



**CUBIC™** | Transportation Systems

## MaaS – A Win for the Individual and a Win for the City?

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20<sup>th</sup> June 2019

# CHOICE OF TWO FUTURES



An aerial, black and white photograph of a city skyline at night. The foreground is dominated by a complex, multi-level highway interchange with numerous lanes and overpasses. In the background, several tall skyscrapers are illuminated, their lights reflecting against the dark sky. The overall scene conveys a sense of urban density and infrastructure.

**A win for the individual?**



So how did you get here today?

- Car?
- Public Transport?
- Taxi?
- Walk
- Cycle!?!
- How did you plan it?
- How much contingency did you add?

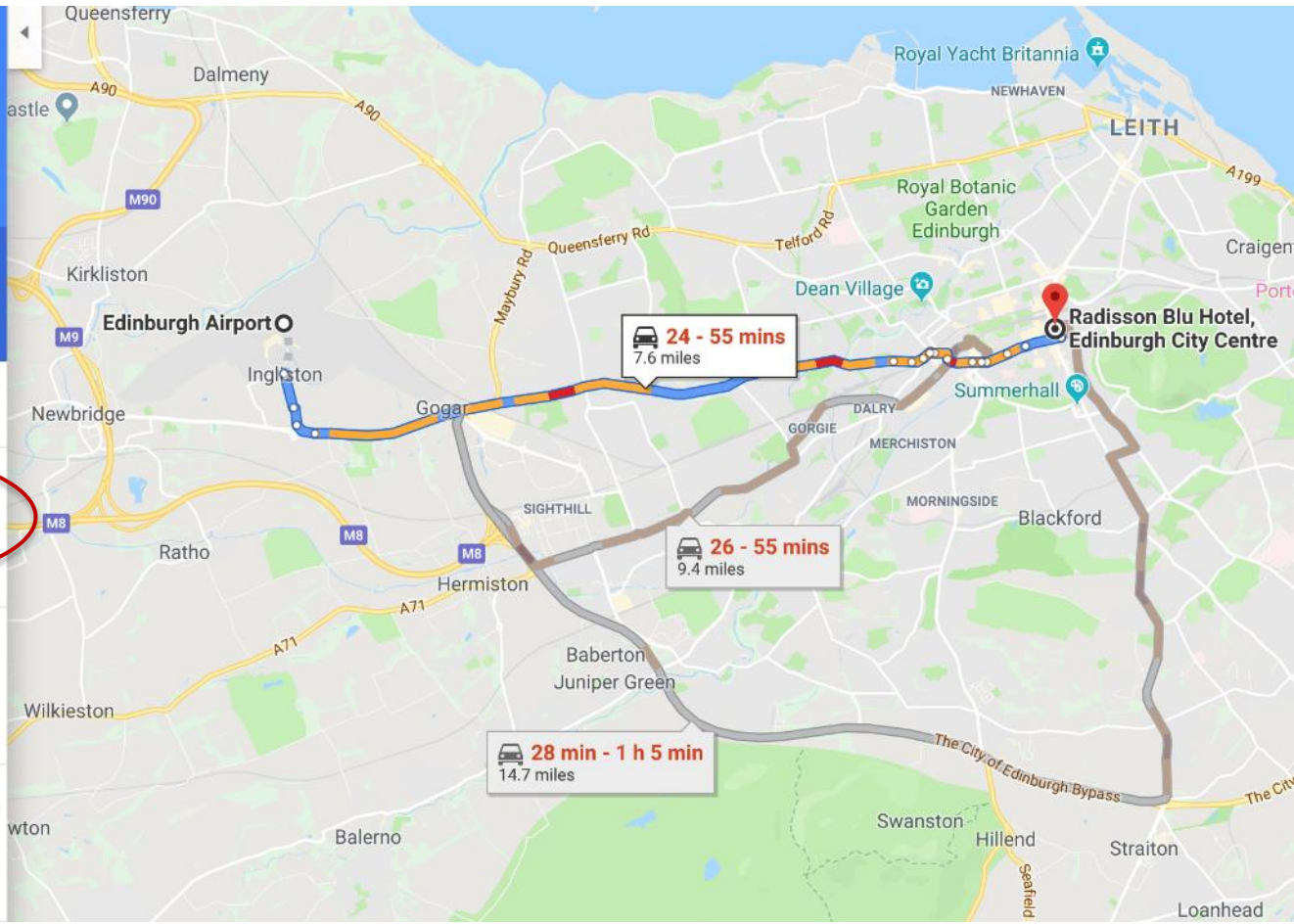
Edinbrough Airport
   
 Radisson Blu Hotel, Edinbrough City Centre
   
 Arrive by OPTIONS
  
 9:00 AM Thu, Jun 20

Send directions to your phone

via Glasgow Rd/A8 and A8 **typically 24 - 55 min**
  
 Leave around 8:05 AM
   
 7.6 miles
   
[DETAILS](#)

