



Innovation underpinning Australia's built environment industry



Project Steering Group Chair:

Dr. Ken Michael AC

30th Governor of Western Australia
Western Australian Commissioner of
Main Roads (1991-96)

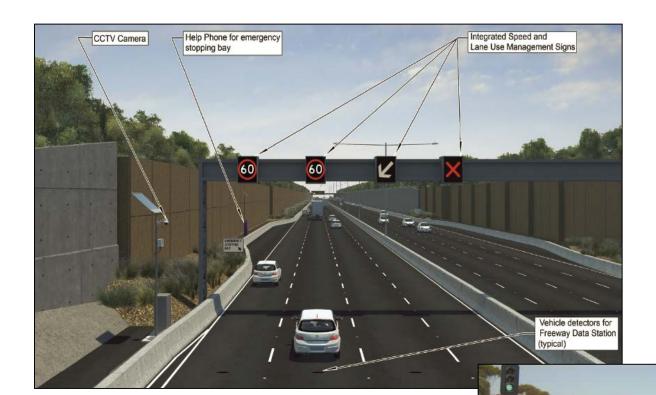
1.45: Big Data, Technology and **Transportation** - Relieving peak congestion and improving emergency responses across the transport network (October 2015-March 2017)



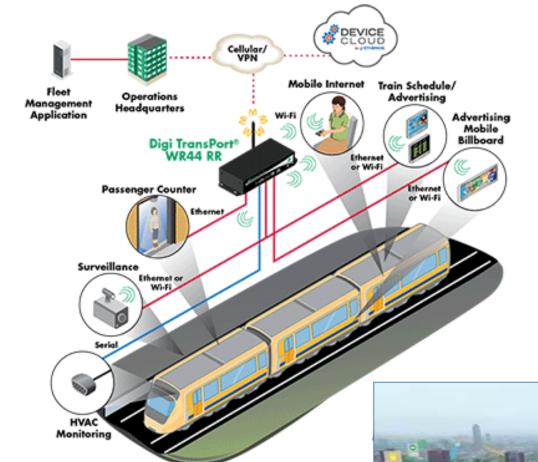
Project Team

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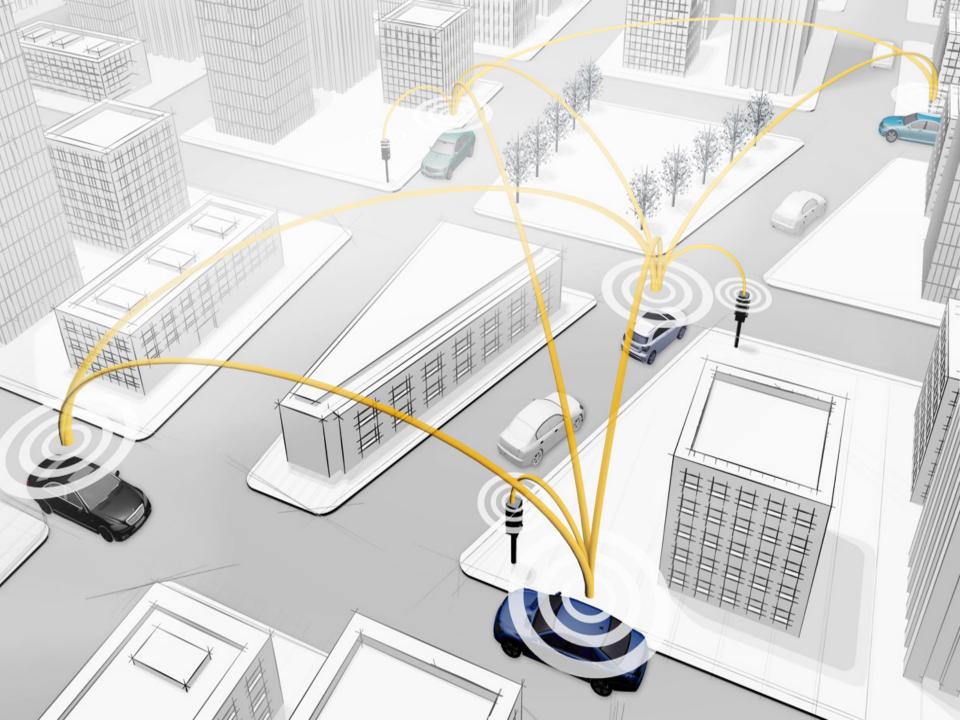




How can Big Data assist in relieving congestion and differing capital investment in main roads?







