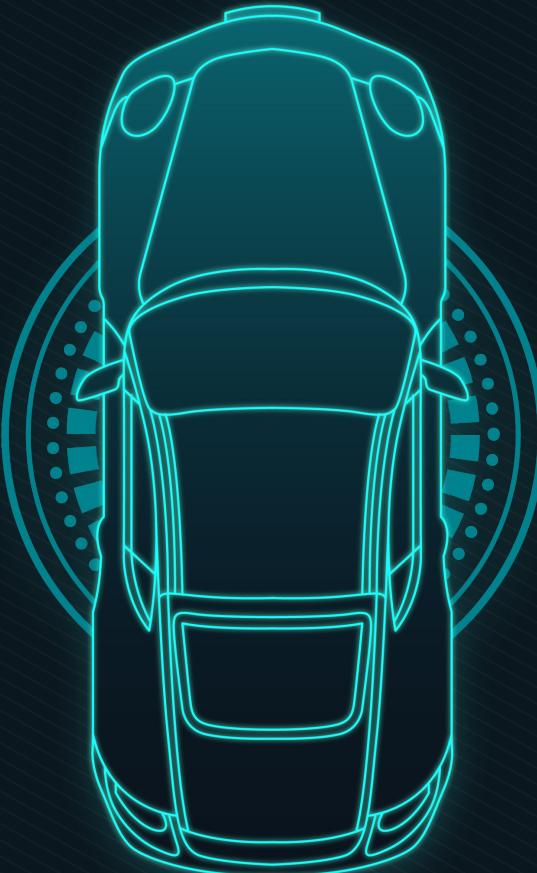


# TRANSPORT GPT

All for a Safer Road for All



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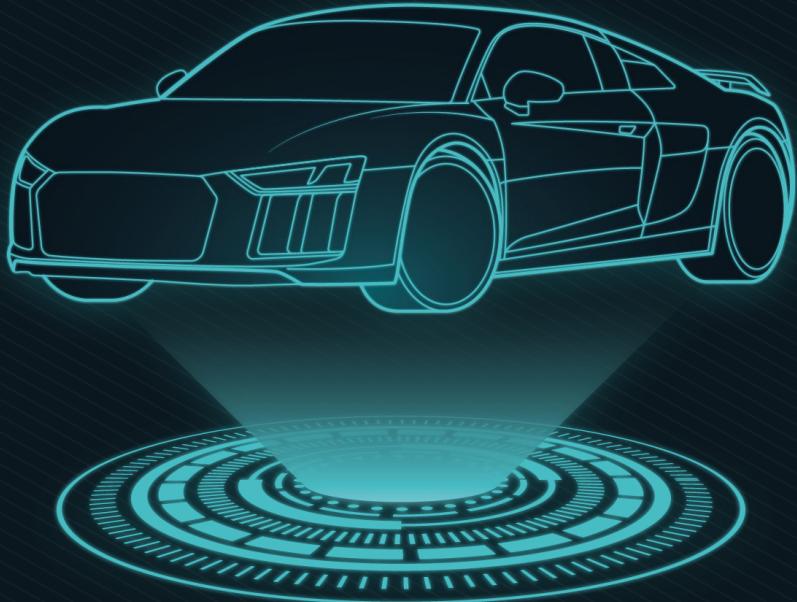
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# PREFACE

