International Transport Forum

OECD

Australian Government

Department of Infrastructure and Transport

Bureau of Infrastructure, Transport and Regional Economics

A policymaker's guide to transport reliability

Results from International Transport Forum study

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with assistance from Jari Kauppila, ITF

Presentation outline

- The International Transport Forum
- Reliability trends
- Measuring reliability
- How much reliability
- Reliability policy instruments
- Policy conclusions

The International Transport Forum

Reliability study by the Forum, Australia and...		
Austria	**Canada**	**Denmark**
Finland	**France**	**Greece**
Japan	**The Netherlands**	**Spain**
The Ukraine	**United Kingdom**	**USA**

The International Transport Forum

- ✓ an inter-governmental body within OECD family.
- ✓ a global platform for transport policy makers and stakeholders

The Forum

- ✓ organises a Conference for Ministers and leading figures from civil society each May in Leipzig, Germany
- ✓ Australia and the UK co-hosted the 2009 Forum in Leipzig

Australia

- ✓ an active participant in Forum events... and in the International Transport Forum-led programme of international research such as the transport reliability study

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Reliability trends

“The central question of this report is whether appropriate levels of reliability are sought and supplied”

Demand for reliability has increased

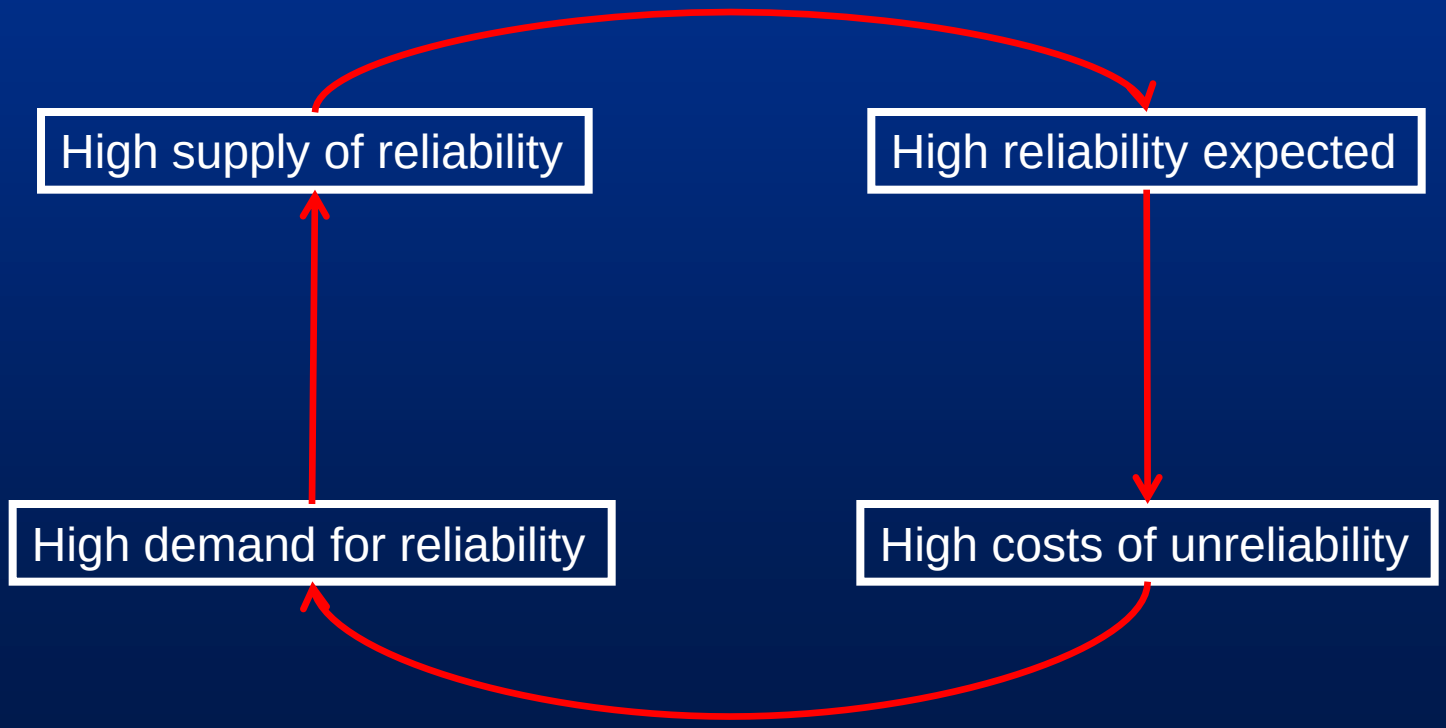
- The decline in transport costs (following improvements in transport infrastructure, vehicles and equipment) has facilitated and complemented product specialisation (with outsourcing, regional warehouses and just-in-time systems)
- This capitalising on specialisation is predicated on affordable and reliable transport costs...

