

ASIA PACIFIC ENERGY RESEARCH CENTRE
(APEREC) Annual Conference 2019
15-16 May 2019, Tokyo

Net-zero emissions pathways: Long-term transport infrastructure development

- Australian infrastructure planning
- Priority projects
- Sustainable funding and financing

Prof. Colin Duffield
The University of Melbourne

Recent relevant experience

Past Director, Infrastructure Australia

- Responsible for strategic infrastructure investment in Australia

Co-leader of Infrastructure Cluster, The Australia-Indonesia Centre

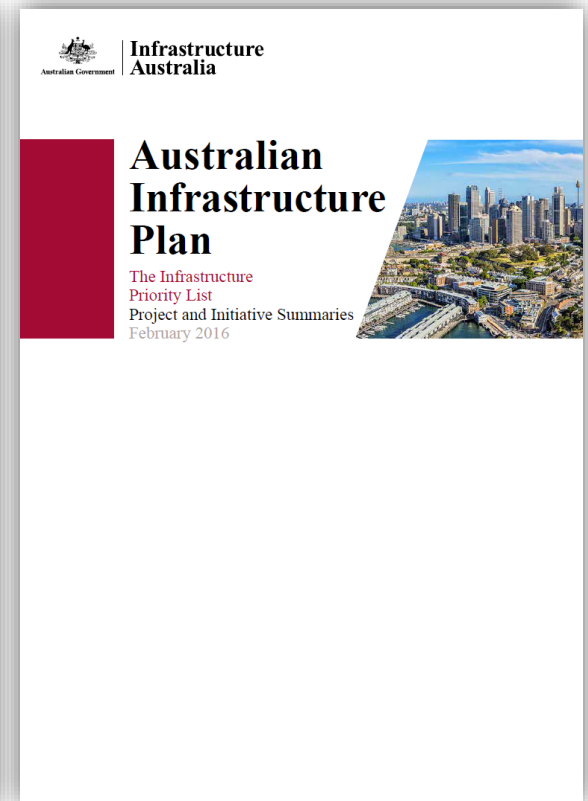
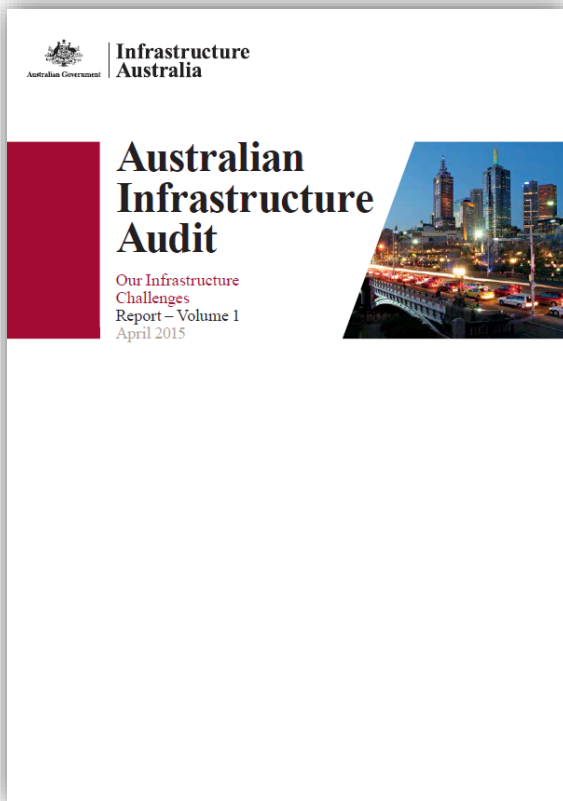
- Active research partnerships between Indonesia and Australia, active partners include government, universities and industry

Active projects – last 2 years: (but involved in PPPs since early 90s)

- City Link widening project
- Sydney Metro Tunnel
- Melbourne Metro Tunnel
- Ravenhall Prison project
- Hopkins Prison Project
- Grafton Prison Project
- Glebe Island Innovation Development