via W Approach Rd **typically 26 - 55 min**
  
 Leave around 8:05 AM
   
 9.4 miles

via The City of Edinburgh Bypass/A720 **typically 28 min - 1 h 5 min**
  
 Leave around 7:55 AM
   
 14.7 miles



Edinburgh Airport

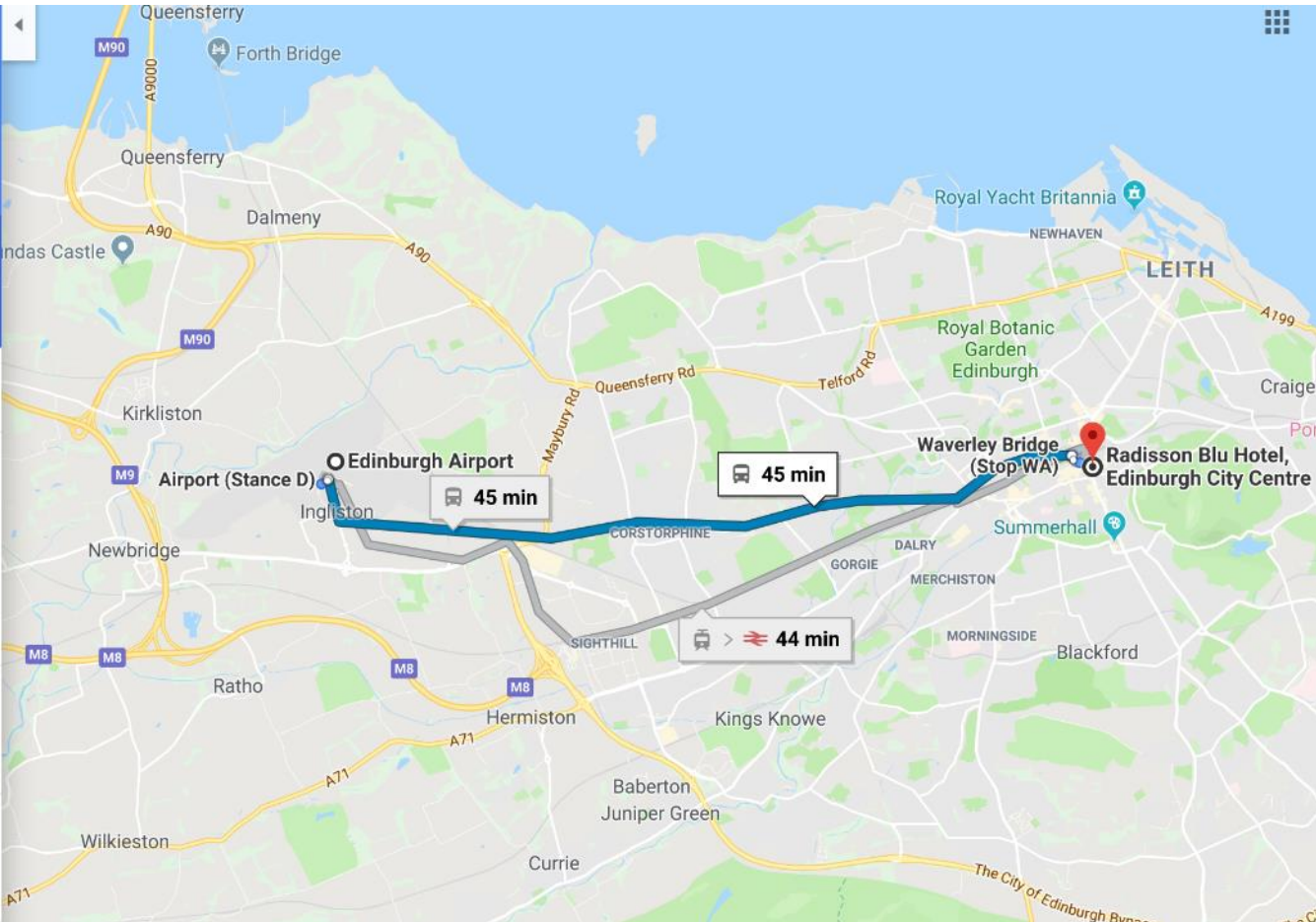
Radisson Blu Hotel, Edinburgh City Centre