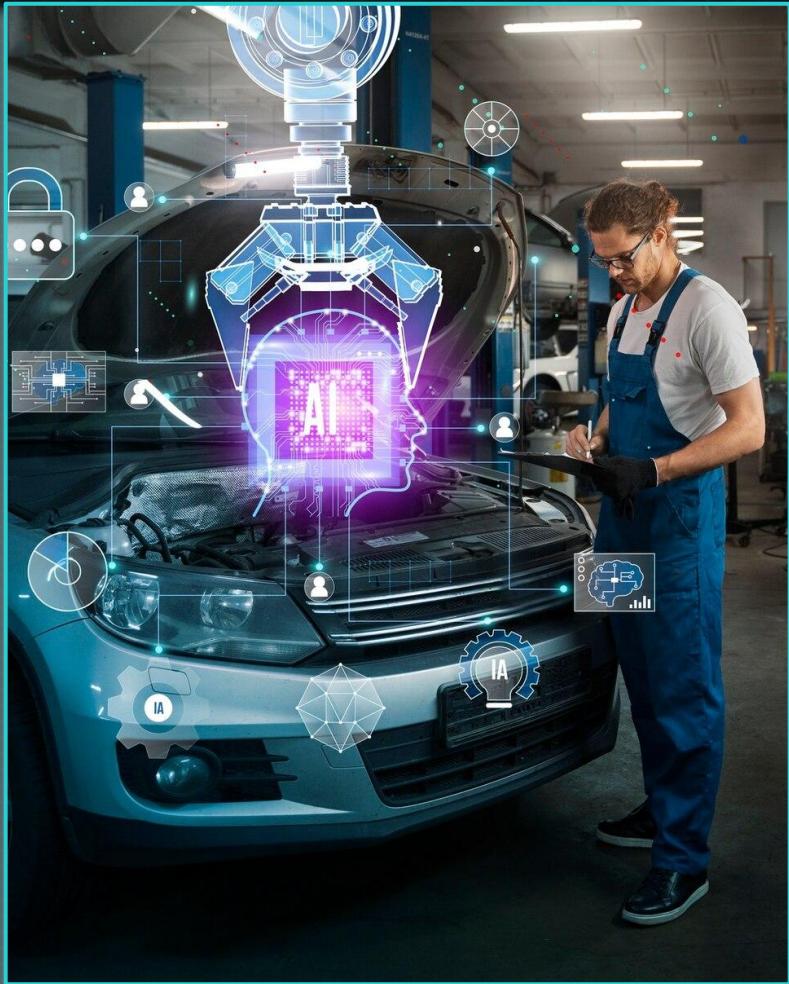


# SIGNIFICANCE

- Road fatality rate in Singapore is 1.49 per 100,000 citizens
- Common causes of road accidents:
  - Lack of patience
  - Speeding past the red lights
  - Reckless or drink driving
  - Changing lanes without signalling
- Issue is also persistent globally

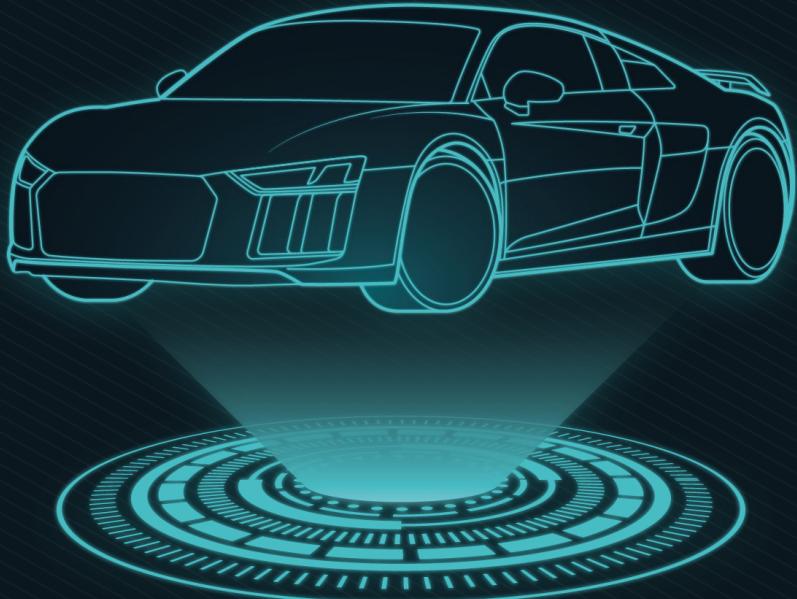
# SOLUTION

- Main target audience: Vehicle drivers
- Other involved stakeholders:
  - Authorities – Eg. LTA
  - Pedestrians
  - Insurance companies
  - Vehicle passengers



# 02

## DATA EXTRACTION



# STATIC DATA SETS

- Public transport ridership (LRT, MRT, public bus)
- Pedestrian facilities (overhead bridges, underpasses, footbridges, covered linkways)
- Traffic facilities (traffic lights, ERP gantries)
- Vehicular facilities (flyovers, vehicular bridges, vehicular underpasses & tunnels)
- Traffic volume entering the city
- Average speed during peak hours (expressway, arterial roads)
- Road accidents (fatal/injury, road user group, cause of accident, number of accident)
- Vehicles involved in accidents



