

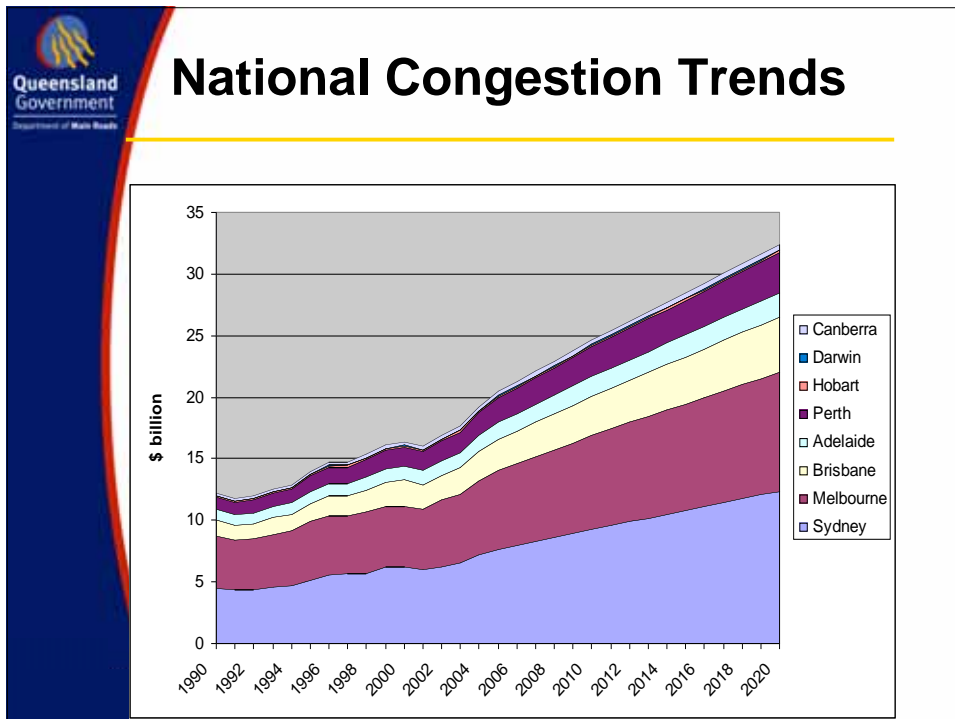
Traffic specific ITS priorities for Australia- a road agency perspective

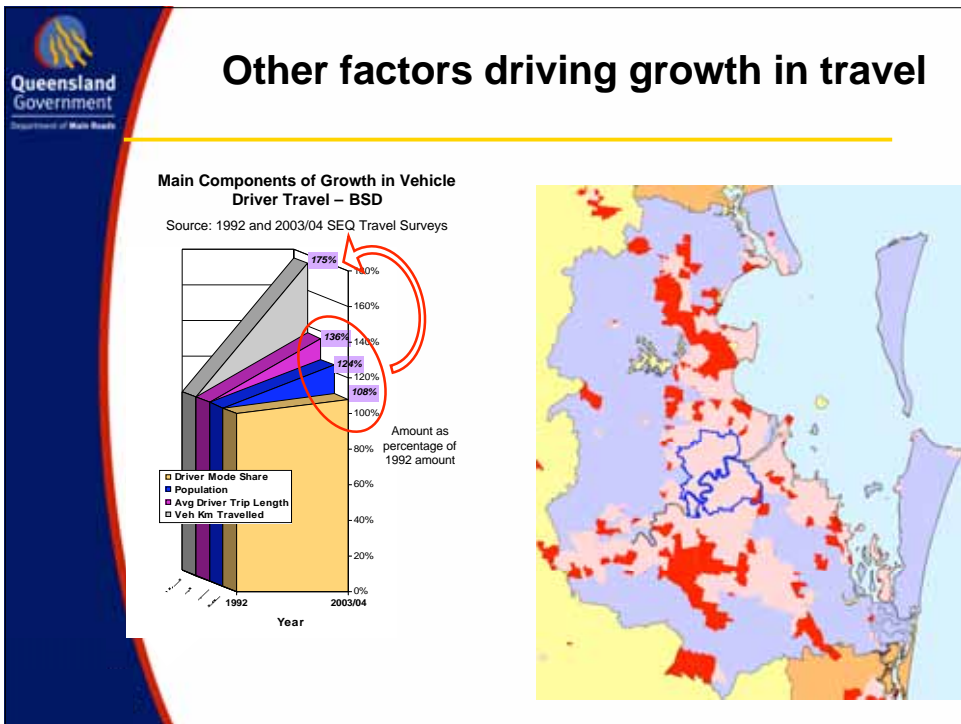
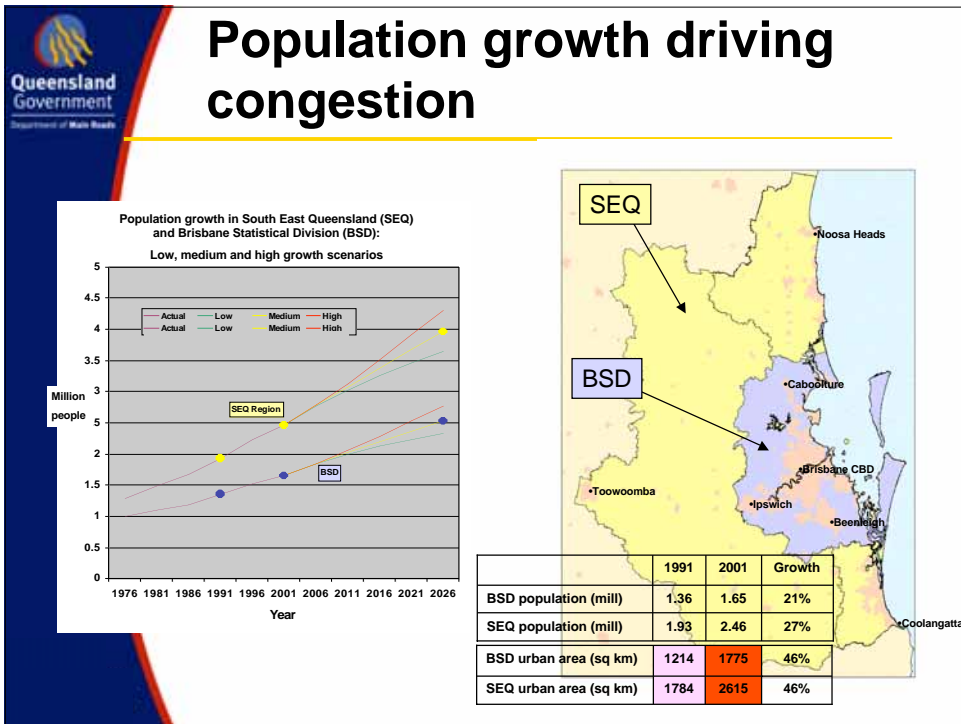
Dennis Walsh
Director (Network Operations & Modelling)