Arrive by 9:00 AM Thu, Jun 20

OPTIONS

Send directions to your phone

- 8:08 AM (Thursday)–8:53 AM 45 min  
 Airlink 100 >
- 8:10 AM from Airport (Stance D)  
 8 min
- DETAILS
- 8:16 AM (Thursday)–8:55 AM 39 min  
 Airlink 100 > ScotRail >
- 8:01 AM (Thursday)–8:46 AM 45 min  
 Airlink 100 >





Arrive Jun 20, 2019 9:00 Transport

Preferred	Departure	Carbon	Price
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8:04 - 8:56 (52 min)

5 min T50 8:10 11 min

0.8kg CO<sub>2</sub> - 40 calories

[View times](#)

8:02 - 8:53 (51 min)

7 min 100 8:10 6 min

0.6kg CO<sub>2</sub> - 35 calories

[View times](#)

24 min (depart 8:36)



£7 - 2kg CO<sub>2</sub> - 40 calories

33 min (depart 8:27)

4 min

£7 - 2kg CO<sub>2</sub> - 40 calories

7:55 - 8:43 (48 min)

7 min 909 8:03 SR:CDD->EDS 8:32 6 min

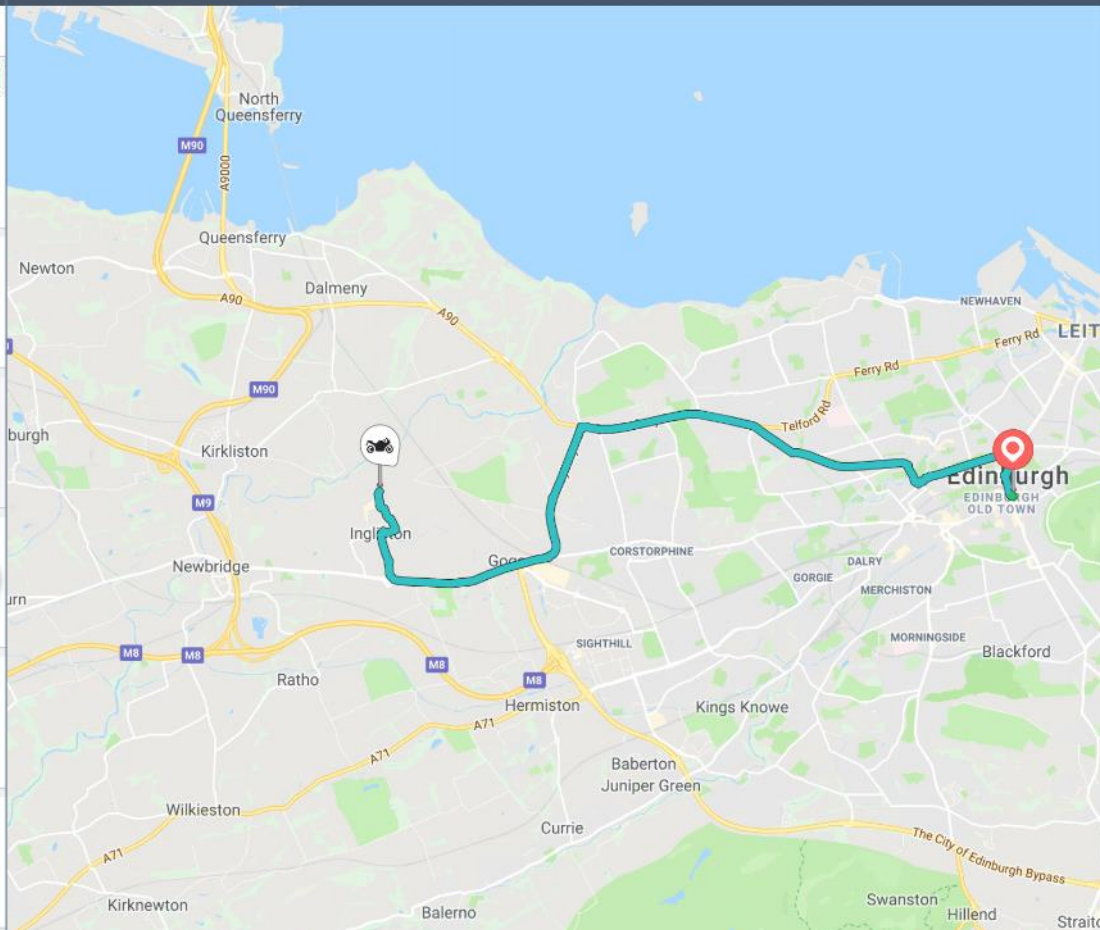
0.5kg CO<sub>2</sub> - 28 calories

[View times](#)