Audit, Plan & Priority List

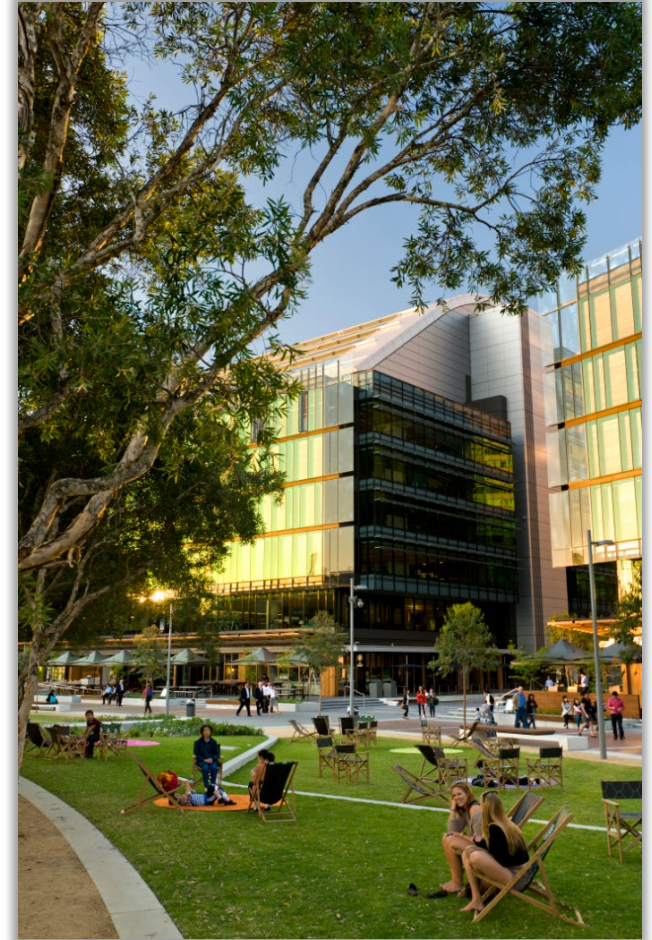


Long term planning

State governments must create long term plans – 15 years

Planning must be integrated with broader land use and economic development plans

Conduct feasibility studies and develop business cases



Project evaluation stages



Stage 1

Problem
Identification
and Prioritisation



Stage 2

Initiative
Identification and
Options Development



Stage 3

Business Case
Development



Stage 4

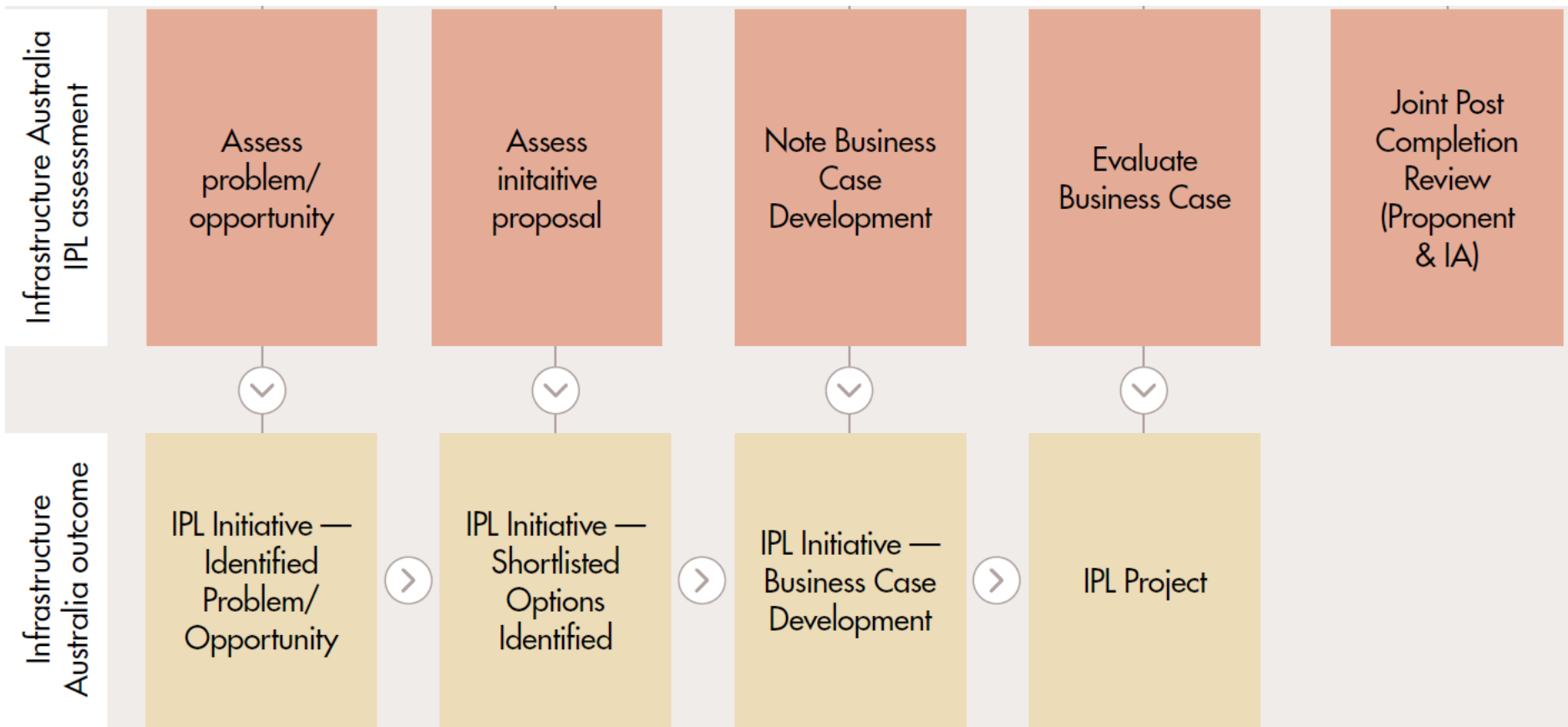
Business Case
Assessment



Stage 5

Post Completion
Review

Project assessment



Strategic research

Future Cities

Planning for our
growing population
February 2018

REFORM SERIES

Reforming Urban Water

A national pathway for change
December 2017

REFORM SERIES

Corridor Protection

Planning and investing
for the long term
July 2017

REFORM SERIES

Improving Public Transport

