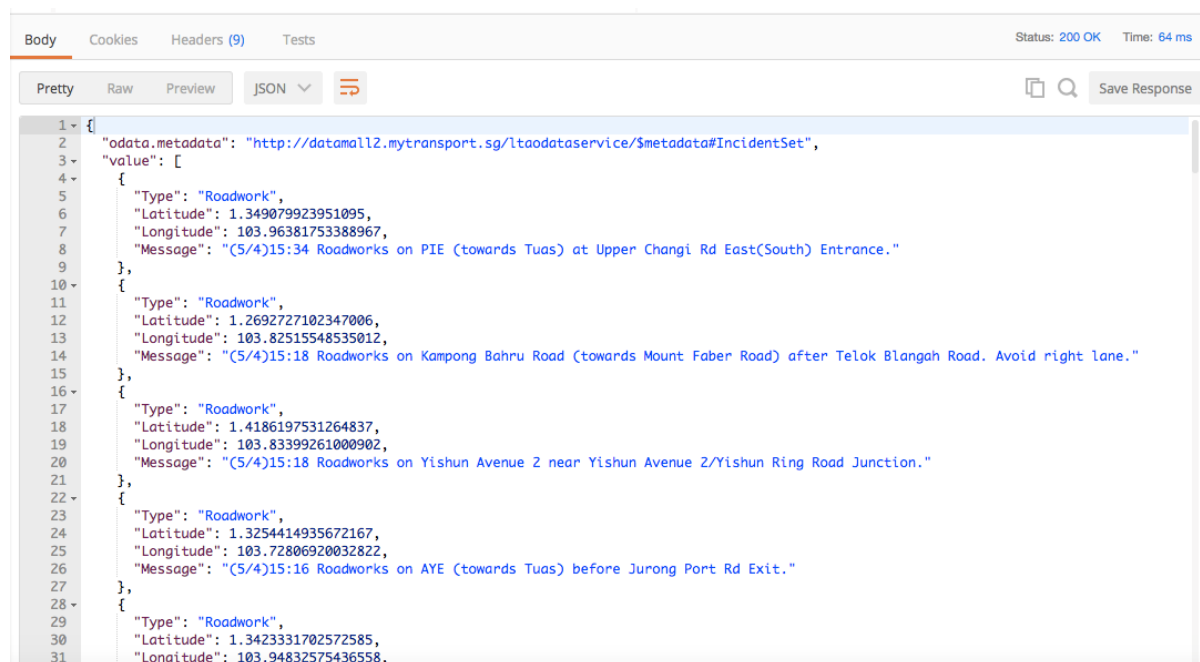
Figure 2-2: API (JSON) Response as shown on Postman.

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.

Table 1: API Response Size

Here's an example of how you can retrieve the data programmatically. This example is coded in Python 2.7. As mentioned previously, this API call only returns the first 500 records.

```python
import json
import urllib
from urlparse import urlparse

import httplib2 as http #External library

if __name__=="__main__":

    #Authentication parameters
    headers = { 'AccountKey' : '6HsAmP1e0R/EkEYWOcjKg==',
                'accept' : 'application/json'} #this is by default

    #API parameters
    uri = 'http://datamall2.mytransport.sg/' #Resource URL
    path = '/ltaodataservice/BusRoutes?'

    #Build query string & specify type of API call
    target = urlparse(uri + path)
    print target.geturl()
    method = 'GET'
    body = ''

    #Get handle to http
    h = http.Http()

    #Obtain results
    response, content = h.request(
        target.geturl(),
        method,
        body,
        headers)

    #Parse JSON to print
    jsonObj = json.loads(content)
    print json.dumps(jsonObj, sort_keys=True, indent=4)

    #Save result to file
    with open("bus_routes.json","w") as outfile:
        #Saving jsonObj["d"]
        json.dump(jsonObj, outfile, sort_keys=True, indent=4,
ensure_ascii=False)
```

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 10)	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	Train Service Alerts	Returns detailed information on train service unavailability during scheduled operating hours, such as affected line and stations etc.
	Traffic Related (Total 10)	Description
11	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.
12	ERP Rates	Returns ERP rates of all vehicle types across all timings for each zone.
13	Estimated Travel Times	Returns estimated travel times of expressways (in segments).
14	Faulty Traffic Lights	Returns alerts of traffic lights that are currently faulty, or currently undergoing scheduled maintenance.
15	Road Openings	Returns all planned road openings.
16	Road Works	Returns all road works being / to be carried out.
17	Traffic Images	Returns links to images of live traffic conditions along expressways and Woodlands & Tuas Checkpoints.

	Traffic Related (Total 10)	**Description**
18	Traffic Incidents	Returns incidents currently happening on the roads, such as Accidents, Vehicle Breakdowns, Road Blocks, Traffic Diversions etc.
19	Traffic Speed Bands	Returns current traffic speeds on expressways and arterial roads, expressed in speed bands.
20	VMS / EMAS	Returns traffic advisories (via variable message services) concerning current traffic conditions that are displayed on EMAS signboards along expressways and arterial roads.
	Active Mobility Related (Total 1)	**Description**
21	Bicycle Parking	Returns the bicycle parking locations within a radius.