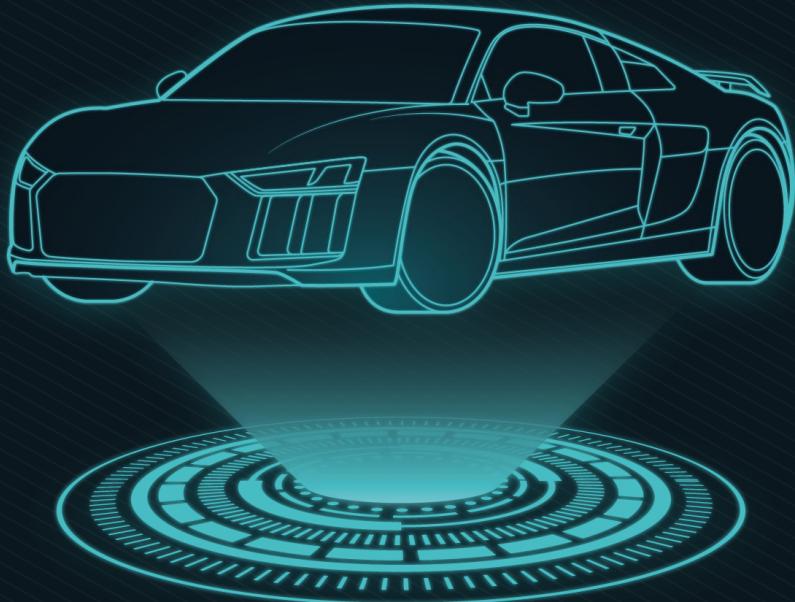
# DYNAMIC DATA SETS

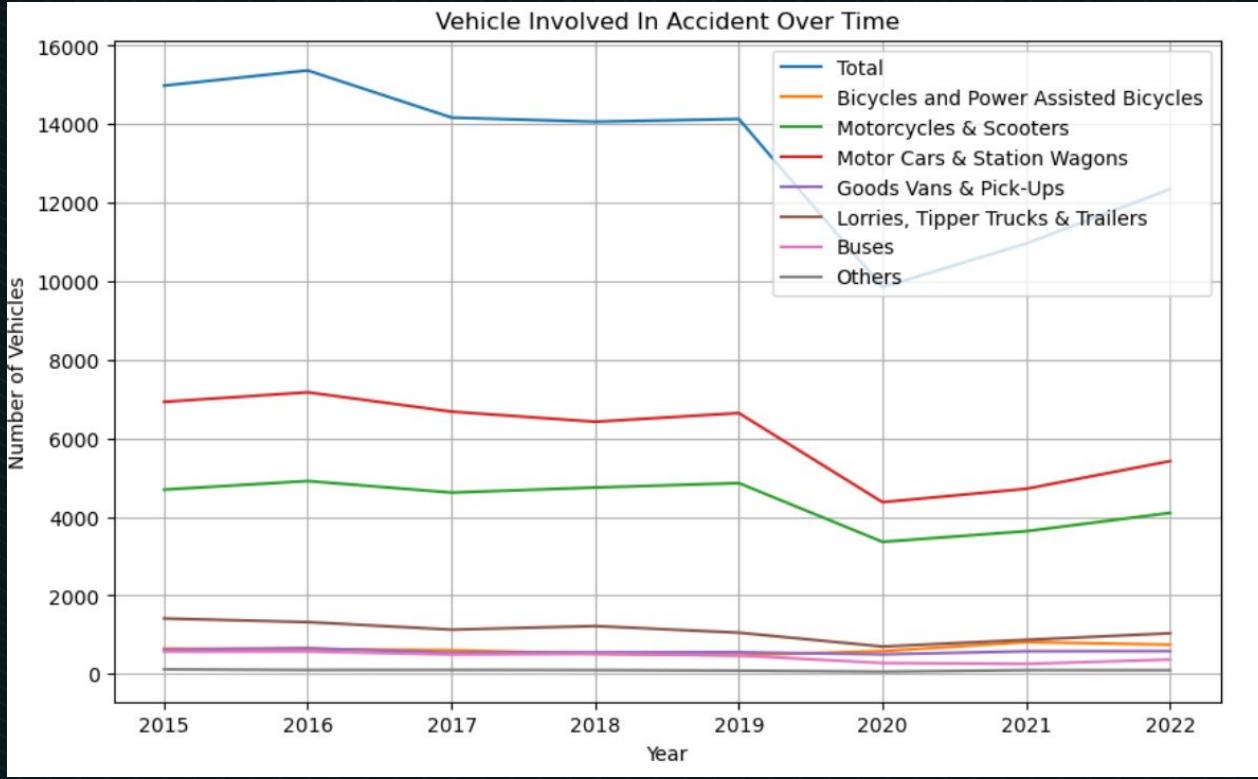
- Traffic Incidents
- Road Works
- Variable Message Signs (VMS)
- Faulty Traffic Lights
- Traffic Flow
- Bus Stops Traffic Flow
- Traffic Speed Bands
- Estimated Travel Times
- Road Section Line



