P15
Driver Woes

- Concerns of local transportation company
- Technologies available to deploy for local distribution
- An update on Singapore's transport landscape

SCHOOL OF ENGINEERING

E216 Distribution &Transportation

Issues/Concerns in Local Transportation

Driving habits

Real-time location of trucks/drivers

Traffic conditions

Illegal parking

ERP gantries charges

Mobile phone charges/prices ($)

Real-time receipt of goods

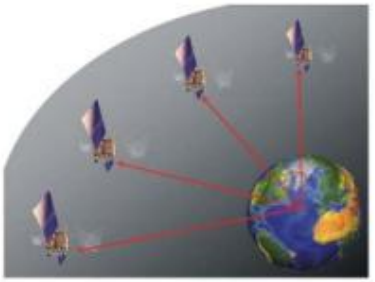
Speeding

Familiarity of destinations

Ferrying of workers/ LTA regulations

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)



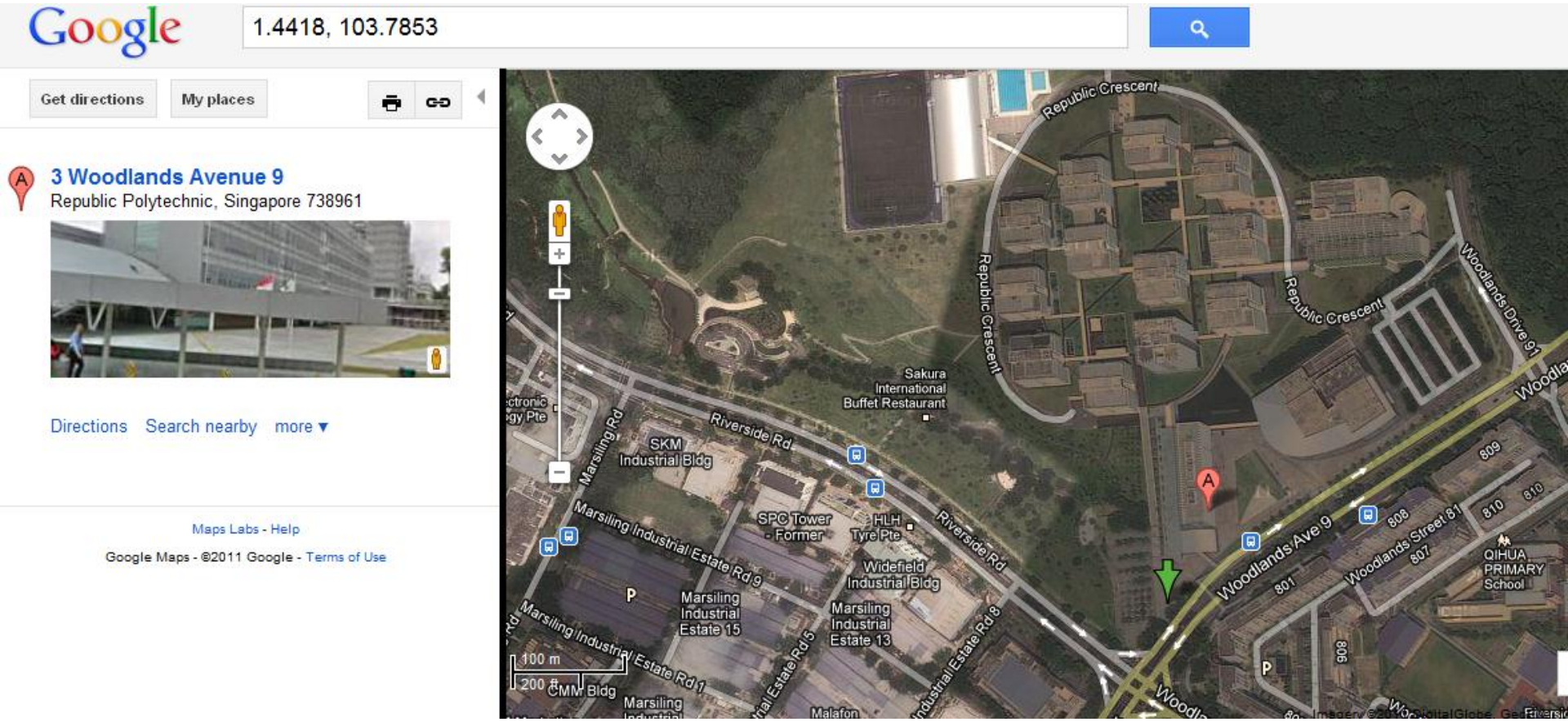
- GPS receivers require an unobstructed view of the sky, so they are used only outdoors and they often do not perform well within forested areas or near tall buildings
- GPS receivers are also able to derive based on position changes information such as direction and speed