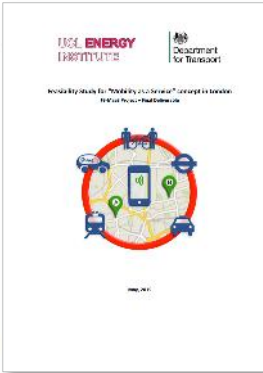
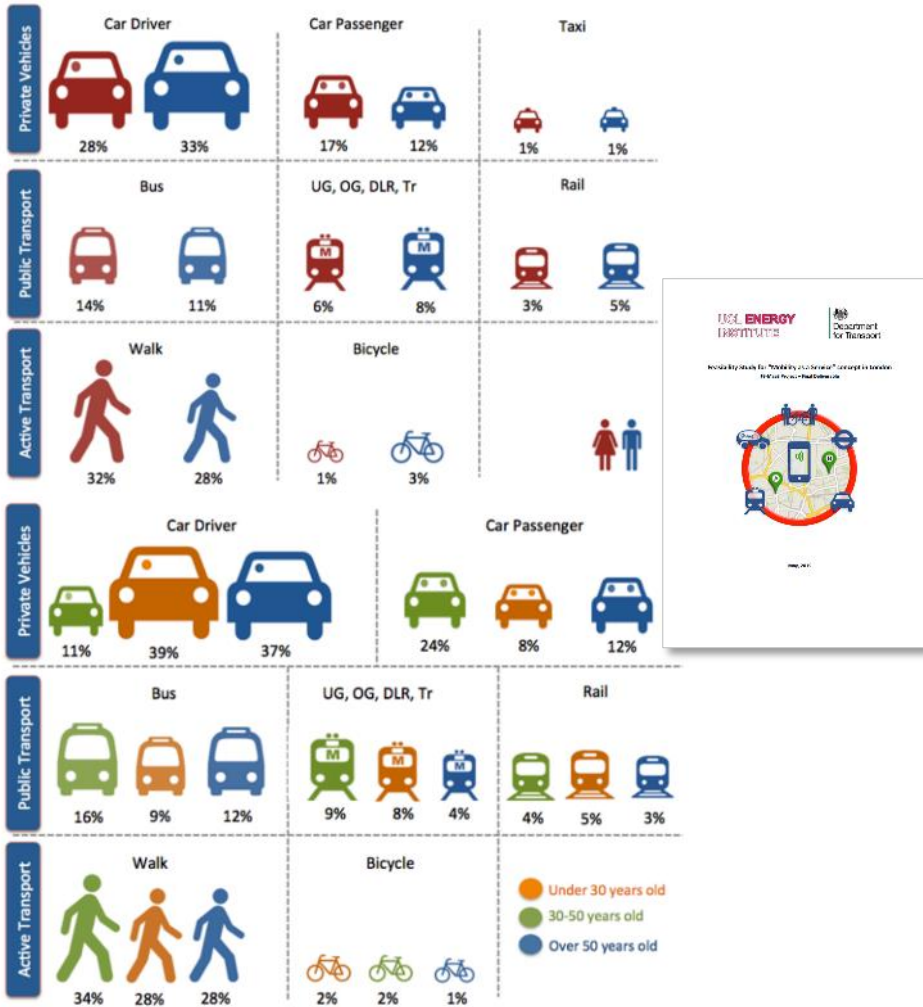
38 min (depart 8:22)

5 min

£9 - 2kg CO<sub>2</sub> - 48 calories



# How do we move?



- UCL Study for the development of MaaS models for TfL
- App that monitors your location and mode of transport to determine the metrics for your journey
- Provided the mobility metrics for the sample audience
- Provided mobility metrics for the individual user at the end of each week



