



# **Drive Smart and Safe**

- Discuss the concerns of local transportation company
- Describe the technologies available for tracking and tracing
- Explain the regulations for transport safety of workers

**E216 Distribution** &Transportation

School of

Engineering











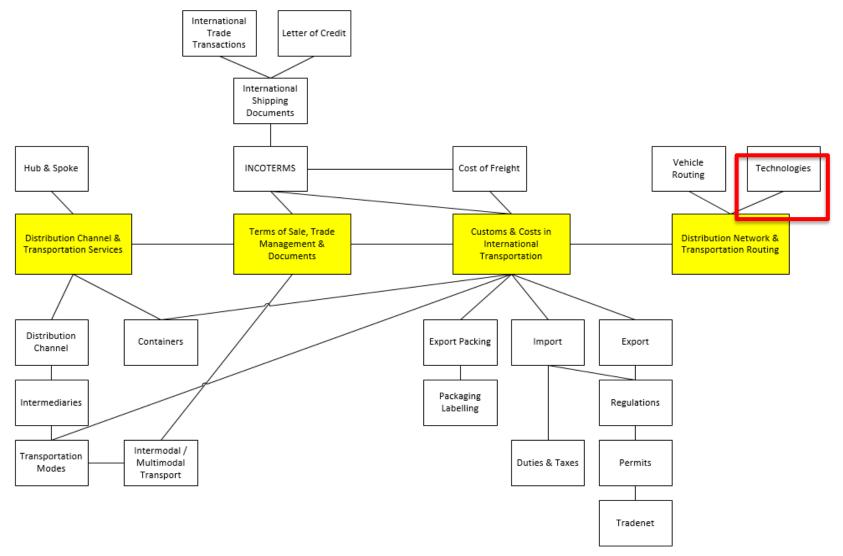






# E216 Distribution & transportation - Topic Tree

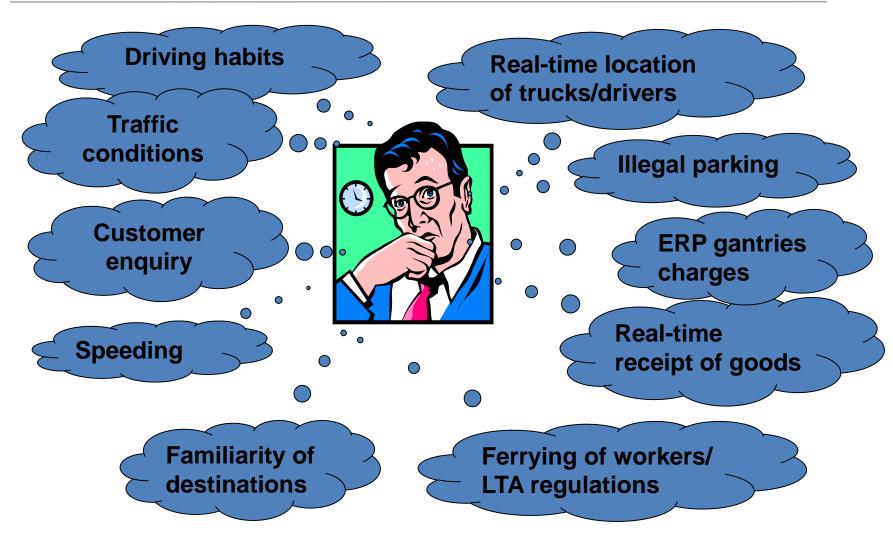






### **Issues/Concerns in Local Transportation**





### The Capability Development Grant (CDG)



 The Capability Development Grant (CDG) is a financial assistance programme aimed at helping Small and Medium Enterprises (SMEs) defray up to 70% of qualifying project costs\*, relating to consultancy, manpower, training, certification, upgrading productivity and developing business capabilities for process improvement, product development and market access.

#### Refer to:

http://www.spring.gov.sg/Enterprise/CDG/Pages/Capability-Development-Grant.aspx for more details.