GPS Coordinates

- Represented in coordinates, which uses minutes and seconds to establish points between degrees, thus
  1. 07’27”
  2. 7 minutes 27 seconds
  3. 7.450 minutes
  4. .124167 (7.45 divided by 60)

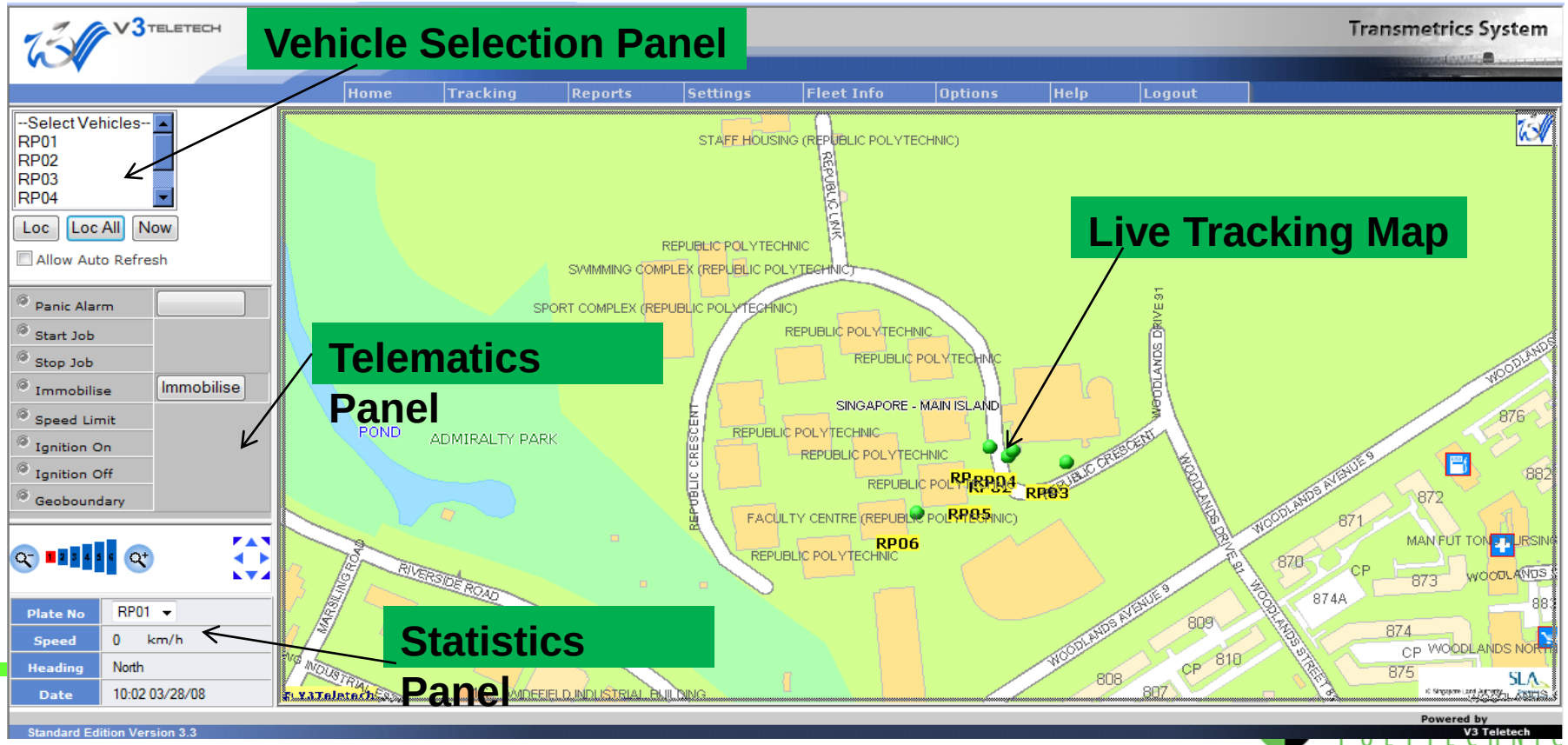
  (They all mean the same location)
- For instance, given location N 1° 26.510’, E103°47.120’ -> alternatively 1.4418, 103.7853
- Go to http://maps.google.com/
- Type in 1.4418, 103.7853