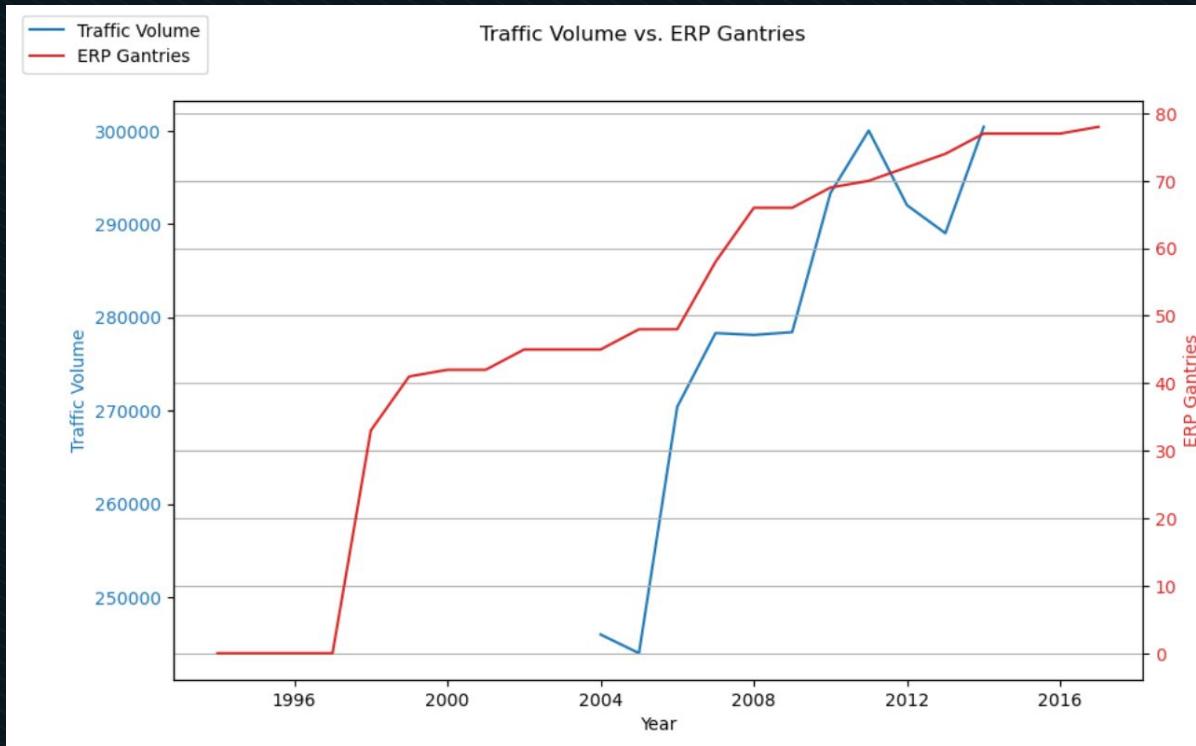
# 03

## DATA ANALYSIS





Efforts should be targeted at motor cars, station wagons, motorcycles and scooters to reduce accidents.



ERP gantries alone might not be a good solution to manage traffic conditions.

Correlation between number of traffic facilities and number of road accidents:

	Traffic Lights	ERP Gantries	number_of_accidents
Traffic Lights	1.000000	0.957203	-0.877372
ERP Gantries	0.957203	1.000000	-0.787382
number_of_accidents	-0.877372	-0.787382	1.000000

More traffic lights and ERP gantries might help to reduce the number of road accidents.

Correlation between number of vehicular facilities and number of road accidents:

	Flyovers	Vehicular Bridges	\
Flyovers	1.000000	0.829436	
Vehicular Bridges	0.829436	1.000000	
Vehicular Underpasses & Tunnels	0.820746	0.974996	
number_of_accidents	-0.682745	-0.887044	

	Vehicular Underpasses & Tunnels	\
Flyovers	0.820746	
Vehicular Bridges	0.974996	
Vehicular Underpasses & Tunnels	1.000000	
number_of_accidents	-0.923783	

