ECONOMICS

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Methodology

- Monetised Benefits and Costs Manual
- 2019 values of time
- 4% discount rate, 40-year evaluation period
- Sensitivity tests on evaluation period

Methodology

- Costs: as per previous estimates
- Road user impacts: AIMSUN model extracts
- Public transport benefit: MRCagney runtime model (physics-based, Monte Carlo model)
- Pedestrian benefits: interim guidance on Urban Amenity in Pedestrian Environments

Key assumptions – road user impacts

- AIMSUN total travel time for:
  - City centre area
  - Private vehicles (not trucks)
  - Weekdays (including offpeak), but not weekends
- No growth in vehicle demand over time
- No mode shift in the options
  - We expect mode shift impacts would have a significant effect on vehicle impacts in options 2/3

Key assumptions – public transport impacts

- MRCagney's public transport runtime model
  - Physics-based Monte Carlo model
  - Variability only from signalised intersections
- Weekdays, but not evenings or weekends
- Public transport demand grows at 1.6% per year, on average

Key assumptions – pedestrian impacts

- Demands from the *Beca Active Modes Model*
  - Currently some uncertainties around these demand estimates
- New Waka Kotahi guidance on pedestrians' willingness to pay for amenity improvements
- Weekdays, but not evenings or weekends
- Pedestrian demand grows at 1.6% per year, on average
- Benefits not yet included:
  - Reduction in adjacent traffic volumes
  - Widening crowded footpaths

Evaluation outcomes – present value impacts

Benefit	Option 1 ($m)	Option 2 ($m)	Option 3 ($m)	Comments
Car travel time impact	-$15 - -$13	-$86 - -$76	-$86 - -$76	• Expect mode shift impacts to **materially** reduce vehicle demand in options 2/3
Public transport travel time benefit	$25	$37	$30	• Variability in dwell times and from vehicle and other buses excluded
Public transport reliability benefit	$13	$21	$23	• Variability in dwell times and from vehicle and other buses excluded
Pedestrian realm benefits	$4.0 - $5.0	$4.0 - $14	$65 - $301	• Excludes value of reduced adjacent traffic volumes and widening crowded footpaths • Uses *'Beca'* demands
Pedestrian travel time benefits	$3.9 - $4.6	$7.2 - $8.9	$16 - $19	• Assumes pedestrian green phase is 12 seconds • Uses *'Beca'* demands
Total	***$31 - $36***	***-$17 - $5.0***	***$48 - $297***	

Evaluation outcomes – benefit-cost ratio

	Benefit	Option 1 ($m)	Option 2 ($m)	Option 3 ($m)
Costs	Total costs	$14 - $21	$20 - $31	$50 - $76
Include all benefits	Total benefits	$31 - $36	-$17 - $5	$48 - $297
	Benefit-cost ratio	1.5 - 2.5	-0.55 - 0.25	0.63 – 5.9
Exclude all traffic impacts	Total benefits	$46 - $48	$69 - $81	$134 - $373
	Benefit-cost ratio	2.2 – 3.3	2.3 – 4.0	1.8 – 7.5

Comments – main caveats

- Offpeak impacts for traffic are estimated, but for pedestrians and public transport are not
- Mode shift: Aimsun model is very sensitive to changes. Mode shift impacts, when modelled, are expected to have a significant effect on traffic impacts particularly in options 2/3
- ‘Mixing and matching’ of options on different sections could be significant
- Impact of adjacent vehicle traffic, loading zones and other buses have not been incorporated into the public transport impacts
- Pedestrian demands are being investigated
- Some pedestrian impacts have not yet been included

Comments

- Biggest uncertainties caused by:
  - Traffic impacts
  - Values of pedestrian realm benefits

WAKA KOTAHI
NZ TRANSPORT AGENCY

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Absolutely Positively
Wellington City Council
Me Heke Ki Pōneke