

# Infrastructure Management and Delivery Industry Forum

## Road Lighting and Traffic Management at Road Works

A presentation by Dennis Walsh  
Deputy Chief Engineer Road Operations  
15 November 2013

# Government Priorities

## Four Pillars of the Queensland Economy

Tourism	Construction
Mining	Agriculture



## The Queensland Plan

*A 30 year vision for Queensland*

## Queensland Public Service Values



Customers  
First



Ideas into  
Actions



Unleash  
Potential



Be  
Courageous



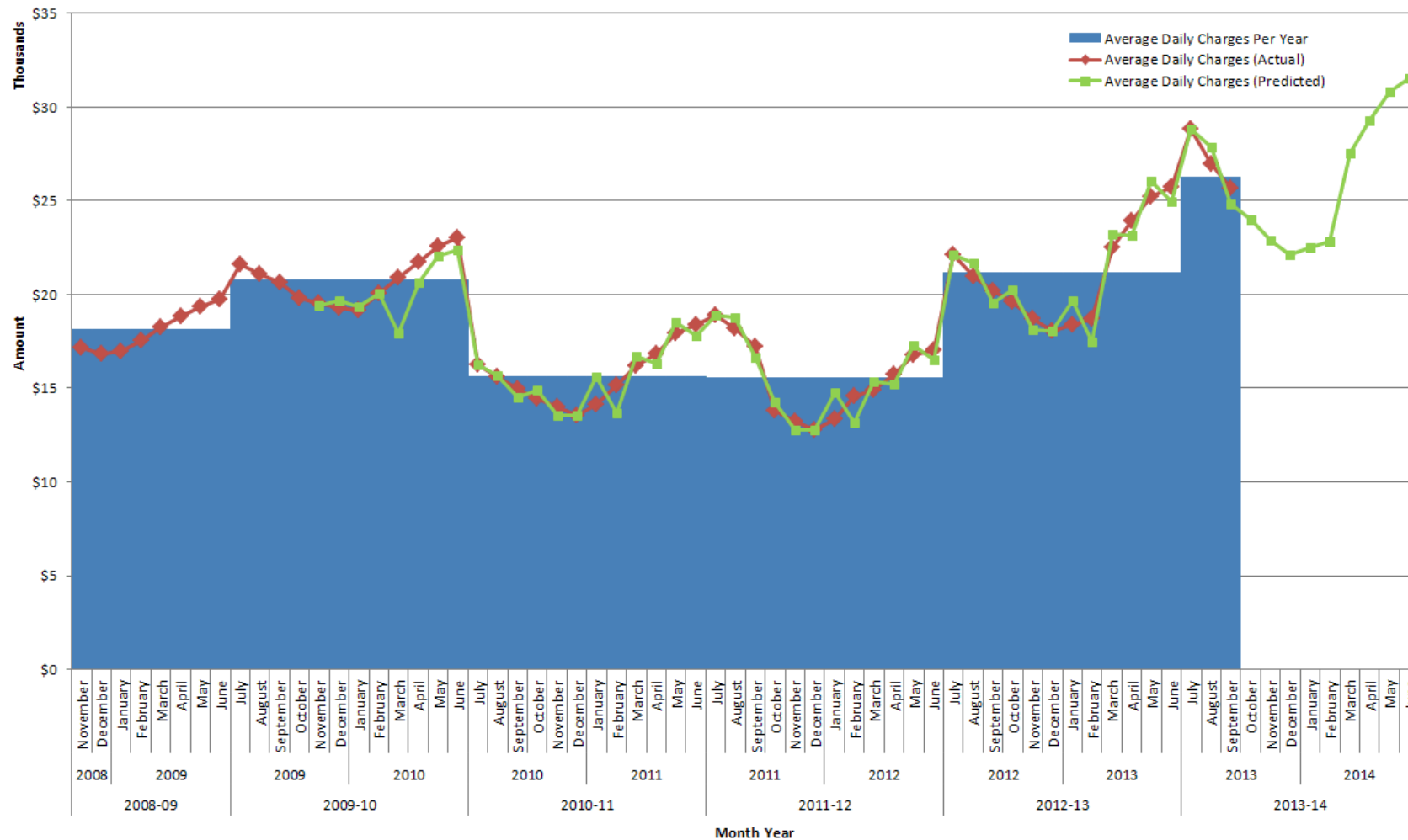
Empower  
People

# Energy costs

- 20% TMR road operations budget
- Expected to increase above underlying inflation rates
- New lighting technologies promise longer lamp life and reduced energy consumption
- LED technology now default for traffic signal lanterns



