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Case studies of recent Australian toll road projects

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Patronage Forecasting Symposium

Hyatt Hotel, Canberra

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Presentation Outline

- Purpose of the case studies
- Toll roads in Australia
- Available information
- Case profiles
- Insights from interviews
- Some Potential Lessons

Note: we are reporting work-in-progress

- At about the half way mark:
  - May start
  - August completion

The project involves exploring the reasons for "good" / "poor" forecasts for toll roads

Case Studies:

- In-depth study of the projects, processes, 'players' / consortia and contextual aspects
- Aim to provide the detail lost when project information is aggregated
- Not intended as a technical modelling review
- Not about "at fault" but challenges in the processes and opportunities for improvements

Process:

- Detailed examination of documentation:
  public and private
- Interviews with individuals involved in projects
- Amended to include interviewing more widely regarding general issues affecting toll road forecasts

Case selection involved consideration of various factors such as cities and project types

CASE SELECTION

Coverage for:

- Geography (3 cities / States)
- Type of road (tunnel / surface / long / short / bridge)
- Type of finance: all private equity, listed on ASX, government owned

2 Major Studies:

- City Link (Melbourne)
- Lane Cove Tunnel (Sydney)

2 Supporting Studies:

- M7 Westlink (Sydney)
- Go Between Bridge (Brisbane)

PUBLIC

CURRENT

Sydney Harbour Bridge NSW

Gateway Motorway & Logan Motorway QLD

Go Between Bridge QLD

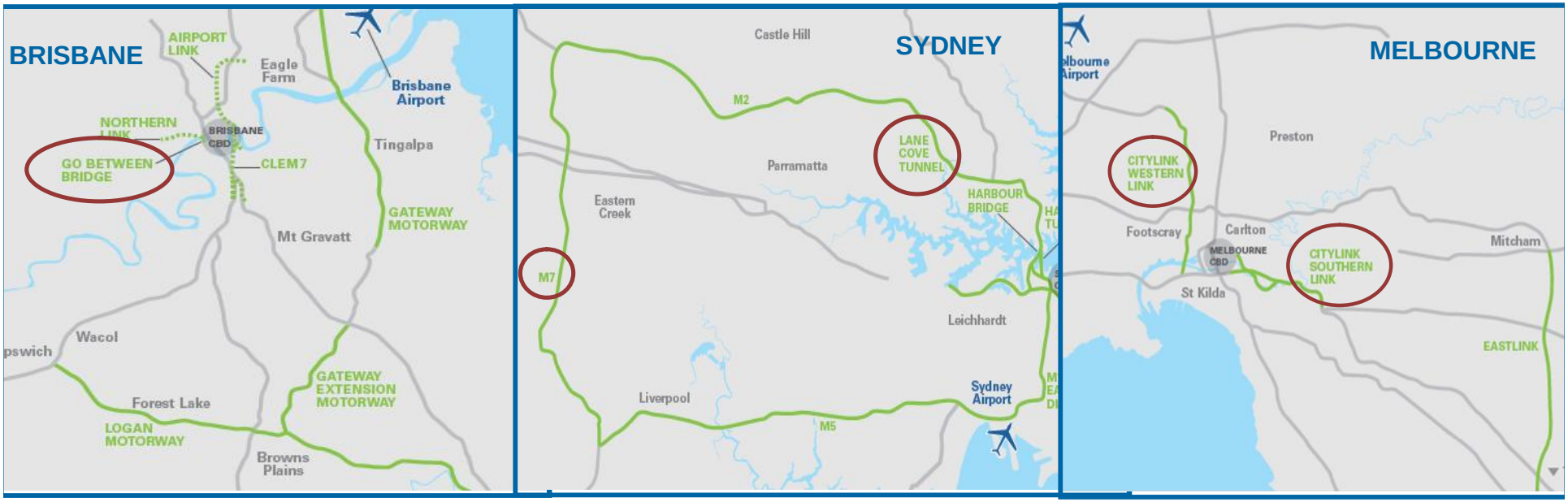
1930 EARLIER | 1940 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010