Customer Focused Franchising
May 2017

REFORM SERIES

Capturing Value

Advice on making value capture
work in Australia
December 2016

REFORM SERIES

<http://infrastructureaustralia.gov.au/policy-publications/publications/future-cities-melbourne-maps.aspx>

Infrastructure Priority List

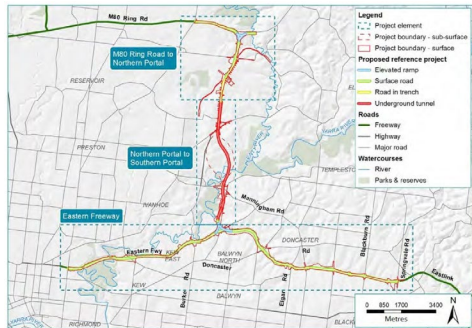
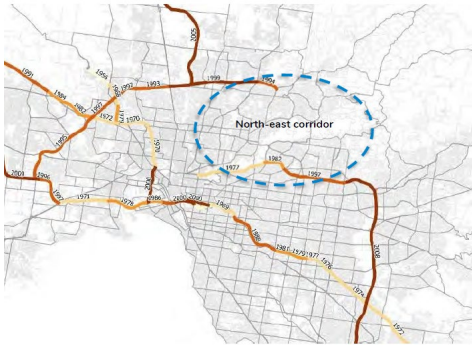
Australian Infrastructure Plan
Project and Initiative
Summaries
February 2019



Transport

Roads:

Advance major routes, improve safety, reduce local problems



Urban rail:

Advance major routes, e.g. Metro West Sydney



Faster commuter services

Freight rail:

Major route upgrades, e.g. Melbourne to Brisbane



Road technology:

An Australian electric vehicle fast-charging network

Automation

Growth in the 'sharing economy'

Technological connectivity

Infrastructure Priority List

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Energy

Policy:

- Public sector monopoly assets have been progressively separated into wholesale and retail industries
- System instability, high prices
- No agreed arrangements for reducing carbon emissions is negatively impacting investments

Projects:

Connectivity and reliability of our National Electricity Market in the medium to long term, and optimisation in the near term
e.g. Snowy II pumped hydro.
Battery use

	Generation	Transmission*	Distribution*	Retail
New South Wales	✓	✓	●	✓
Victoria	✓	✓	✓	✓
Queensland	✗	✗	✗	✓
Western Australia	✗	✗	✗	✗
South Australia	✓	✓	✓	✓
Tasmania	✗	✗	✗	✗
Northern Territory	✗	✗	✗	✗
Australian Capital Territory	n/a	✓	●	●

✓ Privatised ✗ Public ● Partially Privatised

Demand for investment in transport infrastructure exceeds the available budget – current forecasts are in the order of \$100bn

Strategic investment for the forecast growth requires an integrated approach

The emergence of new technologies are clouding the vision for the future

Funding options are compounded by electric vehicles

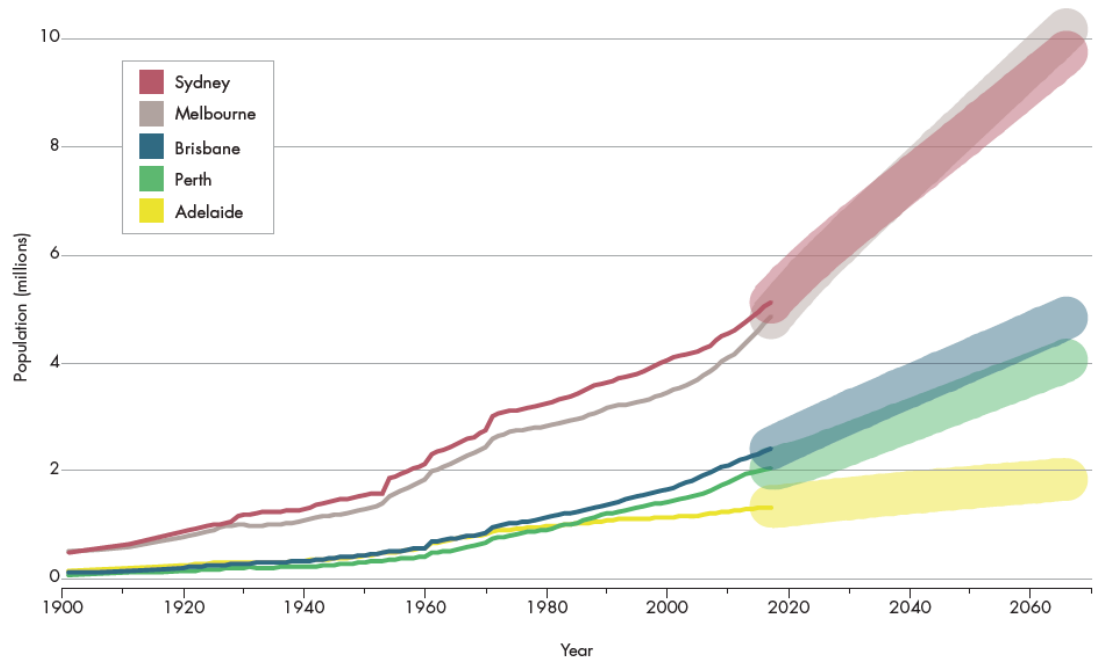
Growth in electric vehicles places greater demands on an already fragile electrical market