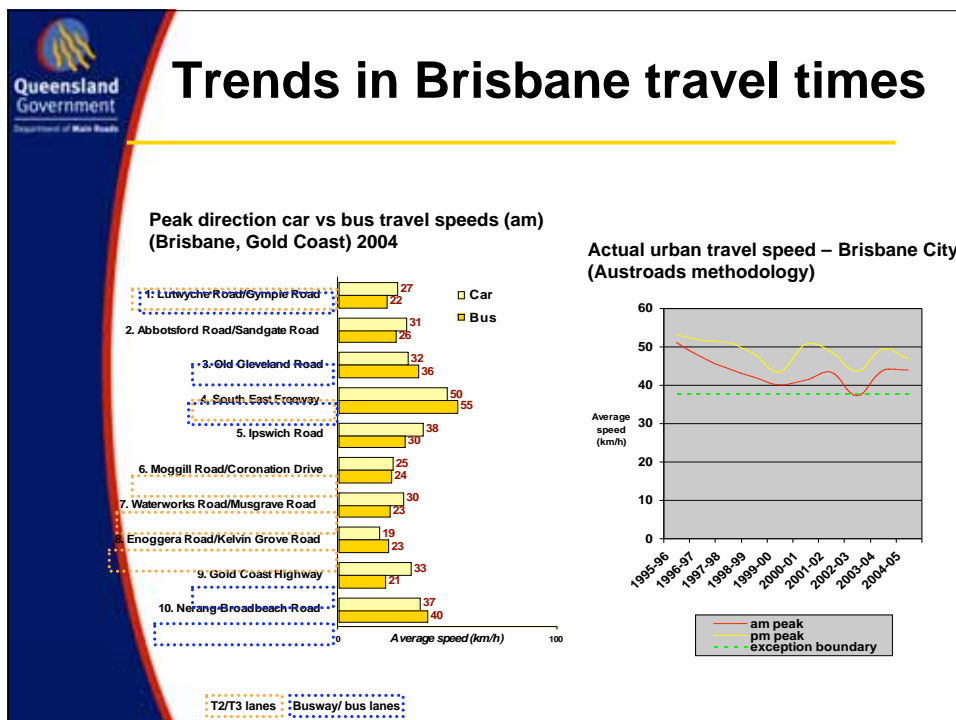
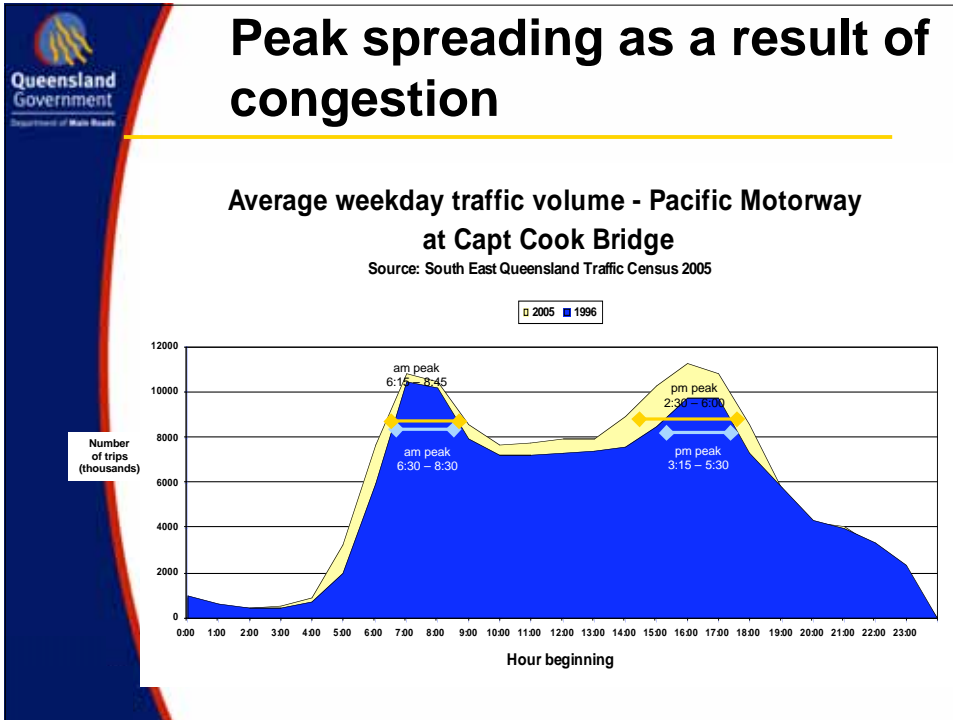
Agenda