Story Bridge / Bradfield Highway, QLD

Southern & Sydney-Newcastle Freeway, NSW

West Gate Bridge, VIC

Sunshine Motorway, QLD



PPPs

CURRENT

M5 South West & Harbour Tunnel, NSW

CityLink VIC M2 & Eastern Distributor, NSW

M5 East Motorway, NSW

Westlink M7 Cross City & Lane Cove Tunnel, NSW

EastLink, VIC

Clem 7 Tunnel, QLD

1930 EARLIER | 1940 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010

M4 Motorway NSW

The literature review has proved a fruitful source of information

Set of publicly available material larger than expected:

Including:

- **Public releases such as**
  - **Summaries of contracts**
  - **ASX information**
- **Details of inquiries and reviews**
  - **RTA *Post Implementation Review M7 Motorway, Cross City Tunnel and Lane Cove Tunnel***
  - **NSW *Parliamentary Enquiry into the Cross City Tunnel and the Lane Cove Tunnel***
- **Academic & Consultants Studies**
  - **General e.g. Hensher and Li (2010) comparing motorway forecasts and outcomes**
  - **Specific e.g. Muhammad & Low (2006) City Link Motorway**

The data unearthed during the review has also included information from non-public sources

Together the published and unpublished information has provided the review useful detail on the toll road projects:

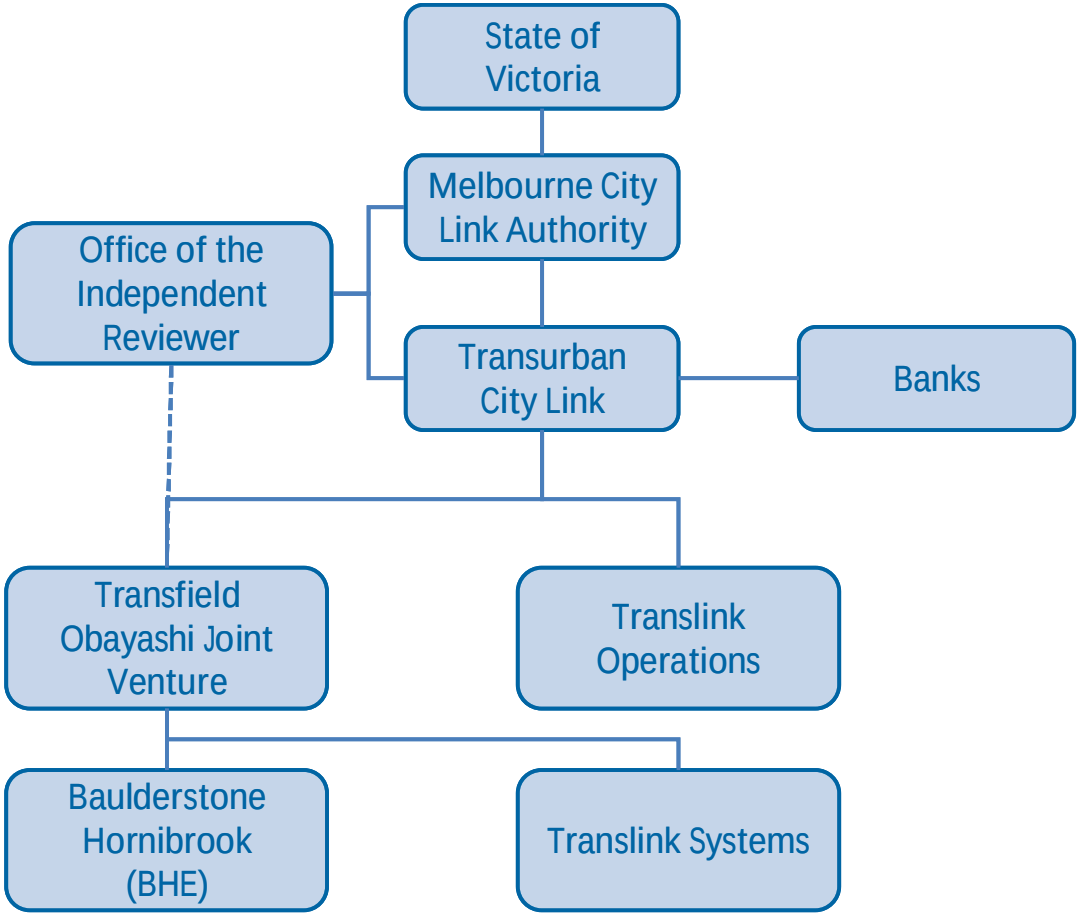
- circumstances of the project
- structure of the procurement
- proponents – the “players”
- modelling teams – the advisers
- forecasts
- actual traffic

