

**Submission
No 151**

**INQUIRY INTO IMPACT OF THE WESTERN HARBOUR
TUNNEL AND BEACHES LINK**

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Parliamentary Inquiry into the Impacts of the Western Harbour and Beaches Link Tunnel Projects

Submission from Terry le Roux: A Benefit Cost Analysis (BCA) of the Beaches Link Tunnel Project

This submission addresses two of the items in the Terms of Reference for the Parliamentary Inquiry – these are:

- (a) the adequacy of the business case for the project, including the cost benefits ratio,
- (g) the extent to which changes in population growth, work and travel patterns due to the Covid-19 pandemic have impacted on the original cost benefit ratio,

In addition, my submission addresses the following issue raised by the Chair of the Commission in the Media Release of 31 March 2021

'Furthermore, COVID-19 has changed people's work and travel patterns, even where people live. The committee is interested to find out whether the original cost benefit ratio remain current for the purpose of the project.', Mr Mookhey added.

1. Introduction:

I am a retired consulting techno-economist who has worked in the energy and petrochemicals industries in Australia, New Zealand, South Africa, SE Asia, the Middle East and in Europe. Part of my work was the preparation of BCAs of energy and infrastructure projects for government agencies.

This submission to the Parliamentary Inquiry is based on part of the submission of the Balgowlah Residents Group to the EIS for the Beaches Link Tunnel and Gore Hill Freeway Connection in February 2021. I undertook the BCA of the Beaches Link Tunnel Project as a member of the group of Balgowlah residents involved in the preparation of the submission to the EIS.

I am available to appear before the Inquiry.

2. Has a Benefit Cost Analysis (BCA) for the Beaches Link Tunnel has been prepared ?

From the Terms of Reference for this Inquiry and the following statement by the Chair of the Inquiry (see below), it can be assumed that TfNSW or Infrastructure NSW have undertaken and prepared both a (preliminary) business case for the Beaches Link Tunnel project – and the business case would include a Benefit Cost Analysis of the proposed project.

'Furthermore, COVID-19 has changed people's work and travel patterns, even where people live. The committee is interested to find out whether the original cost benefit ratio remain current for the purpose of the project.', Mr Mookhey added.

To my knowledge, the business case for the Beaches Link Tunnel and a Benefit Cost Analysis have not been made available to the public. It is of course possible that neither were prepared prior to the announcement by the government in 2017 that it was proposing to build the Beaches Link Tunnel project. I am of the view that government announced its intentions in 2017 to build the Beaches Link Tunnel and connect it to the WestConnex project via the proposed Western Harbour Tunnel without undertaking a Benefit Cost Analysis of the Beaches Link Tunnel project. In its haste to announce the Beaches Link Tunnel project ahead of the by-elections in North Shore and Manly in March 2017, the government shoe-horned the Beaches Link Tunnel project into the Western Harbour Tunnel project with the intention of treating the two projects as one project.

Later, a decision was made to “decouple” the Beaches Link Tunnel project from the Western Harbour Tunnel project – most probably because of the environment containment/mitigation (and the unknown costs) associated with the construction sites in the Flat Rock Creek, the Middle Harbour Crossing, the Widening of the Wakehurst Parkway and the lowering of the water table on Seaforth and North Balgowlah.

In May 2020, Infrastructure NSW released a summary of the business case for a stand-alone Western Harbour Tunnel – include the results of a Benefit Cost Analysis for the Western Harbour Tunnel. The following table is from the May 2020 report of Infrastructure NSW.

Table 1 – Outcomes of the analysis for the combined Western Harbour Tunnel (including Warringah Freeway Upgrade) Project

	Lower cost estimate	Upper cost estimate
NPV – using standard benefits (excluding WEBs + city-shaping + flow breakdown)	\$1,167 million	\$827 million
BCR – using standard benefits (excluding WEBs + city-shaping + flow breakdown)	1.3	1.2
NPV – using total benefits	\$2,789 million	\$2,449 million
BCR – using total benefits	1.7	1.6

According to the NSW Productivity Commission, a BCT of 1.6 – 1.7 is considered only “moderate” – see Table below from p.199 of the recently published Green Paper of the NSW Productivity Commission.