- Congestion Trends
- Laissez Faire Motorway Operations
- Austroads Network Operations Framework and ITS
- Safety Challenges and ITS
- The role of traveller information in system optimisation

Congestion Trends







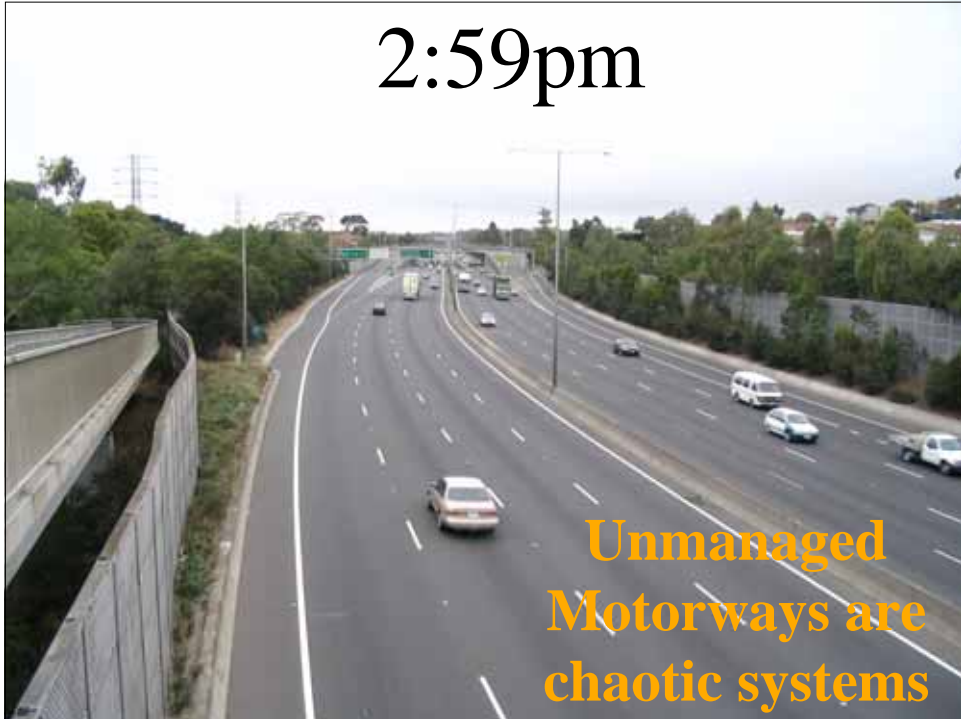
Urban congestion

Imposes:

- Delays (time costs)
- Extra vehicle operating costs (eg extra fuel use)
- Extra air pollution (health costs)