### Other Schemes for SMEs



### Besides CDG, bellows are some schemes to help SMEs:

### **Productivity:**

- Innovation and Capability Voucher (ICV)
- Increase SME Productivity With Infocomm
- Adoption & Transformation (iSPRINT)
- Productivity and Innovation Credit (PIC)
- PIC Bonus
- Wage Credit Scheme (WCS)

### **Workforce & Training Support:**

- SME Enhanced Training Support
- Enterprise Training Support
- WorkPro

#### **Financial Assistance**

Micro Loan Programme (MLP)

#### Real-Time Location Tracking Global Positioning System (GPS)



- GPS uses satellites to provide users their exact positions on the Earth's surface
- When the GPS receiver estimates the distance to at least 4 GPS satellites, it can 'triangulate' its position on Earth in 3 dimensions, in the form of:
  - Latitude (horizontal line)
  - Longitude (vertical line)
  - Elevation
  - (And the fourth satellite is for clock error correction)
- GPS receivers require an unobstructed view of the sky, so they are used only outdoors and they often do not perform well within forested areas or near tall buildings
- GPS receivers are also able to derive based on position changes information such as direction and speed

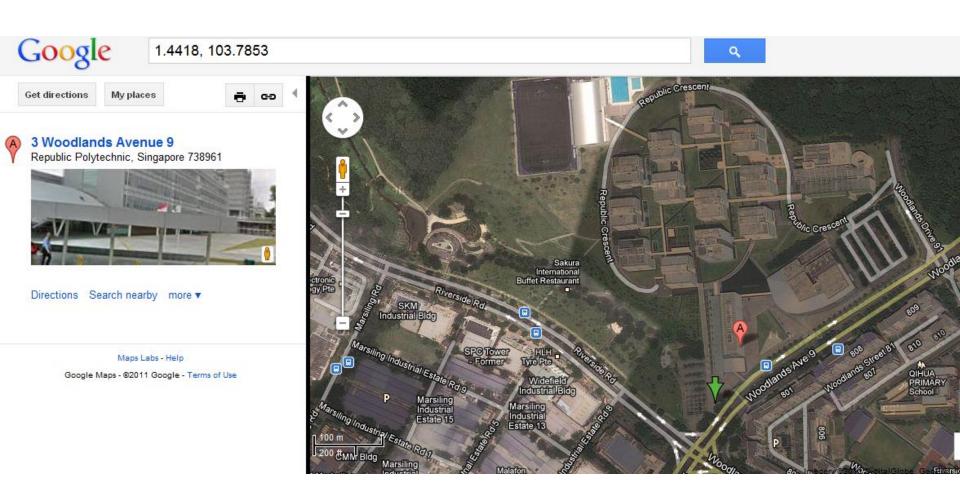
### **GPS** Coordinates



- Represented in coordinates, which use minutes and seconds to establish points between degrees, thus
  - **07'27"**
  - 7 minutes 27 seconds
  - 7.450 minutes
  - .124167 (7.45 divided by 60)
    (Note: They all mean the same location)
- For instance, given location N 1° 26.510',
  E103°47.120' -> alternatively 1.4418, 103.7853
- Go to <a href="http://maps.google.com/">http://maps.google.com/</a>
- Type in 1.4418, 103.7853