TABLE 6.3: TRANSLATING BCRS INTO RATINGS

Core BCR	BCR rating
0-1.0	Poor. The benefits of this project are not expected to outweigh the costs.
1-1.5	Low. The benefits of this project are estimated to be marginally higher than the costs, especially once the excess burden of raising the taxes is accounted for. Higher-value alternatives should be considered where possible.
1.5-2.0	Moderate
2.0-4.0	High
>4.0	Very high

It will be seen from the results of the Benefit Cost Analysis undertaken as part of the submission to the EIS for the Beaches Link Tunnel by the Balgowlah Residents Group that: even taking into account the Wider Economic Benefits (WEB), that the BCR of the proposed Beaches Link Tunnel project is less than 1.50.

3. Need for Early Scrutiny of Infrastructure Projects

Ross Gittins pointed out in an article in the SMH on 25 October 2020 (titled: *Budget's infrastructure spend more about sex appeal than jobs*):

In practice, many infrastructure projects aren't as useful and productivity-enhancing as they could be because they've been selected to meet political objectives, not economic ones.

Politicians favour big, flashy projects – preferably in one of their own party's electorates – that have plaques to unveil and ribbons to cut. It's surprising how many of these projects are announced during election campaigns.

An expert in this field, who keeps tabs on what the pollies get up to, is Marion Terrill, of the Grattan Institute. She notes that since 2016, governments have signed up to 29 projects, each worth \$500 million or more. But get this: only six of the 29 had business cases completed at the time the pollies made their commitment.

We in the community are very concerned that the DPIE will make a Determination on the EIS for the Beaches Link Tunnel without disclosing to the public the economic basis on which the decision is made. In the past, the business case for major infrastructure is not provided to the public, except after a decision is made by the cabinet on the project and then only in a highly-redacted form using the protection provided by commercial-in-confidence.

What is also of great concern to us is the statement made by Minister Andrew Constance in late 2019 that he wanted the contracts for the Beaches Link Tunnel signed before the next State election in March 2023. This is frightening because from experience, residents who

have experience in major infrastructure projects know it is very unwise and actually irresponsible to rush into contracts for complex high-cost projects.

Other examples have recently come to light that put into question the decision-making process of Minister Constance. This includes a seemingly unilateral decision to order TfNSW to plan clearing of trees to a width of 80 metres around state highways, and the subsequent termination of employment of Secretary of Transport Rodd Staples, after he alerted the department has limited power to enact it under law.

These examples undermine the public's confidence in the role and capability of the Minister for Transport in decision-making, and the overall planning process for the transport infrastructure of NSW.

We in we community are hoping (perhaps naively) that the DPIE will play a leadership role within the government to ensure that the decision on the Beaches Link Tunnel project is not rushed – and that any decision is based on sound and defensible assumptions. This project simply has too many uncertainties and potential long term problems for a decision on its Determination by the DPIE to be rushed. Further work needs to be on understanding the long term environmental damage and on whether the tunnel is really necessary.

The BCA I have undertaken will show that if TfNSW had adopted a more realistic approach to forecasting traffic demand in the northern beaches, the Benefit Cost Ratio falls – very substantially under certain assumptions.

4. What is a Benefit Cost Analysis (BCA) ?

A BCA is a process and a tool to analyse projects to determine if the estimated direct and indirect benefits of the project are more than the estimated direct and indirect of the cost of the project over (say) a 30 year period – using a discount rate of between 4% and 7%.

The benefits and costs are “seen from the perspective of the NSW economy” - and not necessarily from the perspective of one sector of the economy or from one geographic location (eg the Northern Beaches).

All benefits and costs are expressed in monetary (\$-value) terms – as the Present Value (PV) in the year the project is formally approved (or commenced). This requires cost and benefits in future years to be identified, valued and discounted - these includes indirect costs and benefits as well as externalities that arise from the project.

The output of a BCA is the Benefit Cost Ratio (BCR) – which is: Benefits/Costs. The BCR is a numerical expression of the "cost-effectiveness" of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, though according to the Productivity Commission of NSW a risk-adjusted BCR greater than 1.50 is desirable.

