

Submission
No 482

INQUIRY INTO IMPACT OF THE WESTERN HARBOUR TUNNEL AND BEACHES LINK

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NSW Government submission

Legislative Council Public Works Committee

Inquiry into the impact of the Western Harbour
Tunnel and Beaches Link

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Introduction

By 2056, NSW will have more than 12 million residents and Sydney will become a global city of eight million people, similar in size to London or New York. The NSW Government's *Future Transport 2056* is an overarching strategy supported by a suite of plans to achieve a 40 year vision for our transport system. Effectively, the NSW Government's vision for Sydney is one of an integrated road and public transport network that has higher capacity and gives everyone the freedom to choose how and when they get around, no matter where they live and work.

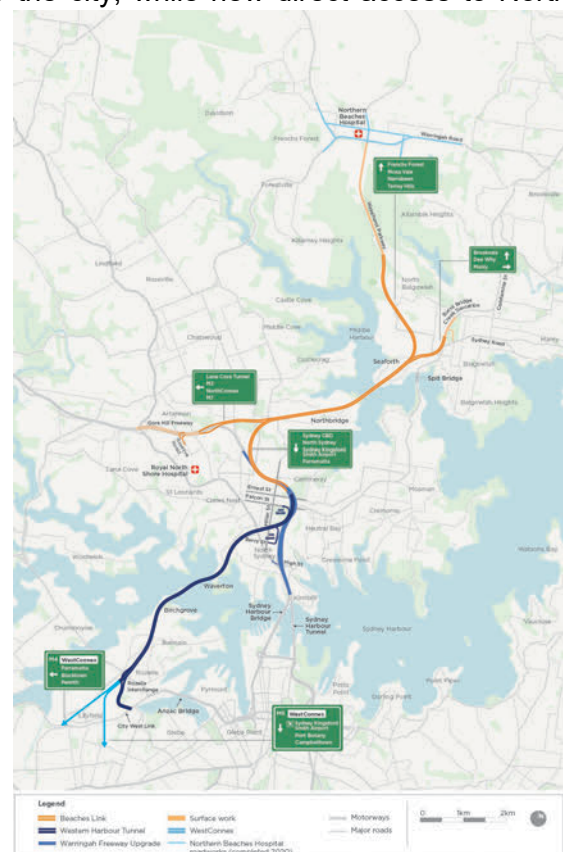
As part of the Movement and Place Framework outlined in *Future Transport 2056*, motorways are identified as strategically significant roads that move people quickly and efficiently. That is why the NSW Government is investing in Sydney's road infrastructure and closing gaps in the motorway network. This investment in motorways will result in thousands of cars and trucks being removed daily from local roads – returning these roads to local communities for local use – reducing congestion and improving safety. Motorways also facilitate the use of public transport – either directly by bus, or by freeing up capacity for public transport on local roads, or by connecting people more easily and efficiently to public transport hubs.

The **Western Harbour Tunnel and Beaches Link Program** (the Program) is part of this integrated transport plan to keep Sydney moving by easing congestion, improving travel times, creating jobs and connecting communities. The project was a recommendation in the 20 year NSW State Infrastructure Strategy, released in 2012 and updated in 2018. Considered the missing link in the motorway network, the Program is more than that, providing opportunities to significantly improve public transport journeys and support up 15,000 full-time equivalent jobs during its construction. The program consists of three projects: Warringah Freeway Upgrade; Western Harbour Tunnel, and Beaches Link.

The Warringah Freeway Upgrade will allow for the connection of the Western Harbour Tunnel and Beaches Link, integrating them with the broader transport network. A dedicated continuous southbound bus lane will improve bus journeys to the city, while new direct access to North Sydney will provide for buses to interconnect with the Sydney Metro Victoria Cross Station (opening in 2024) and Sydney Trains.

The Western Harbour Tunnel will change how customers travel across Sydney Harbour, which will be a game changer for our city. It will take pressure off the Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge and Western Distributor, reducing travel times for bus, freight and private vehicle trips, while offering customers more direct bus routes between the Inner West and North Sydney.

Beaches Link will provide a motorway connection from the existing motorway network to the Northern Beaches, taking pressure off the Spit Bridge, Military Road and Warringah Road. It will provide for more efficient public transport with opportunities for new express bus services to key centres, including Macquarie Park, North Sydney and the Sydney CBD, as well as providing faster and more reliable bus trips on existing surface roads, such as Military Road and Warringah Road.



Response to the Terms of Reference

a) The adequacy of the business case for the project, including the cost benefits ratio

Final Business Cases are developed for all major infrastructure projects to support Government investment decisions. Infrastructure NSW provides independent assurance on all Final Business Cases and regular monitoring of project progress to Government.

Business Case for the Western Harbour Tunnel and Beaches Link Program

The Program has been developed, consistent with objectives in the *Future Transport 2056* strategy¹, to address congestion, improve access by public transport to jobs and services and improve freight access in the Eastern Harbour City.

Following the recommendation in the 20-year Infrastructure NSW State Infrastructure Strategy, Transport for NSW developed a Final Business Case for the Program in 2016 based on a concept design. Further work followed in 2017 to investigate the technical and environmental aspects of the Program, engage the community and the market, and develop a reference design. An economic cost-benefit analysis was undertaken in accordance with NSW Treasury guidelines. This additional level of detail augmented the Final Business Case.

Throughout 2018, Transport for NSW undertook extensive community and stakeholder engagement on the Program. This resulted in an Updated Reference Design that incorporates a series of design refinements informed by community and stakeholder consultation, value engineering and detailed planning on construction staging. The core alignment, connectivity and functionality are retained as per the Final Business Case for the Program.

The Program is a major transport infrastructure program that will make it easier, faster and safer to get around Sydney. As Sydney continues to grow, faster and more reliable trips are essential to reducing congestion and providing new levels of access to jobs, recreation, and services such as schools and hospitals. By creating a western bypass of the Sydney CBD, the Western Harbour Tunnel will take pressure off the congested Sydney Harbour Bridge, Sydney Harbour Tunnel and Anzac Bridge; while Beaches Link will create an alternative to the Military Road and Warringah Road corridors to relieve traffic pressure on the North Shore.

The Program has been designed as part of an integrated transport network, with a focus on new public transport connections and improved journey times and reliability for buses. The Western Harbour Tunnel will integrate with public transport and boost reliability for cross-harbour bus trips, creating new options for express bus services between the Inner West and Lower North Shore and beyond. Congestion will be eased on some of the city's busiest corridors like the Anzac Bridge, Western Distributor and the Sydney Harbour Bridge, improving travel times and reliability for bus customers. Beaches Link will improve B-Line services between the Sydney CBD, North Shore and the Northern Beaches, accommodate new express bus service routes, and provide for a fast and efficient bus interchange with Sydney Metro at North Sydney.

In May 2020, Infrastructure NSW published the Western Harbour Tunnel and Warringah Freeway Upgrade Final Business Case Summary, which independently evaluated the

¹ <https://future.transport.nsw.gov.au/future-transport-strategy>

Program’s anticipated economic and social benefits.² This summary stated the Program is of ‘strategic importance’ for our State, with an average of around 4.3 million trips made across Sydney Harbour each week. As noted on page 10 of the Final Business Case Summary, the Program is expected to produce transport, productivity and city-shaping benefits:

- Transport benefits will result from reduced travel time and better reliability, for all road users travelling between the Northern Beaches and other parts of Sydney, and on key corridors around the Sydney CBD, including the Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge and Western Distributor.
- Productivity benefits will result from employment growth and increased productivity by better connectivity between the Northern Beaches and strategic centres around the Sydney CBD and Greater Sydney.
- City-shaping benefits will result from improving the amenity of Sydney CBD and Military Road and enabling key centres of the Northern Beaches to be renewed by removing through traffic.

This city-shaping piece of infrastructure will deliver a vital boost to the NSW economy, with the Program expected to support around 15,000 full time equivalent jobs during construction. The Program will support faster and more reliable travel times for journeys between the Northern Beaches region and key centres south and west of Sydney Harbour. For example, journeys from Dee Why to Sydney Airport are expected to be 56 minutes faster (total travel time 39 minutes) in the AM peak by 2037 (via the proposed Beaches Link, Western Harbour Tunnel, WestConnex and Sydney Gateway).

Furthermore, travel times will be reduced by up to 20 minutes from Sydney Olympic Park to North Sydney, 20 minutes from Leichhardt to North Sydney or up to 15 minutes from North Sydney to Sydney Kingsford Smith Airport.

Other key journey time improvements in the AM peak as a result of the program of works are shown in Figure 3-8³.

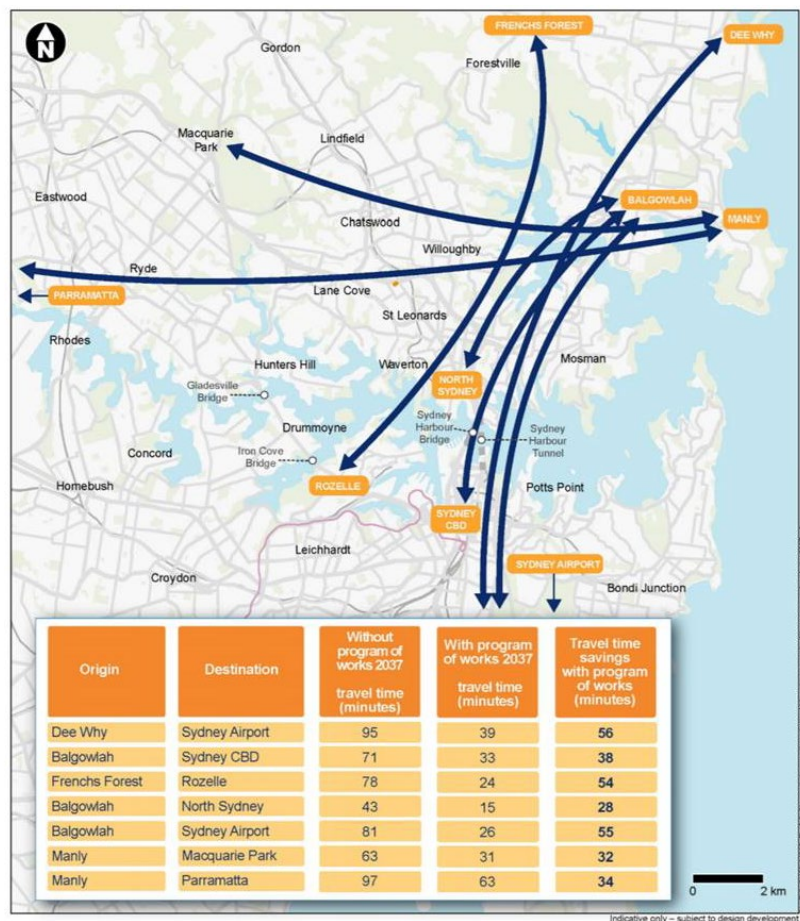


Figure 3-8 Change in journey times in the AM peak as a result of the program of works by 2037

² https://www.infrastructure.nsw.gov.au/media/2528/western-harbour-tunnel_bc-summary-may-2020.pdf

³ Page 18 of Chapter 3 of [the Beaches Link EIS](#)

To better manage the current pipeline of initiatives going into operation, construction timing of projects within the Program will be staged, noting that in part, they will overlap. As a result:

- The Warringah Freeway Upgrade will be delivered as the first project as part of the Program so connections to the existing network are available for the Western Harbour Tunnel and the future Beaches Link projects.
- The Western Harbour Tunnel project will be delivered second to address the capacity constraints of the existing cross-harbour network.
- The Beaches Link project is planned to be completed once cross-harbour network resilience has been improved through the completion of the Western Harbour Tunnel.