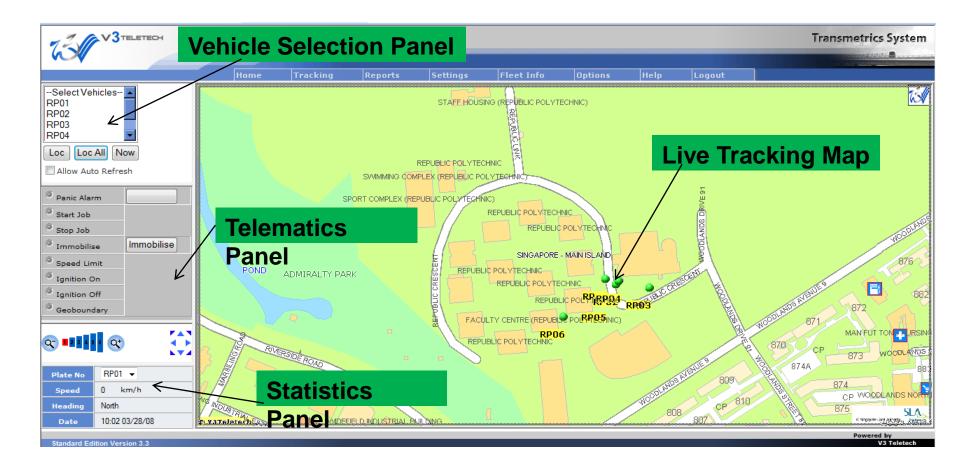
# Finding Locations Using Google Maps







 V3 Transmetrics utilizes an integrated mobile communication platform (either Android Smart phone or vehicle unit) and a Geographical Information System (GIS) to track vehicles using GPS to locate and GPRS to transmit data.







# Telematics Panel – For vehicles installed with a job panel or immobilizer

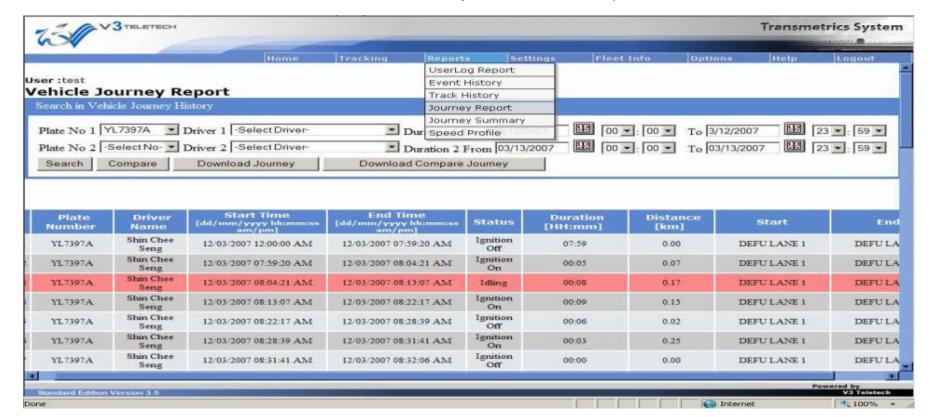
- Green light by the label indicates driver has pressed the corresponding label (e.g. Start Job, Ignition On) on the job panel
- Controller can immobilize vehicle by pressing the Immobilize button on the screen



Statistics Panel – Shows speed and direction of vehicle at current time.