The style of development

Planning Liveable Cities

A place-based approach to sequencing
infrastructure and growth

December 2018



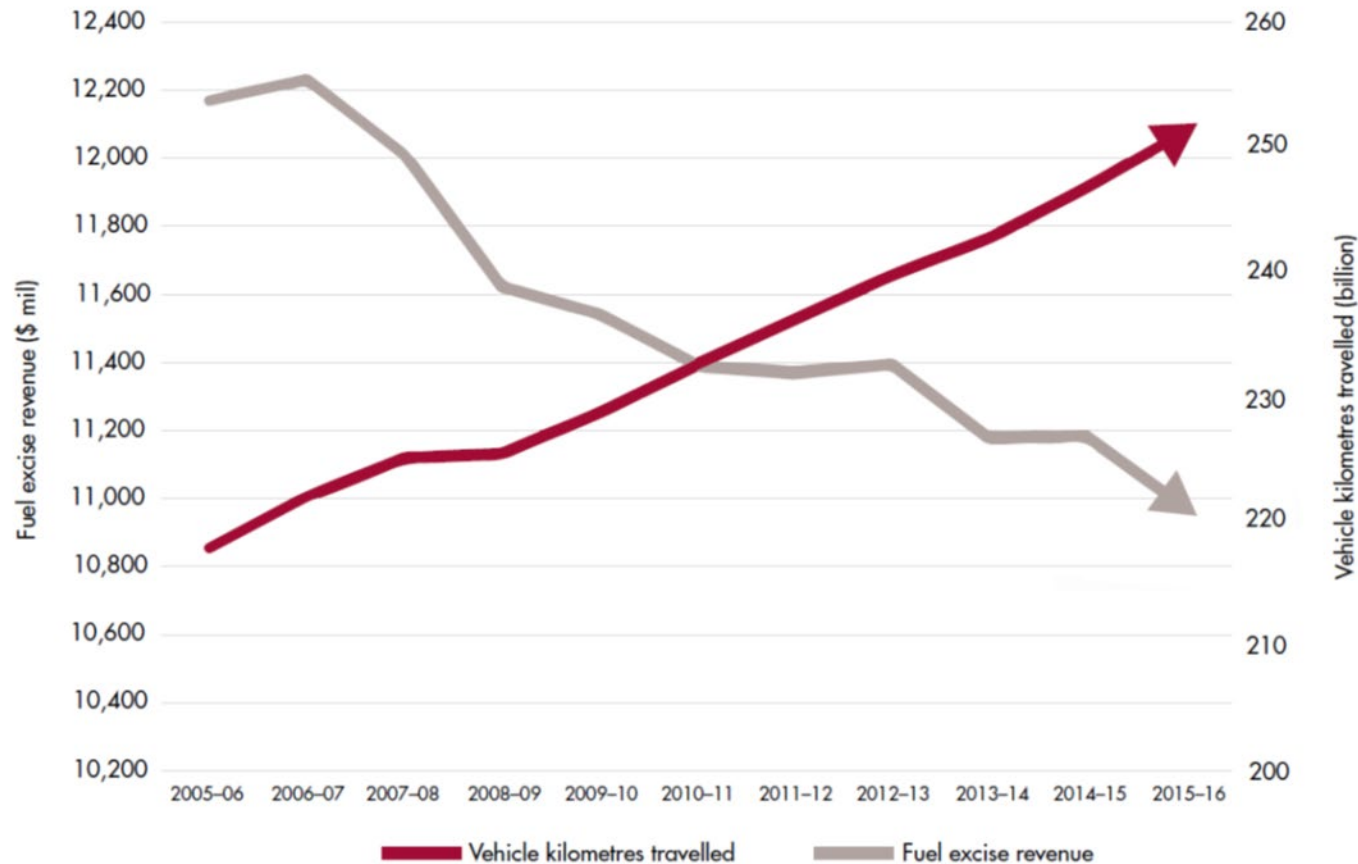
Note: Figures include Census counts (updated for non-Census years) for years 1901 to 1970, and estimated resident population for 1971 onwards. Capital city boundaries are based on Greater Capital City Statistical Areas (GCCSAs) for 1971 onwards. GCCSAs are geographic regions created by the ABS, which represent the socio-economic extent of each capital city. Population figures for 1901 to 1970 are based on earlier boundary definitions and may be inconsistent with GCCSAs.