Final Business Case for the Western Harbour Tunnel and Warringah Freeway Upgrade

Since the Program was announced in 2017, the NSW Government has listened to thousands of people, shared updated plans with local communities, and taken the feedback on board through a number of design refinements. In addition, a detailed Environmental Impact Statement (EIS) for Western Harbour Tunnel and Warringah Freeway Upgrade was placed on public exhibition in January 2020. The EIS reflects the significant efforts made by the NSW Government to understand how the Program can balance the strategic objectives of the project, community impacts and environmental impacts. The EIS presents an assessment of these impacts and measures to manage or mitigate them.

As presented on page 12 of the Infrastructure NSW Final Business Case Summary, the Benefit Cost Ratio was estimated at between 1.2 and 1.3 when only transport benefits are included, and between 1.6 and 1.7 when all benefits (including wider economic benefits, city-shaping benefits and flow breakdown benefits) are included. Some of the key benefits of these projects are outlined below.

Reducing travel times and improving surface roads

Extending the underground motorway network to address capacity, efficiency and reliability issues on critical road corridors will not only provide faster, more efficient and reliable journeys for users, it will also deliver much broader benefits through reduced congestion on existing surface networks (see Figure 3-9).

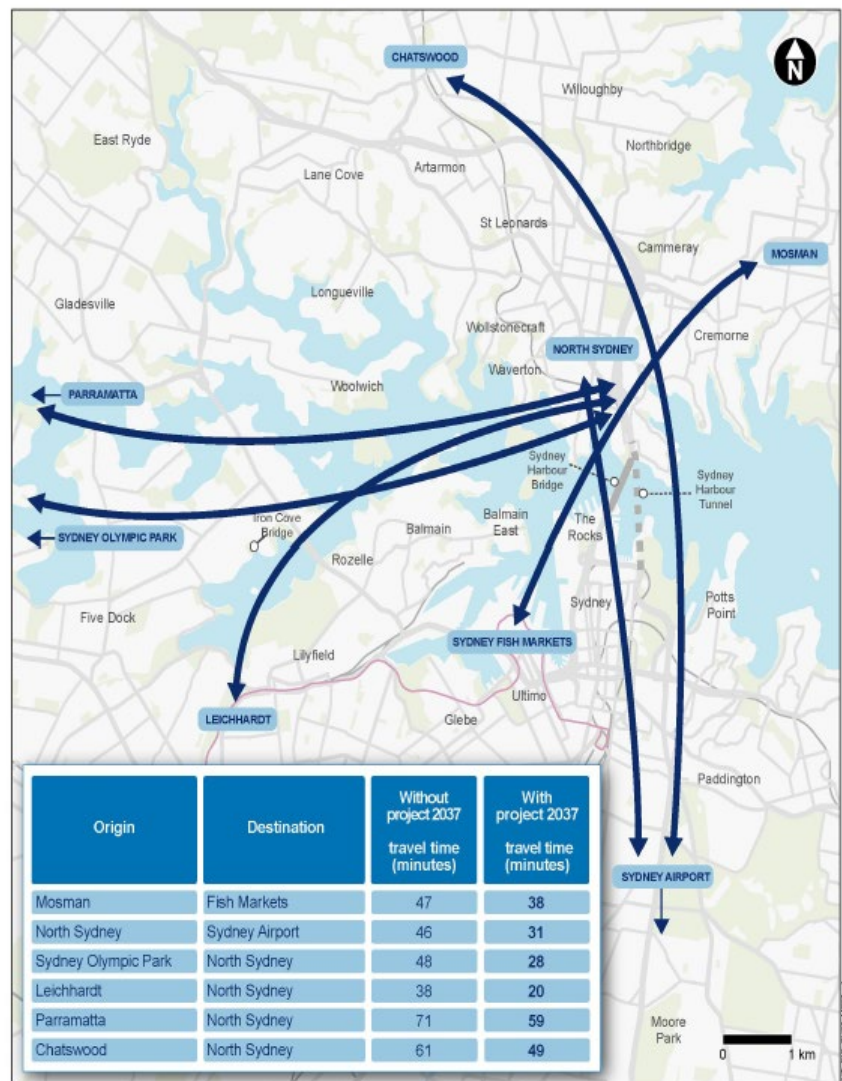


Figure 3-9 Change in journey times in the AM peak as a result of the project by 2037

Improving road safety

The Warringah Freeway Upgrade, a four kilometre stretch of the freeway between the northern end of the Sydney Harbour Bridge and the Willoughby Road interchange at Naremburn, will allow for the connection of the Western Harbour Tunnel and Beaches Link. The upgrade will streamline the way the road operates, reduce merging, and provide a continuous dedicated bus lane onto the Sydney Harbour Bridge to keep vehicles and buses apart, along with dedicated lanes that reduce the number of decisions and lane switches required, to improve road safety.

Providing integrated and seamless multimodal connections across Sydney

Western Harbour Tunnel will integrate with public transport and boost reliability for cross-harbour bus trips, creating new options for express bus services between the Inner West and Lower North Shore and beyond. Congestion will be eased on some of the city's busiest corridors like the Anzac Bridge, Western Distributor and the Sydney Harbour Bridge, improving travel times and reliability for bus customers.

A new harbour crossing will also provide capacity to deliver new strategic connections to the north, including new express bus routes⁴. The project will materially improve the functionality and performance of the bus network, in particular the reliability and optionality for both long distance and inner North Shore services, and efficiency of the Warringah Freeway and Sydney Harbour Bridge southbound bus lane, which services about 57,500 bus commuters each week.

Improving amenity and open space, and more walking and cycleways

Transport for NSW has designed the Program to minimise impacts where possible and leave a positive legacy that balances the needs of motorists and the community. For example, we have already reduced the land we need to use at the Cammeray Golf Course. The NSW Government has also committed to working with the community to deliver new public open space at Berry's Bay. Transport for NSW will also investigate possible further design refinements collaboratively with the successful contractor.

The Warringah Freeway Upgrade project will also provide around 2.5 kilometres of new and upgraded cycleways and pedestrian paths. This includes:

- a dedicated cycleway between Miller and Falcon streets at Cammeray
- upgrading the Ernest Street Bridge across the Warringah Freeway to link Cammeray Golf Course with Anzac Park
- rebuilding the Ridge Street Bridge and expanding the High Street Bridge in North Sydney to provide more room for cyclists and pedestrians.

Transport for NSW will replace the Ridge Street Bridge with a new and wider structure, which will include dedicated cycle lanes and pedestrian paths. The new bridge will be just south of the existing bridge, with its entry located where the lookout is currently situated. The final design of the Ridge Street Bridge and lookout is subject to further refinement and development during detailed design by the successful contractor/s. Further information will be provided to the community once it is available.

Final Business Case for Beaches Link

Government is currently considering the Beaches Link project, therefore a Final Business Case Summary has not yet been prepared or released. Transport for NSW is preparing the relevant material, including the Benefit Cost Ratio, to allow the NSW Government to consider a Beaches Link investment decision. Infrastructure NSW will assess the business case and will release a summary as part of the assurance process.

⁴ Western Harbour Tunnel and Warringah Freeway Upgrade EIS: [Chapter 3 Strategic context and project need](#)

As detailed in the Beaches Link and Gore Hill Freeway Connection EIS, which was on public exhibition from 9 December 2020 to 1 March 2021, Beaches Link is expected to deliver significant benefits to the community.

Reducing travel times and improving surface roads

Beaches Link will provide a new underground motorway bypass of the Military Road/Spit Road (A8) and Warringah Road (A38)/Eastern Valley Way corridors, substantially improving travel times and reliability for millions of freight vehicles, public transport users and other commuters who rely on these transport links.

The provision of underground tunnelled connections to/from the Gore Hill Freeway and Warringah Freeway and Western Harbour Tunnel, is key to improving travel times for both north–south and east–west road journeys to and from the Northern Beaches. It also alleviates congestion on a number of main arterial roads in northern Sydney that are used for these journeys, including Military Road, Spit Road, Warringah Road, Boundary Street, and Eastern Valley Way.

Significantly reducing traffic volumes on main arterial roads around northern Sydney

Analysis of modelled forecast traffic demands across Middle Harbour with the project in 2037 indicates that:

- peak period traffic demand on Military Road and Spit Bridge will decrease by up to 11 per cent and 33 per cent respectively
- peak period traffic demand on Warringah Road will decrease by up to 23 per cent
- peak period traffic demand on Mona Vale Road will decrease by up to eight per cent
- daily traffic demand on Eastern Valley Way will decrease by up to 40 per cent (as depicted in Figure 3-9 on the left).