... but this has also created a dependence.

Increasingly complex scheduling, made possible through improved reliability, creates an ongoing need for reliability...

... but “reliable fast” not “reliable slow”!

Circularity of the demand for reliability



Reliability trends

What Counts

- Reliability will get more important
- But one size doesn’t fit all
- Heterogeneity “granularity” is critical

Policy Response

- Robust assessment is possible
- Use cost–benefit analysis to decide
- to build, manage, price, or inform

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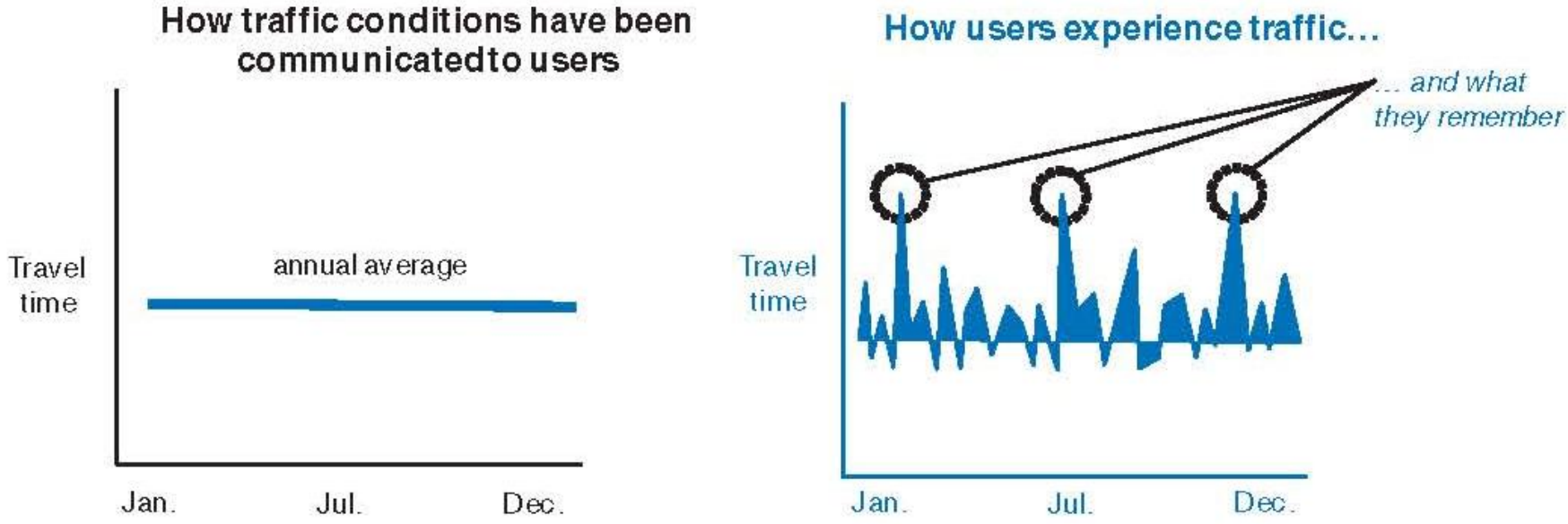
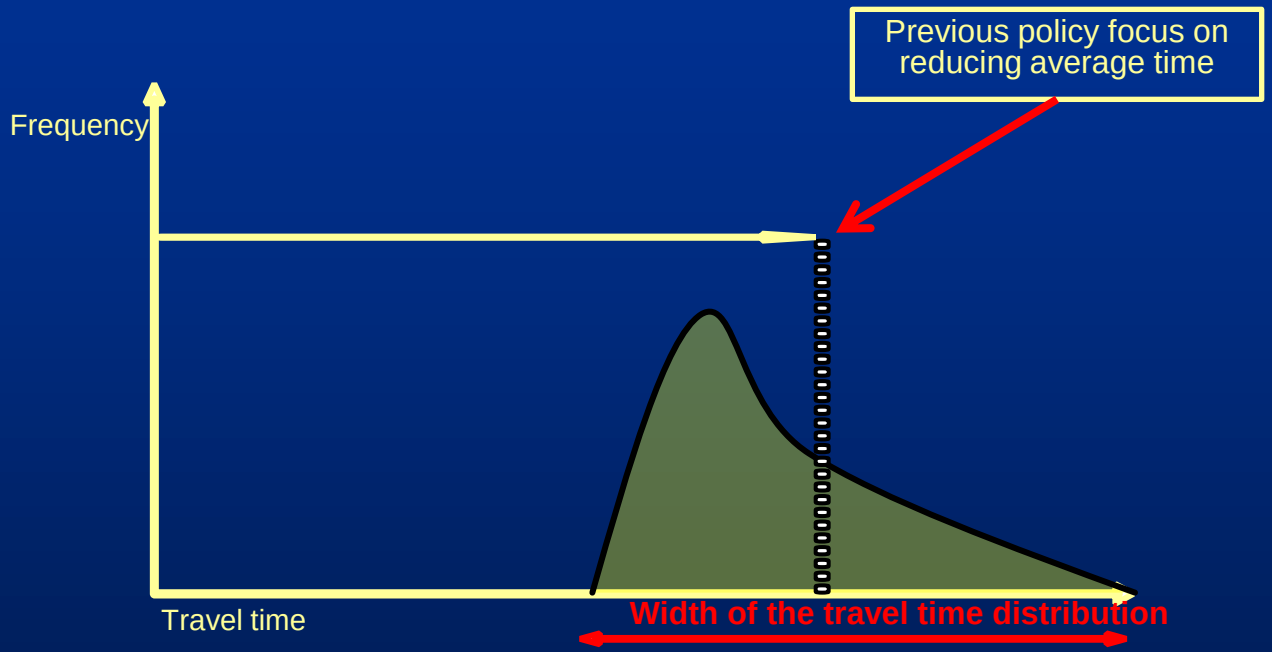
Measuring reliability