# Energex Daily Electricity Charges in SEQ



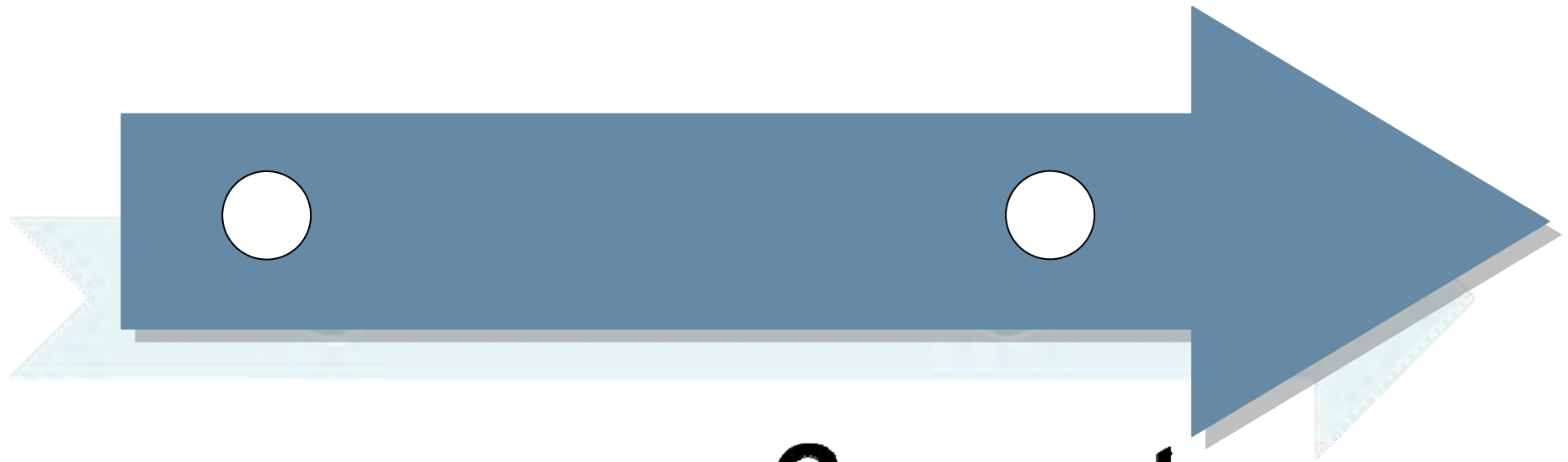
# Findings of our review

Road lighting provided on many of TMR projects exceed:

Current warrants (RPDM)

Australian Standards (AS/NZS 1158)