Finding Locations Using Google Maps

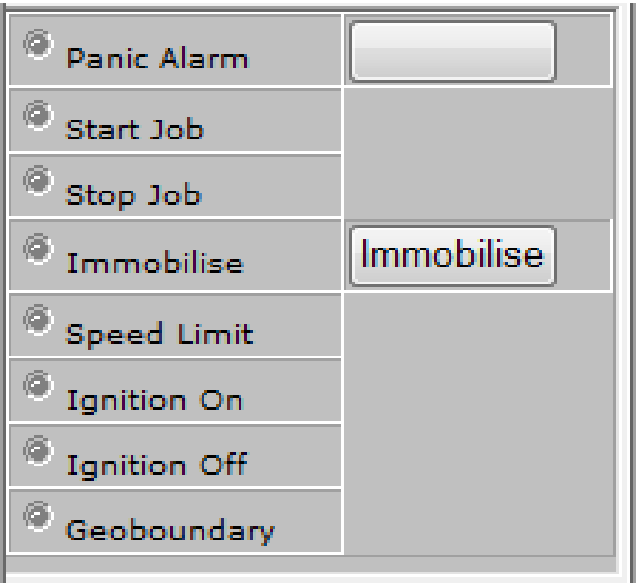


Example of GPS Tracking

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

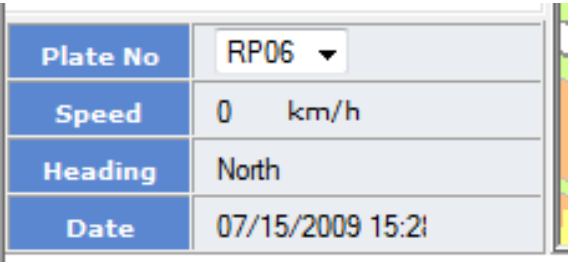


Example of GPS Tracking



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

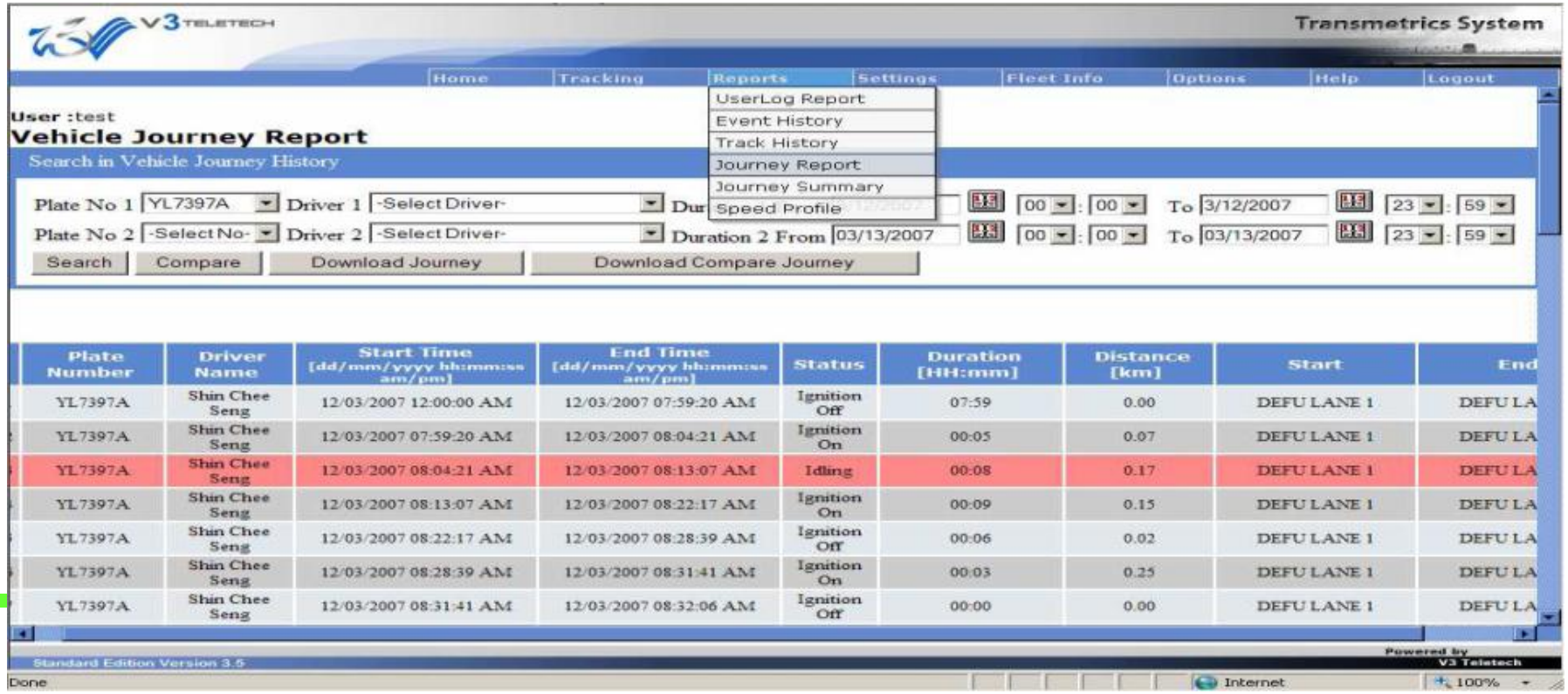
- Green light by the label indicates driver has pressed the corresponding label (e.g. Start Job, Ignition On) on the job panel
- Controller can immobilize vehicle by pressing the Immobilize button on the screen