# What price for the convenience?

- Financial Cost
  - *Parking*
  - *Fuel*
  - *Insurance*
  - *Tolls*
  - *Car Loan/Lease*
  - *Vehicle Excise Duty*
  - *Wear and tear*
- Environmental Impact
- Average Speed
- Safety

→  350km

Fuel economy

Average

8.3km/L

0 10 20 30

Hold **OK** : Reset

33°C

1564km

→  350km

Drive info



78.2km



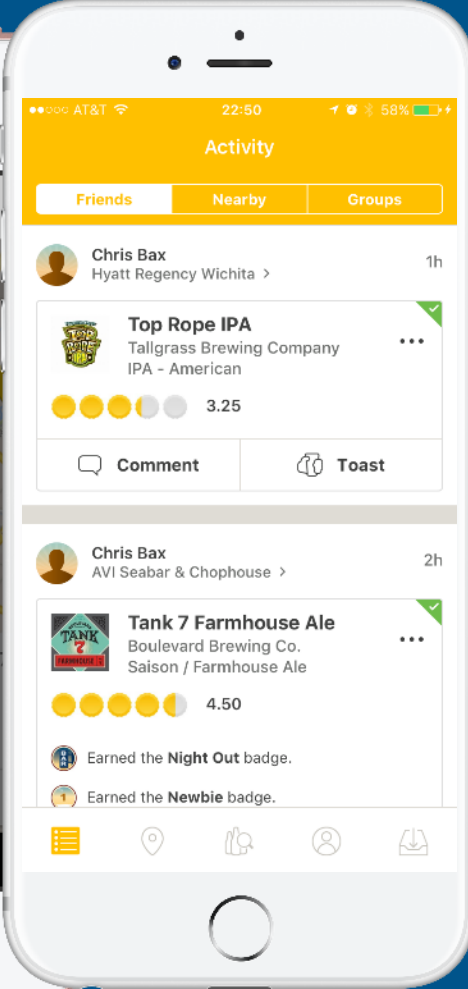
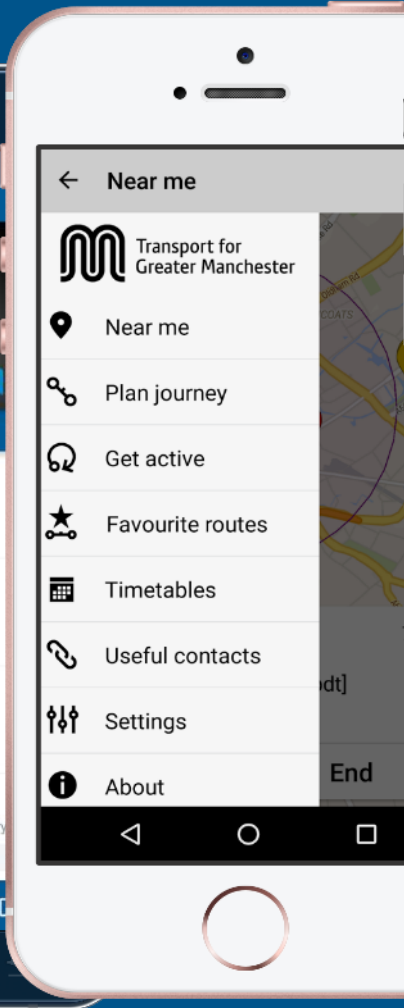
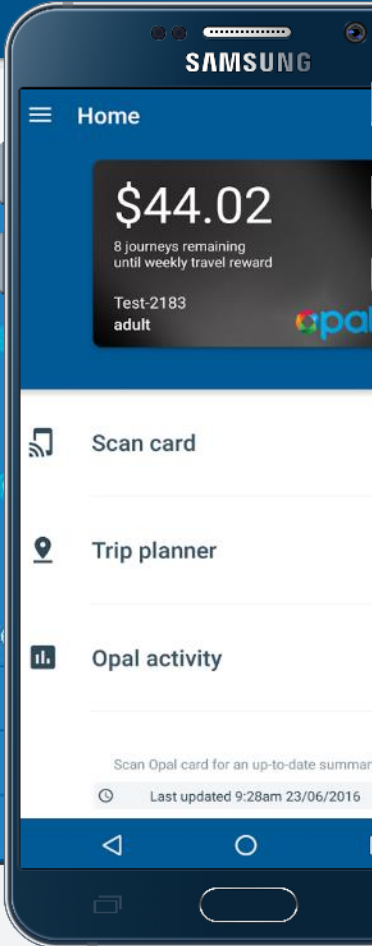
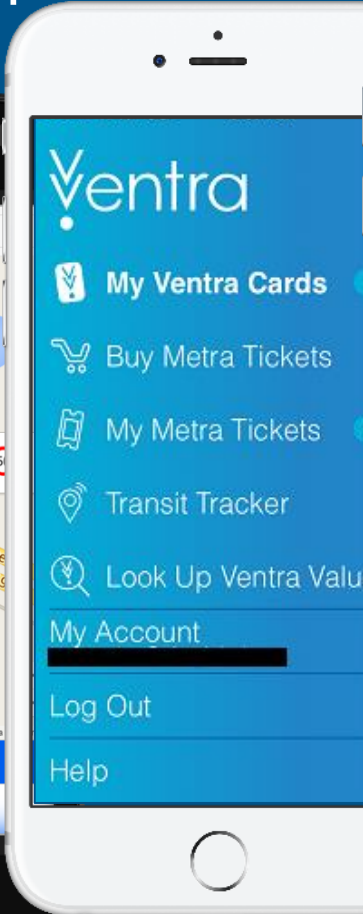
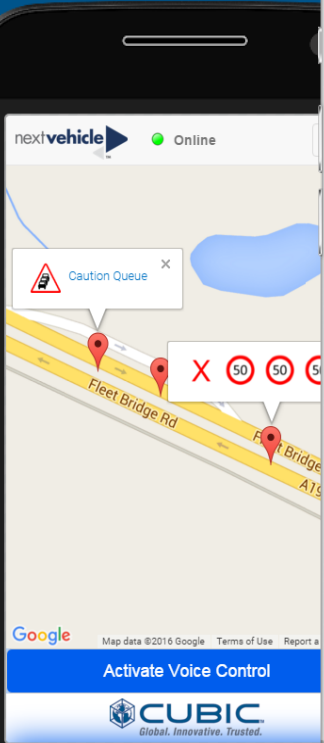
8.0km/L