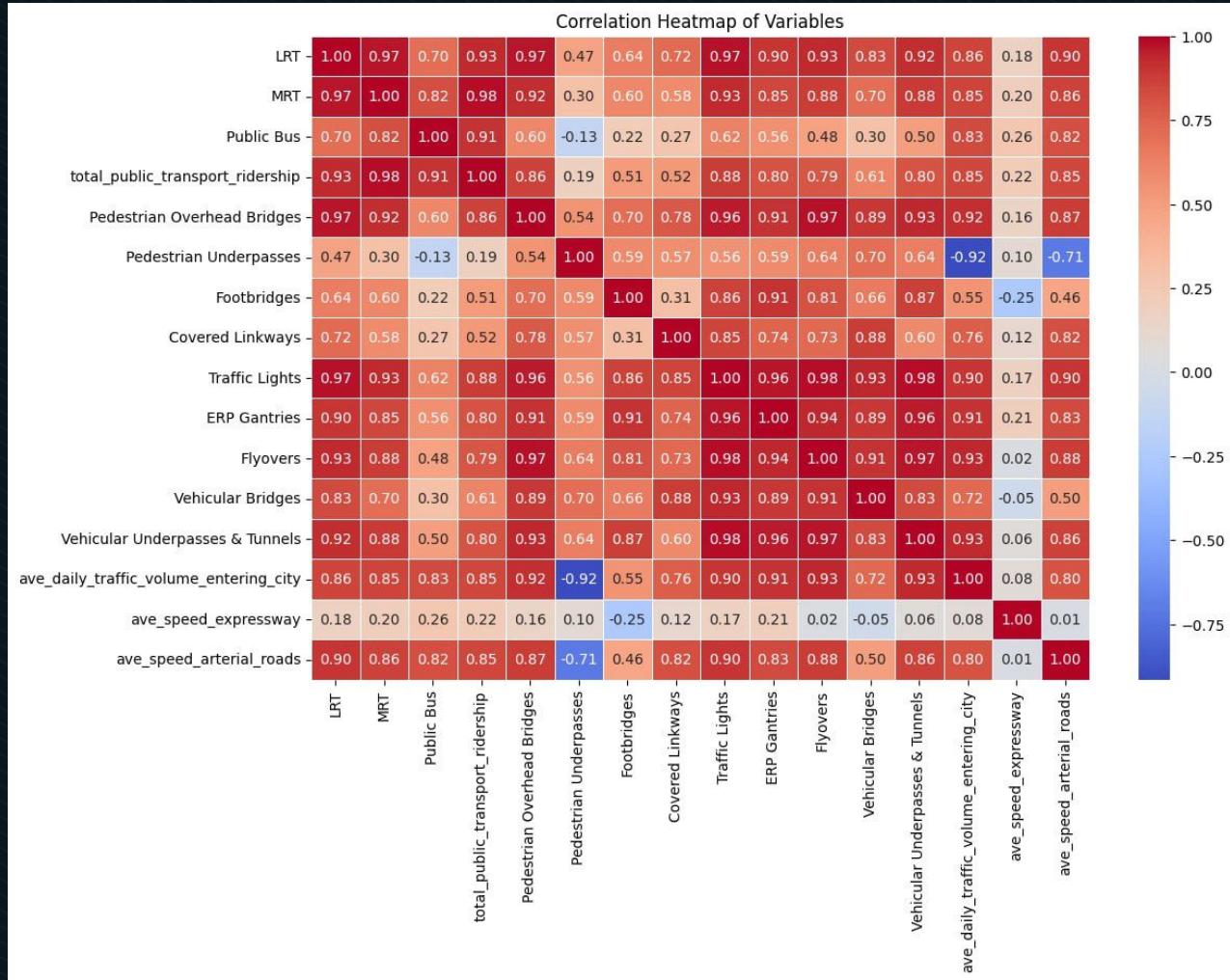
  

	number_of_accidents
Flyovers	-0.682745
Vehicular Bridges	-0.887044
Vehicular Underpasses & Tunnels	-0.923783
number_of_accidents	1.000000

More vehicular underpasses & tunnels and vehicular bridges might help to reduce the number of road accidents.

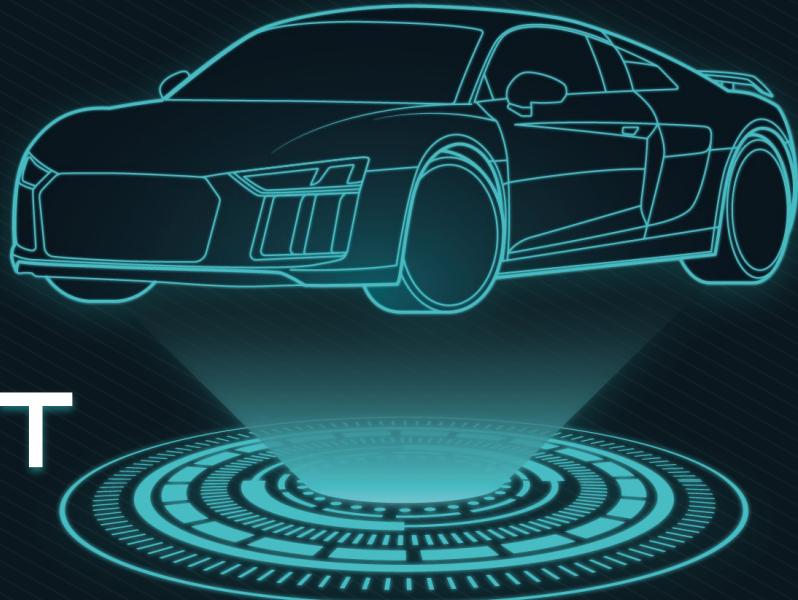
		Feature	Importance
10		Flyovers	0.114781
12	Vehicular Underpasses & Tunnels		0.098124
7		Covered Linkways	0.096934
8		Traffic Lights	0.084430
0		LRT	0.080844
9		ERP Gantries	0.079306
13	ave_daily_traffic_volume_entering_city		0.073111
2		Public Bus	0.058675
4	Pedestrian Overhead Bridges		0.055956
1		MRT	0.055224
14		ave_speed_expressway	0.054596
3	total_public_transport_ridership		0.050873
15		ave_speed_arterial_roads	0.050097
5	Pedestrian Underpasses		0.034128
11		Vehicular Bridges	0.011274
6		Footbridges	0.001650