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

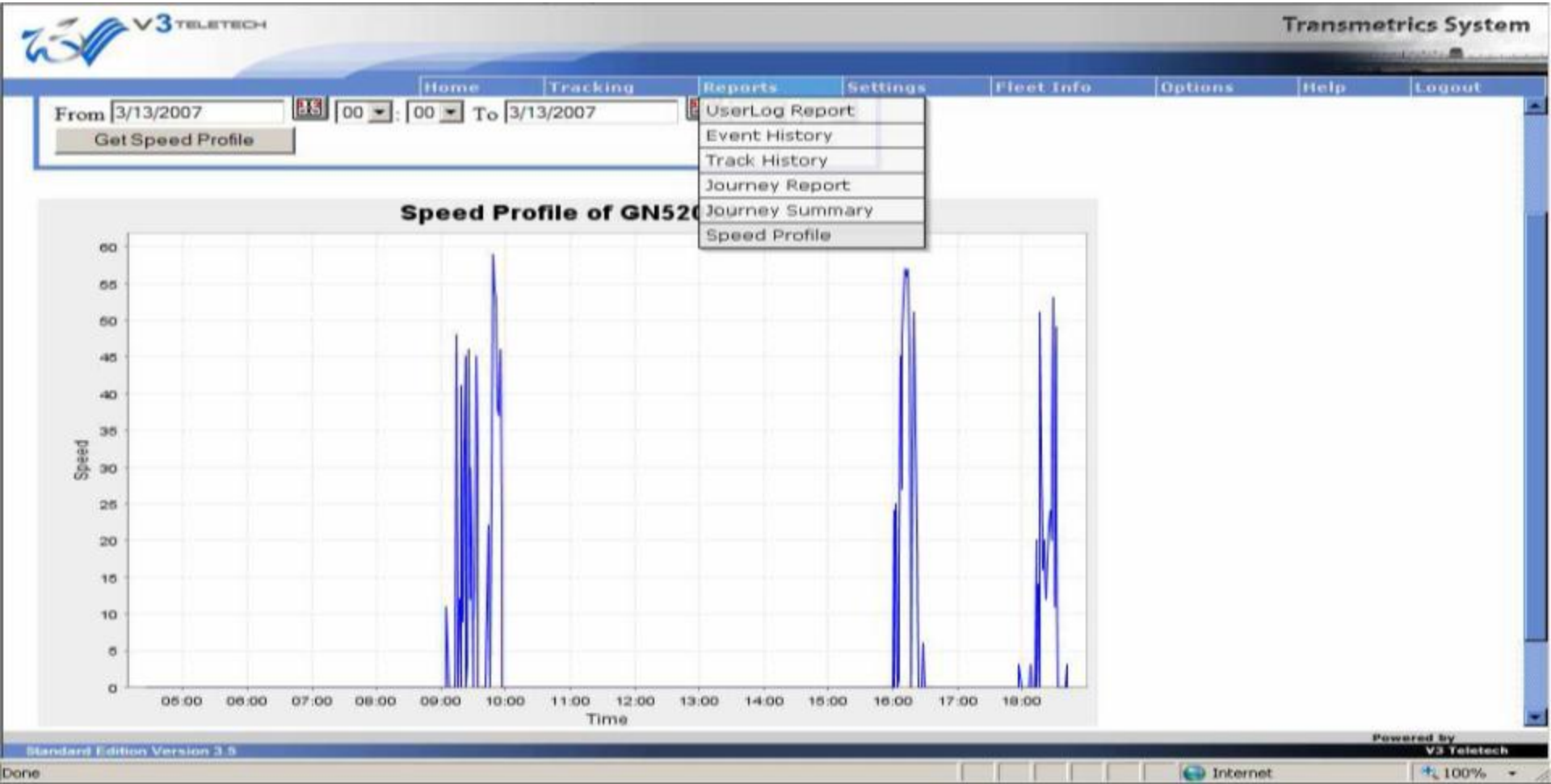
Example of GPS Tracking

- 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)



Example of GPS Tracking

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

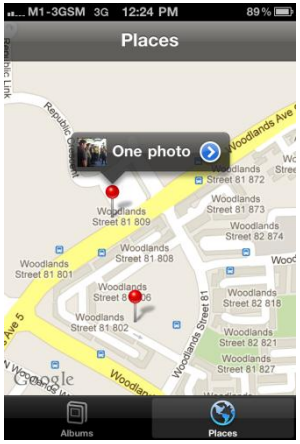


Example of GPS Tracking

- **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)