Source: Australian Bureau of Statistics (2014, 2018).³

Major population growth projections

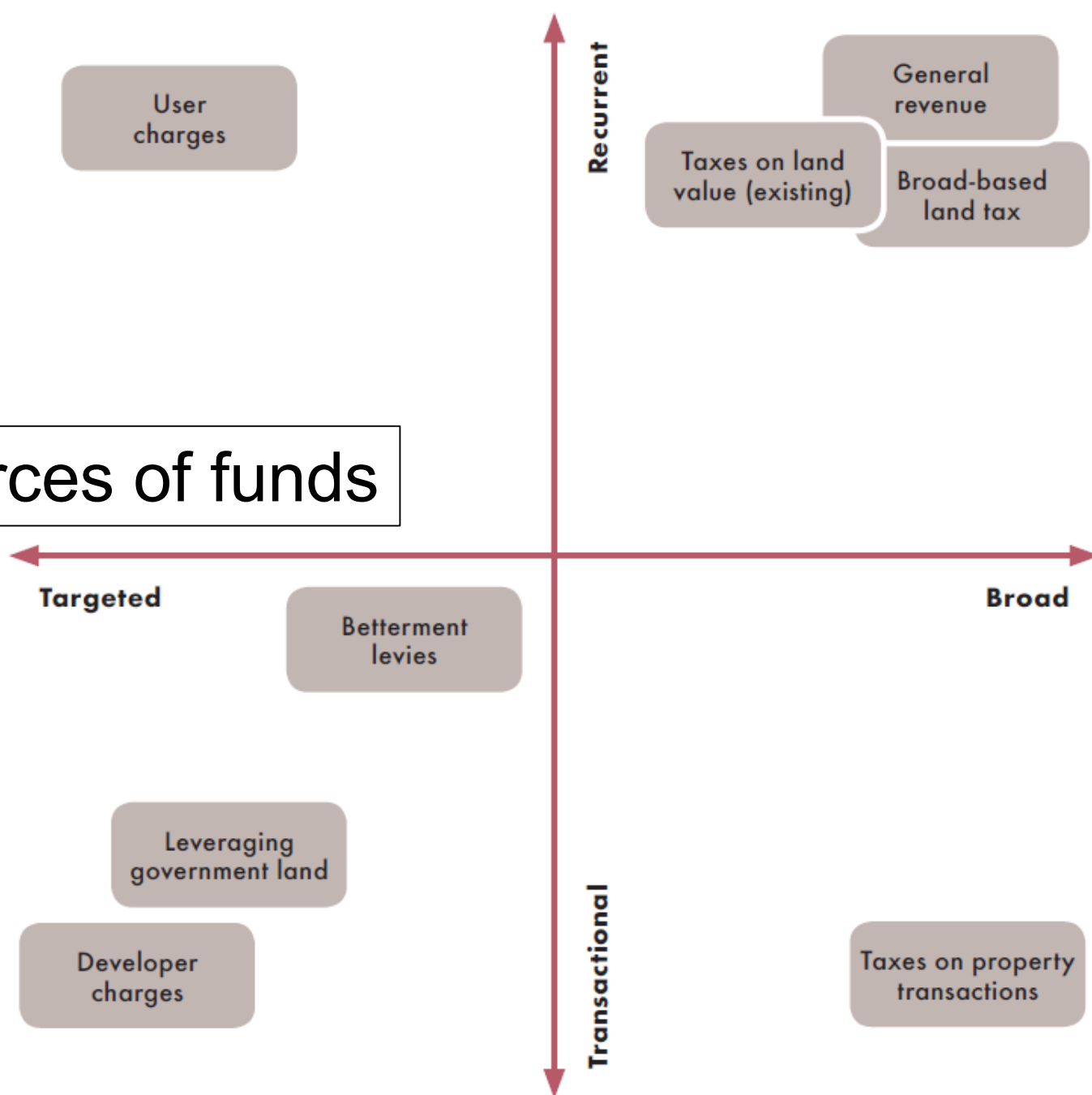
Concern: How best to develop but what is clear is that planning at individual agency level does not work