Areas with a higher number of flyovers may have a higher risk of accidents, possibly due to factors such as complex road configurations, increased traffic flow, or higher speed.



# 04

## SOLUTION DEVELOPMENT



# FUN1: NEAREST INCIDENT

Enter the road name (in caps):

User will need to key in the road name in caps

Enter the road name (in caps): NEIL ROAD

Latitude: 1.2780837, Longitude: 103.8406223

Closest incident type: Roadwork

Message: (17/3)18:22 Roadworks on Outram Road towards Havelock Road. Avoid left lane.

Code will return the details of the nearest incident

# FUN2: VMS

Enter the road name (in caps):

User will need to key in the road name in caps

Enter the road name (in caps): BARTLEY ROAD  
Latitude: 1.3418146, Longitude: 103.8817537  
Message: ROAD WORKS LN 3,

Enter the road name (in caps): PIONEER ROAD  
Latitude: 1.3187408, Longitude: 103.6515755  
No message found.

Code will return the relevant message if applicable

# FUN3: SPEED BAND

```
speed_bands_info = {  
    1: "Speed range from 0 to 9",  
    2: "Speed range from 10 to 19",  
    3: "Speed range from 20 to 29",  
    4: "Speed range from 30 to 39",  
    5: "Speed range from 40 to 49",  
    6: "Speed range from 50 to 59",  
    7: "Speed range from 60 to 69",  
    8: "Speed range from 70 or more"  
}  
  
# Assume 'road_name' is the road name you want to classify  
road_name = "DRAYCOTT DRIVE"  
predicted_speed_band = predict_speed_band(road_name)  
print(f"The predicted speed band for road name '{road_name}' is '{predicted_speed_band}'")
```

The predicted speed band for road name 'DRAYCOTT DRIVE' is '3'.

# FUN4: CONNECTED ROADS

Enter the road you want to search:

User will need to key in the road name in caps

Enter the road you want to search: Nanyang Avenue

Roads connected to Nanyang Avenue: ['CLEANTECH VIEW', 'JALAN BAHAR']

Code will return the connected roads

# FEAT: NOTIFICATIONS

Notifications for upcoming traffic events or road closures:

Upcoming Event: (19/3)23:50 Roadworks on Fullerton Road (towards Shenton Way) after Fullerton Road. at (1.2862182700147327, 103.85374366381824)

Upcoming Event: (19/3)23:43 Roadworks on SLE (towards CTE) before Upper Thomson Rd Exit. Avoid lane 2. at (1.4033318022206356, 103.81143710375068)

Upcoming Event: (19/3)23:42 Roadworks on PIE (towards Changi Airport) at Simei Ave Exit. at (1.3422718170211936, 103.94739324556855)

Upcoming Event: (19/3)23:41 Roadworks on Sims Avenue (toward Changi) after Paya Lebar Road. Avoid left lane. at (1.3170180552487432, 103.89300661114794)

Upcoming Event: (19/3)23:40 Roadworks on PIE (towards Changi Airport) at Kallang Way Exit. at (1.3254162071599345, 103.87163957174351)

Upcoming Event: (19/3)23:32 Roadworks on PIE (towards Changi Airport) at Eng Neo Rd Exit. at (1.3407688431657656, 103.80508871126601)

Upcoming Event: (19/3)23:24 Roadworks on New Upper Changi Road (toward Changi) after Bedok North Road. Avoid right lane. at (1.3269689106436473, 103.94570062840224)

Upcoming Event: (19/3)23:20 Roadworks on AYE (towards Tuas) before Jurong Town Hall Exit. Avoid lane 3. at (1.3210080917890856, 103.75433215545054)

Upcoming Event: (19/3)23:01 Roadworks on BKE (towards PIE) at PIE(Tuas) Exit. at (1.3493292868576503, 103.79255473362424)

Upcoming Event: (19/3)22:56 Roadworks on PIE (towards Tuas) after Jalan Eunos. Avoid lane 1. at (1.326515367846473, 103.90712151069431)