While the resultant BCR is a useful metric, the process of estimating/quantifying the benefits and costs and sensitising the resultant BCR to a range of values for the assumptions used in the BCA provides useful insight into the project's risks.

5. The Major Benefits in the BCA for the Beaches Link Tunnel Project

The major direct and indirect benefits that need to be accounted for in the BCA are:

Journey Time Saved:

• *By users of the Beaches Link Tunnel:*

- 30 minutes per trip to the junction with the Warringah Freeway – deteriorating at 0.8%/year due to growing congestion
- Valued at \$25/hour for private vehicles and \$50/hour for commercial vehicles – in 2017. The value increases at the rate of CPI. This is the \$-value of time used in the WestConnex BCA.
- Commercial vehicles are assumed to be 10% of all vehicles travelling.
- 1.27 occupants per vehicle.
- The number of users using the Tunnel is contained in Attachment 9.

• *By drivers who avoid using the Beaches Link Tunnel and choose an alternate route.*

- The following alternate routes for avoiding the Tunnel are:
 - Spit Bridge
 - Roseville Bridge
 - Mona Vale Road
- Journey saving times for these routes are assumed to be:
 - Spit Bridge: 10 mins
 - Roseville Bridge: 8 mins
 - Mona Vale Road: less than 5 mins.

This is because only 10% of the current users of Mona Vale Road would choose to use the Tunnel. This small reduction in time is considered too small to have any impact – and will be assumed to be zero.

- Journey time saved is assumed to deteriorate at 0.8%/year due to congestion
- 1.27 occupants per private vehicle
- Valued at \$25/hour for private vehicles and \$50/hour for commercial vehicles – in 2017. The value increases at the rate of CPI.

• *By drivers in Mosman who will benefit from the reduction in traffic along Military Road :*

- The average savings for these vehicles is assumed to be 6 minutes per trip – constant through the period of analysis.
- Valued at \$25/hour for private. The value increases at the rate of CPI.
 - Valued at \$25/hour for private vehicles and \$50/hour for commercial vehicles – in 2017. The value increases at the rate of CPI.

- **By “new users” through what is known as “induced demand”:**

These are new users who would not have made the journey from or to the Northern Beaches if there was no Beaches Link Tunnel. This would apply (for example) to vehicles coming to the Northern Beaches over weekends during the summer months – and would be additional to the weekend visitors that are included in the traffic forecasts based on historic vehicle flows.

Unlike all other toll-tunnels in Sydney, there is not much potential for induced demand as the Beaches Link Tunnel comes to a dead-end in the northern beaches peninsula. A reasonable proxy for the induced demand is the forecast additional traffic into and out of the northern beaches on weekends in the summer.

The induced demand is assumed for the purpose of modelling, is assumed to be:

- Induced Demand over weekends: For 26 weekends / year
- 10,000 – 40,000 vehicles per weekend – 2 occupants per vehicle
- Time saving and value to time saved as for weekday drivers.
- No commercial vehicles assumed in the model.

Network Benefits:

These are benefits to the overall transport network system that is closely linked with the Beaches Link Tunnel. With projects like the M2, M7 and other toll road projects, the Network Benefits were estimated to be between 50% and 100% of the direct benefits from travel time savings by users of these toll roads.

This is unlikely to be the case with the Beaches Link Tunnel because projects like the M2 and M7 are links in the sense that they allow vehicles to move “through them”. The Beaches Link Tunnel does not link one road system with another – it allows vehicles to leave the Northern Beaches or to enter the northern beaches (virtually a dead-end).

The major beneficiaries of the Beaches Link Tunnel will be the users of the Tunnel.

It could be assumed that the time savings for residents in Mosman, Cremorne and Neutral Bay (included above in Journey Time Saved) could be classified as the primary Network Benefits.

Wider Economic Benefits:

- Essentially these are benefits like:
 - ***increased investment in economic activities that will only take place if the Beaches Link Tunnel is built:*** These would include:
 - construction of new homes and apartment buildings – because of the greater ease of transport into and out of the Northern Beaches. *Note: These new dwellings are additional to the natural increase in new dwelling construction that the Northern Beaches Council is assuming in its recently adopted*

Northern Beaches Housing Strategy (Feb 2021). In addition, it needs to be assumed that these additional dwellings would not have been built outside the northern beaches even if the Beaches Link Tunnel was built.