Policymakers think about traffic conditions in terms of averages—but this is not how users remember it!

Figure ES1. **Travellers' perception of traffic conditions**



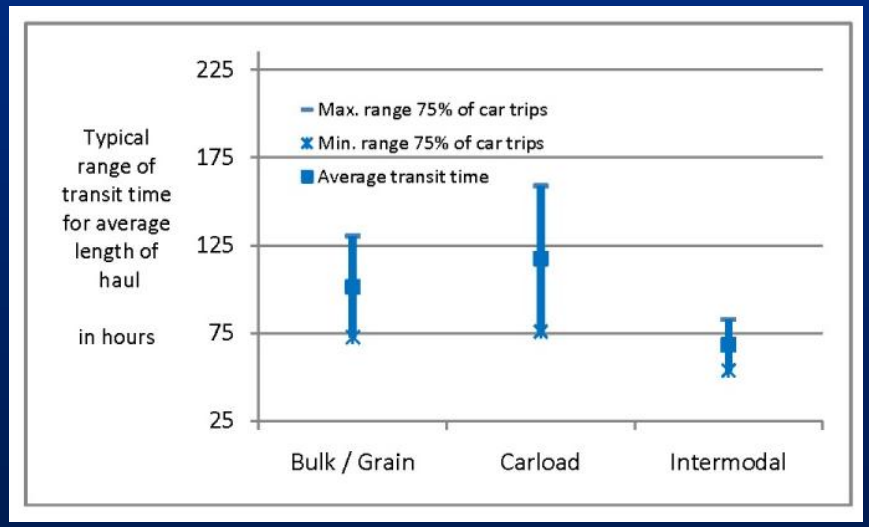
Measuring reliability



Distribution (not average) of transit times is the key—and provides a far better policy focus

Measuring reliability

It is important to monitor reliability (for providers and users)



Canadian Rail Freight Service Review (2010)

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Why is working out "optimal" reliability a problem?

Market mechanisms with standard products/services…

- consumers want different product quality
- reflecting that, suppliers offer quality differentiation
- …and this may lead to…
- price differentiation

Applying this to "reliability"…

- demand for reliability is "granular" so product differentiation could be efficient
- users would trade-off between reliability and price

BUT

- can we product differentiate in rail network reliability? ✓ (sort of!)
  and in road reliability? *Maybe!* *We cannot sell paths/slots in road as easily as we can in rail but opportunities exist for some product/price differentiation eg toll roads and high-occupancy (HOT) lanes*

Why is working out "optimal" reliability a problem?