Laissez Faire Motorway Operations

2:59pm



3:00pm




3:01pm




3:02pm

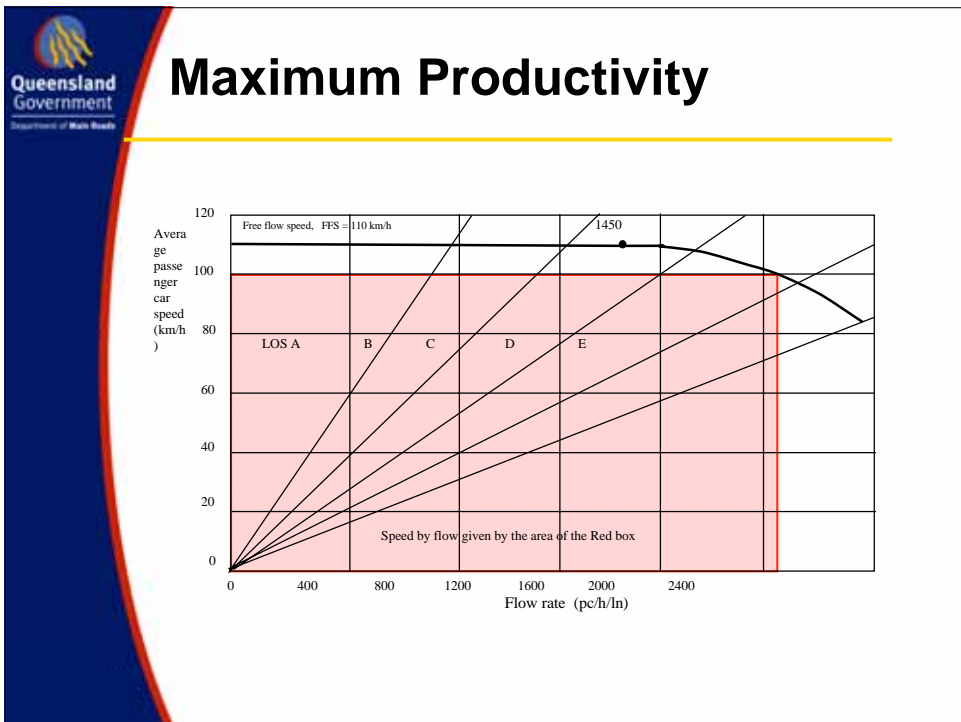




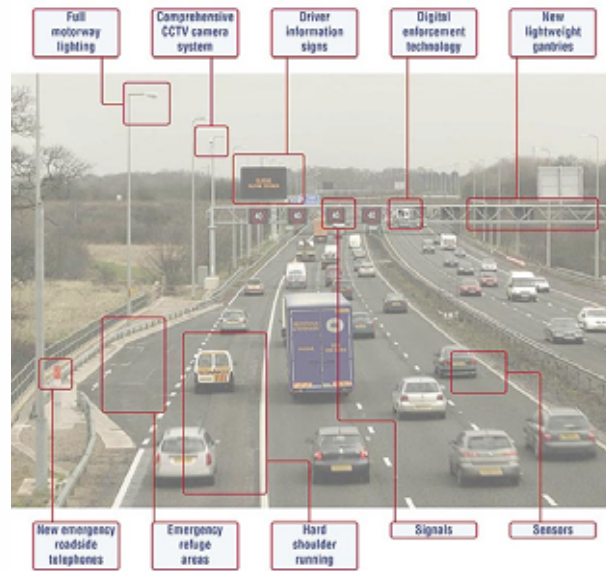

Lost Productivity



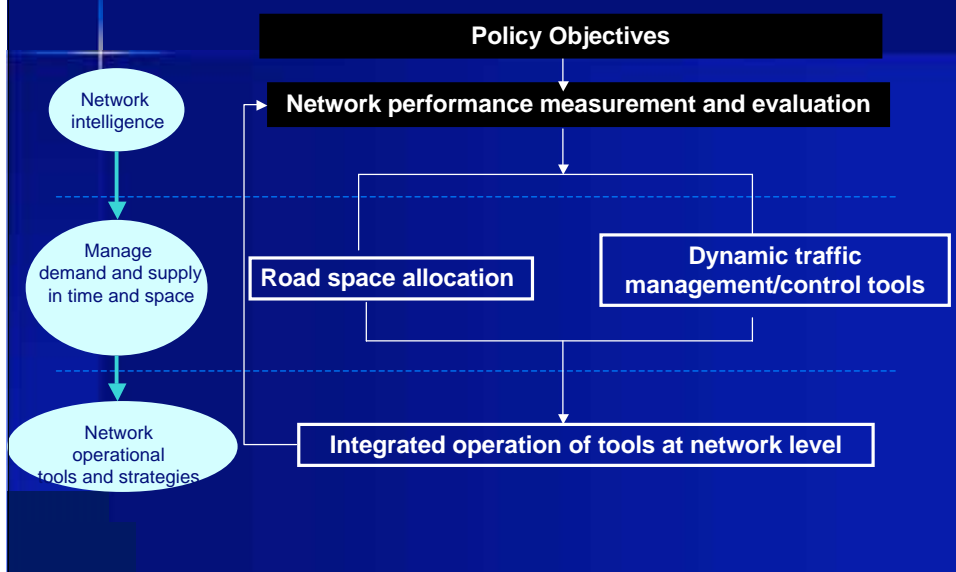
Lost Productivity >25%
almost every day



Overseas practice with Motorway Control



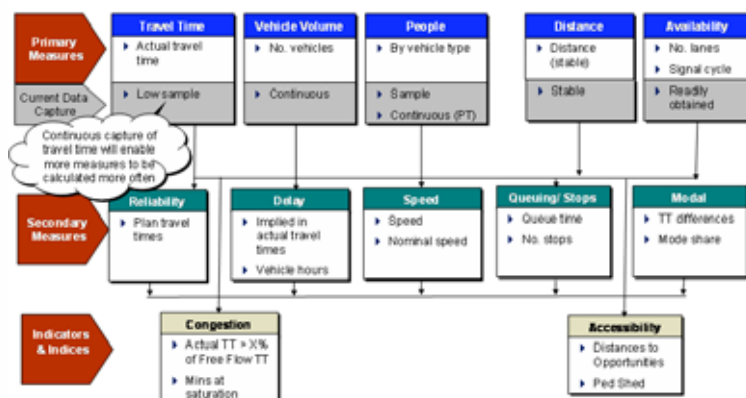
Congestion – Austroads network operations framework and ITS



Policy Objectives

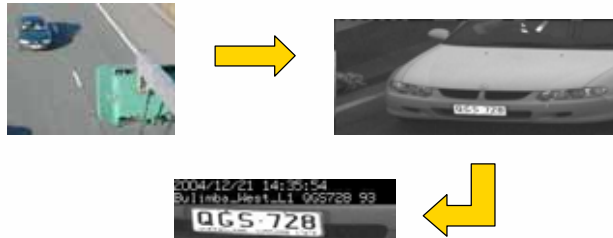
- Safety
- Efficiency - people throughput
- Reliability
- Productivity – throughput per unit of time

Network Performance Measures link to policy objectives (Austroads)