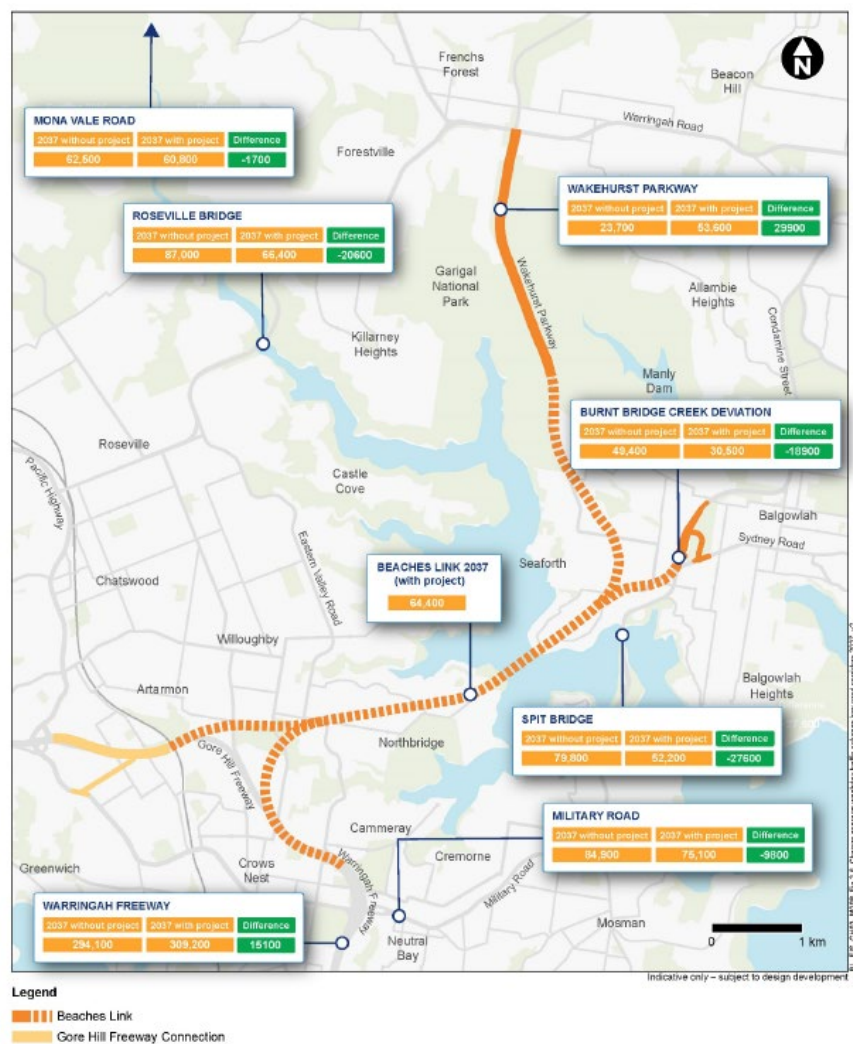
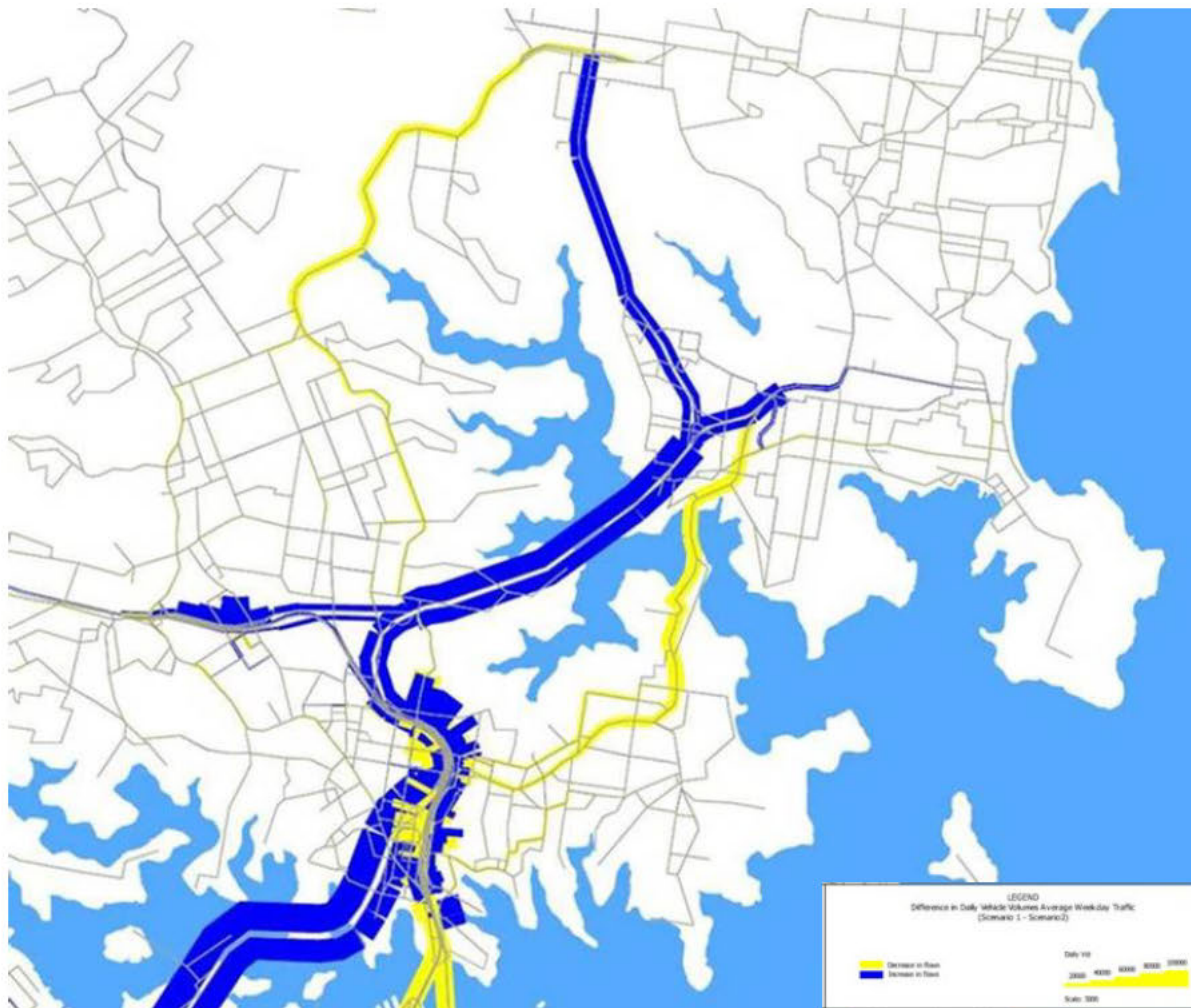


Figure 3-9 Change in average weekday traffic volumes (two-way) on key road corridors by 2037

The overall reduction in traffic on the above main arterial routes will result in improved travel speeds on these routes and reduced rat-running on other existing surface roads including Frenchs Forest Road and Ourimbah Road. The reduction in traffic on Military Road, due to traffic using Beaches Link is, in turn, forecast to make Military Road more attractive relative to rat runs such as Ourimbah Road and Kurraba Road, resulting in some of that traffic moving back on to Military Road – this is why there is a difference in the reduction of traffic on Military Road and Spit Bridge as described above and illustrated below

(with blue showing traffic increasing as a result of the program, and yellow corresponding to traffic decrease).⁵



Beaches Link will transform the way people move to and from the Northern Beaches, bypassing 19 sets of traffic lights through The Spit, Mosman and Neutral Bay. It will reduce travel times by up to 38 minutes between Balgowlah and Sydney CBD, up to 56 minutes between Dee Why and Sydney Kingsford Smith Airport, up to 54 minutes between Frenchs Forest and Rozelle and up to 32 minutes between Manly and Macquarie Park.

Providing integrated and seamless multimodal connections across Sydney

In addition to the travel time and reliability benefits provided for freight services and private vehicle commuters, Beaches Link will unlock considerable improvements for public transport users travelling on some of Sydney's busiest road corridors. The project has been designed to complement and enhance the existing and future public transport network servicing the Northern Beaches region. Beaches Link will materially improve the capacity, efficiency and journey time reliability of bus services for the Northern Beaches region (local and interregional) and ensure the longer-term success of the B-Line by:

- relieving pressure on main arterial roads, allowing surface bus routes to operate more efficiently

⁵ Beaches Link and Gore Hill Freeway Connection EIS [Annexure A, Technical working paper: Traffic and Transport, page 76](#)

- providing an underground bypass route, which will enable express bus services to travel via Beaches Link and the motorway network to destinations like North Sydney, Sydney CBD, Macquarie Park and St Leonards.

Improvements in the capacity of the road network will encourage opportunities for new express bus services, as evidenced by the new rapid bus service from Dee Why to Chatswood (currently being planned), which will benefit from reduced congestion on the Warringah Road corridor. By reducing network congestion and therefore improving network resilience and reliability, particularly in peak periods, Beaches Link will make bus routes to and from the Northern Beaches a more attractive transport option, supporting and encouraging a mode shift to public transport. For example, express buses that currently use Military Road will instead be able to use Beaches Link, entering at Balgowlah, travelling in freeflow traffic with no traffic lights, and exiting onto Warringah Freeway, where they will join the continuous southbound bus lane to connect through to Sydney Harbour Bridge. During peak traffic periods bus travel from Balgowlah to the Warringah Freeway currently takes 30 minutes or more; via Beaches Link travel times would be reduced to around 5 minutes.

New and improved bus priority infrastructure, dedicated bus bays and shared user underpasses offering access to bus stops that will be provided by the project will also improve efficiency and safety for road users and bus passengers.

By providing a new underground bypass route, Beaches Link offers the opportunity for express bus services in the tunnel between the Northern Beaches and strategic centres such as North Sydney, Sydney CBD, Macquarie Park and St Leonards via the new motorway network. These bus services will provide links to strategic stations on the Sydney Trains network, while also facilitating efficient access and interchange with the new Sydney Metro at North Sydney, improving connectivity across the broader public transport network. Expansion of express bus services to take advantage of these opportunities will greatly improve journey times, travel time reliability and connectivity for public transport services both within the Northern Beaches, and between the region and key centres across Greater Sydney.

The potential benefits outlined above only account for the diversion of express bus services to the Beaches Link tunnel and motorway network and improved surface conditions along existing key routes, meaning it is a conservative estimate of the overall public transport benefits and opportunities delivered by the project. It is expected that the bus network could be re-optimised to take advantage of broader opportunities (including provision of new services) unlocked by the project. Beaches Link will enable these opportunities for new services to be developed in response to diverse travel demands and future development.

Beaches Link will improve B-Line services between the Sydney CBD, North Shore and Northern Beaches, accommodate new express bus service routes, and provide a fast and efficient bus interchange with Sydney Metro at North Sydney.

Improving amenity and open space

Transport for NSW will be returning an area equivalent to almost 90 per cent of the open space that it will use during construction at Balgowlah as new and improved open space and recreation facilities. Transport for NSW is working collaboratively with Northern Beaches Council and plans to have over half of the recreational precinct open for the community to use around two years after construction has started, which is three to four years earlier than originally planned.

(b) The adequacy of the consideration of alternative options

The Program has been developed over a number of years with development and design refinement informed by:

- two extensive rounds of community engagement, in 2017 on the Western Harbour Tunnel and Beach Link Concept Design and 2018 Western Harbour Tunnel and Beaches Link Proposed Reference Design, prior to the development of the EISs
- ongoing community and stakeholder engagement, including while the EISs were on public exhibition
- ongoing stakeholder engagement
- several rounds of market interaction.

The EIS chapters can be accessed via the Transport for NSW project portals below:

- Western Harbour Tunnel and Warringah Freeway Upgrade: nswroads.work/whtportal
- Beaches Link and Gore Hill Freeway Connection: nswroads.work/blportal.

The Program development and alternative options considered are presented in Chapter 4 of the EIS for the respective projects, which includes strategic, corridor and further project alternatives. Transport for NSW undertook extensive evaluation of alternatives from pre-feasibility and strategic investigations through to design development and refinement.

Western Harbour Tunnel and Warringah Freeway Upgrade

The EIS outlined that alternative transport modes, including bus, rail, ferry and active transport, could be considered as strategic alternatives to the project. While many of these modes and upgrades are complementary to the project as part of a broader integrated transport network, none of the proposed initiatives negate the need to provide additional cross-harbour motorway capacity.⁶

The array of journey patterns and trip purposes within Sydney, and the dispersed nature of origin and destination points for an individual journey mean that roads remain a critical element in the integrated transport network, servicing bus, freight, commercial and many other journey needs. While improvements to the freight rail network will reduce pressure on the core motorway network, Sydney's freight, commercial and services tasks require distribution of goods and services within the Sydney basin, which relies on a diverse and dispersed point-to-point transport network that is most efficiently provided by the road network. Providing high-quality motorway links to meet this need is key to growing Sydney's economic prosperity while reducing surface traffic through communities.