# Case study

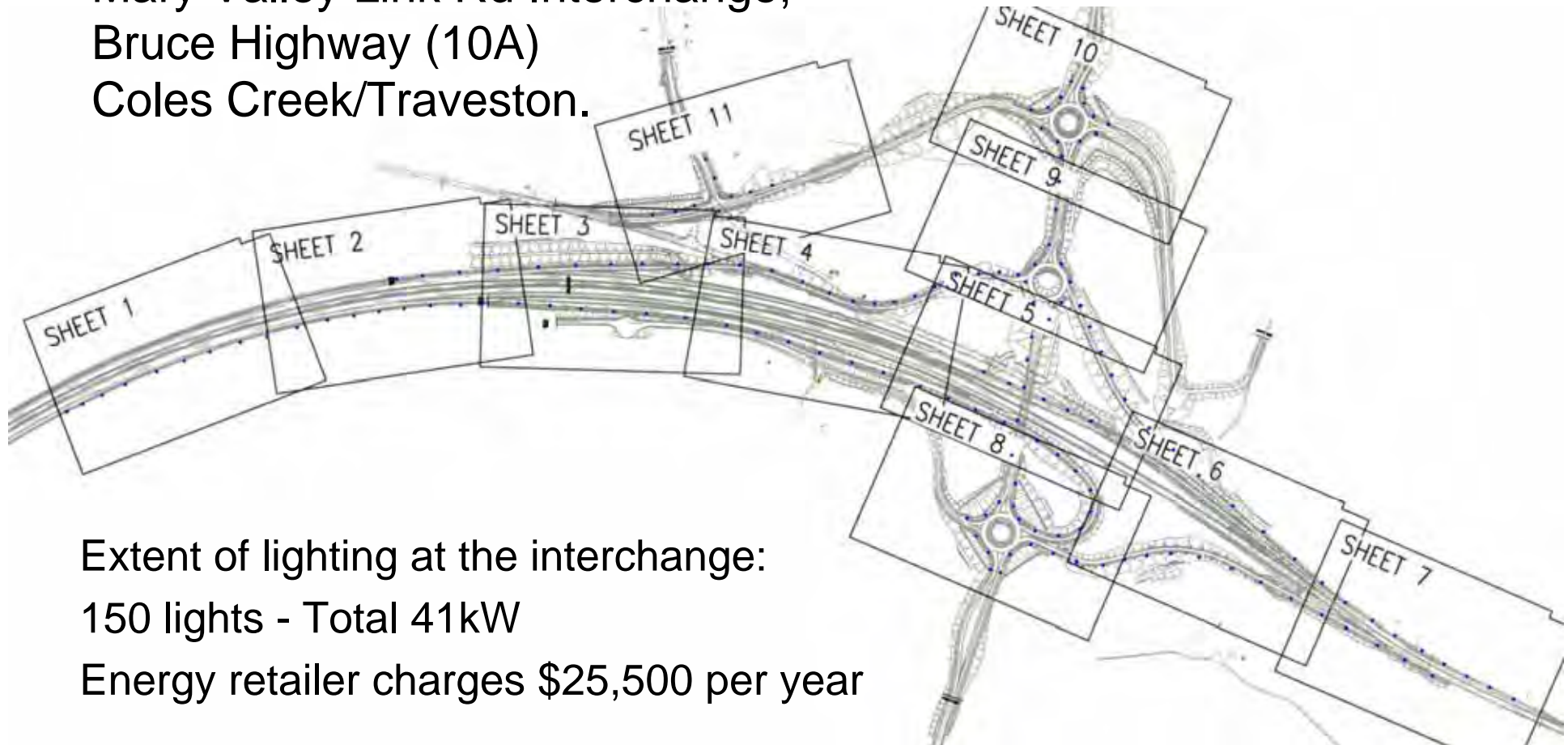


**Cooroy to  
Curra**

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# Cooroy to Curra

Mary Valley Link Rd Interchange,  
Bruce Highway (10A)  
Coles Creek/Traveston.



Extent of lighting at the interchange:  
150 lights - Total 41kW  
Energy retailer charges \$25,500 per year

# Cooroy to Curra

Full lighting provided on acceleration (on-ramp) and deceleration (off-ramp) lanes – for rural motorways only required at gore areas



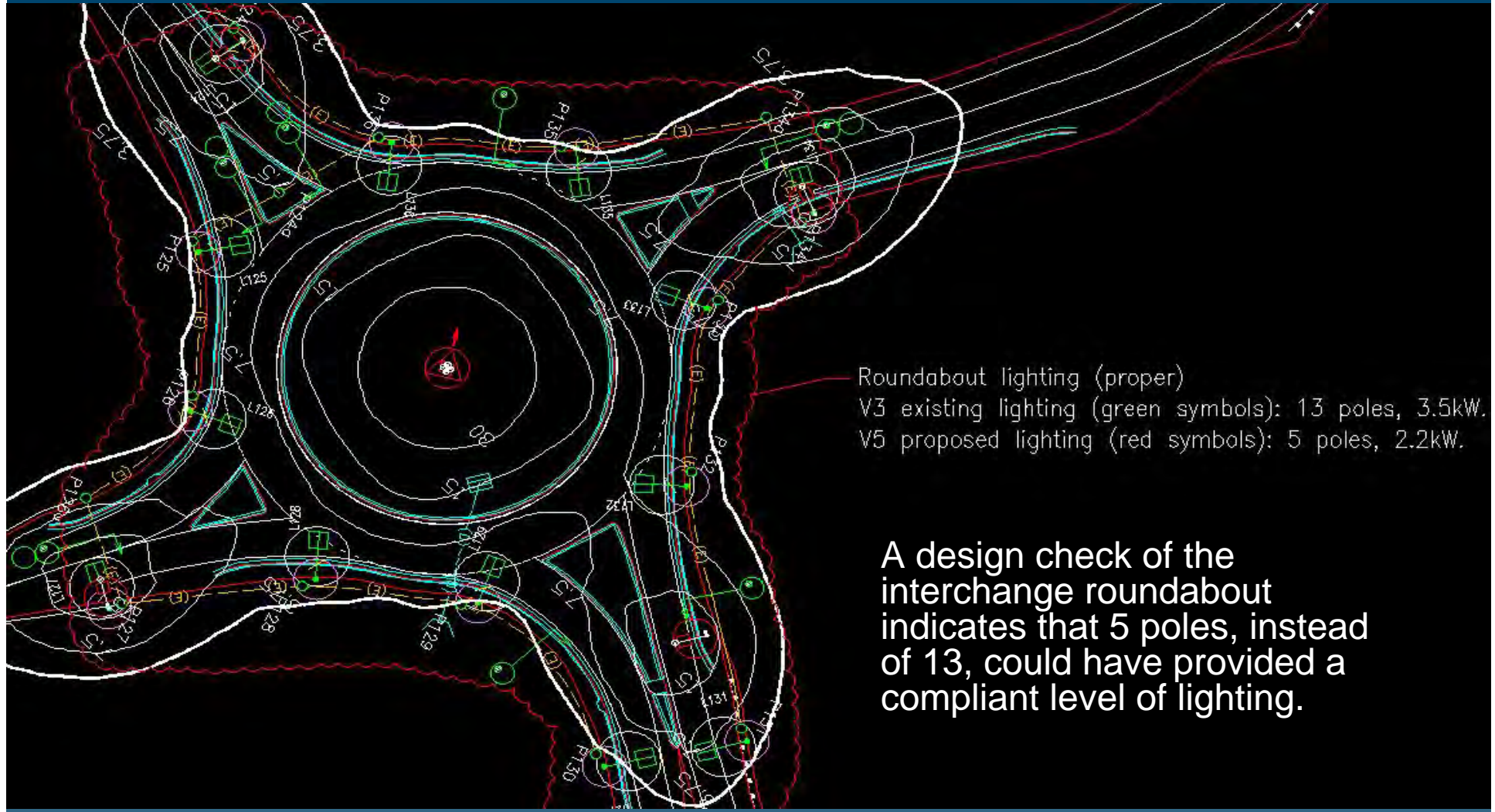


# Cooroy to Curra

Existing arrangement at one of the three roundabouts – 13 lights



# Cooroy to Curra



# Revised Lighting Warrants

## Urban Motorways

- Thru traffic volume = > 40 000 AADT \*  
to be removed
  - <2km between lit interchanges or
  - Sub-standard road design or
  - Significant crash history
-

# Innovation

- Twin Arc and Super Lamp Trial
  - provide increased lumen output
  - double the existing lamp life
  - 200 lamps being trialled in Townsville
- LED Trials



# Innovation



Semi-cut off luminaires should be used to achieve larger pole spacings.