Market may provide options with different levels of reliability—at a price

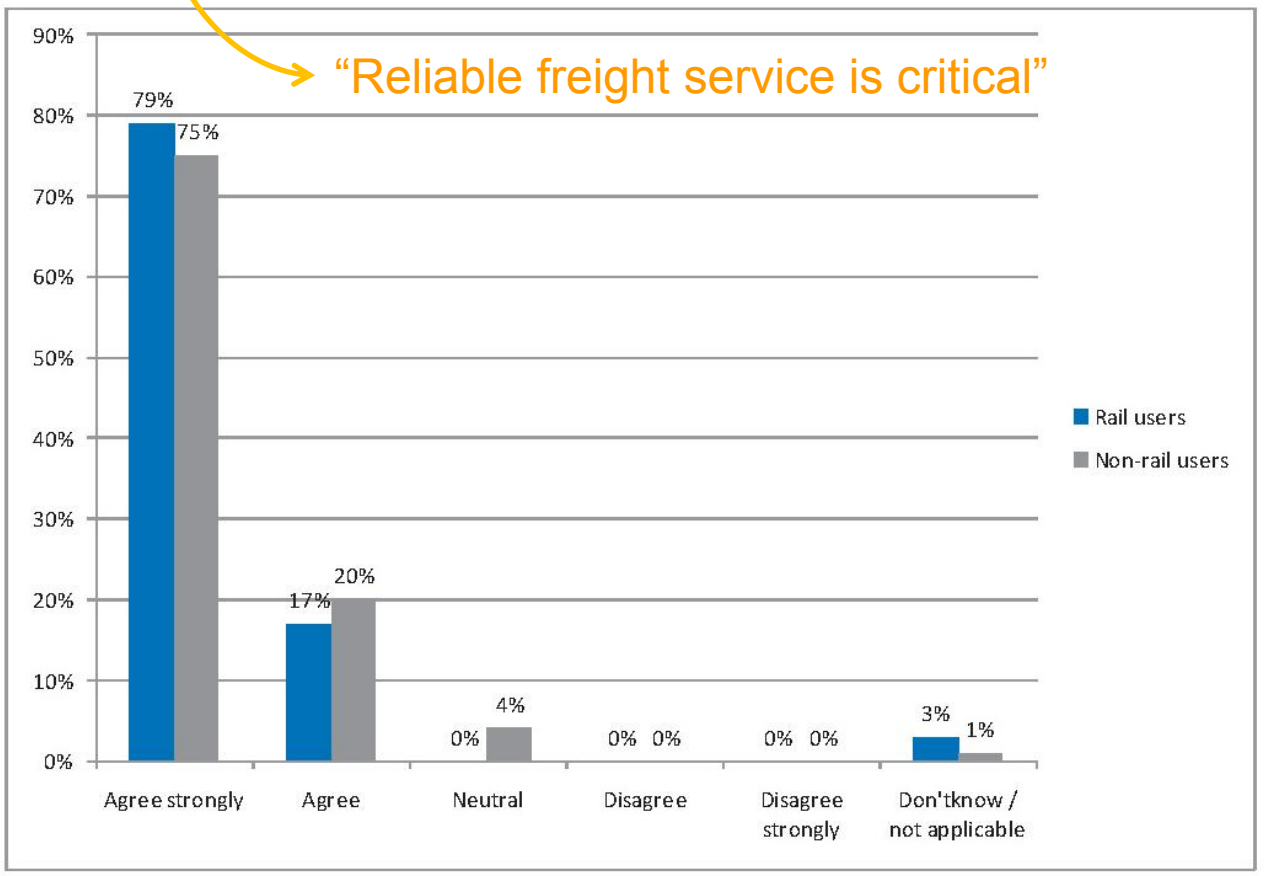
The "Express Lane" fruit and vegetables train has a 15% premium for guaranteed delivery within a given (short) time window

Why is working out “optimal” reliability a problem?

...but policy is challenged when product (reliability) differentiation is not technically or economically feasible

Why is working out "optimal" reliability a problem?

Asking users whether reliability matters does not really help in working out how much reliability to supply! Users will prefer high levels of reliability particularly if they do not have to incur the cost



Source: City of Chicago Department of Transportation (2003).

Why is working out “optimal” reliability a problem?

So... what is the ‘right’ level of reliability?

Determining this can be difficult because

- if costless to users, then a high level will be demanded by all
- if provided at a higher cost than is valued by users, then community welfare declines.

The policy challenge is to identify those options that can increase reliability *at a cost that users are willing to pay.*

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Reliability policy instruments