04:15h

Hold **OK** : Reset

# THERE'S AN APP FOR THAT!





# Journey Planning

## The State of Play Today

- Good for single mode planning
- Improving for multi-mode planning
- Cost routing limited
- Incident re-planning limited

## Industry Trends

- Convergence

# Journey Planning

## The Ideal World Tomorrow

- One App
- Multi-mode journey planning
- Single click payment
- Timely incident notification
- (Helpful) re-planning
- Automatic refunds



# **MAAS BENEFITS – FOR THE PUBLIC**

- **Increase access to opportunities**
- **Simple intuitive user experience**
- **Reduced journey times**
- **Increased productivity**
- **Reduce car reliance**
- **Increase equity**
- **Improved quality of life**





A win for the city?

# Road Congestion

- Demand for physical space,
- Lower average speeds:
  - *Longer trip times,*
  - *Greater unpredictability,*
  - *Periods of no movement.*
- Time,
- Fuel,
- Health,
- Amenity





## Why does it happen?

- Cities with relatively static amounts of space for vehicles,
- Cities with growing populations – housing being built further and further away from the CBD,
- Public transport taking too long to catch up with new housing leaving the car as the only transport alternative
- City centres remaining the place for well paid job opportunities,
- Unchecked access to road networks – no “throttling” of vehicle access,
- A traffic light based system that has to stop half the cars moving half of the time,
- People just assuming that they can travel!



# Why don't we all use public transport?

- Some people love their cars – the personal space,
- For some public transport just doesn't work – it isn't accessible or takes too long,
- For some it doesn't feel like a safe option,
- If not well maintained it can become unreliable due to failures,
- If not looked after, it can be an “unpleasant space” to be in,
- It too (Buses) can suffer from the same congestion.