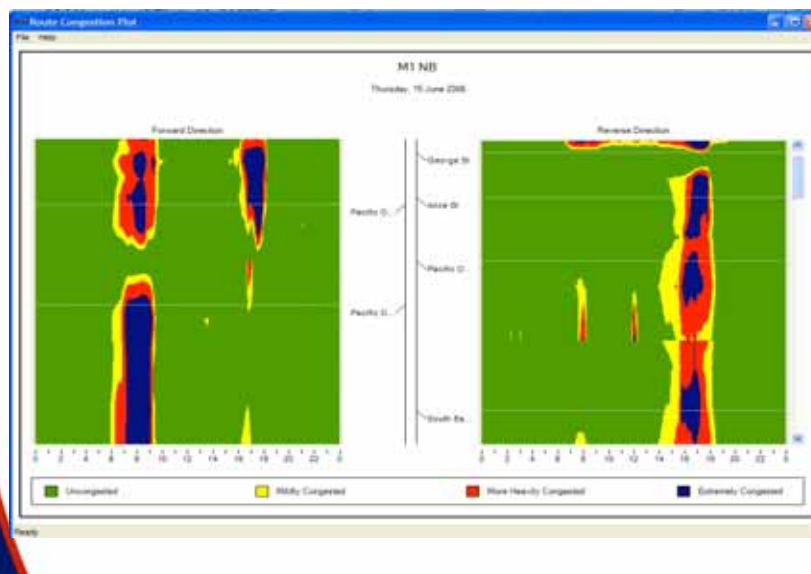


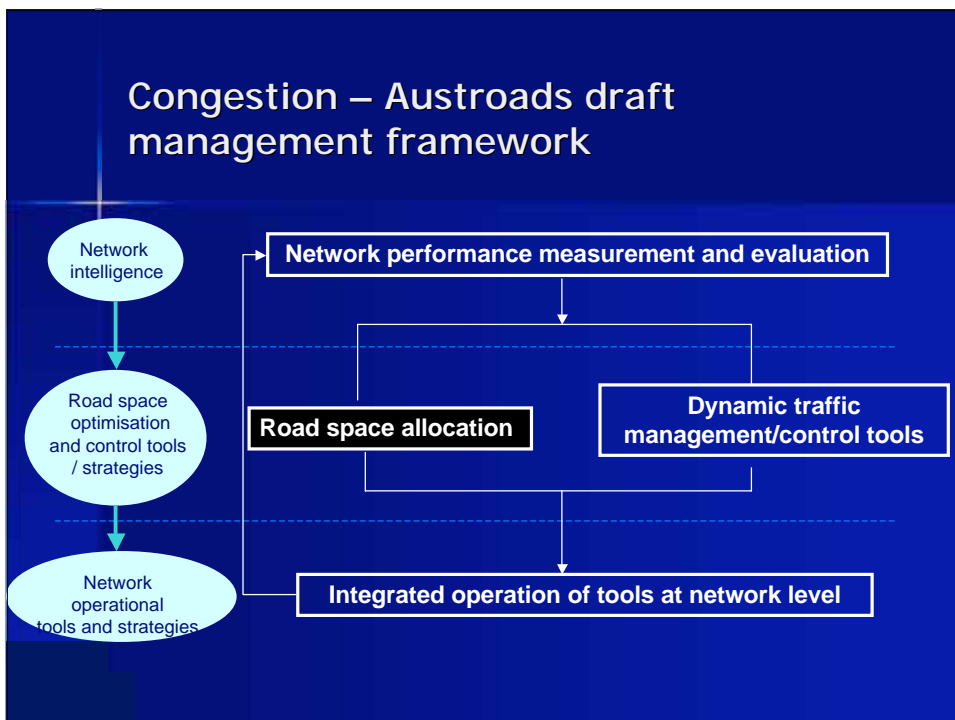
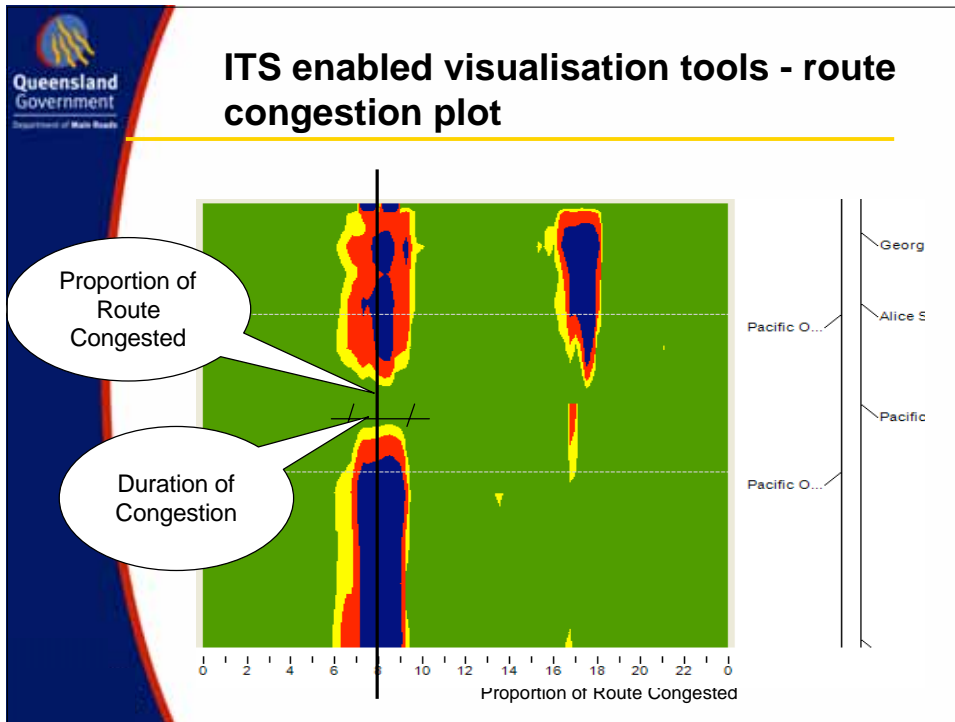
ITS aiding Network performance measurement

- Traditional technologies – loops
- Visualisation tools
(ARTIS, TRIPS, FAT, ARRB TTM, SCATS, STREAMS, Serco)
- New technologies
(the tracking of mobile phones (ITIS), ANPR matching, DSRC tags, cameras and GPS systems)