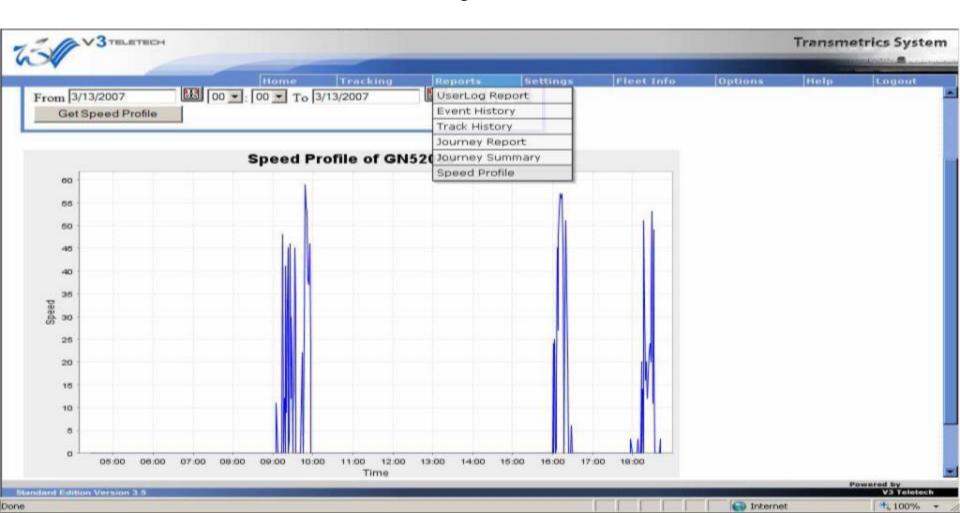


- Vehicle Journey Report
  - Allows user to view or compare the journeys of 1 or 2 vehicles, and monitoring the driving habits of the drivers.
  - Report lists the duration, approximate distance travelled, location when the vehicle's ignition is on or off, or idling. (when the ignition is on for more than 5 min but the speed is near 0)



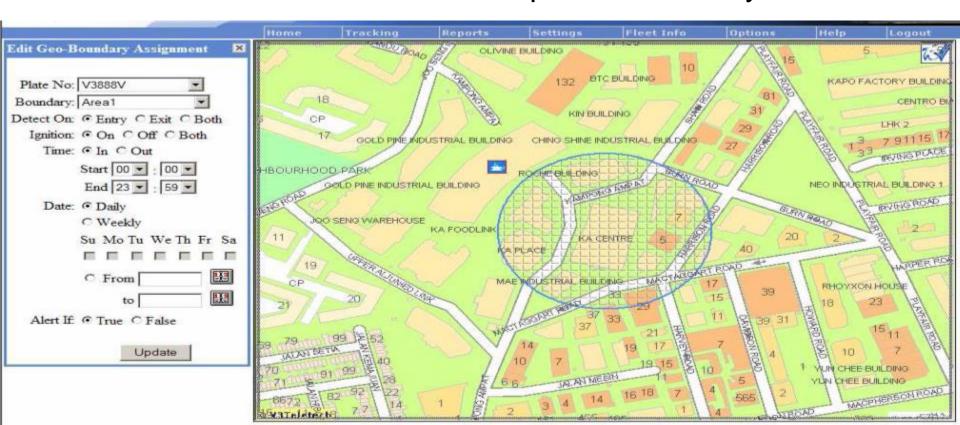


- Speed Profile Report
  - Allows user to view a graph of speed against time, based on selected vehicle and date range





- Geo-boundary is an area on a map, which the user can draw on the tracking map
- User can choose to receive alerts via SMS or email when the vehicle enters/leaves the boundary, e.g. to alert when driver reaches the place of delivery



# Proof of Delivery (POD)



- POD is to establish the fact that the recipient has received the contents by the sender, usually by signing a document receipt
- For real-time updates, electronic POD (ePOD) can be used to update status
- ePOD can be captured by photo image capture or electronic signature and uploaded back to system wirelessly (e.g. via GPRS)







# Traffic conditions and traveling routes



- With increasing number of traffic surveillance cameras on the roads and expressways, and websites offering real-time traffic condition and driving directions, the ease of traveling on Singapore roads is greatly enhanced
- Some of the websites and tools include
  - Google Maps Singapore (<a href="http://maps.google.com.sg">http://maps.google.com.sg</a>)
    Google maps
  - TrafficGEM
  - One Motoring
    - (<a href="http://www.onemotoring.com.sg/publish/onemotoring/en/on\_the\_roads/traffic\_cameras0.html">http://www.onemotoring.com.sg/publish/onemotoring/en/on\_the\_roads/traffic\_cameras0.html</a>)
  - Streetdirectory.com (<u>http://sg.streetdirectory.com/</u>)
  - Gothere.sg (<a href="http://gothere.sg/">http://gothere.sg/</a>)
  - StreetDB Singapore (<a href="http://www.streetdb.com/">http://www.streetdb.com/</a>)
  - OneMAP (<a href="http://www.onemap.sg/index.html">http://www.onemap.sg/index.html</a>)