500 new dwellings (or house-equivalent in apartment buildings or townhouse complexes) – to be built after completion of the tunnel. These houses or house-equivalents are additional to the additional housing mentioned in the Northern Beaches Housing Strategy (Feb 2021) because the additional housing identified in this document are meant to be built irrespective of whether the Beaches Link Tunnel is built or not:

- Economic value of each dwelling is assumed to be \$500,000 (in 2019 \$) – to escalate at 3% per year.
 - construction by the State government of community facilities like schools because of the increase in population consequent on an increase in population in the Northern Beaches that can be ascribed to the easier access into and out of the Northern Beaches. None are assumed in the model.
- **Ongoing increased expenditure in the northern beaches following on from:**
 - The increase in population following the additional new dwellings built in the northern beaches – accepting that these new dwellings would not have been built in NSW without the Beaches Link Tunnel. This expenditure has not been modelled.
 - The increased traffic from the Induced Demand – ie visitors coming to the northern beaches during the summer months. This expenditure has not been modelled.

Environmental and Health:

- The major environmental benefit is the reduction in tail-pipe emissions (particulates, sulphur oxides, nitrous oxides and others) due to the reduction in congestion along the existing arterial roads out of the Northern Beaches.
- A reduction in the amount of CO2 emitted by vehicles.

Reduction in Vehicle Operating and Maintenance Costs:

- For all vehicles that have a reduction in time travelled, there will be a reduction in operating costs (eg fuel and servicing costs)

Reduction in Accidents:

- The EIS contains details of the number of accidents on the feeder roads for the Beaches Link Tunnel.

6. The Major Costs in the BCA for the Beaches Link Tunnel Project

The major direct and indirect (ie externality) costs of the Beaches Link Tunnel Project are:

Construction Costs directly linked to the Beaches Link Tunnel:

These are all the construction costs directly linked to the Beaches Link Tunnel and its integration with rest of the road network system – this includes:

- The tunnel and roads that connect the tunnel to the Warringah Expressway, the Western Harbour Tunnel, the Gore Hill Freeway and the Wakehurst Parkway – this includes the submersible tubes for the Middle Harbour Crossing from Castlecrag to Seaforth;
- Feeder roads to allow local roads to connect with entrances to and exits from the Beaches Link Tunnel – including a Link Road through the Balgowlah Golf Course;
- Operation and refurbishment of all dive sites – including the re-purposing of the Balgowlah Golf Course into a Recreational Precinct;
- A construction cost contingency;
- The construction cost is assumed to be \$10 billion in 2017 (in 2017\$). Additional assumptions are:
 - 4% capital cost escalation factor for a \$2017 capital cost estimate,
 - 8 year build – start in 2023,
 - 10% contingency included in the capital cost estimate.

Council-funded Community Infrastructure Costs:

These are all the construction costs that will need to be provided by the Northern Beaches Council – and funded by council ratepayers. These will include:

- Additional parking facilities at the beaches in the northern beaches that will be visited over weekends in the summer by the anticipated 40,000 + vehicles that can be expected to drive to the beaches in the summer – see Induced Demand,
- Upgrades to the local roads and community spaces following the 500 new dwellings per year that are assumed to be built as a consequence of the Wider Economic Benefits.

This additional expenditure has not be included in the BCA Model.

Environmental Costs – during construction:

Note on estimating environmental costs: The EIS provides no estimates of the cost to the environment of the consequences of the construction activities. TfNSW states in many parts of the EIS that “there will be best practice” “every precaution will be taken” “contractors will be required to follow all proper legislation and regulations” “caution commensurate with what is technically and economically feasible”. The approach taken in the BCA model on the environmental costs is:

Because we do not know what the cost is, a provision for the cost will be made. The quantum of the provision can be the subject of debate, but there should be no doubt that there will be a cost – and this needs to be acknowledged.

I will be shown in the BCA model that the provisions used for each of the identified environmental costs do not have any material impact on the Benefit Cost Ratio – for the range of assumptions used to estimate the benefits and non-environmental costs.