# Traffic management at roadworks



Aim is to achieve safe  
workplace, safe travel with  
minimal delays,  
**at a reasonable cost**

“More isn’t better when it comes to signs”

## Background

ARRB report on the cost of road construction - traffic management as high as 7% of project costs for brownfield sites

ARRB Group commissioned in November 2012 to review our Traffic Mgt practices and compare to other states

ARRB delivered report in June 2013 - recommendations relating to:  
Innovation; Speed compliance;  
Practitioner competence;  
Standards and specifications etc

Improved practice -  
> improved credibility ->  
improved compliance ->  
**Improved safety**

**Key  
Initiatives**

Enhancements to  
documents  
(MUTCD Part 3,  
MRTS02 and  
TRUM)

LOS tool

Speed  
Compliance

Practitioner  
Competence

AAPA/TMR  
Strategic  
partnership  
project  
"Design for  
roadwork sites  
for traffic  
accommodation"



## Enhancements to Documents

MUTCD Part 3 outlines "optimal" requirements (not minimum)

MRTS02 allows for consideration of innovation

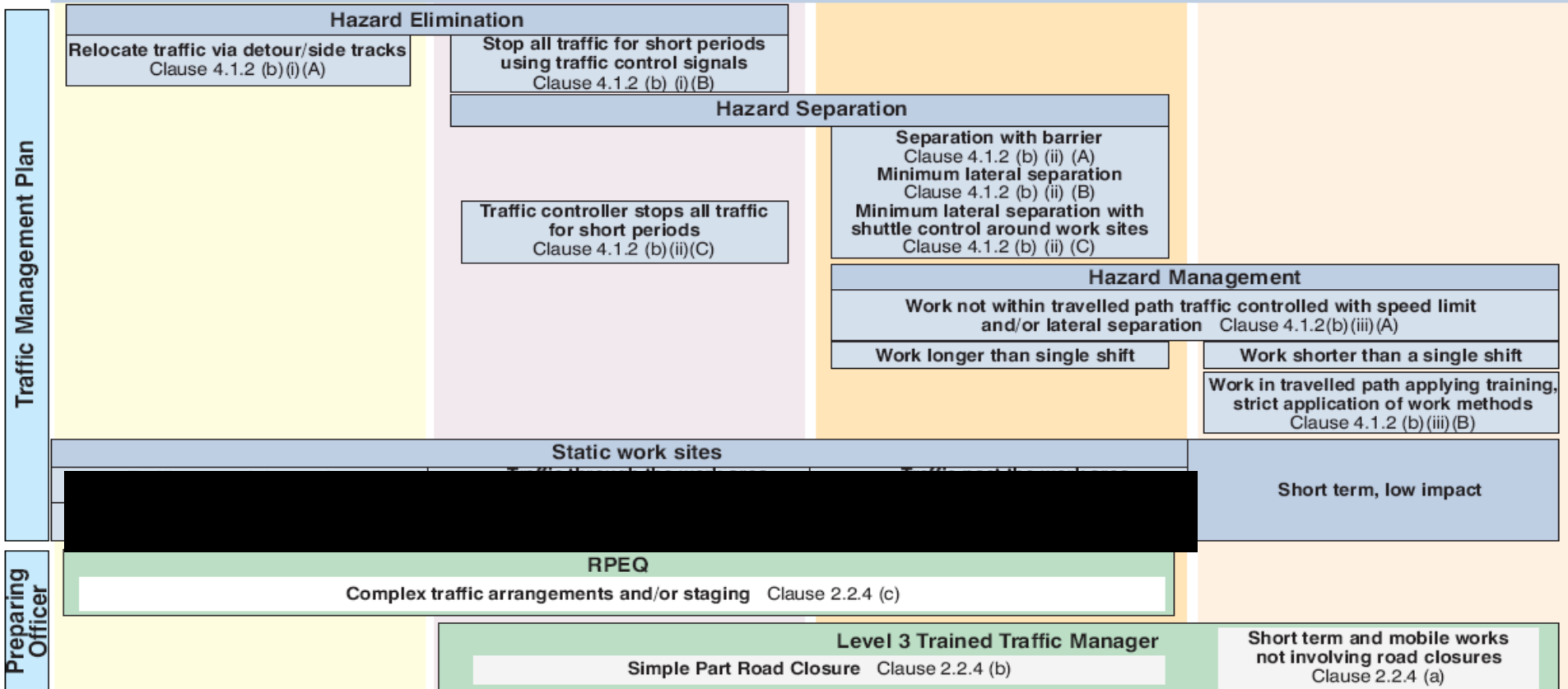
Part 3 design exceptions require RPEQ approval e.g. width or sight distances below standard