City Link (Melbourne) - profile

- Connects the Tullamarine Freeway, the West Gate Freeway and the Monash Freeway
- 22 kilometre automated tollway divided into Southern and Western Links
- Capital cost estimated to be around $1.8 billion

Distance based tolling adjusted with CPI. Current toll caps are:
Cars $6.93 for car, Commercial Vehicles $9.24 (day) and $6.93 (night)

City Link Project Structure

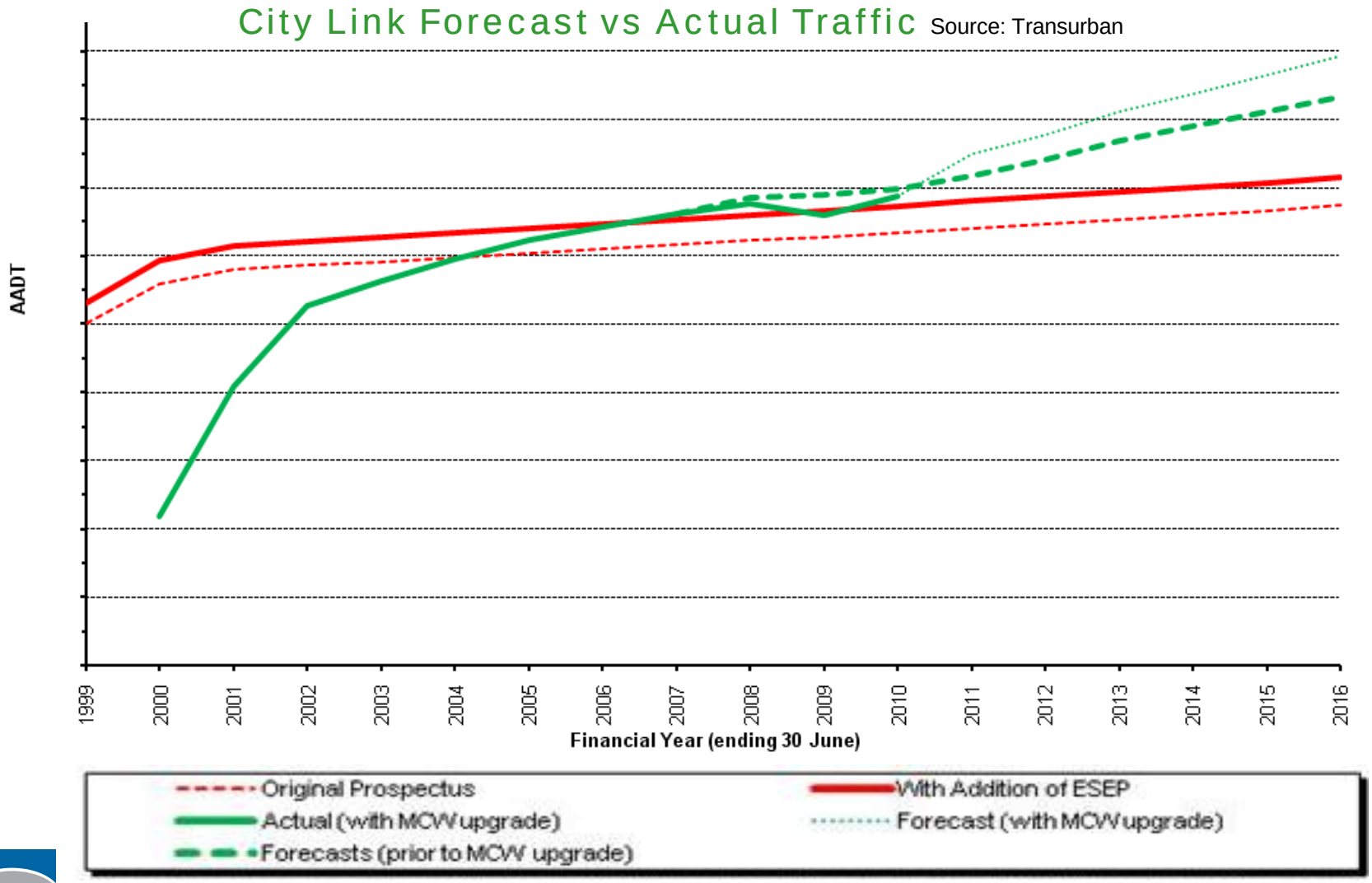


Process

- City Link Authority
  - Models for traffic
  - Macro models of economic impact
  - EIS
- 1992 Call for tenders for BOOT for construction
- 1994 Transurban & CHART Roads short listed
- 1996 Contract awarded to Transurban
- Floated on ASX
- 2000 (Dec) - opened for traffic
- Full electronic cashless tolling
- Concession ends 2034

Source: Muhammad and Low (2006)

City Link traffic performance has improved and the project expanded over time



ESEP = Exhibition St Extension Project

MWC = Monash-CityLink-West Gate corridor

Lane Cove Tunnel (Sydney) - profile

- A 3.6-kilometre tunnel linking the Gore Hill Freeway with the M2 Motorway - a key link in the Sydney Toll Road Network plus Military Rd E-ramps on the Warringah Freeway (the ramps are shortest toll route in Australia)
- 4 bid teams – 2 short listed
- Opened March 2007 - concession period 30 years
- Operated by Connector Motorways funded by privately
- Receivership in January 2010 after a string of losses - Transurban purchased the tunnel in May 2010
- Fixed toll adjusted with CPI:
  - current rates: $2.85 for passenger vehicles and $5.69 for heavy vehicles

Sydney's Lane Cove Tunnel has been a 'high profile' toll road where usage has been and continues to be well below expectations

Forecasts and Traffic Flow:

Actual traffic level was 37% lower than predicted during the first year of operation (2007-2008)

Still considerably lower than predicted

Westlink M7 (Sydney) - profile

- 40 km toll road linking Northwest and Southwest Sydney
  - Connecting the M2, M4 and M5 motorways
  - Outer link in Sydney's major toll road network

- Opened to traffic in December 2005.
  - Current concessionaires: Transurban (50%) and Western Sydney Road Group (50%)
  - Fully electronic toll by km capped at 20 km

- Led to considerable development of greenfield sites

M7 Forecasts and Traffic Flow

- Opened 50% below
- Revenue predictions better than traffic:
  - short trips high/long trips low
- Now with land use change close to forecasts

Go Between Bridge (Brisbane) - profile

- A four-lane tolled bridge linking Brisbane's northern, western and southern suburbs
- Owned by Brisbane City Council
  - Built by Hale St Link Alliance
  - Now operated by Leighton Contractors
- Opened for traffic in July 2010

Go Between Forecasts and Traffic Flow

Close to estimates:

Predicted 12,800 Oct 2010
($2.70 toll)

Actual 11,700 vehicles Sep 2010
($1 toll)

Interviews have been conducted to provide additional insights

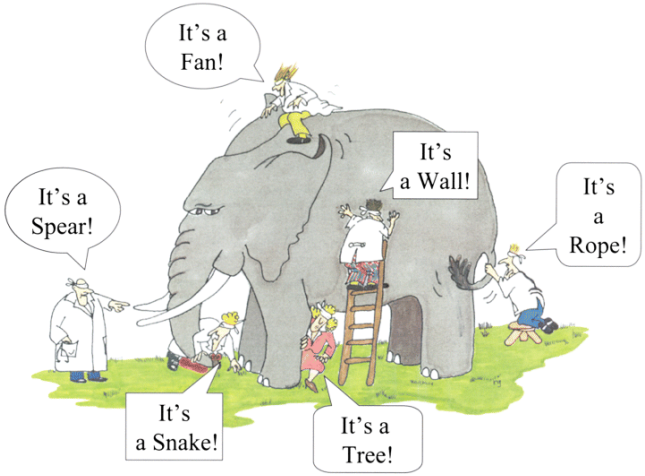
While documents provide:

- Details of history and material for review

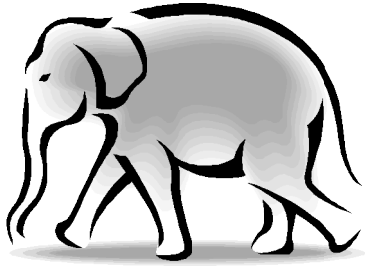
Interviews provide extra insights:

- “Off the record” with people with a variety of roles in projects
- General rather than project-specific questions have been a benefit rather than a disadvantage
- Helps set case study projects in context
- Brings out differences in views as canvassed in this presentation
- Also, helps to indicate some generally agreed options

Pessimists suggested we might find



Instead Holistic views



Differences regarding emphasis and solutions

It appears that physical differences affect patronage risk

Context Characteristics & Patronage Risks*

Characteristic	City Link (& similar)	Lane Cove Tunnel (& similar)	Affect on Forecasting Risk
Length	Longer	Shorter	Increased trip options make longer links more forgiving
Location	Surface	Tunnel	Tunnel higher Capex & Opex /km requires higher patronage/km
Entrances/exits	Multiple	Restricted	Increased access more forgiving
Competing routes	Multiple by section	Direct competing surface route	Subject to changes in competing route conditions
% Commercial Traffic	Mid level	Low level	Commercial users more likely to pay tolls

***** As indicated in some interviews

The commercial / tender context may affect level of optimism

Government Tender Managers

- Concentration on engineering design requirements
  - may advantage design but reduce focus on patronage
- Undertakings to bidders regarding
  - alternative route traffic calming
  - expected land use changes
- Specifications leading to competition on traffic only
  - where revenue depends on Toll, Escalation, Term and AADT
- Acceptance of up-front payment as part of bid
- Potential lack of consideration of toll network affects
  - e.g. the upstream and downstream tolls impacting on Lane Cove Tunnel

The project proponents bring a different perspective which can influence the level of optimism than that of Government

Proponents

- Characterised by a high level of competition between bidding teams
- Bid leader – financier-led teams may place great emphasis on “bankable” forecasts
- Short-term focus may “cloud” the picture particularly regarding key elements such as ramp-up
- Limited traffic data showing misleading trends may gain more importance than appropriate

Issues with modelling may be more about application and data than the models *per se*

General agreement - not a "technical model" issue

- Appropriate application of tools is of greater concern
- Value of "parameters" outside the model
- Input data – quality and reliability

"why would someone pay $5 million for traffic modelling if they did not want an accurate forecast?"