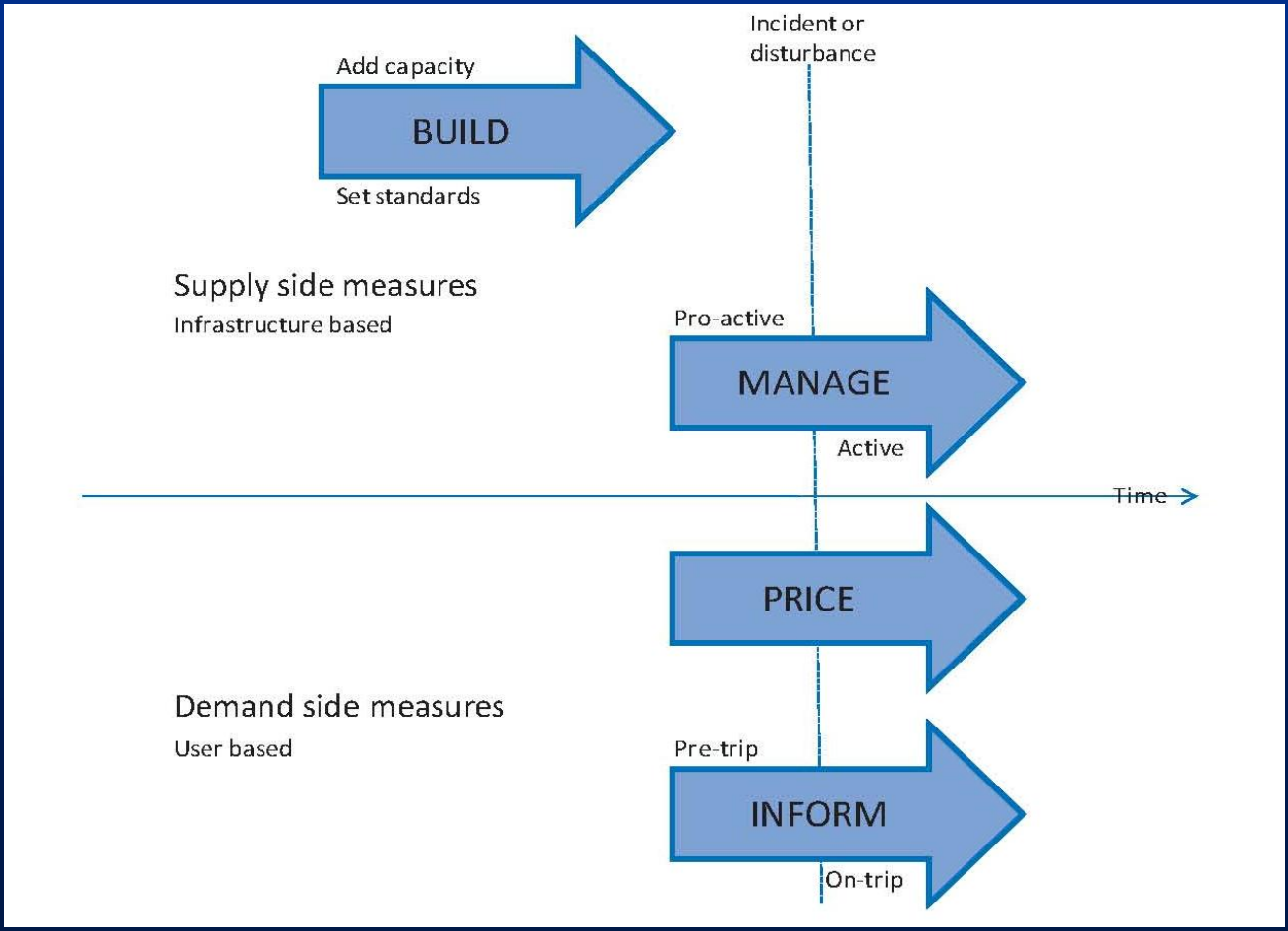
In principle, network users can adapt and influence reliability

- users can adapt their behaviour to achieve higher levels of reliability
- shippers control some aspects of reliability

... which reinforces the importance of cost–benefit analysis

Reliability policy instruments

Four government policy instruments influence reliability... ALL the policies should be considered—and be subject to cost–benefit analysis



1. Build

The level and quality of infrastructure are reliability parameters
... and allowing for reliability can alter what and how we build

Table 4.1. **Economic evaluation of long life pavements: one km of 3-lane motorway surfacing (present value $000s)**

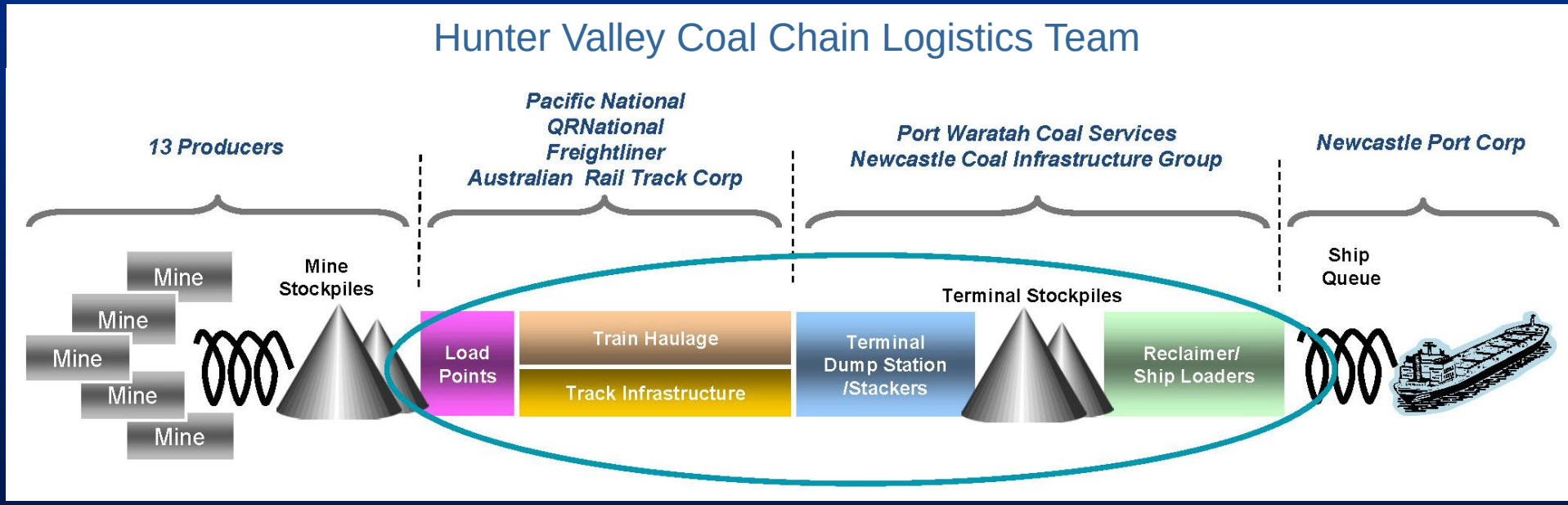
Contributing factors	Traditional surface	Advanced (low maintenance) surface
Initial works costs	480	1440
Maintenance works	1080	280
User costs (delays)	1280	520
Traffic management costs	260	170
Residual value	-40	-90
Net Present Value	3060	2320
Difference in NPV of costs		-740