Extending the underground motorway network to address capacity, efficiency and reliability issues on critical road corridors will not only provide faster, more efficient and reliable journeys for users who will use this network, but will also deliver much broader benefits through reduced congestion on existing surface networks. The project will materially improve the functionality and performance of the bus network, in particular the reliability and optionality for both long distance and inner North Shore services, and efficiency of the Warringah Freeway and Sydney Harbour Bridge southbound bus lane, which services about 57,500 bus commuters each week. The project will improve active transport links through the provision of a new dedicated bicycle path along the eastern side of the Warringah Freeway between Miller Street at Cammeray and Ernest Street, as well as a number of new and upgraded shared user bridges which will provide connectivity across the Warringah Freeway.

⁶ Western Harbour Tunnel and Warringah Freeway Upgrade EIS: [Chapter 4 Project development and alternatives](#)

The analysis concluded that the construction and operation of a new tunnelled motorway crossing of Sydney Harbour (Western Harbour Tunnel) was the preferred solution, providing additional transport capacity across Sydney Harbour to relieve congestion on existing crossings, and improving the efficiency and reliability for all non-rail journeys across Sydney Harbour.

Western Harbour Tunnel and the Warringah Freeway Upgrade is part of a suite of current and future transport initiatives outlined in *Future Transport 2056* that will work together to provide the cross-harbour transport capacity required to cater for a diverse array of journeys and future population growth. Furthermore, a new harbour crossing will also provide capacity to deliver new strategic connections to the north, including new express bus routes, to be developed⁷.

Beaches Link

Beaches Link is part of a suite of current and future transport initiatives outlined in *Future Transport 2056* that together will provide the cross-harbour transport capacity required to cater for a diverse array of journeys and future population growth. Further, a new tunnelled harbour crossing will allow new public transport routes to be developed in response to diverse travel demands and support new social and economic development such as the emerging Northern Beaches Hospital Precinct in Frenchs Forest.⁸

Alternative transport modes, including bus, rail, light rail and active transport, could be considered as strategic alternatives to the project. While many of these modes and upgrades are complementary to the project as part of a broader integrated transport network, none will be as effective in providing improvements to journey times and journey time reliability for freight services, public transport and other road users, while improving efficiency and amenity along existing surface road corridors.⁹

The array of journey patterns and trip purposes within Sydney and the dispersed nature of origin and destination points for an individual journey mean that roads remain a critical element in the integrated transport network, servicing freight, commercial, bus and many other journey needs. While improvements to the freight rail network will reduce pressure on the motorway network, Sydney's freight, commercial and services tasks require distribution of goods and services within the Sydney basin, which relies on a diverse and dispersed point-to-point transport network that is most efficiently provided by the road network.

Providing high-quality motorway links to meet this need is key to Sydney's growing economic prosperity while reducing surface traffic through communities. Extending the tunnelled motorway network to address capacity, efficiency and reliability issues on critical road corridors will not only provide faster, more efficient and reliable journeys for users of the network, it will also deliver much broader benefits through reduced congestion on existing local and arterial road networks.

Beaches Link will materially improve the functionality and performance of the bus network, providing opportunities for faster and more reliable express bus services to travel via the tunnel and motorway network from the Northern Beaches to strategic centres including North Sydney, the Sydney CBD, Macquarie Park and St Leonards.

The design for Beaches Link will also allow for these services to interchange with the new Victoria Cross Metro Station at North Sydney. Furthermore, the use of the Beaches Link tunnel for express bus services will reduce pressure on the Military Road/Spit Road and Warringah Road/Eastern Valley Way bus corridors, allowing for further optimisation of surface services.

⁷ Western Harbour Tunnel and Warringah Freeway Upgrade EIS: [Chapter 3 Strategic context and project need](#)

⁸ Western Harbour Tunnel and Warringah Freeway Upgrade EIS: [Chapter 3 Strategic context and project need](#)

⁹ Beaches Link and Gore Hill Freeway Connection EIS: [Chapter 4 Project development and alternatives](#)

Beaches Link will improve active transport links through the provision of new and upgraded shared user paths in Artarmon, Balgowlah, Killarney Heights, Seaforth and Frenchs Forest, as well as a number of new shared user underpasses and new shared user and pedestrian bridges, which will provide connectivity across the Wakehurst Parkway.

In summary, when considering the strategic alternatives and complementary projects, it was concluded the construction and operation of a new tunnelled motorway crossing of Middle Harbour (Beaches Link) was the preferred solution.

Beaches Link, in combination with the Western Harbour Tunnel, Warringah Freeway Upgrade, and the WestConnex network, will provide a step-change in transport capacity between the Northern Beaches and strategic centres across Greater Sydney. This will materially improve journey times and reliability for freight services, public transport and other road users on both the new motorway link and bypassed surface routes. Reduced pressure on existing surface routes will also improve the safety, efficiency and amenity of these corridors.

(c) The cost of the project, including the reasons for overruns

The Program consists of three projects:

- Warringah Freeway Upgrade
- Western Harbour Tunnel
- Beaches Link (including Gore Hill Freeway Connection).

Contracts have not been awarded for any of these three projects, therefore costs have not been finalised. There are no cost overruns.

Warringah Freeway Upgrade

The tender process is underway for the Warringah Freeway Upgrade, with tenders submitted to Transport for NSW in April 2021. The contract is expected to be awarded by August 2021.

Warringah Freeway Upgrade will be delivered using an Incentivised Target Cost model, meaning the Target Cost will be known at contract award. The Incentivised Target Cost model provides Transport for NSW and its construction partner with flexibility to accommodate changes that may arise through the construction period, such as changes to lane closures, should that be considered necessary to manage impacts on customers or the community.

Western Harbour Tunnel

Transport for NSW is currently working with industry to refine the procurement and delivery model for Western Harbour Tunnel. This includes determining the number of packages, contract form for each package and timeframe for the procurement process.

The objective of working with industry is to:

- develop a procurement and delivery model appropriate for the project, to facilitate a competitive tender process and thereby deliver a value for money outcome for NSW
- ensure appropriate risk allocation and incentive arrangements, such that a sustainable construction industry is maintained to deliver the large pipeline of infrastructure projects
- ensure the timing of bringing the project to market is done with consideration of other projects currently in the market, both in NSW and interstate.

Beaches Link

Transport for NSW is preparing the relevant material to allow the NSW Government to consider a Beaches Link investment decision. Infrastructure NSW will assess the business case and will release a business case summary as part of the assurance process.

(d) The consideration of the governance and structure of the project including the use of a ‘development partner’ model

The governance and structure of the Program, including the use of a ‘development partner’ model, has been carefully considered.

Warringah Freeway Upgrade

Transport for NSW will procure the Warringah Freeway Upgrade as an Incentivised Target Cost model. The parties to this contract will be Transport for NSW and the preferred construction partner. Governance of the Warringah Freeway Upgrade is set up as appropriate for a project of this nature, including:

- an executive committee, including senior representatives of Transport for NSW
- a steering committee, including senior representatives of Transport for NSW and NSW Treasury.

Appropriate governance will be established once the contract is awarded to manage the delivery phase of the project.

Western Harbour Tunnel

Transport for NSW conducted extensive market interactive process, to consider how to fund, procure and deliver Western Harbour Tunnel. Based on that feedback, it has been determined Western Harbour Tunnel will be procured and delivered using a State-led model rather than a Public Private Partnership. That is, the parties to the construction contracts will be Transport and the preferred construction partner/s. Ongoing engagement with industry has led Transport for NSW to consider delivering Western Harbour Tunnel as two separate packages, being the:

- immersed tube tunnel crossing of Sydney Harbour, and
- driven tunnels on the north and south of Sydney Harbour, as well as the fitout, testing and commissioning of the entire tunnel.

Transport for NSW is continuing to engage with industry on the procurement and delivery strategy for Western Harbour Tunnel and is seeking to structure the project to facilitate a future monetisation of Western Harbour Tunnel. There has been no decision made on whether to monetise Western Harbour Tunnel, nor the form or timing of a monetisation. The structure is being developed to retain flexibility.

The potential Development Partner model provides an opportunity to optimise outcomes for the procurement and delivery of Western Harbour Tunnel. It has been developed to support the State-led procurement, integration, delivery and whole-of-life outcomes of Western Harbour Tunnel, particularly in the context of current market dynamics. Should it be pursued, the Development Partner’s scope is likely to include items such as:

- running the procurement process for the Western Harbour Tunnel construction contract(s)
- managing project delivery, including interface and integration of the packages
- managing operations and maintenance integration.

The procurement of the Development Partner is a market-led process, providing an opportunity for the tenderers to develop a tailored scope and commercial framework that meets Transport for NSW’s objectives. Should these objectives not be achieved, Transport for NSW retains the ability to run the procurement and manage the delivery of Western Harbour Tunnel.

Beaches Link

Transport for NSW is preparing the relevant material to allow the NSW Government to consider a Beaches Link investment decision. Infrastructure NSW will assess the business case and will release a business case summary as part of the assurance process.

(e) The extent to which the project is meeting the original goals of the project

The Program’s challenges, objectives and benefits are presented in the EISs for the respective projects, which are publicly available. As outlined above, the Program is considered as three projects:

- Warringah Freeway Upgrade
- Western Harbour Tunnel
- Beaches Link (including the Gore Hill Freeway Connection).

The Program remains designed to solve some of Sydney’s major network issues.

Western Harbour Tunnel and Warringah Freeway Upgrade

Project need

The motorway crossings of Sydney Harbour, including the Sydney Harbour Bridge, Sydney Harbour Tunnel and Anzac Bridge, are critical links in Sydney’s motorway and arterial road network. Key metrics for the Eastern Harbour City’s road transport network are shown below.



In addition to the large number of customers who rely on these corridors, the limited capacity and number of alternate routes for crossing Sydney Harbour make these corridors critical to the performance of the broader motorway and main arterial road network. Network data demonstrates that incidents (breakdowns, crashes, hazards) on the harbour crossings and their approaches impact journey times for freight, buses and private vehicles travelling on the main arterial road network across the region.

During the period 2014 to 2017, there were an average of 1,418 incidents per year on Sydney Harbour Bridge and its approaches (including the Warringah Freeway) impacting journey times for customers. Without intervention, the predicted growth in traffic demand over time will result in further increases in journey time delays and deterioration of reliability over time.



In addition to large traffic volumes, a major contributor to congestion around the Sydney CBD is that many of the most critical road corridors – including the Sydney Harbour Bridge, the Sydney Harbour Tunnel, Anzac Bridge, Western Distributor and the Warringah Freeway – perform both bypass and access functions. The dual function of these corridors is reflected in

the high proportion of vehicles that use them to travel to destinations other than the Sydney CBD. This contributes to high levels of congestion as well as poor network outcomes, as bypassing traffic is impacted by congested collector/distributor roads¹⁰.

The *Australian Infrastructure Audit 2019* listed the Eastern Distributor, Sydney Harbour Bridge, Warringah Freeway and the Gore Hill Freeway corridor among Australia's most congested road corridors, generating a congestion cost of \$65,000 per day in 2016. If no action is taken, this is forecast to rise to \$98,000 per day by 2031. As congestion on these corridors increases, so too will the costs.

