Understanding the causes of congestion

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Data analytics

It costs less than 0.002 cents to store a megabyte of data.

In 2014 81% of Australians owned a smartphone.

60 Gigabytes of data generated per hour by Google’s self driving car.

“Analysis and presentation need to be considered hand-in-hand, since the purpose of any analysis is to support a decision – whether in real-time operations or in a policymaking context.”

USDoT Chief Data Officer
Today’s focus

Cost of excessive congestion

Understanding the causes of congestion

Decision-making in the department
Cost of excessive congestion
Congestion Management Approach (CMA) Policy Framework

- **Measure**
  - Excessive congestion
  - Multimodal
  - Trip time reliability

- **Inform**
  - Customer first
  - Stakeholder partnerships

- **Consult**
  - Engage

- **Respond**
  - Shape demand
  - Leverage technologies
  - Responsive investment
  - Restructure public transport

Transport Policy Branch 2013
Cost of excessive congestion

ARRB/Austroads excessive congested speed:
- Motorways <70% of posted speed
- Arterials <55% of posted speed.

Why
Investment and benchmarking – limited to before/after

What
Cost of time, emissions and fuel above nominal cost of travel

Where
STREAMS network, route or link

When
Daily cost with a breakdown for peak periods

How
User-defined day and network element
Daily cost of congestion for Brisbane state-controlled roads

Network & Performance Team, Engineering and Technology (E&T) Road Operations Feb 2016
Free roads are not free

Cost of Congestion per Congested VKT: Brisbane Metro TMR

Ave Weekday
Congestion costs from incidents on the Bruce Highway

Incident congestion cost = $580,000
Brisbane state-controlled roads included in costing
Data limitations

- Missing data
- Stationary vehicles
- Truck cost excludes value of goods
- Other modes
- Congestion inside 15 min periods
Understanding the causes of congestion
Separating the causes of excessive congestion

- Normal
  - Infrastructure bottlenecks
- Abnormal
  - Incidents
  - Weather
  - Roadworks
  - Special events
Congestion – normal recurring

Weekday freeway speeds, 5:30pm

Excessive congestion < 70% of posted speed

Posted speed 100 km/h
Weekday freeway speeds, 5:30pm

Average speed
53 km/h  Normal range
Congestion – normal recurring

Weekday freeway speeds, 5:30pm

Normal recurring 44%
Congestion – incident example

Weekday freeway speeds, 5:30pm

Speed, km/h
Weekday freeway speeds, 5:30pm

- Abnormal recurring: 34%
- Incidents: 9%
Decision-making in Transport and Main Roads
Causes of congestion, Brisbane 2014

- Abnormal recurring: $86,874,208
- Normal recurring: $112,302,783
- Incidents: $22,533,228
- Unknown: $24,204,211
- Roadworks: $535,967
- Other: $302,107
- Special: $7,368
- Weather: $7,189,360

TOTAL: $209,641,387
Causes of congestion, Brisbane 2014

Incidents
$22,533,228
Causes of congestion, Brisbane 2014

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NetBI tool
NetBI tool
Thank you