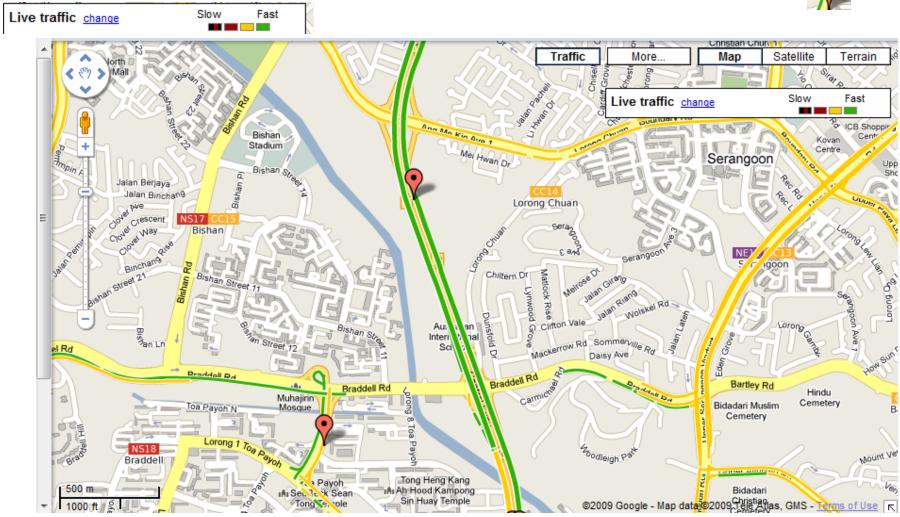


# Google Maps Singapore



- Live Traffic updates
- ERP gantry locations





# Google Maps Singapore



Print Send - Link

Suggested traveling directions



iPhone Apps

# Navigation - TrafficGEM



- Drivers can use TrafficGEM to make a planned route with real-time traffic info update.
- If the route is congested, they can make a turn off, and the system will re-route to the destination.
- The fastest way to the destination is not just based on distance, but also on real road conditions.

#### The Straits Times, 1 Sep 2009

Home > Breaking News > Singapore > Story Sep 1, 2009

### **GEM** to ease traffic jams

By Christopher Tan



With TrafficGEM, motorists can see if the route to their selected destination is congested at any point. -- ST PHOTO: CAROLINE CHIA

IT'S CALLED TrafficGEM and it is meant to get you out of traffic jams.

The real-time traffic information service is offered by the Automobile Association of Singapore, delivered in a portable navigation device made by Mio.

With TrafficGEM ( Guided Expeditious Mobility), motorists can see if the route to their selected destination is congested at any point. If so, they can make a turn off, and the system will re-route to the destination.

# Transaction tracing

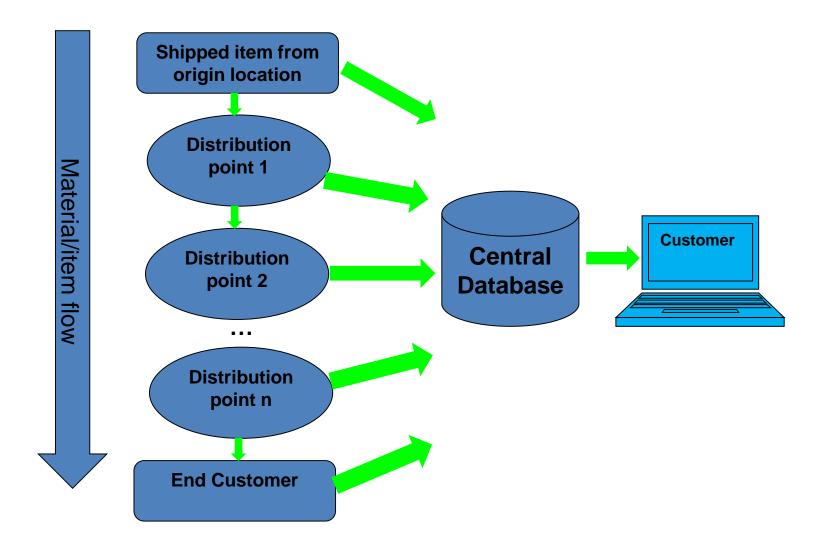


# Benefits of transaction tracing

- Able to forecast order arrive date more accurately
- Optimize inventory management
- Increasing firms efficiency by planning ahead
- Reduction in back orders
- Reduce the impact of unexpected events/accidents

