



V2X Traffic Management Initiatives in NSW

2nd ITS AP Workshop – Innovative Transport Management

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V2X (C-ITS) technologies will bring substantial benefits to roads

- Safety benefits from significant reduction in crashes
- Improved data to accurately assess road network performance, and to actively manage the system in real time for optimal performance
- More accurate traveller information for transport users
- Environmental benefits from more efficient operation of vehicles (eg reduction in stops)

Traffic signals will be a key component of the V2X ecosystem

- Several initial V2X use cases involve traffic signals
- Some of these include:
 - Red Light Violation Warning
 - Imminent Green Light Alert
 - Green Wave Speed Advice
 - Priority for high value vehicles (emergency, bus, freight, etc)

RMS is preparing SCATS to support V2X use cases

- This is important not just for NSW, but for SCATS users throughout the world
- Challenges associated with adaptive nature of SCATS
 - Some use cases difficult to achieve
 - Most previous V2X trials have used fixed time systems

RMS is implementing a major V2X freight priority trial

- Aimed at improving traffic congestion in Sydney, and improving freight travel times
 - Increase efficiency of existing traffic network
 - US trials suggest up to 20% reduction in travel time for freight vehicles
- Will use Cohda DSRC communications equipment
- V2I communication between trucks and SCATS sites

This will be one of the largest V2X freight trials in the world

- 116 intersections along 3 freight corridors across Sydney
 - Pennant Hills Road (38 intersections)
 - Parramatta Road (44 intersections)
 - King Georges Road (34 intersections)
- 112 heavy vehicles
- Initial 3 month field trial

Route 1 Pennant Hills Road King Georges Road

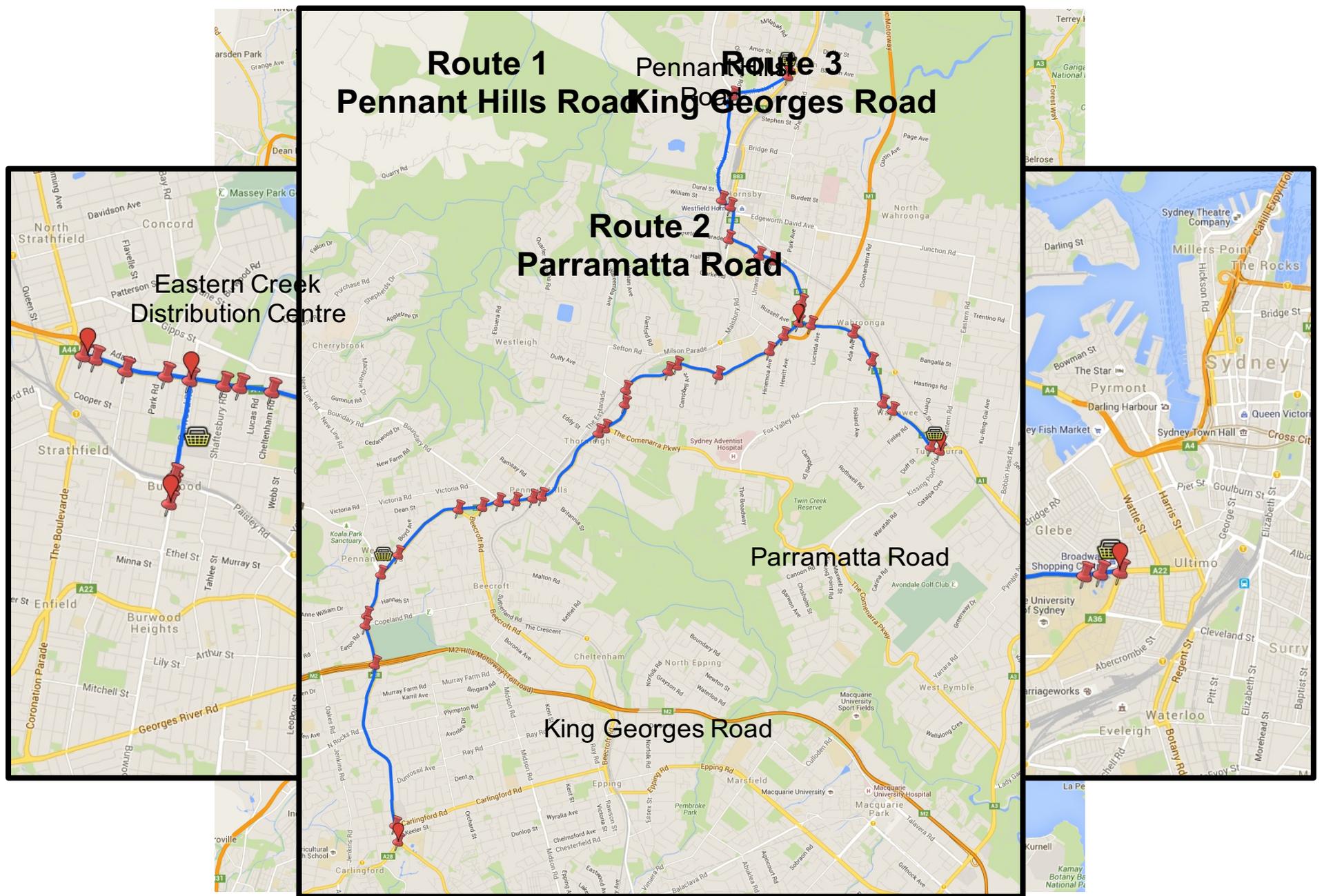
Route 3 Pennant Hills Road King Georges Road