Impact of efficiency and electric vehicles on road levy



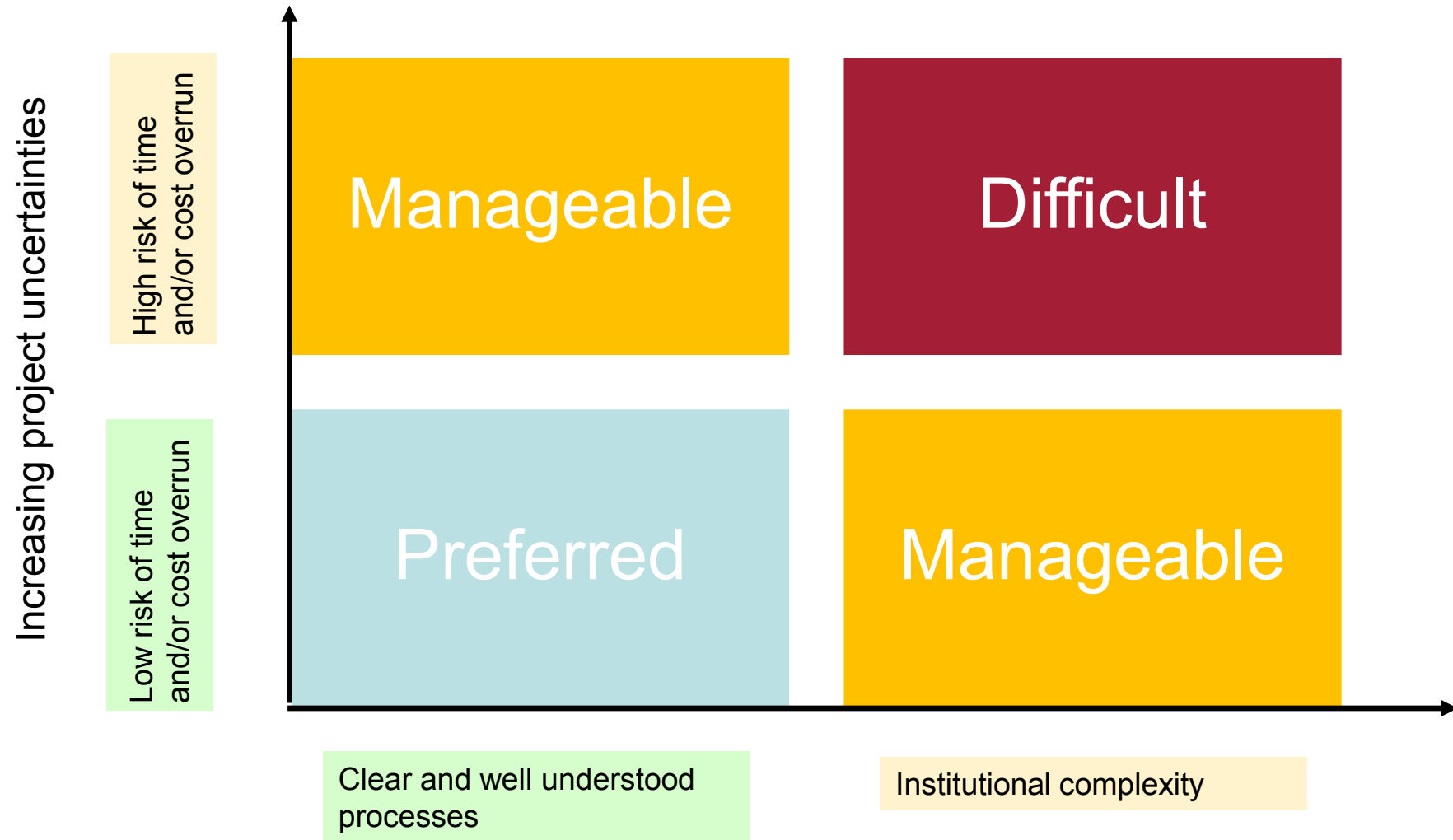
Road funding under pressure due to changing technology and impact on fuel levy

Sources of funds





Stimulating finance....