No. of passengers sitting ROAD INCLINATION

Size of footpath Vehicle acceleration rate

GPS IDLE TIME

Vehicle break usage

SIZE OF TRAM/TRAIN CARRIAGES (PASSENGER CAPACITY)

Average vehicle velocity

No. of passengers getting on/off each stop

Average overtaking distance between vehicle and bike Average vehicle wait time at an intersection

CFS Distance to carpark VEHICLE WE GHT No. of road potholes per unit distance NO. OF BREAKDOWNS PER YEAR PER VEHICLE

WIFI availability and usage on public transport NO. OF PHONE CALLS

Average vehicle waiting time at pedestrian crossing Social media event location/size/attendance/time NO. OF LANE CHANGES PER VEHICLE

Average distance before intersection vehicle breaks AVERAGE BIKE SPEED Average time bus is stationary at bus stop

RAGE VEHICLE SPEED THROUGH AN INTERSECTION CARPARK EARLY BIRD COST

Average heavy vehicle speed

No. of lanes

Vehicle value % OF CARS TRAVELLING OVER SPEED LIMIT % OF TIME HAND BREAK IS ON

Carpark cost **Carpark** size

FREQUENCY OF BIKE ACCIDENTS **GPS** speed ROAD SURFACE TYPE

Fuel mileage Intersection size Sun strength Vehicle type

AVERAGE DISTANCE BETWEEN VEHICLES Carpark height restrictions NO. OF STOPS ON BUS ROUTES Carpark usage

Average heavy vehicle acceleration

% of cars travelling under speed limit Average wait time to overtake heavy vehicle Road size **Rain intensity** AVERAGE VEHICLE WAIT TIME TO OVERTAKE BIKES

No. of tram/train carriages per train/tram AVERAGE TIME VEHICLE STOPPED BEHIND STATIONARY BUS

SOCIAL MEDIA KEY WORDS: ACCIDENT/CONGESTION ETC. Heavy vehicle lane usage on multilane roads

AVERAGE TIME OF PASSENGER PICK-UP/DROP-OFF

FREQUENCY OF HEAVY VEHICLES ON ROAD

NO. OF PEDESTRIANS USING CROSSING No. of passengers getting on/off at train/tram stop No. of road cracks per unit distance STREETLIGHT COVERAGE

VEHICLE USAGE (% TIME)

Instantaneous vehicle emissions No. of accidents on road/intersection

No. of toll roads NO. OF HEAVY VEHICLES ON ROAD

AVERAGE VALUE OF VEHICLE INSURANCE

Instantaneous vehicle velocity No. of past tyre changes per road SPEED OF CARS THROUGH SCHOOL ZONE % of oxygen in vehicle emissions STRENGTH OF SUNLIGHT ON CARPARK

Last service date of vehicle FREQUENCY OF ROAD UPGRADES % USAGE OF INDICATORS **BUS WEIGHT**

NO. OF CHILDREN BEING PICKED UP/DROPPED OFF

Frequency of motorbike lane filtering No. of seats available on train/tram NO. OF CARS STOPPING AT SCHOOL ZONE

No. of stopped delivery vehicles % tread wear of vehicle tyres No. of parked car break-ins No. of double parked cars



Phone activity Building elevation Intensity of lightning

Location of pets Coverage of affected areas

Demographics in buildings

Density of people

Value of affected buildings Humidity Design life of structures

No. of emergency vehicles available No. of displaced people **Building design capacity**

No. of building occupants No. of children in community

Water capacity of emergency vehicles

en trees No. of medical personnel

Drone temperature sensing Level and density of rainfall

Volume of local traffic No. of distress calls made Wind velocity History of

No. of vehicle ownership

Flow capacity of gutters

Twitter trends
Back-up power supplies

Access to mobile networks

Status of surrounding vegetation Sources **Average response time**

Location of fallen power Range of radio coverage Location of live stock No. of people trained in first aid

Elevation of affected area Soil moisture content **Temperature**

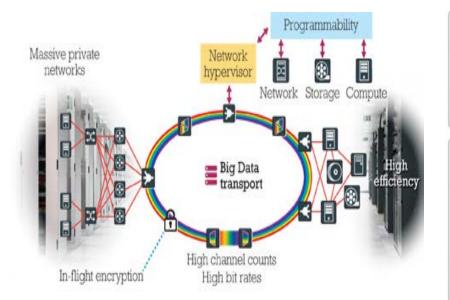
Insurance premiums of buildings

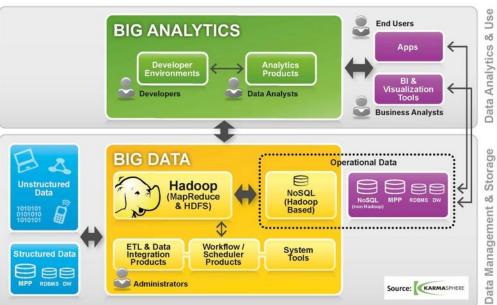
Location of deployed units Updates on social media Porosity of road:

















Outcomes

- Value of Big Data: The project has investigated how the shift from 'small data' to 'Big Data' stands to present tangible value to transport system management, in particular in congestion management and emergency responses. The findings have identified specific value that can be created from the analytics and visualisation of an increasing number of urban data sets.
- Emerging Platforms: The project investigated the emerging digital platforms for Big Data analysis and analytics and has provided guidance on their application.
- Recommendations: Based on the findings above the research team has developed a set of key recommendations to inform the further harnessing of Big Data to deliver real value.