Indicative economic evaluation results. *Source*: OECD (2005).

Reliability policy instruments

2. Manage

...for example, through coordination of activities



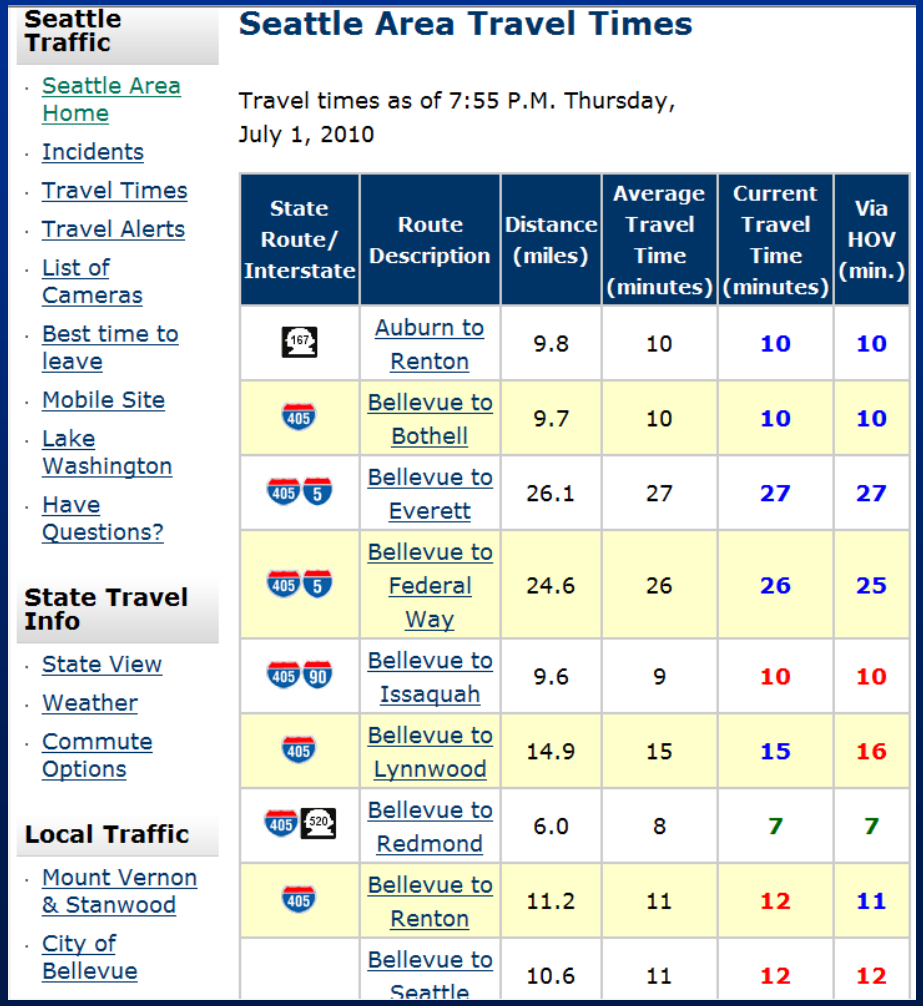
3. Price

Where it is practical to apply, prices can be crucial in delivering an efficient level and usage of reliability

- infrastructure managers inform users what it costs to deliver a given reliability
- users communicate how they value reliability and structure their network use accordingly

Reliability policy instruments

4. Inform



Seattle Traffic

- Seattle Area Home
- Incidents
- Travel Times
- Travel Alerts
- List of Cameras
- Best time to leave
- Mobile Site
- Lake Washington
- Have Questions?