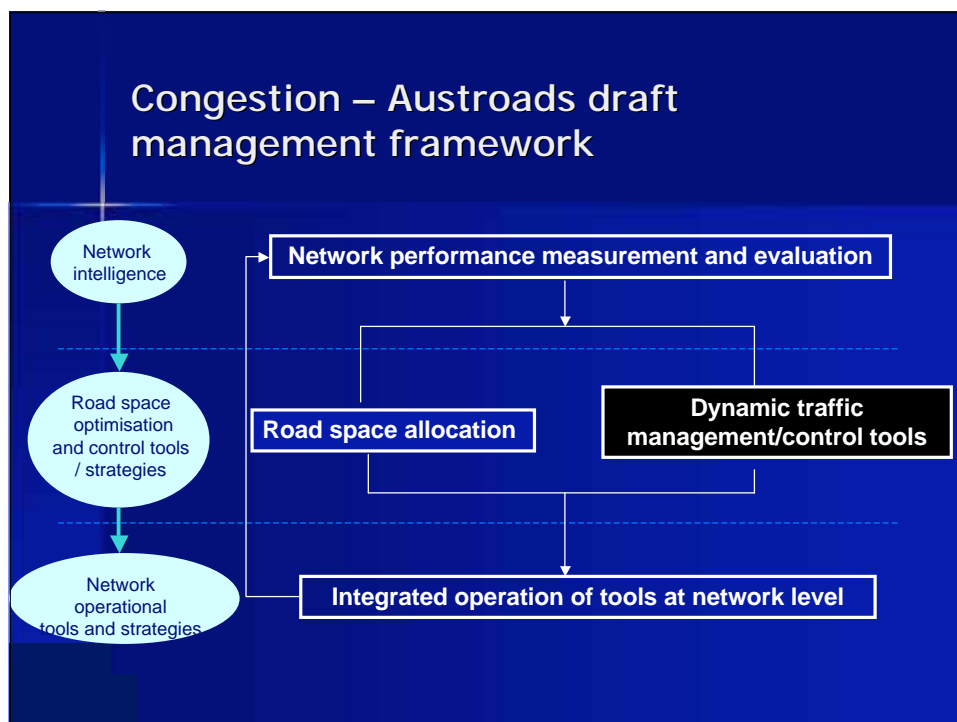
ITS enabled visualisation tools – congestion plot






Optimisation of road space

- Various lane access control and allocation strategies (clearways, hard shoulder running, parking, HOV lanes, reversible lanes, narrow lanes – fixed or dynamic and merging treatments)
- Innovative intersection designs
- Freight/Public Transport ramp meter bypasses
- Sydney G-turns
- Queue jumps for bus priority



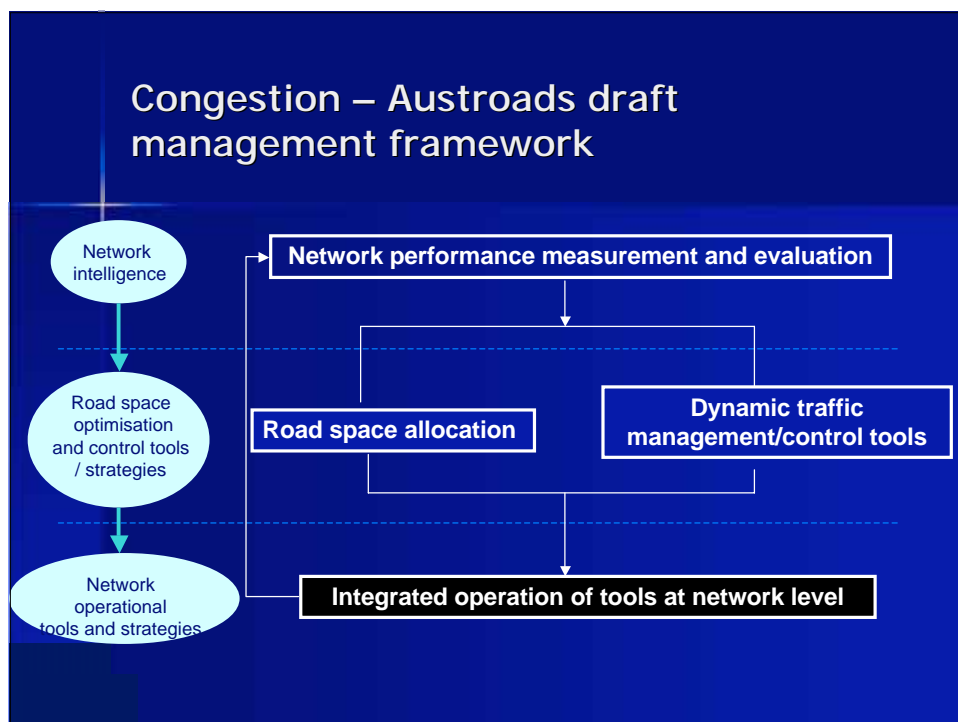
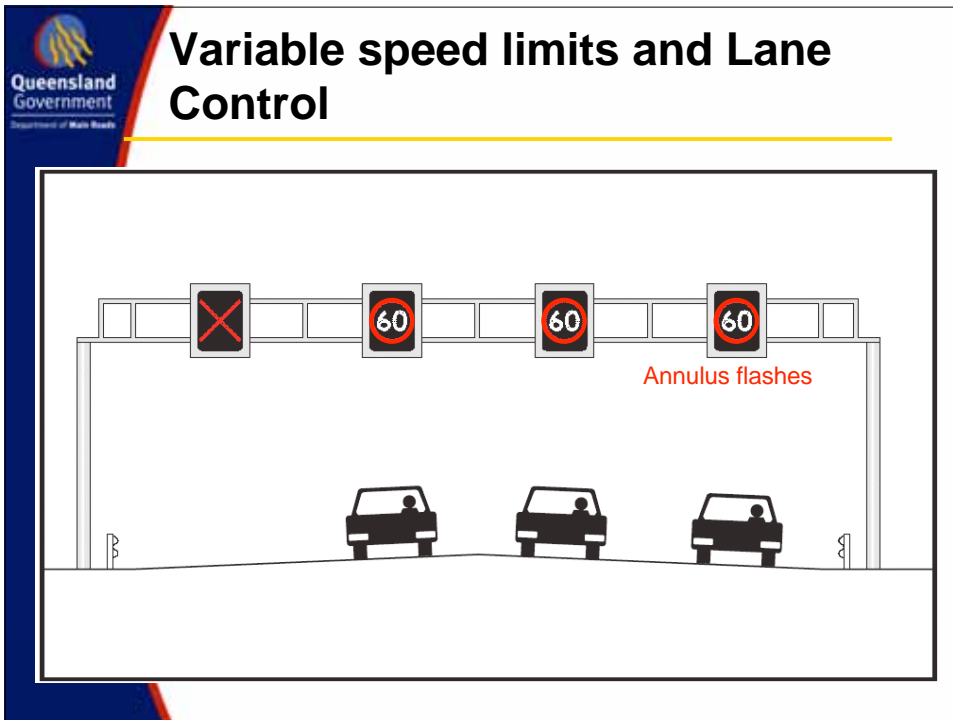
Dynamic traffic management/control systems (ITS)