Infrastructure NSW has estimated the economic risk to growth and productivity posed by traffic congestion in the Eastern City District is about \$5 billion a year, and is forecast to increase to about \$8 billion annually by 2020. Infrastructure NSW has observed that 'without corrective action, congestion will worsen – and the costs to business and the community will escalate – as the city's population grows'. More recent forecasts suggest that the costs could be even higher¹¹.

Proposed solution

The Western Harbour Tunnel will link Rozelle to the Warringah Freeway, delivering the third road crossing of Sydney Harbour. By creating a western bypass of the Sydney CBD, this new crossing will change the way people move around Sydney, and ease pressure on the Anzac Bridge, Sydney Harbour Tunnel, Sydney Harbour Bridge and Western Distributor corridors to revolutionise transport capacity in and around our city.

The new tunnel will start at the new Rozelle Interchange and head under the Harbour to the Warringah Freeway, and will integrate new and existing public transport connections. The 6.5 kilometre tunnel will have three lanes in each direction. The Warringah Freeway Upgrade will link Western Harbour and Beaches Link tunnels. The core capacity improvement offered by the Western Harbour Tunnel and Warringah Freeway project is key to enabling the proposed Beaches Link, and the associated significant change in connectivity and reliability for the northern transport network.

For the design to meet the transport challenges of the Eastern Harbour City, the following objectives have been developed for the Western Harbour Tunnel and Warringah Freeway Upgrade project:

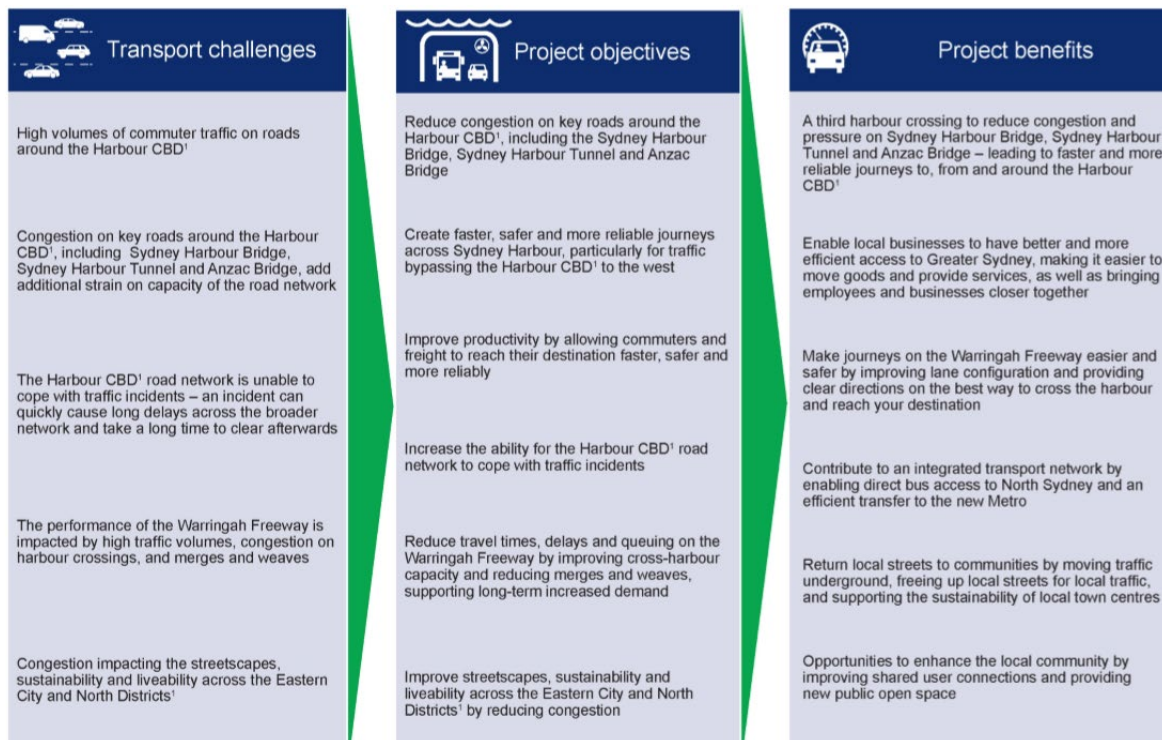
- reduce congestion on distributor roads around the Sydney CBD, including the Sydney Harbour Bridge, Western Distributor and Anzac Bridge
- create faster, safer and more reliable journeys across Sydney Harbour, particularly for traffic bypassing the Sydney CBD to the west
- improve productivity by allowing commuters and freight to reach their destination faster, safer and more reliably
- increase the ability for the Sydney CBD road network to cope with traffic incidents
- reduce travel times and delays on the Warringah Freeway by improving cross-harbour capacity and reducing merges and weaves, supporting long-term increased demand
- improve streetscapes, sustainability and liveability across the Eastern Harbour City and North Districts by reducing congestion.

A summary of the project challenges, corresponding objectives and overall project benefits are shown below.

Summary of challenges, solutions and benefits

¹⁰ Western Harbour Tunnel and Warringah Freeway Upgrade EIS: [Chapter 3 Strategic context and project need](#)

¹¹ The Infrastructure Australia Audit 2019, [Urban Transport Crowding and Congestion](#), p. 31



Beaches Link

The project need

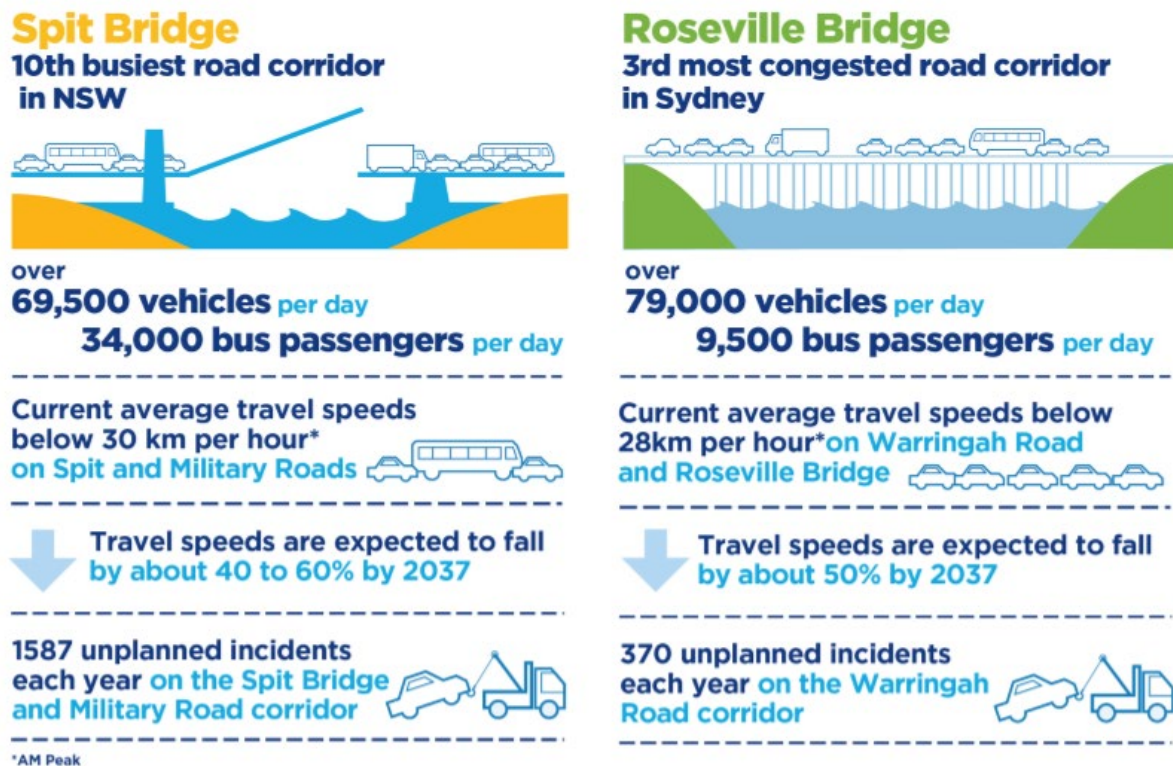
Supporting the current needs and future growth of the North District, Eastern Harbour City and Eastern Economic Corridor through an efficient transport network is fundamental to maintaining the liveability, productivity and sustainability of Greater Sydney. Yet, freight services, public transport and other road users travelling to and from the Northern Beaches region currently experience some of the slowest and most unreliable journey times across Greater Sydney.

The Eastern Harbour City has the largest concentration of jobs in Greater Sydney, accommodates the most productive industries and is home to a highly skilled workforce. Accordingly, the eastern motorway crossings of Sydney Harbour and crossings of Middle Harbour are critical links in Sydney's motorway and arterial road network. These major transport corridors around the Sydney CBD are critical to the performance of the main arterial road network servicing the Northern Beaches, particularly for north-south trips, and are some of the busiest in Greater Sydney and indeed in Australia, as shown in the Figure below.

In addition to the large number of customers who rely on these corridors, the limited capacity and number of alternative routes for crossing Sydney Harbour make these corridors critical to the performance of the broader motorway and arterial road network. Network data demonstrates that incidents on the harbour crossings and their approaches can greatly impact journey times for freight, buses and private vehicles travelling north and south on the main arterial road network servicing the Northern Beaches region, with Military Road and Spit Road particularly affected.

During 2019, there were 1149 incidents on the Sydney Harbour Bridge and its approaches (including the Warringah Freeway), further impacting journey times for vehicles travelling to and from the North District and Northern Beaches region.

Figure: key metrics for the critical Middle Harbour road crossings



Without intervention, the predicted growth in traffic demand over time will result in further increases in journey time delays and deterioration of reliability. In addition to high traffic volumes, a major contributor to congestion around the Sydney CBD and North District is that many of the most critical road corridors, including the Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge, Western Distributor, Military Road, Spit Road, Warringah Road and Eastern Valley Way, perform both bypass and access functions. The dual function of these corridors is reflected in the high proportion of vehicles that use them to travel to destinations other than the Sydney CBD.

This contributes to high levels of congestion as well as poor network outcomes, as bypassing traffic is impacted by congested collector/distributor roads. Supplementing capacity and reducing the conflict between access and bypass functions for the Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge, Western Distributor, Military Road, Spit Road, Warringah Road and Eastern Valley Way is therefore a key element of the integrated transport network required to support the liveability and productivity of the Eastern Economic Corridor and its connections with international gateways and their surrounds. This is also a key step in supporting and enabling future strategic links, including Beaches Link.

Proposed solution

The Beaches Link and Gore Hill Freeway Connection project is a vital part of the overall Program. The Northern Beaches and its strategic centres suffer from poor accessibility caused by limited transport capacity connecting the region and the resulting flow on effects for bus performance during peak periods. Beaches Link will provide a step-change in journey times and reliability, and resilience for the critical road network servicing the Northern Beaches region. This will deliver considerable benefits for freight services, public transport, and other users of the new and existing links and also enable amenity improvements in areas along and adjacent to the congested surface corridors.