- ***Middle Harbour crossing*** – from dredging and the erection and operation of the coffer dams in the waters off Castlecrag and Seaforth: The water depth in this part of Middle Harbour is 18 fathoms – the second deepest part of Sydney Harbour. Water turbidity and associated damage from the construction and approximately 4 year dewatering operation of the coffer dams will result in environmental damage.
- ***Reduction in groundwater flows into the Burnt Bridge Creek*** – from the removal of groundwater into the unlined tunnels from the Middle Harbour Crossing to the portals in North Seaforth and in Balgowlah. The loss of groundwater will result in the water table in Seaforth and North Balgowlah to fall - and according to the EIS, the natural groundwater flows into the Burnt Bridge Creek will fall by 96%. This means this much-loved creek will become an open stormwater drain with downstream impacts all the way to Manly Lagoon and Manly Beach. In the beautiful and unique Burnt Bridge Creek in North Balgowlah and Balgowlah there will be loss of wildlife and large canopy trees. Finding options to limit the loss of groundwater is complex and expensive - and the final cost is not known
- ***Removal of trees and the dumping of tunnel spoil on the Balgowlah Golf Course:***
As the Balgowlah Golf Course will be used as a dump and construction site for the Balgowlah entrance to the Tunnel, it is assumed 300+ trees and the on-course pond will be removed. The environmental damage to the fauna and flora of the construction activity and the building of playing fields, roads, parking lots and recreational buildings will result in the death of much of the wild life that is currently reliant on the vegetation and the wildlife corridor to the Burnt Bridge Creek watercourse.

- ***Dive and Construction Site Activity and Tree removal in Artarmon and Cammeray:***
The environmental damage to the fauna and flora of the construction activity will be significant.
- ***Widening of the Wakehurst Parkway:*** The construction of the dual carriageway from the North Seaforth Entrance to the Tunnel to Warringah Road will result in parts of the Garigal National Park (west of the Wakehurst Parkway) and the Manly Warringah War Memorial State Park (Manly Dam) to be damaged and have bushland vegetation removed for the road. The environmental damage to the fauna and flora of the construction activity related to the widening of the Wakehurst parkway will be substantial.
- ***Flat Rock Creek:*** The dive site at this location is on an old tip. It is acknowledged in the EIS that there is the potential for a number of toxins to be released and leached out from the excavation activities – these will be carried down the valley to Tunks Park and into Middle Harbour. The potential damage is documented in the Submission of the Save Flat Rock Community Group.

Disruption Costs – during construction:

- During the 7-8 year construction period, there is increased traffic congestion. The disruption to local traffic trying to access the major routes or simply driving around the neighbourhood as a consequence of construction activities. These can be estimated by assuming how much extra time drivers will spend in their cars – compared with the time spent before the construction commenced. The following areas will experience disruption for much of the construction period:
 - Artarmon/Cammeray – local roads
 - Burnt Bridge Creek Deviation and Manly Vale
 - Seaforth and North Seaforth – local roads

Property Acquisitions:

- Balgowlah – Dudley Street properties: In the BCA Model, these costs are included as part of the estimate for the construction costs for the project.

Tunnel Operating and Maintenance Costs:

- These costs are on-going throughout the life of the Tunnel.
- It has been assumed that these costs are based on a % of the capital cost of the tunnel-only component of the overall cost – 0.5% of the tunnel-only capital cost has been used in the model.

Environment and Health Costs – After Construction Completed:

- ***Increase in Cancers from an Increase in Levels of PMs close to the Ventilation Stacks***
 - The concentration of air-pollutants (particularly small diameter particulates) around the Exhaust Emission Stacks in Balgowlah, North Seaforth, Cammeray and Artarmon will lead to additional deaths from cancer. This is despite the drop in the total quantum of air particulates emitted into the atmosphere from the vehicles using the Tunnel. While the advice provided by the Chief Scientist and the Chief Medical Officer that the ground-level concentration of particulates are within the acceptable levels determined by the WHO, there is no guarantee that there will be events (eg plume wash during inversion and during high smoke levels from bush fires in the Sydney Basin) that will not lead to spikes in the concentration of small diameter particulates that could lead to deaths.
- ***Groundwater Loss in Seaforth and North Balgowlah***
 - After completion of the tunnel, groundwater levels in the whole of Seaforth and parts of North Balgowlah will fall – leading to a number of structural issues for some residences and the death of trees in the area. The EIS does not attempt to quantify these potential losses, but in the BCA a provision for the loss has been included in the model.
- ***Biodiversity Loss and Fall in Water Quality in Manly Dam (including the cost of biodiversity off-sets)***
 - Even after the damage done to the bushland in Garigal National Park and the Manly Dam War Memorial Park during the widening of the Wakehurst Parkway, there will be ongoing problems for the bushland because of the changes to the landscape and the reduction in important vegetation.
 - It needs to be acknowledged and accepted estimating the cost of biodiversity off-sets at this early stage of evaluating the project is fraught with uncertainties AND the cost of the off-sets could be very high. The current debate around the cost of the biodiversity and cultural heritage off-sets for the proposed project to raise the wall of Warragamba Dam is a good example of how expensive biodiversity and cultural offsets can be.
- **Sunk Costs:** These costs include all the activities necessary to develop the Project Description for Consulting with the Community and preparing the EIS – eg geotechnical work, consulting reports, base case air monitoring, traffic modelling, etc. These costs are not included in a BCA.

7. The Benefit Cost Ratio (BCR)

7.1 Using Traffic Modelling Forecasts of TfNSW

Using the traffic forecasts for 2037 and the time saving for users of the tunnel, the NPV of the total benefits (using a discount rate of 4%) is approx. \$19 billion.

The key assumptions in the TfNSW's traffic forecasts of relevance in the determination of the benefits are:

- Traffic flows along the feeder roads in the northern beaches are expected to grow at 0.7% per year from 2017 until the completion of the project in 2030 and then at 1.5% per year from 2031.
- The time savings for journeys from a point before the tunnel entrance to where the tunnel joins the Gore Hill Expressway is 30 minutes – deteriorating at 0.8% per year from 2031.
- A range of time-saving assumptions for drivers avoiding the tunnel and using the feeder roads have been made in the model.

Assumes No Adoption of WFH	
Benefits:	\$ Mill
Time Saved for:	
Users of the Tunnel	6,111
Avoiders of the Tunnel	4,200
Residents in Mosman and Cremorne	474
Induced Demand	1,194
Total	11,978
Wider Economic Benefits	
Environmental	89
Reduction in Car Operating Costs	147
Reduced Accidents	50
Wider Health Benefits	50
Total Benefits	19,055

The NPV of the costs (using the same discount rate) is \$15 billion – resulting in a Benefit Cost Ratio of 1.24.

If a discount rate of 7% is used (the rate recommended by Treasury for Benefit Cost Analyses for State infrastructure projects, the Benefit Cost Ratio drops to 0.80.

Costs:	\$ Mill
Construction of Tunnel	13,517
Tunnel Operating Costs	1,076
Delays during construction	272
Environmental:	
During Construction	226
Post Construction	238
Total	465
Health	8
Total Costs	15,337

7.2 Recognising the Adoption of WFH by Residents in the Northern Beaches

The adoption of WFH in a post-Covid world, will result in fewer residents driving to work in private vehicles and via public transport. The move to WFH has started. If the tunnel is built, the challenges facing northern beaches residents trying to avoid the traffic congestion and chaos around the tunnel entrances in the Burnt Bridge Creek Deviation, in Sydney Road opposite Balgowlah Boys High School, and on Wakehurst Parkway Seaforth will most certainly accelerate the adoption of WFH by residents in the northern beaches.

In the BCA Model, the impact the move to WFH is done by changing the following assumptions:

- For the period 2024 – 2030, the traffic along the feeder roads falls by 5% per year, but from 2031 it starts to increase by 1.5% per year. This represents a reduction in

the average daily traffic over (for example) Spit Bridge of 20,000 vehicles per day from 2023 to 2030.

- The time savings for both users of the tunnel and the avoiders of the tunnel will be 80% of the time assumed for the TfNSW Traffic Forecast.