MRTS02 allows for financial penalties for non-conformances with sign management

# MUTCD Part 3 – ‘Ready Reckoner’

## Traffic Management Plan Preparation

Developing the Traffic Management Plan Clause 2.2.1, 2.2.2  
 Responsibility for Safety at Work Sites Clause 1.5  
 Risk Assessment Clause 2.2.3  
 Safety & Convenience Clause 2.3.2



# Innovation to address “Back of Queue” issues



TURN ON  
HAZARD LIGHTS  
WHEN QUEUED



RUMBLE  
STRIPS



# New TRUM notes

- 7.8 – Risk Management and exceptions process
  - 7.9 – Level of service for roadwork sites
  - 7.10 – Travel time surveys on large projects
-

# Level of Service Tool

**Question 1/5**

Update Traffic Flows

Traffic Management will occur on:

Weekdays    Weekend

Please ensure you have updated the traffic flows using the buttons above before continuing

**Question 2/5**

Existing Link

What is the existing 85% Speed ?  kph

What is the existing link length on which there is to be Traffic Management?  m

What is the number of Existing Lanes?

Detour Information

What is the likely detour routes 85% Speed ?  kph

What is the diversion length ?  m

HGV Information

What is the likley HGV % (Between 0 and 10%)

**Question 1a - Weekday Traffic Flows**

Traffic Volume Form

Update the Volume per Hour per Lane for each WEEKDAY hour, and select whether roadworks occurs at this hour.

Time (24hr)	Volume (v/h/l)	Road works	Time (24hr)	Volume (v/h/l)	Road works	Time (24hr)	Volume (v/h/l)	Road works	Time (24hr)	Volume (v/h/l)	Road works
00:00 - 01:00	<input type="text" value="600"/>	<input checked="" type="checkbox"/>	06:00 - 07:00	<input type="text" value="1950"/>	<input checked="" type="checkbox"/>	12:00 - 13:00	<input type="text" value="1950"/>	<input checked="" type="checkbox"/>	18:00 - 19:00	<input type="text" value="2250"/>	<input checked="" type="checkbox"/>
01:00 - 02:00	<input type="text" value="450"/>	<input checked="" type="checkbox"/>	07:00 - 08:00	<input type="text" value="2475"/>	<input checked="" type="checkbox"/>	13:00 - 14:00	<input type="text" value="2100"/>	<input checked="" type="checkbox"/>	19:00 - 20:00	<input type="text" value="1875"/>	<input checked="" type="checkbox"/>
02:00 - 03:00	<input type="text" value="525"/>	<input checked="" type="checkbox"/>	08:00 - 09:00	<input type="text" value="2700"/>	<input checked="" type="checkbox"/>	14:00 - 15:00	<input type="text" value="2250"/>	<input checked="" type="checkbox"/>	20:00 - 21:00	<input type="text" value="1500"/>	<input checked="" type="checkbox"/>
03:00 - 04:00	<input type="text" value="300"/>	<input checked="" type="checkbox"/>	09:00 - 10:00	<input type="text" value="2250"/>	<input checked="" type="checkbox"/>	15:00 - 16:00	<input type="text" value="2625"/>	<input checked="" type="checkbox"/>	21:00 - 22:00	<input type="text" value="900"/>	<input checked="" type="checkbox"/>
04:00 - 05:00	<input type="text" value="675"/>	<input checked="" type="checkbox"/>	10:00 - 11:00	<input type="text" value="2100"/>	<input checked="" type="checkbox"/>	16:00 - 17:00	<input type="text" value="2662"/>	<input checked="" type="checkbox"/>	22:00 - 23:00	<input type="text" value="1125"/>	<input checked="" type="checkbox"/>
05:00 - 06:00	<input type="text" value="900"/>	<input checked="" type="checkbox"/>	11:00 - 12:00	<input type="text" value="2025"/>	<input checked="" type="checkbox"/>	17:00 - 18:00	<input type="text" value="2550"/>	<input checked="" type="checkbox"/>	23:00 - 00:00	<input type="text" value="450"/>	<input checked="" type="checkbox"/>

Select All/Unselect All    Select/Deselect Offpeak AM & PM

# Level of Service Tool

Question 3/5

Traffic Management Scenarios to Compare:

- Scenario 1 (Three to two lanes, speed 100 to 60)
- Scenario 2 (Three to two lanes, speed 100 to 40)
- Scenario 3 (Three to one lane, speed 100 to 60)
- Scenario 4 (Three to one lane, speed 100 to 40)
- Scenario 5 (Two to one lane, speed 100 to 60)
- Scenario 6 (Two to one lane, speed 100 to 40)

Signalised Contraflow  75m  125m  225m  325m  
 425m  525m  625m

- Total Road Closure
- Narrow Lanes (3 lanes) 60 kph
- Narrow Lanes (3 lanes) 40 kph
- Narrow Lanes (2 lanes) 60 kph
- Narrow Lanes (2 lanes) 40 kph

Quick Selection

Select 3 Lane Scenarios

Select 2 Lane Scenarios

Back Next

Question 4/5

Estimate The Duration of Works for TM Scenarios  days

Estimate The Duration of Works for Full Road Closure  days

Back Next

# Level of Service Tool

Question 5/5

Works Cost Assumptions

Enter either assumed % efficiency and TM as a % of works cost or actual expected values:

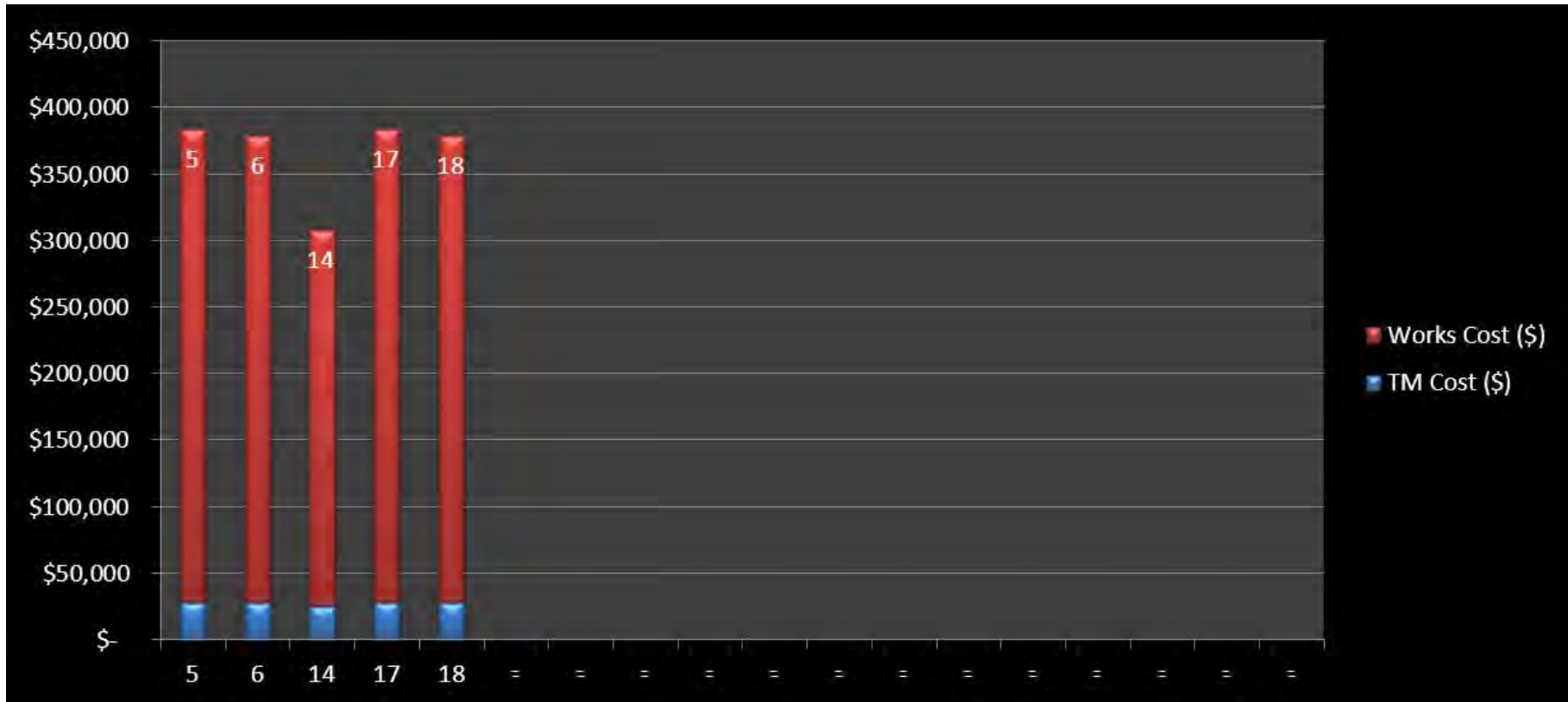
TM Tool Estimated Costs

Actual Costs

	Expected TM Cost (\$'s)	Expected Works Cost (\$'s)
Scenario 5 (Two to one lane, speed 100 to 60)	28422	355275
Scenario 6 (Two to one lane, speed 100 to 40)	28055	350687
Scenario 10 (Total Closure)	7500	93750
Scenario 9A (two narrow lanes, speed 100 to 60)	28422	355275
Scenario 9B (two narrow lanes, speed 100 to 40)	28055	350687