State Travel Info

- State View
- Weather
- Commute Options

Local Traffic

- Mount Vernon & Stanwood
- City of Bellevue

Seattle Area Travel Times

Travel times as of 7:55 P.M. Thursday, July 1, 2010

State Route/ Interstate	Route Description	Distance (miles)	Average Travel Time (minutes)	Current Travel Time (minutes)	Via HOV (min.)
167	Auburn to Renton	9.8	10	10	10
405	Bellevue to Bothell	9.7	10	10	10
405 5	Bellevue to Everett	26.1	27	27	27
405 5	Bellevue to Federal Way	24.6	26	26	25
405 90	Bellevue to Issaquah	9.6	9	10	10
405	Bellevue to Lynnwood	14.9	15	15	16
405 520	Bellevue to Redmond	6.0	8	7	7
405	Bellevue to Renton	11.2	11	12	11
	Bellevue to Seattle	10.6	11	12	12

Reliability policy instruments

Reliability policy instruments are:

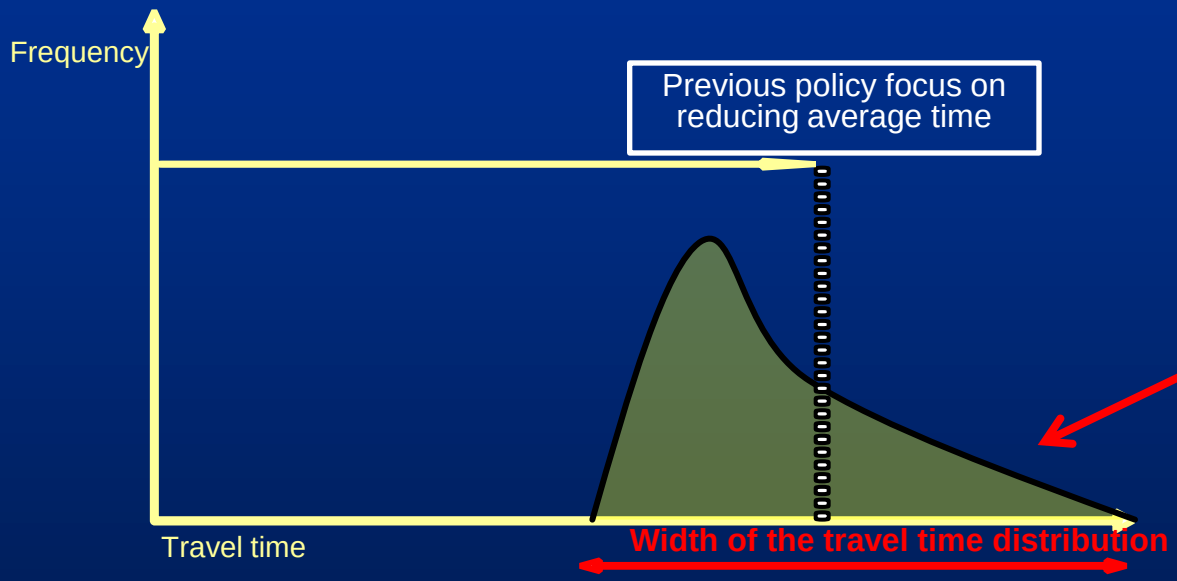
- Build
- Manage
- Price
- Inform

BUT

Reliability policy instruments

Optimising reliability requires use of Cost Benefit Analysis

Summary: impact of the policy instruments



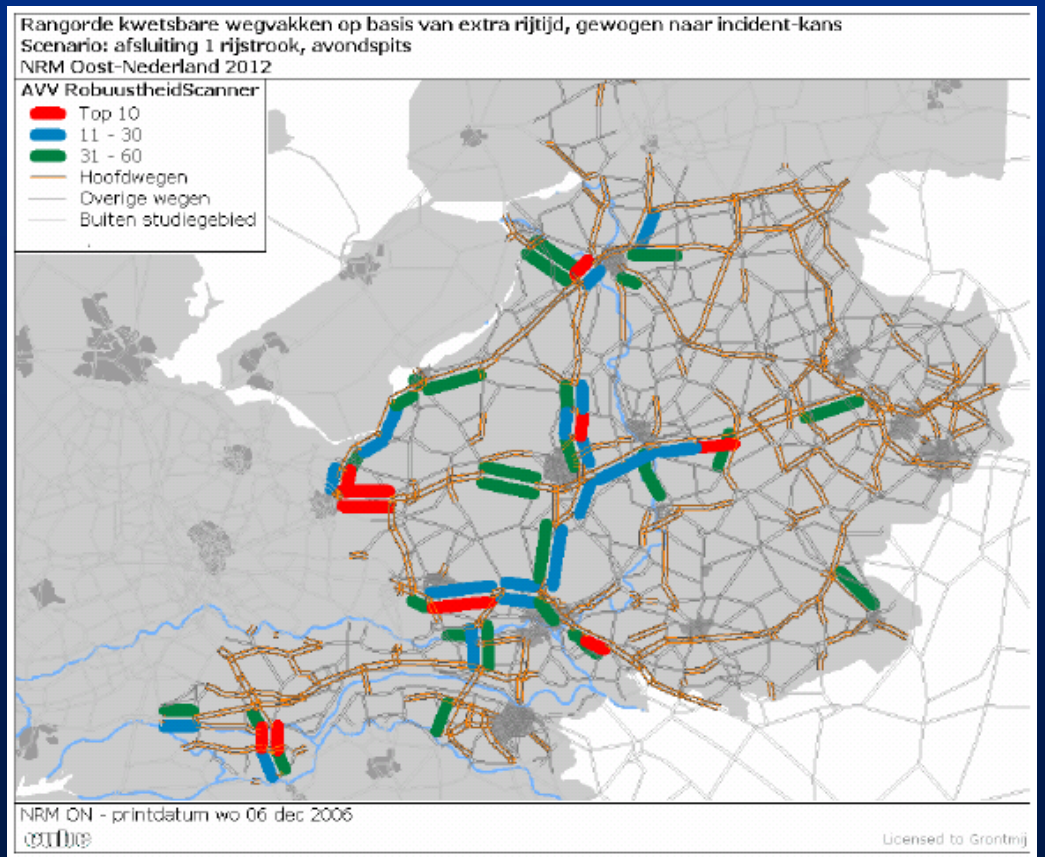
1. Future policy focus on reducing variability