Institutional uncertainty: Governance, legislation, process



- Clear project priorities and commitment to complete the project once commenced
- Controlled risk
 - Secure payment
 - Construction surety
 - Known approvals and land access
 - Skilled resources
 - Consistent legal systems
 - Long term control of sovereign risk
- Demand for projects seems to outstrip resources
- Available capital – debt and equity

Private finance initiatives in Australia – incl. PPPs

PPPs (~100)

- Fully demand risk transfer
- Capital contribution
- Availability payments
- Availability payments with capital cont.
- Asset roll over
- Market led proposals

Asset recycling

Franchising

Direct foreign investment

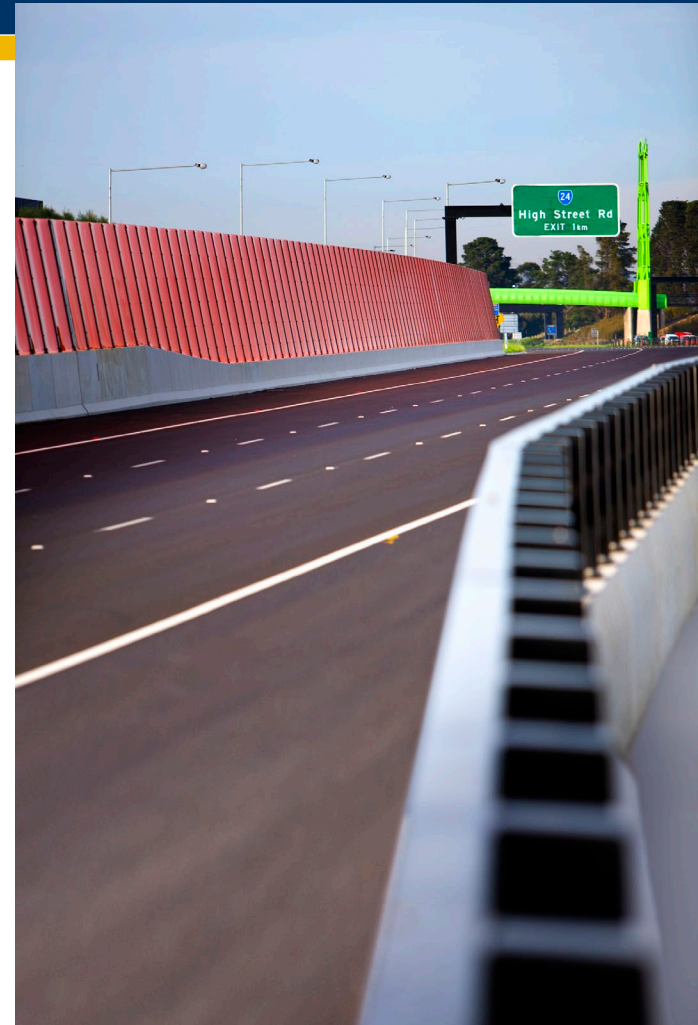
Direct government, incl debt

Tax incentivised loans – North Aust.

Australian transport PPPs

1990s	2000s	2010s	In delivery/contract
Sydney harbour	Southern Cross	NorthConnex	Western/ Northern/ South Eastern Roads upgrade
M2 motorway	Cross City	City Link Widening	Westgate tunnel
M5 tollway	Eastlink	Port Phillip Ferries	Melb Metro Tunnel
Eastern distributor	Lane Cove	Sydney Light Rail	Syd Metro (City & SW)
City Link	M2 widening	Sydney Metro NW	
Airport rail	Paramatta interchange	Waratah Rolling Stock	
	Peninsula Link	High Capacity Trains	
	M7 Western Orbital	Gold Coast Rapid Transit	

PPP examples: Eastlink toll road



Mechanisms that appear to be working that may be of interest to APEC economies

- Direct government investment
- PPPs where government and the private sector share elements of the initial construction cost and then enter a long term lease. Government frequently injects capital from asset recycling programs thus reducing both the impact on their budgetary funds and also optimises long term debt repayments. Under this arrangement the private sector raises new debt and equity.
- PPPs as per above that are an extension of current PPP contracts. Changes to the arrangements of the existing contract may provide a shared investment/payment regime for the additional asset
- For the electrical market, new investment has been slow unless incentivised as an option for renewable energy
- New market entrants are envisaged for fast charging centres