# Incident Management

## State of Play Today

### Initial Tactical Response

- Keep people safe
- Deal with incident
- Get traffic and transit moving

### Incident Management Issues

- Single mode – limited coordination
- Notifications; limited ability to action
- Limited prediction capability
- Limited data on preferred re-routing options

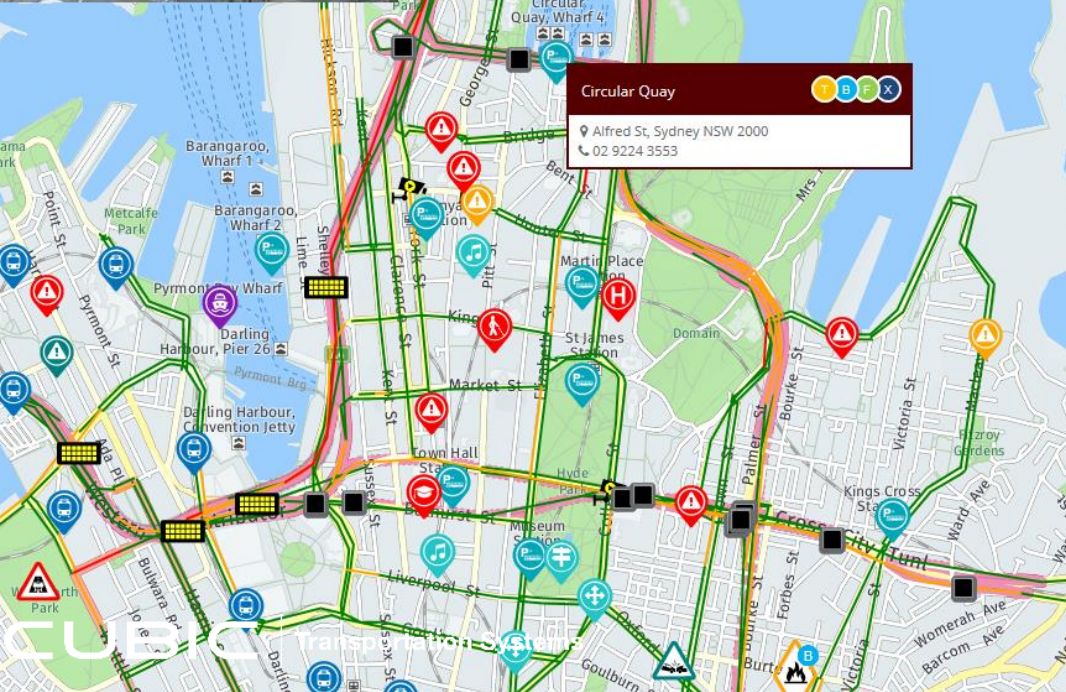


# CREATING SITUATIONAL AWARENESS

- Removing transport 'blind spots'
- Clear view of what is happening across the entire network



# COMMON OPERATING PICTURE



**Circular Quay**

Alfred St, Sydney NSW 2000  
02 9224 3553

Y B E X

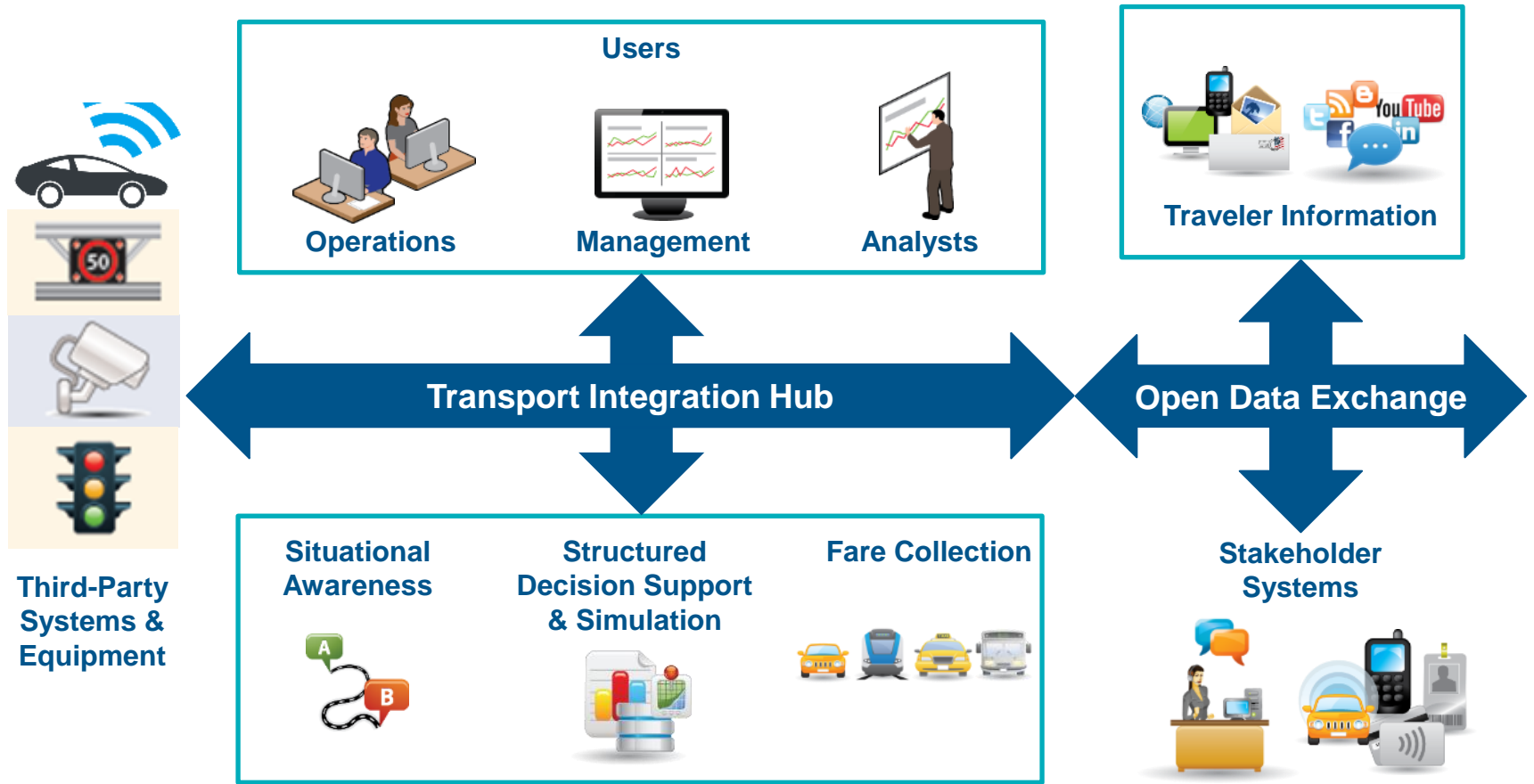
- Road congestion status
- Integrated CCTV
- Public transport disruptions
- Field crew location / status
- Smart / private motorways
- Predicted travel times
- Current and forecast incidents