Assumes Adoption of WFH			
Benefits:	\$ Mill	Costs:	\$ Mill
Time Saved for:		Construction of Tunnel	13,517
Users of the Tunnel	3,251	Tunnel Operating Costs	1,076
Avoiders of the Tunnel	2,793	Delays during construction	272
Residents in Mosman and Cremorne	474	Environmental:	
Induced Demand	955	During Costruction	226
Total	7,473	Post Construction	238
Wider Economic Benefits	6,741	Total	465
Environmental	223	Health	8
Reduction in Car Operating Costs	89	Total Costs	15,337
Reduced Accidents	50		
Wider Health Benefits	50		
Total Benefits	14,626		

It can be seen that the costs remain at \$15 billion, but the benefit fall to \$15 billion.

Using a discount rate of 4%, the Benefit Cost Ratio is 0.95 – representing a reduction from 1.25. If a discount rate of 7% was used, the Benefit Cost Ratio is 0.61.

7.3 Summary of BCR for a Stand-Alone BCA of the Beaches Link Tunnel

Using the assumptions on capital costs, time-saving benefits from users of the tunnel and other issues/items of relevance to a BCA set out in Sections 5 and 6 above, the following table summarises the NPV (using a discount rate of 7%) of the Benefits, the Costs and the BCR from the BCA – for the two sets of assumptions on the future traffic volumes expected from the northern beaches into use the tunnel.

The table does not include a risk or sensitivity analysis based on different assumptions on capital and operating costs, actual time-savings and the mitigation of environmental risks from those assumptions stated in Sections 5 and 6 above. It can be assumed that the final cost will be different from those given in Sections 5 and 6. Based on the track record of TfNSW, the final costs will be much higher than those assumed in the estimation of the BCR in the table below.

	Using TfNSW Traffic Volume Forecasts	Traffic Volume Forecasts Adjusted for Adoption of WFH in the northern beaches
	\$ bn	\$ bn
NPV of Benefits:		
Including WEB	19.1	14.6
Excluding WEB	12.4	9.9
NPV of Costs	15.3	15.3
Benefit Cost Ratio (BCR)		
Including WEB	1.2	1.0
Excluding WEB	0.8	0.6
WEB = Wider Economic Benefits		

7.4 What is an Acceptable BCR for an Infrastructure Project ?

The discussion above has shown that the BCR for a stand-alone Beaches Link Tunnel (using a discount rate of 7%) is consistently below 1.5 for the range of assumptions on future traffic use that has been assumed in the model. If higher costs for the construction of the tunnel and the connection with the Gore Hill Freeway and higher costs for mitigating the environmental damage, the BCR will be less.

Even if the discount rate was reduced to 4%, the BCR would be consistently less than 1.60.

The following table is taken from the May 2021 Green Paper of the NSW Productivity Commission. It can be seen that the Productivity Commission is of the view that a BCR in the range of 1.50 – 2.00 is considered *Moderate* and a BCR less than 1.50 is either poor or (if under 1.0) unacceptable.

TABLE 6.3: TRANSLATING BCRS INTO RATINGS

Core BCR	BCR rating
0-1.0	Poor. The benefits of this project are not expected to outweigh the costs.
1-1.5	Low. The benefits of this project are estimated to be marginally higher than the costs, especially once the excess burden of raising the taxes is accounted for. Higher-value alternatives should be considered where possible.
1.5-2.0	Moderate
2.0-4.0	High
>4.0	Very high

8. Discussion of the Economic Benefits Ascribed to the Beaches Link Tunnel

Using the quantified benefits from Section 5 of this submission (repeated in the following table), a number of interesting observations can be made:

Assumes No Adoption of WFH			
Benefits:	\$ Mill	% of Tot	For NB
Time Saved for:		Benefits	Residents
Users of the Tunnel	6,111	32%	32%
Avoiders of the Tunnel	4,200	22%	22%
Residents in Mosman and Cremorne	474	2%	
Induced Demand	1,194	6%	
Total	11,978	63%	
Wider Economic Benefits	6,741	35%	
Environmental	89		
Reduction in Car Operating Costs	147		
Reduced Accidents	50		
Wider Health Benefits	50		
Total Benefits	19,055		

- About half of the total for estimated benefits apply to the residents of the northern beaches. More than 40% of the benefits go to people and corporations who do not necessarily reside in the northern beaches. The Beaches Link Tunnel has been “sold”

to the residents of the northern beaches residents on the basis that they will benefit from the time saved in travelling to the city and beyond. The reality is different.