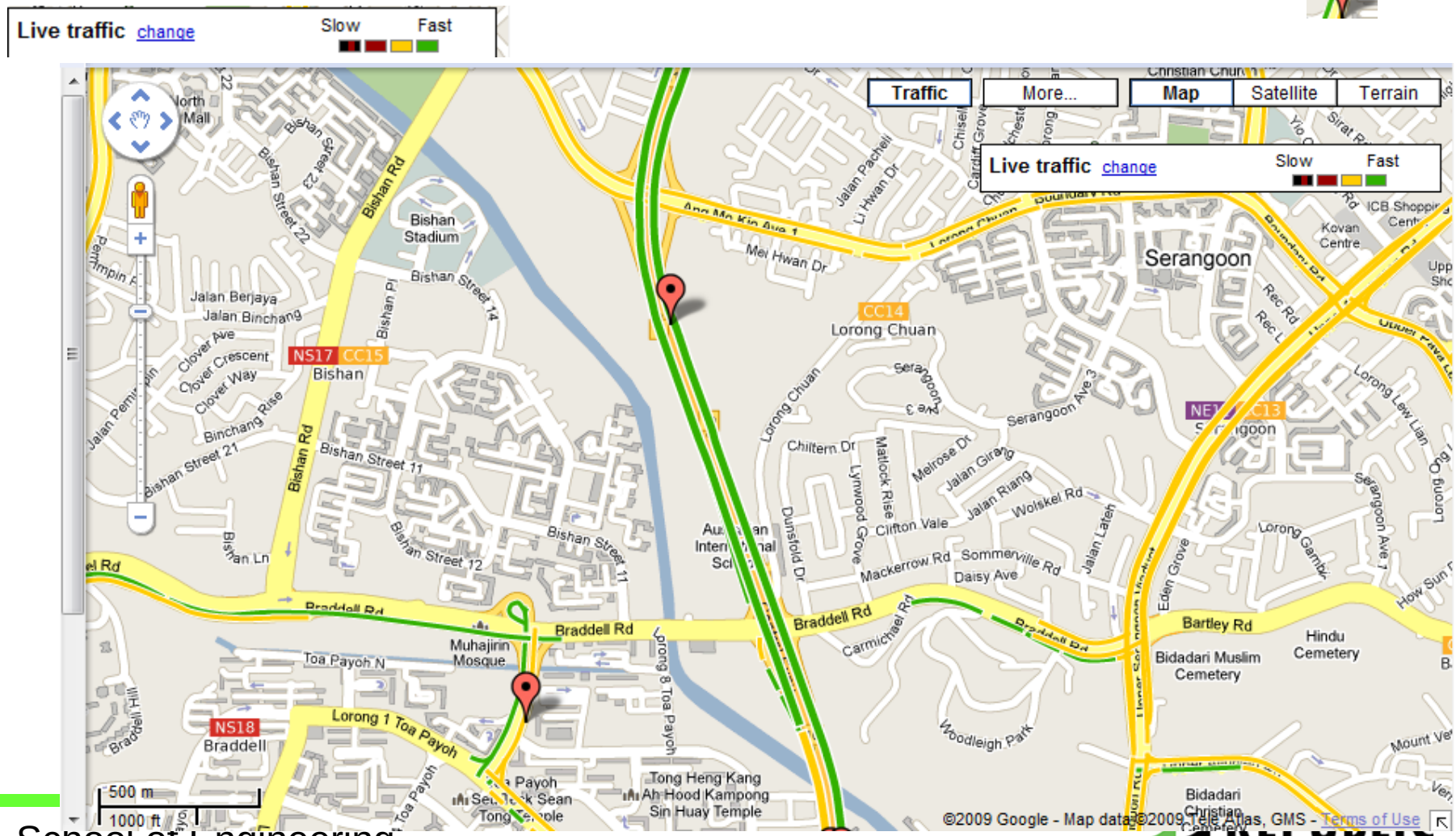


Traffic Conditions and Traveling Routes

- 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 (http://maps.google.com.sg)
  - TrafficGEM
  - One Motoring (http://www.onemotoring.com.sg/publish/onemotoring/en/on_the_roads/traffic_cameras0.html)
  - Streetdirectory.com (http://sg.streetdirectory.com/)
  - Gothere.sg (http://gothere.sg/)
  - Rednano (http://www.rednano.sg/index.html?t=2)
  - StreetDB Singapore (http://www.streetdb.com/)
  - My Lifestyle Map (http://www.mylifestylemap.com/