Beaches Link will, for the first time, provide a motorway link between the Northern Beaches and the rest of Sydney, including to key commercial and economic centres at St Leonards,

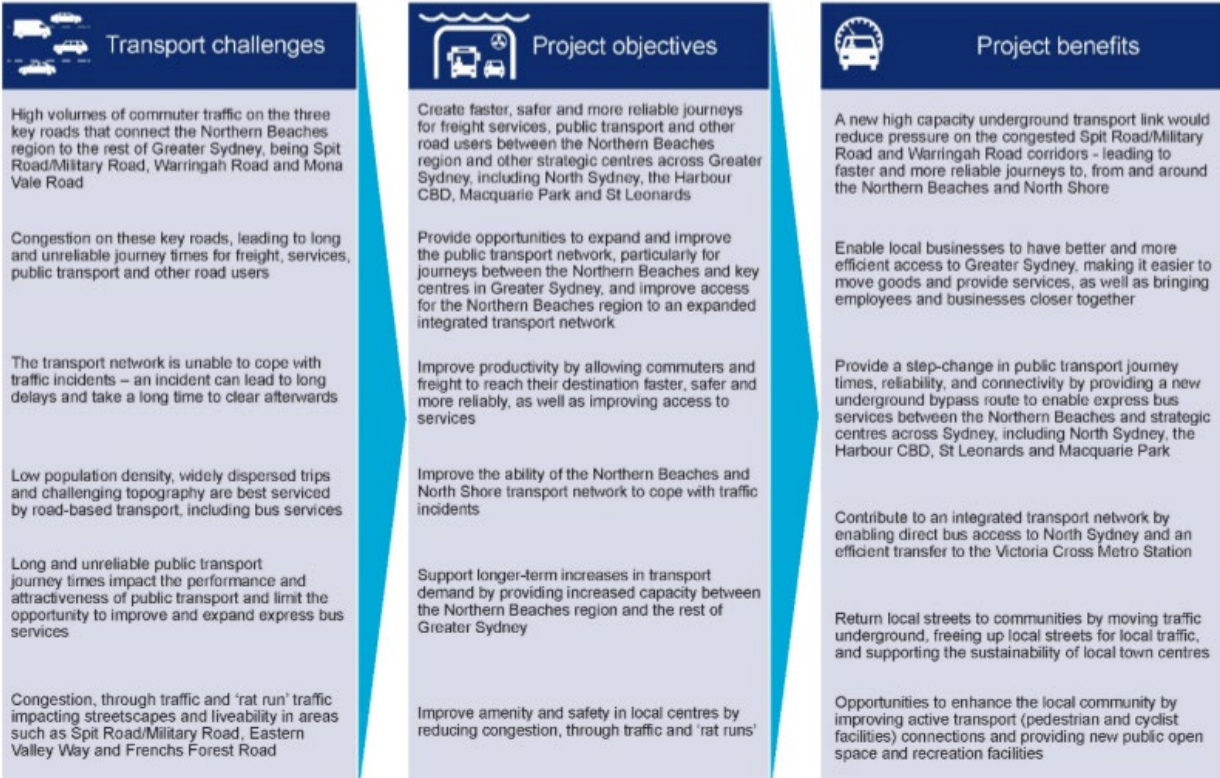
Macquarie Park and beyond to northwest Sydney. The tunnel will include new connections on the Gore Hill Freeway at Artarmon, Warringah Freeway at Cammeray and direct access onto Burnt Bridge Creek Deviation at Balgowlah and Wakehurst Parkway at Seaforth – which will also be widened from one lane to two in each direction between Seaforth and Frenchs Forest.

The overarching objectives of the Program translate into the following specific objectives and benefits of Beaches Link:

- provide increased capacity on the road network connecting the Northern Beaches region and Greater Sydney by reducing congestion and through traffic on arterial roads
- create faster, more reliable journey times for freight services, public transport and other road users between the Northern Beaches region and other strategic centres across Greater Sydney, including North Sydney, the Sydney CBD, Macquarie Park and St Leonards
- provide opportunities to expand and improve public transport journeys between the Northern Beaches and key centres across Greater Sydney, and improve access for the Northern Beaches region to an expanded transport network, including Victoria Cross Metro Station at North Sydney (opening 2024)
- improve productivity and access to services by facilitating faster and more reliable journey times for commuters and freight to reach their destinations
- increase the resilience of the Northern Beaches and North Shore road network to traffic incidents
- improve urban amenity by reducing congestion, through traffic and rat-running on surface corridors.

Summary of challenges, solutions and benefits

A summary of the project challenges, corresponding objectives and overall project benefits are shown below.



(f) The consultation methods and effectiveness, both with affected communities and stakeholders

Community and stakeholder engagement process

Transport for NSW recognises that a program of this scale will have an unavoidable impact on local communities. This is why one of the most extensive community and stakeholder engagement programs has been delivered, ahead of and during the EIS exhibition periods for both Western Harbour Tunnel and Beaches Link.

As part of this extensive community and stakeholder engagement process, a range of engagement tools have been used to engage with the community (adapting for COVID-19), including:

- community information sessions (face to face and online)
- market stores and kiosks at shopping centre
- doorknocking impacted properties
- meetings with community groups and key stakeholders
- letterbox drop of community notifications
- interactive portal (website) featuring interactive maps
- emails to subscribers
- project phone line and email inbox to respond to enquiries
- social media.

2017 design community engagement

In March 2017, the NSW Government announced the Program. Feedback on the design was invited between 16 March and 31 July 2017, supported by community engagement activities summarised in the table below.

ACTIVITY	DETAILS
General program information and feedback channels	
Program email address	Over 700 emails were sent to the program email account
Program 1800 number	Over 1000 telephone calls were received via the program information line
Letterbox drops	More than 330,000 program fact sheets and community feedback session information flyers delivered
Online community engagement map	More than 1700 comments posted on specific topics by members of the community
Subscribers to program updates	Over 2300 subscribers to receive ongoing program updates
Ministerial	About 90 customer enquiries issued as ministerial enquiries
Hosted events	
Community Feedback Sessions attended by program team and technical specialists	Sixteen sessions attended by more than 2100 people at the following locations: <ul style="list-style-type: none"> • Mosman Club (two sessions) • McMahons Point Community Centre (two sessions) • Chatswood Club (two sessions) • Balmain Town Hall (two sessions) • Manly-Warringah Leagues Club (two sessions) • Northbridge Bowling Club (two sessions) • North Sydney Oval Function Centre (two sessions) • Seaforth Community Centre (one session) • Fred Hutley Hall, North Sydney Council Chambers (one session)

Pop up information displays	Twelve displays in major shopping centres attended by more than 800 people including: <ul style="list-style-type: none"> • Birkenhead Point Shopping Centre (two sessions) • Warringah Mall (four sessions) • Balgowlah Stockland (two sessions) • Chatswood Westfield (four sessions)
Direct engagement with individual stakeholders	
Meetings with residents and stakeholders	More than 25 meetings were attended by more than 1000 people
Door knocks	More than 1500 residences
Notifications of investigation work	
Marine geotechnical notifications	More than 170 notifications to properties in the vicinity of the proposed harbour crossings
Land based geotechnical notifications	More than 5500 notifications and more than 1200 doorknocks
Noise monitoring installation notifications	More than 590 notifications and more than 470 doorknocks
Air quality monitoring station installations	More than 50 notifications and more than 40 doorknocks
Media	
Newspaper advertisements	89 half page advertisements, placed in the local media in the weeks preceding the community feedback sessions
Media releases	One media release was issued by the NSW Government to coincide with the announcements of the preferred corridor and start of field investigation works
Facebook	More than 169,000 people reached through two direct program related Facebook posts on the Roads and Maritime Facebook page, as well as a broadly targeted Facebook advertising campaign

2018 further developed design community engagement

In July 2018, the NSW Government announced a further developed design for the Program. Feedback was invited between 26 July and 1 December 2018, supported by community engagement activities summarised in the table below. This feedback helped to inform the design which was included in the EIS for the respective projects.

ACTIVITY	DETAILS
General program information and feedback channels	
Program email address	Around 2320 emails were sent to the program email account
Program 1800 number	More than 300 telephone calls were received via the program information line
Letterbox drops	About 400,000 program fact sheets and community feedback session information flyers delivered
Online community engagement map	More than 4000 comments posted on specific topics by members of the community
Subscribers to program updates	Over 3300 subscribers to receive ongoing program updates
Subscribers to program updates	More than 530 written feedback forms received at community sessions
Ministerial	Over 90 customer enquiries issued as ministerial inquiries
Hosted events	
Community Feedback Sessions attended by program team and technical specialists	Twenty sessions attended by more than 2600 people at the following locations: <ul style="list-style-type: none"> • Balgowlah Club Totem (one session) • Balgowlah Golf Club (one session) • Crows Nest Centre (two sessions) • Mosman RSL (two sessions) • North Sydney Council – Fred Hutley Hall (two sessions) • Waverton Bowling Club (two sessions) • Balgowlah RSL (three sessions) • Manly Warringah Leagues Club (two sessions)

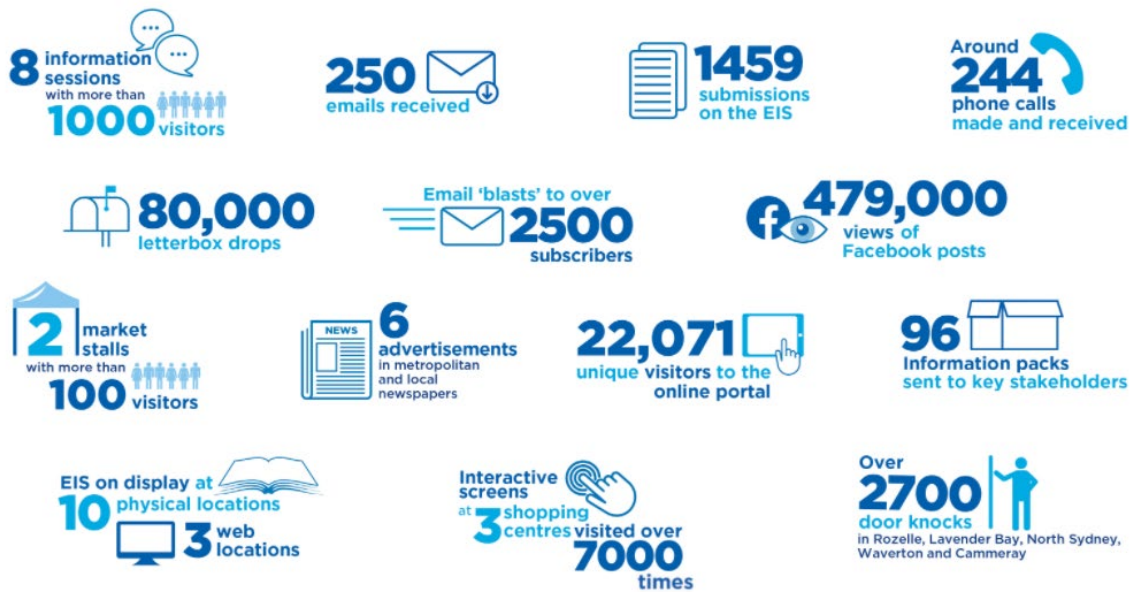
	<ul style="list-style-type: none"> • Balmain Town Hall (two sessions) • Northbridge Golf Club (two sessions) • Cammeray Golf Club (one session)
Pop up information displays	Six displays in major shopping centres attended by more than 590 people including: <ul style="list-style-type: none"> • Birkenhead Point Outlet Centre (three sessions) • Balgowlah Stockland (three sessions)
Direct engagement with individual stakeholders	
Stakeholder meetings	More than 88 meetings were held with local precinct committees, schools and school Parents & Citizens (P&C) Associations, resident groups, special interest groups, sporting associations, Government agencies and local councils
Door knocks	More than 3890 residences
Notifications of investigation work	
Land based geotechnical notifications	More than 132 notifications and more than 20 doorknocks
Media	
Newspaper advertisements	Eighteen half page advertisements, placed in the local media in the weeks preceding the community feedback sessions
Media releases	One media release was issued by the NSW Government to coincide with the announcements of the further developed design