Upcoming Event: (19/3)22:38 Roadworks on Queensway Underpass (towards AYE) at Queensway Underpass. Avoid left lane. at (1.3003344641329595, 103.80092000870664)

Upcoming Event: (19/3)22:38 Roadworks on Ang Mo Kio Avenue 1 (towards Marymount Road) after Ang Mo Kio Street 32. Avoid left lane. at (1.3641557445548094, 103.84468097432891)

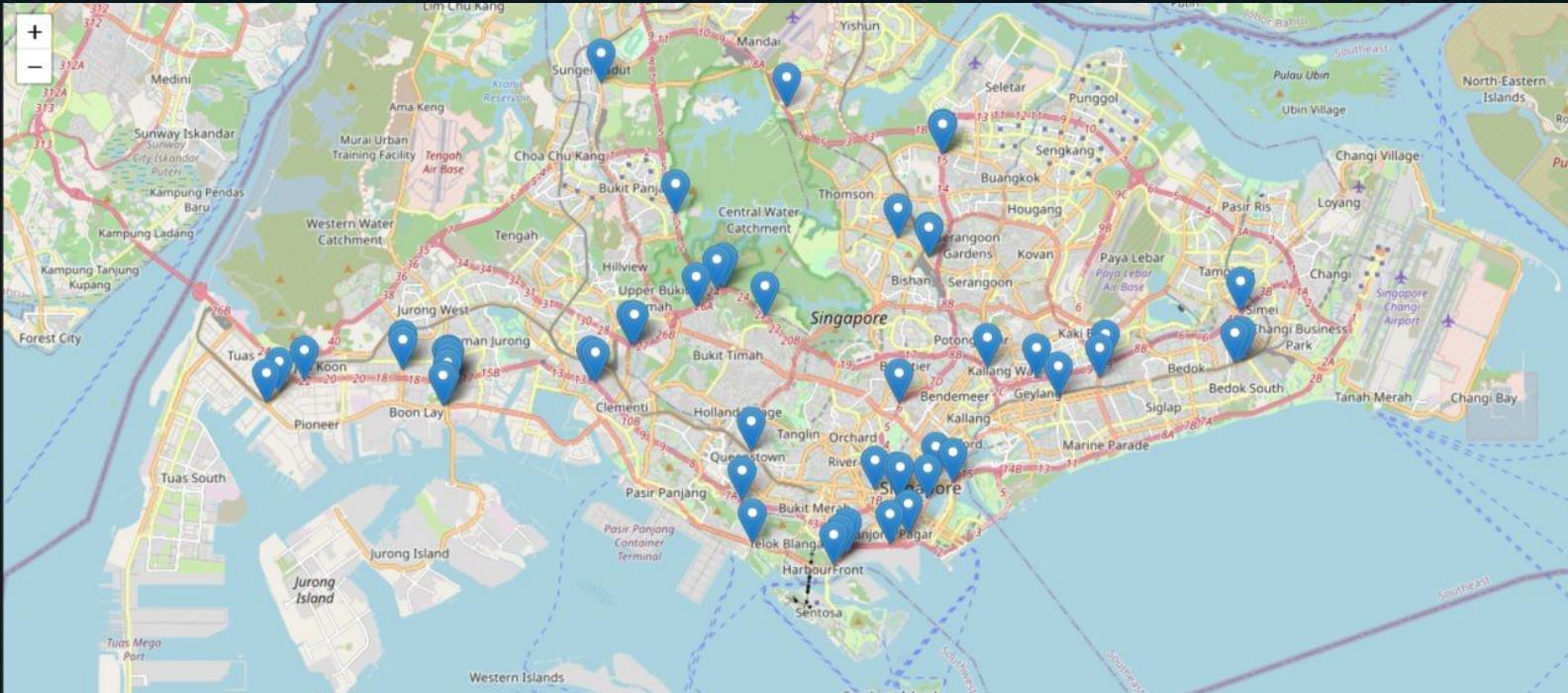
Upcoming Event: (19/3)22:37 Roadworks on Jalan Eunos (towards Still Rd) after PIE. at (1.3223216058686134, 103.9053056731636)

Upcoming Event: (19/3)22:36 Roadworks on AYE (towards Tuas) after Tuas Rd Exit. Avoid lane 3. at (1.321843995901527, 103.66701232545482)