Back Next

# TM and Estimated Works Cost

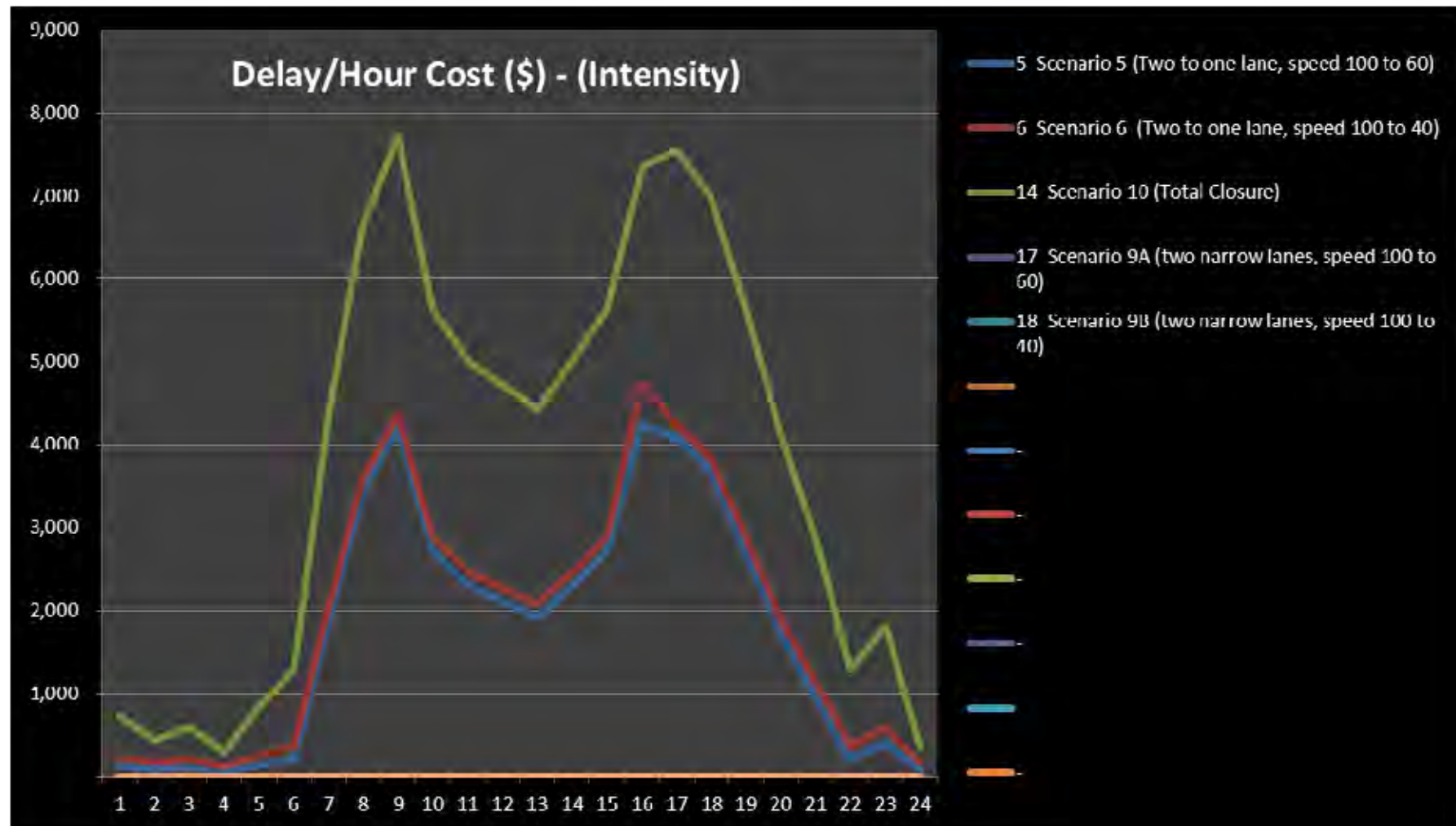




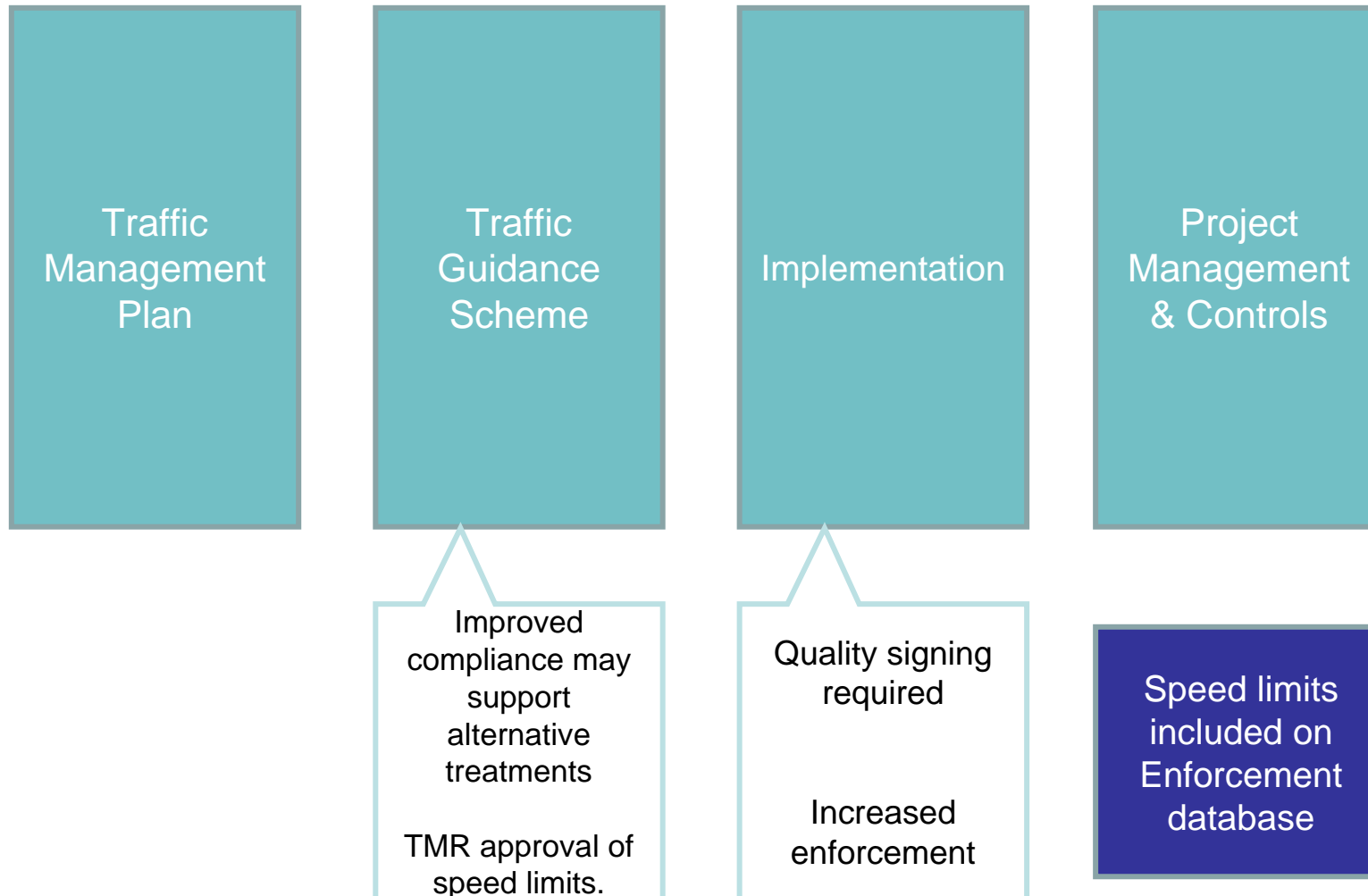
# Total Project Cost including user delay