Route 2 Parramatta Road

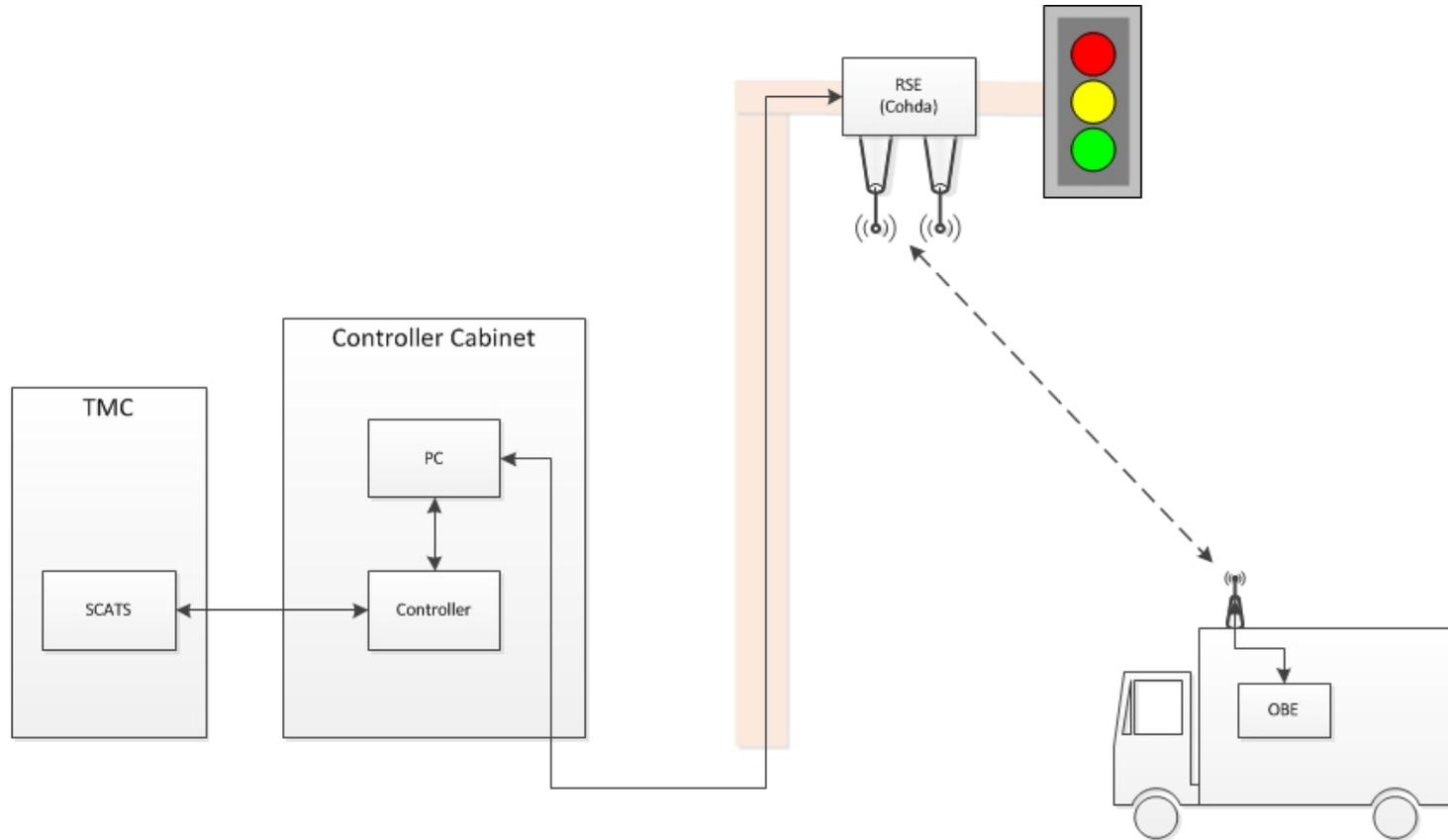
Eastern Creek Distribution Centre

Parramatta Road

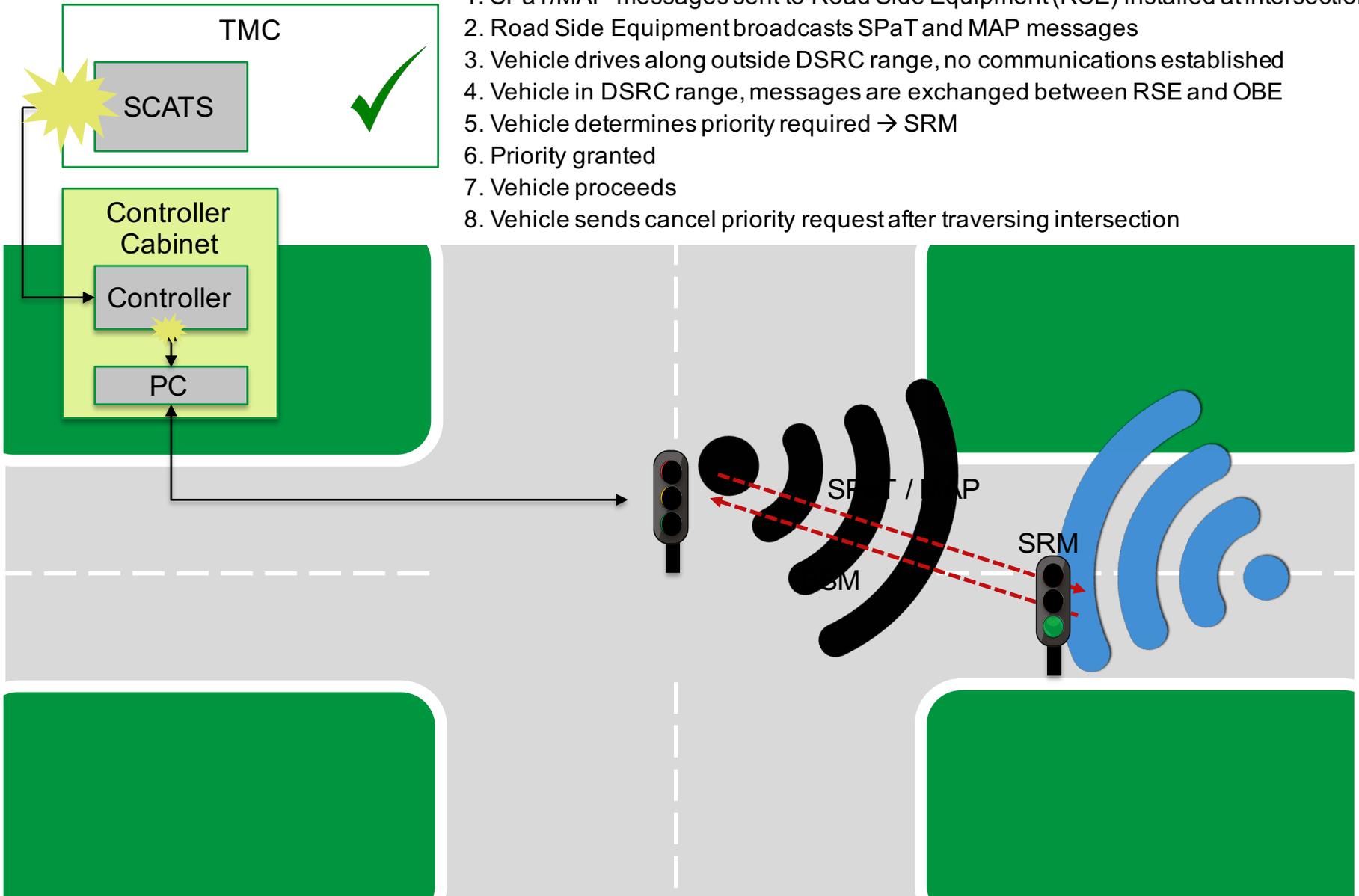
King Georges Road



The trial will use DSRC communication between trucks and SCATS sites



1. SPaT/MAP messages sent to Road Side Equipment (RSE) installed at intersection
2. Road Side Equipment broadcasts SPaT and MAP messages
3. Vehicle drives along outside DSRC range, no communications established
4. Vehicle in DSRC range, messages are exchanged between RSE and OBE
5. Vehicle determines priority required → SRM
6. Priority granted
7. Vehicle proceeds
8. Vehicle sends cancel priority request after traversing intersection



Technical

Messages

- **NTCIP 1211** - National Transportations Communications for ITS Protocol