- The wider economic benefits (from 500 additional houses or house-equivalents per year) account for 35% of the benefits. Both of these are beneficial for the State of NSW – and this demonstrates why many residents are justified in their conviction that the real reason for the government rushing a review of the EIS is to sign the contracts for the Beaches Link Tunnel before the march 2023 State Election.
- The residents of the Northern Beaches were never told explicitly by the Government that without the extra residences being built in the Northern Beaches and the increase in visitors to the Northern Beaches over weekends, the Benefit Cost Ratio for the Beaches Link Tunnel will be significantly less than 1.0. Instead, residents have been told by elected representatives that the Beaches Link Tunnel was “catch-up infrastructure” with no mention of necessary development.
- Both of these “benefits” (Induced Demand from weekend visitors to the northern beaches and the construction of 500 new residences per year) will place strain on the infrastructure in the northern beaches and reduce the amenity of local residents. Currently, parking in the beachside suburbs in the Northern Beaches over weekends in the summer is problematic. Having the tunnel will result in many more people driving to the Northern Beaches – which is their prerogative. However, the impact on the amenity of local residents will be very significant.

9. Conclusions

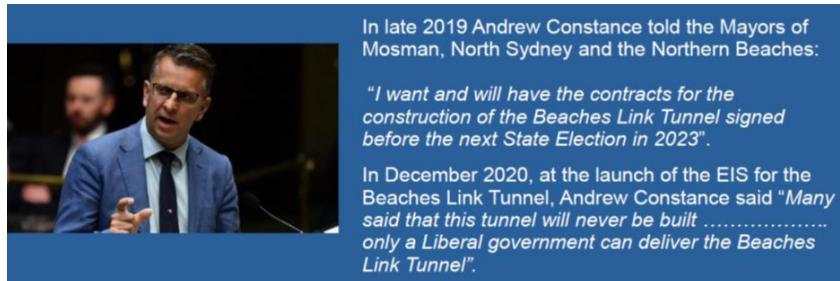
The community believes that by undertaking the analysis, we have demonstrated that TfNSW has deliberately overstated the benefits of the Beaches Link Tunnel by refusing to accept that future traffic flows from residents in the northern beaches will be less because of the adoption of WFH following the forced introduction of Covid Restrictions in 2020.

The BCA also shows the overwhelming level of risk associated with the project - if traffic volumes are overestimated, if development is rejected and benefits not realised, or if cost blow-outs occur in construction or due to environmental damage caused by the project needing to be remediated. It reveals at this early stage that the project has ever decreasing benefits, unknown environmental costs, and with overall no net benefits to the local community or even the wider NSW economy.

Up to 40% of the benefits identified in the BCA (eg increased traffic coming to the northern beaches and the additional housing development) are not a benefit for the residents on the northern beaches.

The estimated Benefit Cost Ratio for the Beaches Link Tunnel Project is less than the 1.50 considered a minimum for infrastructure projects by the Productivity Commission.

Finally, Andrew Constance the Minister for Transport has said on multiple occasions that he wants the government to sign contracts for the construction of the Beaches Link Tunnel before the next State Election in March 2023. It is obvious that at this early stage of its evaluation that there are massive risks that have not been fully identified or quantified. It is therefore very unwise for the DPIE to make a determination on the EIS without these risks being fully and properly identified.



10. Issues for the Parliamentary Inquiry to Pursue

- Request the Secretary for the Transport for NSW to provide the initial Business Case and Benefit Cost Analysis undertaken by Infrastructure NSW (and provided to the Risk and Audit Committee of the RMS) prior to the announcement by the government in 2017 that it was proposing to build.
- Have a Benefit Cost Assessment of the Beaches Link Tunnel project prepared by an organisation or consulting company independent of TfNSW or any of the companies that have undertaken work for the TfNSW as part of the preparation of the EIS for the Beaches Link Tunnel. This analysis should also include an assessment of the risk factors that could have an impact on the estimated Benefit Cost Ratio.

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