2. Use price to provide choice, such as tolled roads

3 Use information to mitigate the effects of unreliability

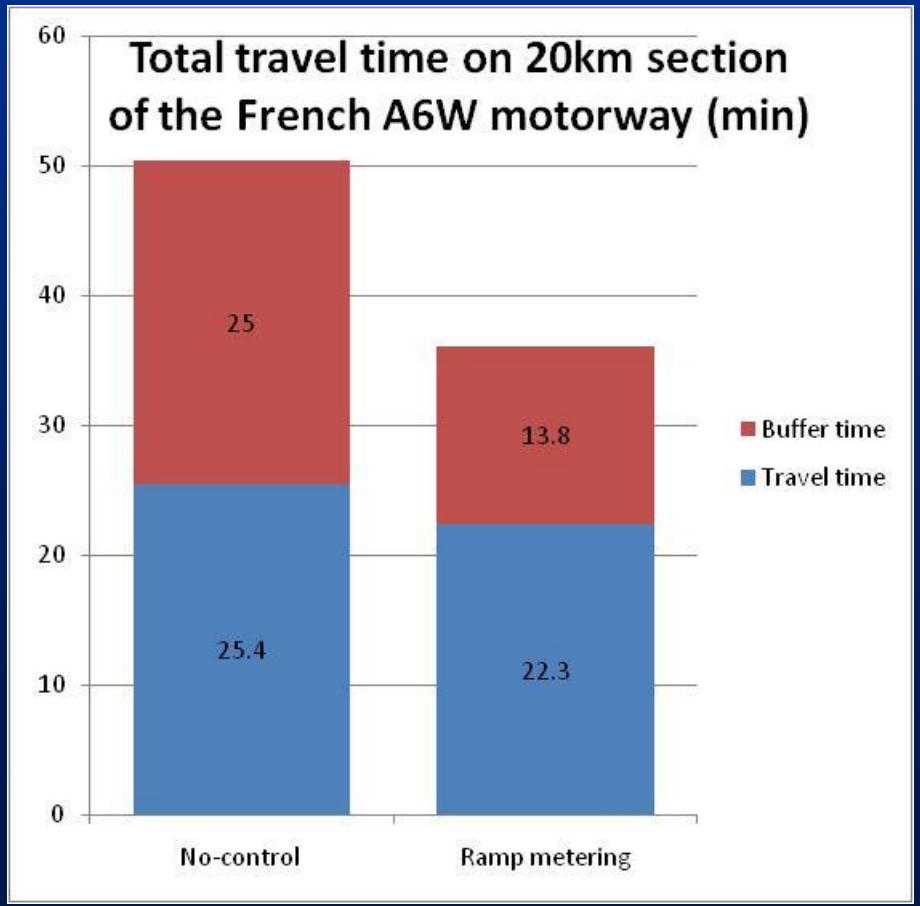
How governments are responding

Road network vulnerability planning



How governments are responding

Impact of ramp metering on travel time and buffer time



Source: Bhouri & Kauppila 2010

(Used in Australia too!)

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Policy conclusions

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- Infrastructure provision and management policy should shift from covert to overt strategies for managing reliability
- Reliability needs the policy prominence such as is traditionally given to congestion

- The key reliability policies are:
  - ✓ monitor reliability
  - ✓ recognise the policy instruments of build, manage, price and inform
  - ✓ assess those policy instruments by cost-benefit analysis

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Thank you