- Automatic incident detection technologies
- Adaptive traffic signals
- Ramp metering
- Variable speed limits
- Dynamic Lane Control
- Variable message signs

Ramp metering in Victoria

- Demand management
- Separates platooned vehicles to aid merging
- Decreases the impact of entrance ramps on the mainline





Integrated operation of dynamic traffic control tools at a network level

- We need to move to a single network view of motorways and arterials
- Intelligent Transport Systems need to support an integrated suite of policy responses
- For example, ITS applications for passenger information, traffic signal control, ramp metering and lane control need to enable integrated service provision to public transport users
- We need to integrate enforcement technologies with traffic based ITS

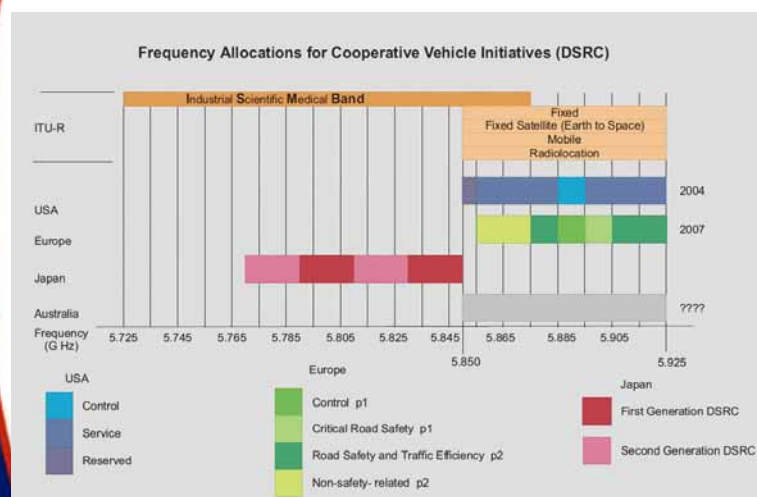
Safety Challenges and ITS

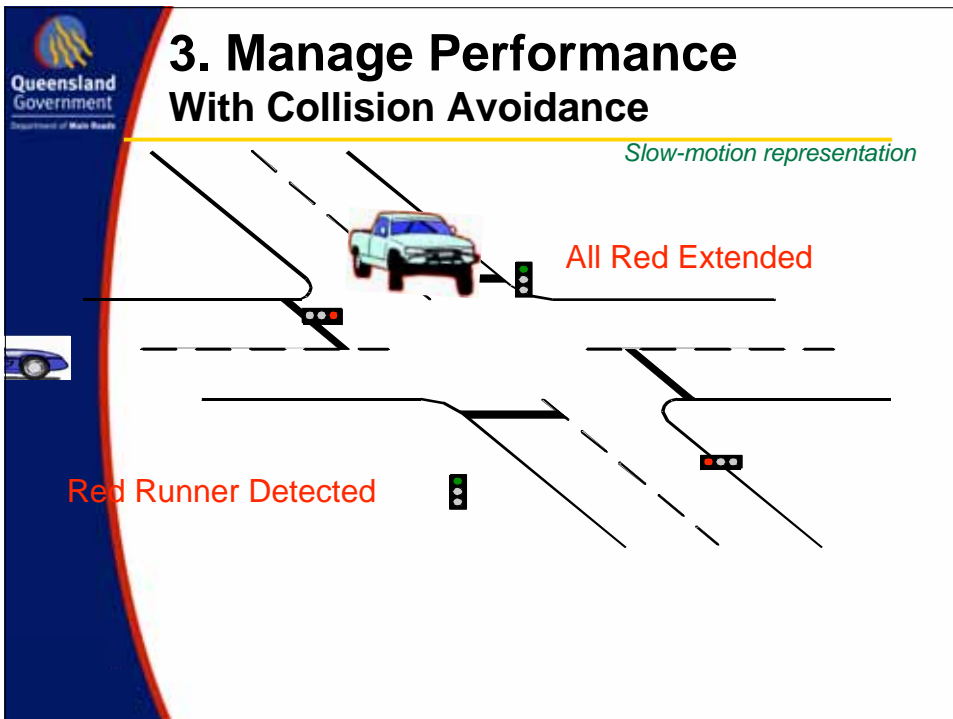
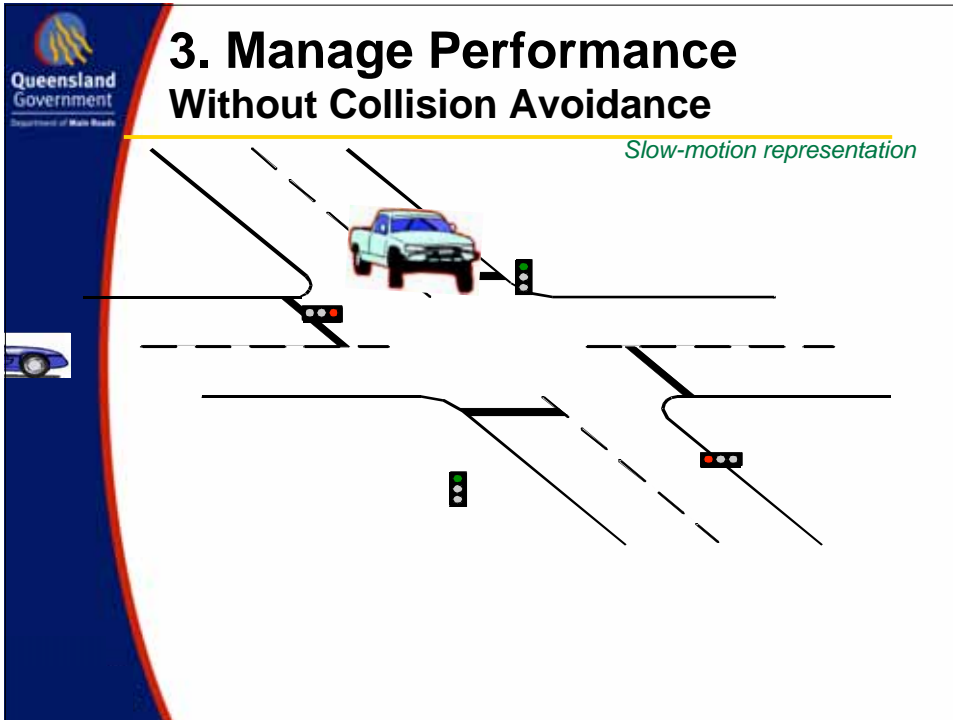
Dedicated Short Range Communication