2019 Beaches Link project updated design

In November 2019, the NSW Government announced an updated design for Beaches Link. The community were advised of the preferred temporary construction sites at Wakehurst Parkway East and Flat Rock Drive, an updated design of the Balgowlah access road and the updated timing for the public exhibition of the EIS. Community updates were distributed to 46,500 properties along the Beaches Link alignment and uploaded onto the project website. Suburb specific fact sheets were also created to update the community about design changes in their area. The fact sheets focussed on Balgowlah, Cammeray, Willoughby, and Seaforth and Frenchs Forest. In addition, an email was sent to 2592 subscribers, informing them of the changes and linking them to the community update on the website.

2020 community engagement on Western Harbour Tunnel and Warringah Freeway Upgrade EIS

The Western Harbour Tunnel and Warringah Freeway Upgrade EIS was placed on public exhibition from 29 January to 30 March 2020. As part of this process, various community engagement activities were carried out. An overview of community and stakeholder engagement as part of the Western Harbour Tunnel and Warringah Freeway Upgrade EIS is outlined below.



During this time, Transport for NSW received community submissions and prepared a submissions report to respond to the community's valued comments and concerns. The submissions report is available [here](#).

Community engagement since the Western Harbour Tunnel and Warringah Freeway Upgrade Submissions Report

Since the lodgement of the Submissions Report in September 2020 Transport for NSW has:

- distributed the January 2021 community update notifying of planning approval to about 84,000 properties and emailed to 2816 registered stakeholders
- offered property condition surveys to about 315 properties (as part of the Warringah Freeway Upgrade works obligations). Offers have been accepted and surveys completed on 171 properties
- distributed the March 2021 start of service and utility work community update to about 84,000 properties and emailed to 2821 registered stakeholders
- prepared and distributed detailed fact sheets about upcoming work for local residents adjacent to sites, with over 300 properties doorknocked. The fact sheets have been letter boxed dropped to over 8000 properties, emailed to all registered stakeholders and uploaded on to the project portal
- ongoing meetings with key stakeholders including schools, the Cammeray Golf Course and North Sydney Council
- started the implementation of *Getting to know our community* survey for directly adjacent residents and businesses. This survey will support Transport for NSW to further build knowledge of the community and surrounding local businesses. The information from the survey will be collated and used to identify themes and trends which will be considered when planning the work
- since January 2021, the project team has also received 418 emails, sent 399 emails, received 141 phone calls to the project 1800 number and made 279 phone calls to members of the community and key stakeholders.

Community engagement on Beaches Link and Gore Hill Freeway Connection EIS

From 9 December 2020 to 1 March 2021, during the Beaches Link and Gore Hill Freeway Connection EIS exhibition period, Transport for NSW carried out a wide range of consultation and engagement activities (see below).

The project team is preparing a submissions report to respond to the community's valued comments and concerns. This is expected to be publicly available later this year.

Community engagement during construction

All engagement during the construction period will be carried out in accordance with the Ministers Conditions of Approval and any Environment Protection Licences granted for each project.

The successful contractors for each project will be required to develop a comprehensive community engagement strategy in accordance with the Condition of Approval, which will be made public

(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

Does COVID-19 impact the business case?

With more than 12 million people expected to live in NSW by 2056, Transport for NSW is continuing to invest in and build transport infrastructure to support current and future generations. Improvements to road, rail and public transport will ensure the transport network enables easier, faster and safer journeys. That is why the NSW Government is investing \$107.1 billion in infrastructure over the next four years, including \$72.2 billion for roads and public transport, helping to grow the NSW economy and create tens of thousands of jobs in the process.

While the pandemic (along with other unprecedented events such as bushfires) presents short to medium-term challenges for Sydney (and NSW more broadly), the Program has been developed with a long-term view to address the challenges Greater Sydney will face over the next 40 years, and to deliver long-lasting benefits for road users, commuters, communities and businesses. As such, the need for this Program, and other strategic transport projects, to meet the demands of a growing population and economy, remains critical to ensuring the future success of Sydney.

Will modelling be redone to reflect changes in traffic due to COVID-19?

At this time, long-term impacts to traffic from COVID-19 are still unknown and current traffic conditions and travel behaviours are the result of a variety of temporary factors, including reduced public transport demand.

Ongoing traffic and transport analysis show that traffic in the projects' area has already returned to levels near that of the pre-COVID-19 period. Given the interim nature of current conditions, and also the relative stability of traffic levels (while noting some traffic is likely related to suppressed demand for public transport) there is no plan at this time to review the modelling for the Program.

Transport for NSW will continue to monitor and analyse the potential long-term effects of COVID-19 on travel demand, including changes to existing travel conditions as well as future travel behaviours and underlying economic demand driver.

(h) Whether the NSW Government should publish the base-case financial model and benefit cost ratio for the for the project and its component parts

The Program will be procured in stages, in line with other infrastructure projects of this scale, such as Sydney Metro and WestConnex. The Program involves three projects: the Warringah Freeway Upgrade, the Western Harbour Tunnel and Beaches Link. Benefit cost ratios are published in the Final Business Case Summaries.

Western Harbour Tunnel and Warringah Freeway Upgrade

In May 2020, Infrastructure NSW published the Final Business Case Summary for the Western Harbour Tunnel (which included the Warringah Freeway Upgrade)¹².

A full economic cost-benefit analysis was undertaken of the project in accordance with NSW Treasury guidelines. As presented on page 12 of the Final Business Case Summary, the Benefit Cost Ratio was estimated at between 1.2 and 1.3 when only transport benefits are included, and between 1.6 and 1.7 when all benefits (including wider economic benefits, city-shaping benefits and flow breakdown benefits) are included.

Base Case Financial Models typically apply to projects containing elements of private sources of capital. Base Case Financial Models are commercial in confidence. The Western Harbour Tunnel and Warringah Freeway Upgrade is currently expected to be delivered as government funded projects, without private sources of funding and therefore a Base Case Financial Model has not been prepared at this point in time.

Beaches Link

The investment decision has not been made for Beaches Link, and therefore a Final Business Case Summary has not been prepared. Transport for NSW is preparing the relevant material, including the Benefit Cost Ratio, to allow the NSW Government to consider a Beaches Link investment decision. Infrastructure NSW will assess the business case and will release a business case summary as part of the assurance process.

¹² https://www.infrastructure.nsw.gov.au/media/2528/western-harbour-tunnel_bc-summary-may-2020.pdf

(i) Whether the project is subject to the appropriate levels of transparency and accountability that would be expected of a project delivered by a public sector body

Major infrastructure projects in NSW are subject to rigorous oversight to ensure their validity and value for the tax payer. During the development stage of major projects, agencies such as Transport for NSW, NSW Treasury, Infrastructure NSW, the Department of Industry, Planning and Environment (DPIE) and the Department of Premier and Cabinet (DPC) work to ensure adequate independent checks and balances. These include the development of strategic plans and application of merit based tests, preparation of detailed business cases, independent assurance, development assessment and consent, and competitive tendering.

Infrastructure NSW's Infrastructure Investor Assurance Framework

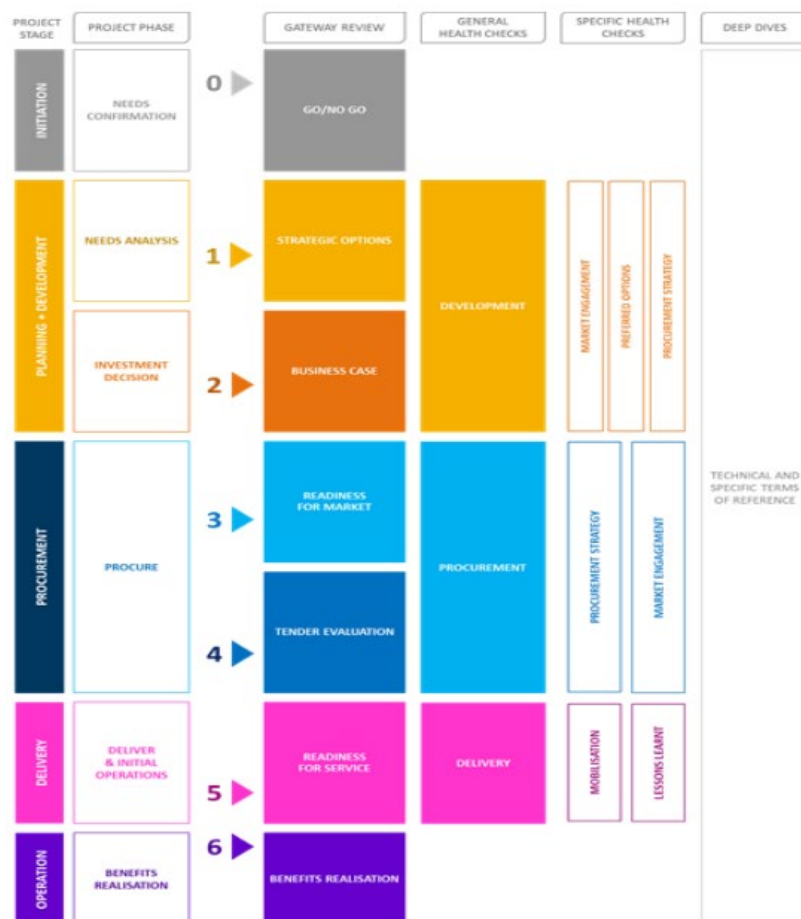
The development and delivery of large infrastructure projects is subject to Infrastructure NSW's Infrastructure Investor Assurance Framework (IIAF). As part of this framework, all large projects whether delivered publicly or privately, are subject to expert and independent gateway reviews and health checks. The Western Harbour Tunnel and Beaches Link projects are progressing through INSW's independent investor assurance framework as a part of their development.

The objective of the IIAF is to ensure the Government's key infrastructure projects across NSW are delivered on time and on budget through the implementation of this risk-based external assurance framework. The purpose of the IIAF is also to ensure that Cabinet is supported by effective tools to monitor the NSW Government's infrastructure program, receive early warning of any emerging issues, and to act ahead of time to prevent projects from failing.