### Architecture of transaction tracing system







#### Source of information:

http://www.onemotoring.com.sg/publish/onemotoring/en/lta\_information\_guidelines/maintain\_vehicle/lorries\_safety\_regulations.html

- Under the Road Traffic Act, Iorries cannot be used for private passenger transport
- The Road Traffic Act provides an exception for owners and hirers of lorries to use their vehicles to transport their workers to and from their lodgings and places of work, or between their places of work, subject to the following requirements:
  - The lorry must not travel faster than the posted road speed limit or the vehicle speed limit of 60 km/h, whichever is lower



- The front passenger seat(s) in the lorry's cabin must be occupied before workers can be carried on the rear carriage deck
- Workers carried on the carriage deck of lorries must be properly seated in a manner that would not cause them to fall off the vehicle
- No part of the seated worker, when he is in a seating position shall be more than 1.1 metres from the carriage deck. This is to lower the risk of a worker falling off from the back of a lorry
- If goods are also transported, they must be properly secured such that they will not endanger the workers carried or other road users



- All light lorries (G-Plate lorries with maximum laden weight not exceeding 3,500 kg) used to transport workers are to be fitted with canopies and higher side railings by 1 February 2011, while Heavy lorries (X- or Y-Plate lorries with maximum laden weight exceeding 3,500 kg) will need to comply by 1 August 2011
- Note: The side-railings should be fitted up to a height of not less than 700 millimetres from the carriage deck and not less than 300 millimetres from the top of the side-boards





- For light lorries (G-Plate lorries with maximum laden weight not exceeding 3,500 kg), the height of the canopy structure must not exceed 1.35 times the height of the lorry's cabin when measured from the road surface to ensure the stability of the vehicle
- For heavy lorries (X- or Y-Plate lorries with maximum laden weight exceeding 3,500 kg), the height of the canopy structure must not exceed 3.2 metres when measured from the road surface (regardless of the height of the lorry's cabin). Certification from a Professional Engineer would be required if the height limit is exceeded



- Lorry owners who wish to use their lorries to carry their workers must display a <u>Maximum Passenger Capacity (MPC)</u> label on the right side of lorry's rear tailboard indicating the maximum number of workers that can be transported when the carriage deck is empty
- The lorry must not carry an excess number of workers based on the minimum deck space requirement of 0.372 square metres (or 4 square feet) per seated worker. If goods or equipment are also transported, the number of workers that may be carried is reduced according to the remaining floor area available.
- Lorries registered before 1 January 2010 and used to transport workers will continue to display MPC label with white characters on a black background. Lorries registered on or after 1 January 2010 and used to transport workers will display MPC label with black characters on a yellow background

### Determining Maximum Passenger Capacity (MPC)



 When determining the maximum passenger capacity of a lorry's carriage deck, the usable deck area should not include the area occupied by any permanent fixtures on the carriage deck such as cranes and toolboxes.

### Example

- A lorry with a permanent toolbox secured on the carriage deck has the following dimensions:
- Lorry total deck area = 3.1m (Length) x 1.6m (Width) = 4.96m<sup>2</sup>
- Area occupied by permanent toolbox = 1.6m x 0.65m = 1.04m<sup>2</sup>
- MPC =(4.96-1.04)/0.372=10 (Note: round down to the nearest integer number)





Lorries registered <u>before</u> 1 January 2010 and used to transport workers (White characters on Black background)



Lorries registered on or after 1 January 2010 and used to transport workers (Black characters on Yellow background)



### Common Causes of Commercial Truck Accidents



Commercial truck drivers are skilled and patient drivers, for the most part. However, in addition to the dangers inherent in the size and weight of the trucks used in commercial transportation and shipping, a number of characteristics inherent in the business can contribute to traffic accidents.