2.1 BUS ARRIVAL

URL	http://datamall2.mytransport.sg/ltaodataservice/BusArrivalv2		
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*
^ 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:

http://datamall2.mytransport.sg/ltaodataservice/BusArrivalv2?BusStopCode=83139

API Response:

```
{
    "odata.metadata":
"http://datamall2.mytransport.sg/ltaodataservice/$metadata#BusArrivalv2/@Element",
    "BusStopCode": "83139",
    "Services": [
        {
            "ServiceNo": "15",
            "Operator": "GAS",
            "NextBus": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2017-06-05T14:46:27+08:00",
                "Latitude": "1.3143508333333334",
                "Longitude": "103.906379",
                "VisitNumber": "1",
                "Load": "SDA",
                "Feature": "WAB",
                "Type": "SD"
            },
            "NextBus2": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2017-06-05T14:57:09+08:00",
                "Latitude": "1.334717",
                "Longitude": "103.90723483333333",
                "VisitNumber": "1",
                "Load": "SDA",
                "Feature": "WAB"
                "Type": "SD"
            },
            "NextBus3": {
                "OriginCode": "77009",
                "DestinationCode": "77009",
                "EstimatedArrival": "2017-06-05T15:00:20+08:00",
                "Latitude": "1.3370036666666667",
                "Longitude": "103.913939",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            }
        },
        {
            "ServiceNo": "150",
            "Operator": "SBST",
            "NextBus": {
                "OriginCode": "82009",
                "DestinationCode": "82009",
                "EstimatedArrival": "2017-06-05T14:54:06+08:00",
                "Latitude": "1.319458",
                "Longitude": "103.9012405",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            },
                "NextBus2": {
                "OriginCode": "82009",
                "DestinationCode": "82009",
```

```
                "EstimatedArrival": "2017-06-05T15:04:49+08:00",
                "Latitude": "0",
                "Longitude": "0",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            },
            "NextBus3": {
                "OriginCode": "82009",
                "DestinationCode": "82009",
                "EstimatedArrival": "2017-06-05T15:19:49+08:00",
                "Latitude": "0",
                "Longitude": "0",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            }
        },
        {
            "ServiceNo": "155",
            "Operator": "SBST",
            "NextBus": {
                "OriginCode": "52009",
                "DestinationCode": "84009",
                "EstimatedArrival": "2017-06-05T14:55:12+08:00",
                "Latitude": "1.3184713333333333",
                "Longitude": "103.89202066666667",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            },
            "NextBus2": {
                "OriginCode": "52009",
                "DestinationCode": "84009",
                "EstimatedArrival": "2017-06-05T15:02:41+08:00",
                "Latitude": "1.3186606666666667",
                "Longitude": "103.88303666666667",
                "VisitNumber": "1",
                "Load": "SEA",
                "Feature": "WAB"
                "Type": "SD"
            },
            "NextBus3": {
                "OriginCode": "52009",
                "DestinationCode": "84009",
                "EstimatedArrival": "2017-06-05T15:20:22+08:00",
                "Latitude": "1.3360038333333333",
                "Longitude": "103.87798466666666",
                "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.

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	http://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	http://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	http://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	http://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	http://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	http://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	http://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	http://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 TRAIN SERVICE ALERTS

URL	http://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

2.11 CARPARK AVAILABILITY

URL	http://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**

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).

2.12 ERP RATES

URL	http://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
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	*AY1*
ChargeAmount	Chargeable amount	*0.5*
EffectiveDate	Rate is effective as of this date (in YYYY-MM-DD format)	*2016-02-01*

2.13 ESTIMATED TRAVEL TIMES

URL	http://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*

2.14 FAULTY TRAFFIC LIGHTS

URL	http://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.*

2.15 ROAD OPENINGS

URL	http://datamall2.mytransport.sg/ltaodataservice/RoadOpenings
Description	Returns all 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*

2.16 ROAD WORKS

URL	http://datamall2.mytransport.sg/ltaodataservice/RoadWorks
Description	Returns all road works being / to be 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*

2.17 TRAFFIC IMAGES

URL	http://datamall2.mytransport.sg/ltaodataservice/Traffic-Images
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	*5795*
Latitude	Latitude map coordinates	*1.326024822*
Longitude	Longitude map coordinates	*103.905625*
ImageLink	Link for downloading this image.	*https://s3-ap-southeast-1.amazonaws.com/mtpdm/2016-03-29/18-32/5795_1822_20160329182706_c3e176.jpg*

2.18 TRAFFIC INCIDENTS

URL	http://datamall2.mytransport.sg/ltaodataservice/TrafficIncidents
Description	Returns incidents <u>currently</u> 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.*

2.19 TRAFFIC SPEED BANDS

URL	http://datamall2.mytransport.sg/ltaodataservice/TrafficSpeedBandsv2
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*
Location	Latitude and Longitude map coordinates for start and end points for this stretch of road.	*1.3220591510051254* *103.86246461405193* *1.3215993547809128* *103.86315591911669*

2.20 VMS / EMAS

URL	http://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*

2.21 Bicycle Parking

URL	http://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*

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: On a typical `weekday` of `May 2018`, from `2000hrs to 2059hrs`, at Bus Stop `50199`, Opp Shaw Plaza, the 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 <u>DataMall Portal</u> 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: On a typical `weekday` of `May 2018,` from `1700hrs to 1759hrs,` the total number of trips that travelled 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 2.6 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)

```json
{
    "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

```
{
    "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": []
    }
}
```