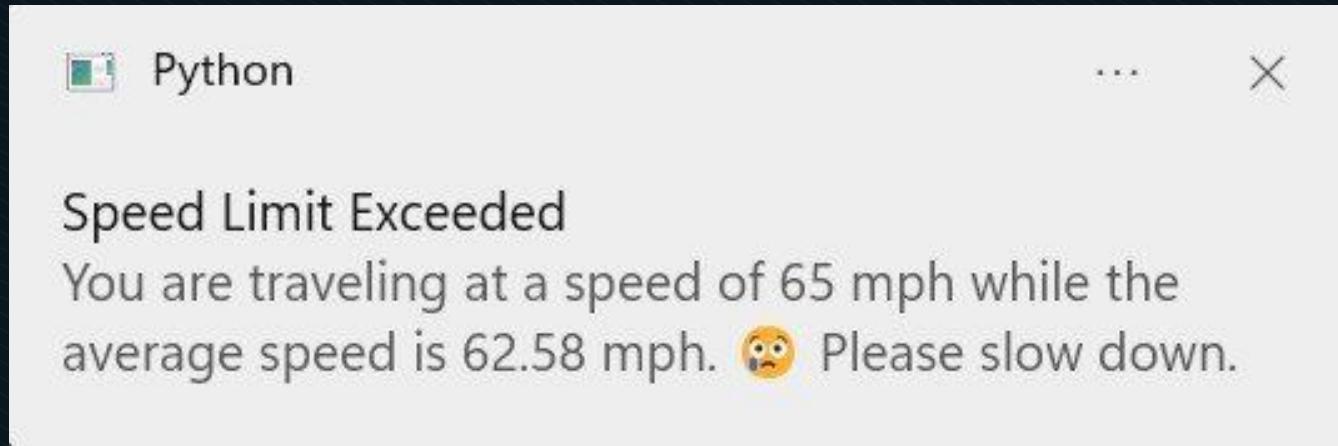
Upcoming Event: (19/3)22:36 Roadworks on PIE (towards Changi Airport) before Paya Lebar Rd. Avoid lane 5. at (1.3223389415766427, 103.88643625221601)

Upcoming Event: (19/3)22:27 Roadworks on BKE (towards Woodlands) before Bukit Panjang Rd Exit. at (1.3715629708321455, 103.77822000126214)

# FEA2: REAL-TIME ROAD ACCIDENTS

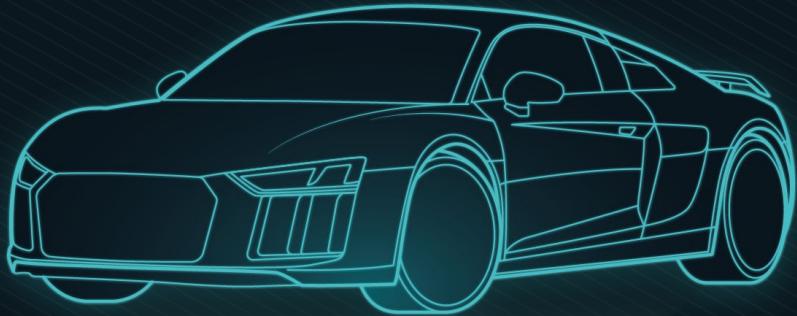


# FEA3: SPEED LIMIT NOTIFICATION



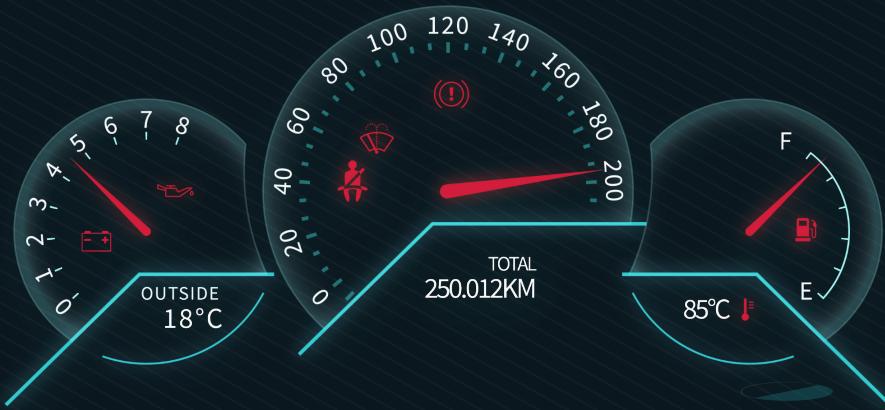
# 05

## CONCLUSION



# OVERVIEW OF TRANSPORTGPT

Feature	Purpose
Notifications of the details of the nearest incident	Inform users of road closures ahead of time and redirect traffic to less congested routes
Displaying information on the VMS on TransportGPT	
Recommending the optimal speed band of each road	Enhance the safety level for both drivers and pedestrians
Finding connected roads	Increase accessibility of roads and convenience of drivers
Speed limit notification	Maintain safe travelling speeds



All for a Safer Road for All

THANK YOU

# THANKS



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