- Inadequate training as to driving technique, safety concerns, and defensive driving
- System of compensation that encourage faster vehicle speeds and more hours of consecutive vehicle operation that would normally be advisable

Unrealistic schedules and expectations of companies that encourage drivers to

hurry, despite safety risks involved





# Heavy Vehicle Parking



Document.

- The 6-ton box truck is classified as a heavy vehicle, and is required to park at designated parking places, located away from residential environment
- Under current legislation, a residential development cannot be used for the parking of heavy vehicles. However, if you are the owner or lessee of an industrial development, you may apply to LTA and use the premises for overnight parking of heavy vehicles. After obtaining the licence, you can then apply for a certain number of VPCs, depending on space availability, for heavy vehicles belonging to yourself and / or your tenants
- The Vehicle Parking Certificate Scheme was implemented in 1994 by LTA, and requires all heavy vehicles in Singapore to have a parking lot in an authorized parking place licensed by LTA
- It will be an offence if its owner does not park it in its designated parking place when it is not in use (between 12 midnight and 6am)
- Example of locations where Heavy Vehicle Parking can be found in the Central region (Note: More examples can be found at:)

http://www.onemotoring.com.sg/publish/onemotoring/en/on\_the\_roads/parking/parking\_for\_heavy.html

# Heavy Vehicle Parking



### **Example**

Region	Name of Operator / Heavy Vehicle Park Code No.	Name / Location of Heavy Vehicle Park	Total Lots	Vacant lots	Contact person and Number
CENTR	AL REGION	•	•		
Central					
	URA / P0039	Palmer Road Off Street	5	0	URA Public Hotline:
					Tel: 63293434
Bukit Me	rah / Queenstown	•			
	URA / D0028	Delta Circus Fringe Car Park	157	0	URA Public Hotline:
	URA / T0070	Tanglin Halt Close	18	0	Tel: 63293434
Bukit Tin	nah/Thomson	•			
	URA / M0059	Mackenzie Road B	76	0	URA Public Hofline:
	URA / W0033	Whitley Rd / Thomson Rd HV Pk	141	0	Tel: 63293434
East Coas	st/ Changi		•		
	URA / F0029	Fort Rd/East Coast Pk Hv Pk	85	0	URA Public Hotline: Tel: 63293434
	URA / S0077	Siglap Link	15	0	
Kallang I	ndustrial Estate		•		
	URA / L0060	Lorong Bakar Batu	12	0	URA Public Hotline: Tel: 63293434
	URA / K0052	Kallang Sector	7	0	
	URA / G0018	Genting Lane	21	0	
	URA/ B0099	Bendemær Road Heavy Vehicle Park	75	0	
Pasir Pan					
	URA / P0030	Pasir Panjang Rd / Labrador Ville Rd	9	0	URA Public Holline: Tel: 63293434
Telok Bla					
	URA / T0100	Telok Blangah Street 31	10	0	URA Public Hofline:
	URA / T0109	Telok Blangah Drive HV Park	55	0	Tel: 63293434
Braddell		•	•		
	URA / B0082	Braddell Road HV Park	86	0	URA Public Hotline:
					Tel: 63293434
Ubi / Kak	i Bukit				
	URA / K0091	Kaki Bukit Road 2	10	0	URA Public Hofline: Tel: 63293434
	URA / U0014	Ubi Road 2	20	0	

# Today's Problem



### Possible Recommendations:

- Real-time location of trucks Using GPS
- Driving habits
- Speeding

Using Telematics system (e.g. V3)

Real-time receipt of goods

Using e-POD

- Traffic condition
- Familiarity of destinations
- ERP gantries

Using GPS Navigation System

- Illegal parking Refer to LTA Heavy Vehicle Parking (HVP)
- Ferrying of workers Following guidelines and safety rules

# **Learning Outcome**



- Discuss the concerns of local transportation company
- Describe the technologies available for tracking and tracing
- Explain the regulations for transport safety of workers