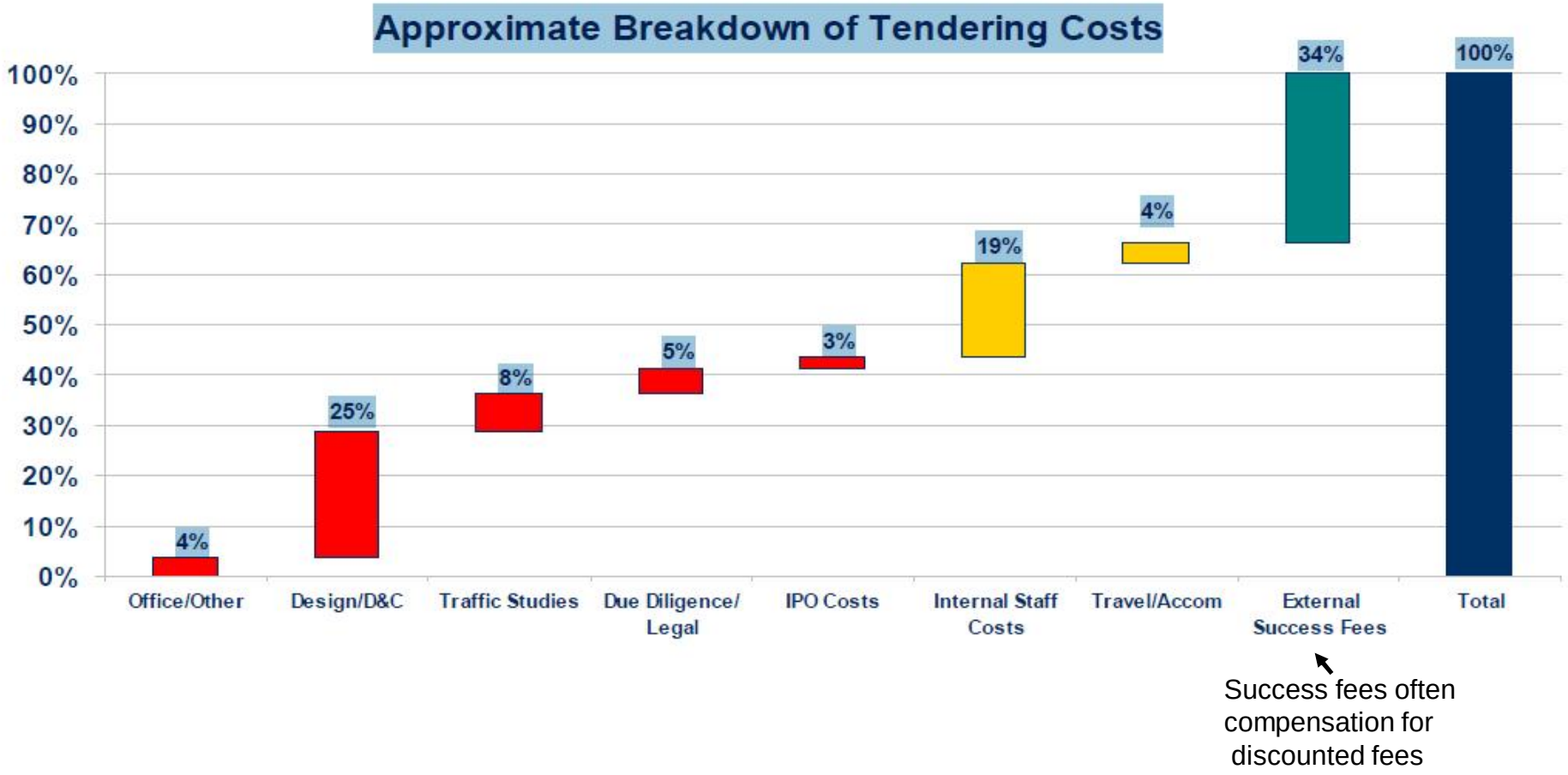
Modellers however do have areas where increased focus will be important

Modellers note:

- Some models don't make best use of feedback loops in strategic travel models
- Value of Time estimated via use of stated preference (SP) surveys
  - May need more traveller categories – increased market segmentation
  - May apply when travel is established - but at opening?
- Models can suffer from lack of base data – quantum and quality
- Unexpected changes can impact forecasts
  - network / land use / economic conditions
- In "some" cases - optimism may be encouraged, but not always!

"why would someone pay $5 million for traffic modelling if they did not want an accurate forecast?"

The traffic study component can be a significant proportion of tendering costs



Source: P Hicks Leighton Contractors
Presentation to Public Private Partnership conference July 2008

Strategic selection has not emerged as a key factor in case studies

- Little support for view that **systematic** "strategic selection" occurred in local cases

- Bids may "require" some optimism
  - Upper range population
  - Continuing economic growth