Intelligent Car Initiative

- **Co-Operative car to car and car to infrastructure systems**
 - **Network Management**
 - Adaptive routing and lane use
 - Emergency operations
 - **Safety**
 - Intersection Collision Avoidance
 - Co-operative Collision Warning
 - Co-operative safe speed


Dedicated Short Range Communication





The role of traveller information in system optimisation

“Chaos theory – large complex systems are self optimising with the right inputs”



Network Performance

Users were surveyed to broadly determine their information requirements

Key Questions	Commuter Focus Groups
<ul style="list-style-type: none"> What are the most important attributes to users' when assessing the performance of the road network? How would you like performance information expressed? What and how should timely information about changes in road conditions be conveyed? 	<ul style="list-style-type: none"> Identify key issues, understanding and potential approaches to information delivery Clarify terminology for survey Two hour round table discussion with 8 participants <ul style="list-style-type: none"> – One held in Melbourne and Sydney
PT: Existing Surveys	Commuter and Freight Telephone Survey
<ul style="list-style-type: none"> Existing surveys sourced from various public transport agencies <ul style="list-style-type: none"> – NSW, Vic, Qld, SA, WA, ACT Previous work undertaken by Booz Allen were also sourced 	<ul style="list-style-type: none"> Commuter (road users): 400 respondents each from Brisbane, Melbourne and Sydney Freight: : Total of 300 respondents from Brisbane, Melbourne and Sydney

Queensland Government
Department of Main Roads

Network Performance

Travel time and reliability was rated as the most important attributes across all user groups

Ranking of Attributes by User Group

Attribute	Commuter	Freight	Public Transport
Travel time	1	1	2
Reliability	1	1	1
Ability to Maintain Schedules	-	2	-
Speed	2	3	-
Accessibility	3	-	3
B Double Network Coverage	-	4	-
Traffic Signal Delays	4	5	-
Unexpected or Temporary Delays	5	6	-

Source: World Transport User Ratings and Attitudes Survey
(1) Existing surveys sourced from various public transport agencies across Australia
(2) Previous work undertaken by Booz Allen

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Department of Main Roads

Network Performance

Users prefer to receive timely information on either a continuous basis or as problems occur

Preferred Frequency of Receiving Timely Info (One Response)

- Slightly more freight users wanted information on a continuous basis as there are on the road for longer time periods
- Many commuters wanted information only when there are problems and during peak hours
- There very few respondents who did not want any information at all

Frequency	Commuter	Freight
Continuous	32.2%	39.3%
Only when there is a	34.3%	28.9%
Peak hours only	15.8%	16.9%
Regular time intervals	7.3%	3.6%
Traffic related (on demand)	0.4%	0.3%
Don't Know	9.2%	6.2%
Other	0.6%	4.2%
None	0.2%	0.6%

Network Performance

Users prefer to receive timely information en-route by roadside signs or radio

- Users preferred to receive timely information through media that is accessible whilst en-route, such as electronic roadside signs and radio
 - Timely information specific to the location of the user was regarded as the most useful (eg electronic road signs and radio)
- Media amenable to providing information to plan trips were viewed as being useful by one in four commuters and one in three freight users
 - Such media includes internet sites, TV channels and email

Useful Media
(Multiple Stated Intention Responses)

Frequency	Commuter	Freight
Electronic roadside signs	71.1%	72.6%
Radio	66.1%	70.8%
Traffic internet site	26.0%	34.5%
Permanent TV channel	25.8%	23.5%
SMS to mobile phone	19.6%	24.9%
Email to work or home	12.5%	28.1%
Two way radio	0%	25.3%

Traveller information Standardisation of data

- Main Roads is working with Transmax on the development and distribution of STREAMS and other traffic data via the internet.
- Through agreement with Main Roads, third parties will be able to access this data as one source in providing 'Real Time Public Traffic Information Services'.
- Intelematics is the first company to request access.

Conclusions

- We need to actively control our Motorways
- ITS offers tools to apply in our congestion management framework
- We need to develop a network wide approach to operations
- We can leverage ITS safety and traffic applications off each other
- Providing the right information into the system can assist in optimisation