- **SAE J2735** - Society for Automotive Engineers
 - Broadcast by Infrastructure
 - Signal Phase and Timing (SPaT)
 - Intersection Map (MAP)
 - Broadcast by Vehicle
 - Signal Request Message (SRM)
 - Basic Safety Messages (BSM)
 - Vehicle position, speed, heading accelerations, brake, ...

Technical

Communications

- Dedicated short range communications (DSRC)
 - 5.9 GHz DSRC Band

Technical

Hardware

- Hardware
 - On Board Equipment: Cohda Wireless MK5 OBU
 - Road Side Equipment: Cohda Wireless MK5 RSU



Target Outcomes

for Proof of Concept

- Reducing environment impacts
 - Reduce vehicle emissions and fuel consumption
 - By reducing vehicle stop-start.
- Improving productivity in road infrastructure use
 - Greater efficiency for freight industry
 - Cohda assume 27.6% travel time reduction.
- Reduce congestion
 - Smoother overall traffic flow along corridor.
- Trial of Vehicle to Infrastructure (V2I) technology.

RMS is supporting V2X ITS World Congress demonstrations

- Several proposed demonstrations will involve V2X traffic signal interaction
 - RMS SCATS team is providing support to achieve this
- Demonstrations will involve 8 SCATS sites in Melbourne
 - Corridor between Congress and Demonstration venues
- Demonstrations will use DSRC and other communications technologies

There are still challenges to successful V2X deployment in Australia

- Positioning
 - GPS accuracy
- Security
 - Need secure communications
- Band allocation
 - Allocation of DSRC frequency
- Standards
 - ISO / CEN / ETSI / SAE standards
- Vehicle fleet issues
 - Grey imports

Thank You