**Layers**

- HERE Road Links (WMS)
- HERE Road Links
- Congestion Links
- Congestion Links
- Priority
- High Priority
- Low Priority
- Strategic Alerts
- High Priority
- Medium Priority
- Low Priority
- Strategic Events
- Devices
- Variable Message Signs
- ITS Assets
- CCTV Cameras (PTZ)
- CCTV Cameras (Web)
- Variable Speed Signs
- Traffic Signals (SCATS)
- POI - Transport
- Multi-Modal Interchange
- Railway Stations
- Light Rail Stations
- Bus Stations
- Ferry Terminals
- POI - High Risk
- Schools
- Curseries



# Integrated Multi-modal Transportation & Incident Management



# IMPROVED PLANNING

- Streamlined approval process for public works
- Network visibility to identify conflicts during planning
- Simulate network impact of an event or capacity reduction
- Encourage work on the network to be optimised by those that undertake it

# IMPROVED INCIDENT RESPONSE

- Predict issues before they occur
- Better information to resources on the ground
- Monitoring people's behavior and react
- Understanding impacts on public transport
- Managing emergency bussing & Clearways
- Green light runs

# **PREDICT 30 minutes into the future**

- Monitor network in real-time
- Predicted travel times on key corridors
- Identify potential incidents
- Scenario evaluation of incident responses
- Enable the most effective mitigation actions
- Impact analysis for road occupancies and major events





# KEEPING TRAVELLERS INFORMED

- Enhanced information to the public
- SIRI-SX, Live Traffic, IVR, Social Media
- Create rule based workflows to automate message publication
- Publish multimodal incident information in a single message

# TRANSPORT TRAVEL DATA

- Insight into patronage of services
- Service planning and adjustments
- Inform potential impacts on other modes when planned or unplanned incidents occur
- Improved situational awareness e.g station overcrowding, people movement
- Real time public transport data can contribute to incident detection

# Incident Management

## The Ideal World

**Multi-modal, coordinated, and predictive**

### **Characteristics**

- Understand services affected
- Understand impact on other services
- Generate travel options
- Keep people informed
- Data for targeted re-routing
- Refund delays



# **MAAS BENEFITS – FOR CITIES**

- **Reduce vehicles miles per person**
- **Leverage infrastructure**
- **Support urban real estate development**
- **Augment/change public transport services**
- **Increase public transport ridership**



CUBIC™

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THANK YOU

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