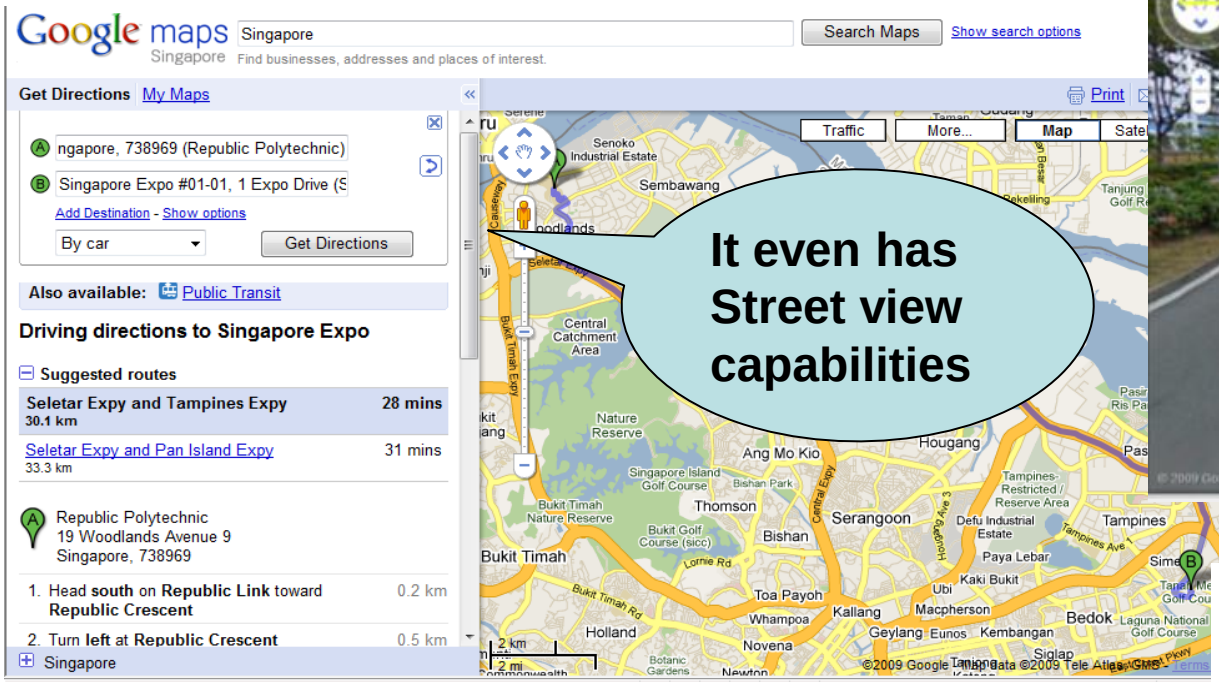
Google Maps Singapore

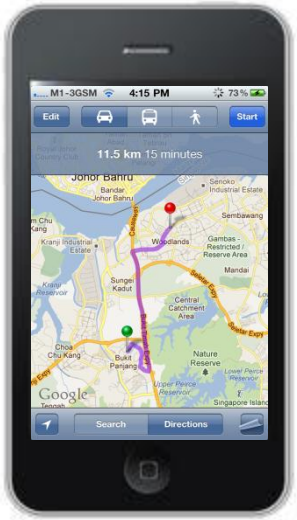
- Live Traffic updates
- ERP gantry locations



Google Maps Singapore

- Suggested traveling directions





iPhone Apps

REPUBLIC POLYTECHNIC

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.

Driver Communication

- Besides the common GSM mobile communication networks, there is an integrated Digital Enhanced Network technology (iDEN), developed by Motorola
- GRID (http://www.grid.net.sg) offers this island-wide mobile communication service to the business community.
  - Fastest call setup at the push of a button (Push to Talk: PTT)
  - Unlimited 1-to-1 call for cost management
  - Efficient 1-to-many group call for operation management
  - High network availability (>98% street level coverage)

Heavy Vehicle Parking

- 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

HVP - Central Region

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
WESTERN REGION					
Ayer Rajah					
	URA / A0043	Ayer Rajah Crescent	8	2	URA Public Hotline: Tel: 63293434
Bukit Batok					
	URA / B0081	Bukit Batok Rd/Jurong Road	531	0	URA Public Hotline: Tel: 63293434
	URA / B0086	Bukit Batok East Ave 2 HV Park	212	0	
Choa Chu Kang					
	URA / S0111	Stagmont Ring HV Park	180	0	URA Public Hotline: Tel: 63293434
Upper Bukit Timah					
	URA / W0013	Woodlands Road Lorry Park	273	0	URA Public Hotline: Tel: 63293434
	URA / D0029	Dairy Farm/Petir Road HV Park	124	0	
Jurong East					
	URA / S0075	Science Centre Road	59	0	URA Public Hotline: Tel: 63293434
Chin Bee					
	URA / GC007	Third Chin Bee Road	125	0	URA Public Hotline: Tel: 63293434
	URA / GC007	Chin Bee Road			
	URA / GC007	Chin Bee Drive			
	URA / GC007	Second Chin Bee Road			
	URA / GC007	Jalan Tukang			

Safety Measures For Lorries Carrying Passengers

(**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, lorries 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

Safety Measures For Lorries Carrying Passengers

- 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

Safety Measures For Lorries Carrying Passengers

- 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 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

Safety Measures For Lorries Carrying Passengers

- 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

Safety Measures For Lorries Carrying Passengers

- Lorry owners who wish to use their lorries to carry their workers must display a Maximum Passenger Capacity (MPC) 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
- 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

Lorries registered **before** 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*)

Today's Problem

Possible Recommendations

- Real-time location of trucks — Using GPS
- Driving habits
- Speeding — Using Telematics system such as V3
- Real-time receipt of goods — Using e-POD
- Traffic condition
- Familiarity of destinations
- ERP gantries — Using online system such as Google Maps Singapore
- Mobile phone charges — Using GRID
- Illegal parking — Refer to LTA Heavy Vehicle Parking (HVP)
- Ferrying of workers — Following new guidelines

Learning Outcome

- Concerns of local transportation company
- Technologies available to deploy for local distribution
- An update on Singapore's transport landscape