# Delay/Hour Cost (\$) – (Intensity)



# Key Changes – Speed Compliance



## **Practitioner Competence**

A full review of levels  
3 and 4 traffic  
management training

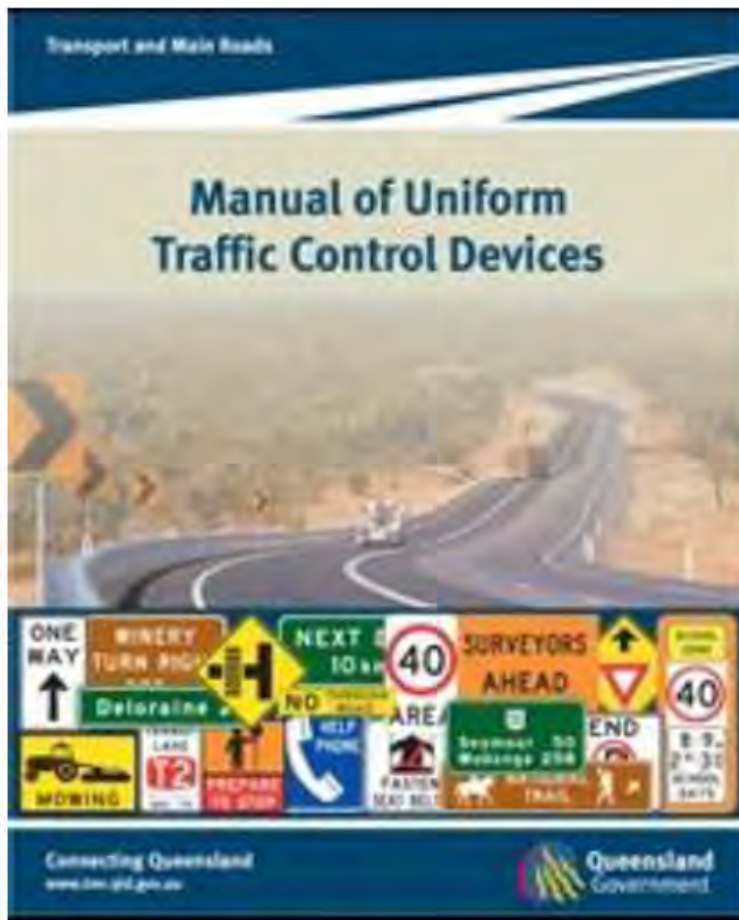
Significant expansion  
of the content and  
duration of level 3  
training is likely

Austrroads project –  
national  
harmonisation of  
traffic management  
competency  
requirements

Workshops and  
awareness sessions  
will be held on  
changes to the  
MUTCD part 3 and  
the MRTS02

# AAPA QTMR Strategic Alliance Safety Project

## Design of road worksites for traffic accommodation



**NCHRP**  
REPORT 581

NATIONAL  
COOPERATIVE  
HIGHWAY  
RESEARCH  
PROGRAM

Design of  
Construction Work Zones  
on High-Speed Highways

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

# Conclusion

To conclude

Aim is to achieve a safe workplace, safe travel with minimal delays, **at a reasonable cost**

We need credible speed limits -  
“lower limits aren’t always better”

Road works signs that are respected -  
“more isn’t better”

**Thank** *you*