- Of Rob Bain's 21 selection mechanisms only a few were identified as occurring

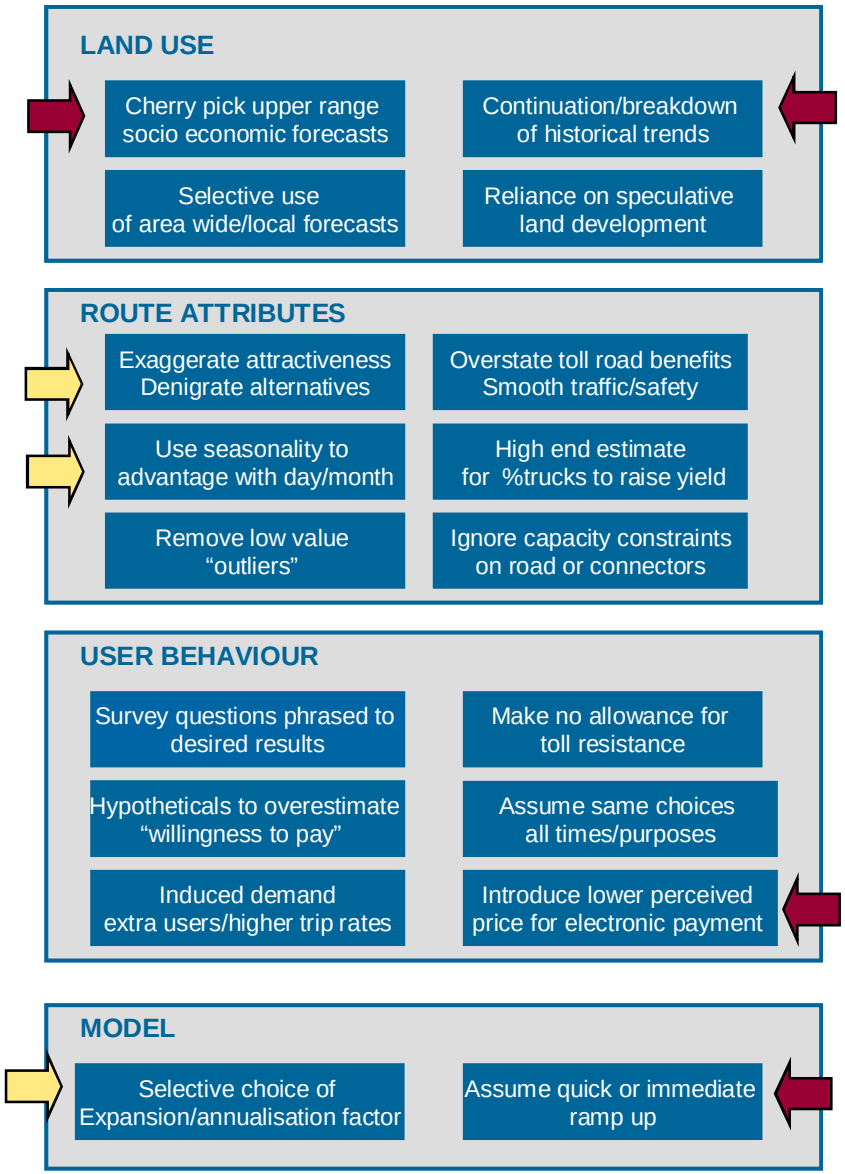
  - Selected intentionally 

  or

  - Optimistic choices in absence of data 

  Note: some local evidence that electronic payment does reduce perceived price

Using Dr Bain's very useful framework for consideration of choices we note some adoption of various selection 'approaches'



From our *work-to-date* a number of suggestions have emerged – and a degree of consensus

With respect to the Pre Tender phase:

- Better traffic models for business case (consideration of using Government models e.g. existing 4-step / strategic transport models STM, MITM, BSTM MM)
  - Models used for Environmental Impact Statements (EISs) not suited to the purpose
  -
- Detailed classified traffic counts over more than a year made available to bidders
  - Save significant traffic count costs
  - Improve expansion factors: peak-to-day, day-to-week, week-to-year: factors too high = forecasts too high
  - Assist more accurate commercial traffic revenue estimation

Even at the tender evaluation stage it is possible to "influence" outcomes in a positive way

Tender Evaluation

- Extend technical reviewers brief from method validation to:
  - Comment on inputs / parameters / outputs (and suggest different sources and / or treatments)
  - Comparison of forecasts between bids (can be up to 100% difference)

Lessons for the future are emerging from our work and these should be useful to Government and others

The case study investigation has shown:

- There are multiple causes of over-optimistic forecasts
  - thus there is no one simple remedy

BUT

- Measures exist for government before and during process to assist response via:
  - Improved information
  - Changes to the tender evaluation process

- Indicators of higher risk can be identified:
  - Could lead to traffic risk sharing options in such projects

Greater collaboration between government (sponsors) and the private sector needs to exist over the project life-cycle

General agreement that:

Greater collaboration between government and private sector:

Before

During

After

the tender process

Provides:

Better long term outcomes

One word of caution: Over-estimation had been increasing pre GFC:

- Need to be careful pendulum does not swing the other way

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THANK YOU!

COMMENTS?

QUESTIONS?

Special thanks to:
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