The IIAF incorporates a risk-based approach to infrastructure investment assurance and is in line with recommendations made by the Auditor General in the performance audit report titled *Audit Large construction projects: Independent assurance* (May 2015).

The IIAF is designed to support both the delivery agencies' own decision-making and assurance processes and to support Budget processes throughout the project lifecycle as shown in the Figure on the right.

The Program is following the Infrastructure NSW's Infrastructure Investor Assurance Framework.



(j) The impact on the environment, including marine ecosystems

Transport for NSW understands the importance of the natural environment and is committed to minimising project impacts, protecting the local plant and animal life, implementing monitoring programs and safely managing contamination risks. Extensive testing has been carried out, including sediments at the location of the proposed harbour crossings and outlined in the EIS for the respective projects. Work will be based on expert peer-reviewed advice and past experience, and will use of the world's best practice to protect our environment.

Air quality

The ventilation systems for the Program will be built strictly in compliance with the conditions specified in DPIE's planning approval and will be operated to comply with the terms of the Environment Protection Licence issued by the NSW Environment Protection Authority.

The tunnels will be built to meet strict air quality standards using state-of-the-art ventilation and tunnel design. Emissions from the tunnels will be ejected high into the atmosphere, mixing and becoming diluted hundreds of times, rapidly becoming indistinguishable. The design also ensures sufficient air flow within the tunnel with zero emissions from portals. Air quality will be monitored before and after the tunnels are built, and after opening communities will be able to check data online, to verify everything is performing as expected.

The independent NSW Chief Scientist and Engineer released a report in relation to road tunnel air quality. The report found that emissions from well-designed road tunnels cause a negligible change to surrounding air quality, and as such, there is little to no health benefit for surrounding communities in installing filtration and air-treatment systems in such tunnels. Further information is available at www.chiefscientist.nsw.gov.au and nswroads.work/airquality.

The Chief Health Officer also noted that any potential impacts will be primarily due to traffic on surface roads – not ventilation outlets. Given future traffic predictions, air quality may improve in many local areas.

Marine ecosystems

The EIS presents an assessment of potential environmental issues identified during the planning and assessment of the project, in accordance with Division 5.2 of the *Environmental Planning and Assessment Act 1979*. The assessment considers the area directly or indirectly affected by construction and operation of the project, including marine ecosystems, as relevant to each technical assessment.

The design of the Harbour crossings and methods of construction have considered the means by which potential impacts to marine ecosystems can be avoided or minimised. Chapter 19 of each EIS provides an assessment of the potential impacts of the project on terrestrial, aquatic and marine biodiversity and identifies measures to address these impacts. The detailed assessment of marine biodiversity is included in Appendix T (Technical working paper: Marine ecology) of each EIS¹³¹⁴.

As a result of the assessment, environmental mitigation measures have been developed to reduce the extent of impacts during construction and operation of the projects.

¹³ [Appendix T \(Technical working paper: Marine ecology\) of the Western Harbour Tunnel and Warringah Freeway Upgrade EIS](#)

¹⁴ [Appendix T \(Technical working paper: Marine ecology\) of the Beaches Link EIS](#)

Western Harbour Tunnel and Warringah Freeway Upgrade

Transport for NSW developed the Western Harbour Tunnel and Warringah Freeway Upgrade EIS, in response to the Secretary's environmental assessment requirements (SEARs) issued by DPIE on 15 December 2017, and the relevant provisions of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

A summary of the project impacts and management measures in response to the SEARs are described in Chapter 28 of the EIS,¹⁵ which was publicly exhibited by DPIE from 29 January to 30 March 2020.

Following the exhibition of the EIS, a Response to Submissions report was prepared and published in September 2020. A revised list of environmental management measures was provided in Part D, Section D2 that addressed the issues and concerns raised from the submissions.¹⁶

The project was approved on 21 January 2021 by the Minister for Planning and Public Spaces as a State significant infrastructure project under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979*.

Beaches Link and Gore Hill Freeway Connection

Transport for NSW is seeking approval for the Beaches Link and Gore Hill Freeway Connection project as State significant infrastructure under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979*. Transport for NSW has also requested the NSW Minister for Planning and Public Spaces declare the project as critical State significant infrastructure.

The EIS was prepared to address the SEARs issued by DPIE on 15 December 2017 (and reissued on 22 April 2020), and the relevant provisions of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

DPIE placed the EIS on public exhibition from 9 December 2020 to 1 March 2021, providing the opportunity for the community, government agencies, stakeholders and other interested parties to comment on the project.¹⁷

Transport for NSW is considering the feedback received and will respond to issues raised in a Submissions Report. After publishing the Submissions Report, DPIE will complete its assessment of the merits of the project in accordance with Government legislation, policies and guidelines and prepare an Assessment Report.

The Minister for Planning and Public Spaces is the approval authority for all Critical State significant infrastructure (CSSI) applications and may approve the carrying out of the project, subject to modifications or conditions, or disapprove of it.

¹⁵ [Chapter 28 of the Western Harbour Tunnel and Warringah Freeway Upgrade EIS](#)

¹⁶ [Response to Submissions to the Western Harbour Tunnel and Warringah Freeway Upgrade EIS report, Part D, Section D 2](#)

¹⁷ Beaches Link EIS: <https://caportal.com.au/rms/bl/documents#eisChapters>

(k) The adequacy of processes for assessing and responding to noise, vibration and other impacts on residents, during construction and operationally

Assessment in the EIS stage

The construction noise and vibration chapter (Chapter 10) of the EIS for the respective projects considers the potential noise and vibration impacts from construction and identifies management measures to minimise these impacts^{18 19}. The operational noise and vibration chapter (Chapter 11) of each of the EIS considers the potential noise and vibration impacts associated with the operation of the projects and identifies management measures to address these impacts^{20 21}.

These assessments involved identifying areas which may experience changed levels of noise or vibration as a result of the project and assessing the type, level and duration of potential impacts and how these impacts will be managed. The assessments are conservative and assess the worst-case scenario, such as all equipment being used at the same time.

These assessments are based on the reference design for the respective projects. Once the project is tendered, construction contractor/s will develop the detailed designs and construction methodologies. These need to adhere to the Conditions of Approval, including the preparation of a Construction Environmental Management Plan (CEMP).

The Minister for Planning and Public Spaces' Conditions of Approval for the Western Harbour Tunnel and the Warringah Freeway Upgrade project requires Transport for NSW (as the Proponent) to engage an Environmental Representative, as well as an Acoustic Advisor for the duration of construction. Both appointments must be independent of the design and construction personnel. They are tasked with the responsibility to consider and recommend to Transport for NSW any improvements that can be made to work practices to avoid or minimise adverse impacts (specifically noise and vibration impacts in the case of the Acoustic Advisor) to the environment and community.

Construction Environmental Management Plan (CEMP)

For each project, a CEMP will be prepared in accordance with the Minister's Conditions of Approval and any Revised Environmental Mitigation Measures (REMMs), as presented in the response to submissions report.

All work will be carried out in line with the project's Conditions of Approval, Environment Protection Licence (EPL) and CEMP, which are overseen by DPIE and the NSW Environment Protection Authority (EPA).

The CEMPs will cover the requirements of the relevant planning approval documentation, the conditions of all other permits and licences, the Principal Contractor's corporate Environmental Management System (EMS), and the environmental provisions of the contract documentation. Each CEMP and associated sub-plans will be reviewed by an independent environmental representative and approved by DPIE before main construction starts.

Independent Environment Representative and Acoustic Advisor

During construction, noise and vibration will be monitored to check levels are less than predicted and identify if any additional mitigation measures are required. Transport for NSW will engage

¹⁸ [Chapter 10 of the Western Harbour Tunnel and the Warringah Freeway Upgrade EIS](#)

¹⁹ [Chapter 10 of the Beaches Link EIS](#)

²⁰ [Chapter 11 of the Western Harbour Tunnel and Warringah Freeway Upgrade EIS](#)

²¹ [Chapter 11 of the Beaches Link EIS](#)

an independent Environment Representative and Acoustic Advisor for the duration of the project to:

- review, provide comment on and endorse (where required) any relevant environmental documentation to verify it is prepared in accordance with relevant environmental legislation and Conditions of Approval
- monitor and report on the implementation and performance of the above mentioned documentation and other relevant documentation, in accordance with relevant environmental legislation and Conditions of Approval
- be the principal point of advice for DPIE in relation to all questions and complaints concerning the environmental performance of the project
- ensure that environmental auditing is undertaken in accordance with all relevant project requirements
- recommend reasonable steps, including 'stop works', to be taken to avoid or minimise adverse environmental impacts.

Noise Insulation Program

To proactively mitigate construction and operational noise impacts of the Western Harbour Tunnel and Warringah Freeway Upgrade project, Transport for NSW has started engaging with owners of properties identified for consideration of noise treatment as part of the EIS noise assessment process. Transport for NSW is managing the delivery of the Noise Insulation Program so the delivery of noise treatment is equitable, transparent and focused on customer outcomes.

Independent Property Impact Assessment Panel

Transport for NSW will establish an Independent Property Impact Assessment Panel to verify property condition survey reports, resolve any property damage disputes and establish ongoing settlement monitoring requirements. Panel members will be highly qualified in the fields of structural, geotechnical and/or civil engineering and be independent of the Government and the program. If any damage is found to be directly related to the project, the damage will be fixed at no cost to the property owner.

(I) The impact of the project on nearby public sites, including Yurulbin Point and Dawn Fraser Baths

The land use and property chapter (Chapter 20) of the EIS for the respective projects details potential impacts of the project on land and property including public sites, and identifies measures which address these impacts^{22 23}. Chapter 21 of each EIS details potential impacts on socio-economic issues including public sites and identifies management measures which address these impacts.

Impact of Western Harbour Tunnel and Warringah Freeway Upgrade projects on nearby public sites

There are a number of public open areas located within the Western Harbour Tunnel and Warringah Freeway Upgrade project footprint. The following public open space areas would be temporarily impacted during construction: Yurulbin Park, Birchgrove; Rose Avenue Reserve, Neutral Bay; St Leonards Park, North Sydney; ANZAC Park, North Sydney; Cammeray Golf Course and Merlin Street Reserve.

The majority of open space used for construction of the project would not be required to operate the project and would be rehabilitated and returned to an equivalent state as soon as practicable at the completion of construction. The project would not impact on the long term viability of these areas as public open space.

Yurulbin Point

Of the public recreation areas between Rozelle and Birchgrove, Yurulbin Park is the only public recreation area within the construction footprint given that the park will be temporarily leased for use as a construction support site. This site would not be required on a permanent basis to operate the project.

As outlined in the relevant EIS Chapter 14 on Non-Aboriginal heritage, which deals with the potential non-Aboriginal heritage impacts associated with the project and outlines the proposed environmental management measures, Yurulbin Park would be rehabilitated in line with the design vision provided by the original landscape architect (Mr. Bruce Mackenzie AM) as part of this project as soon as practicable at the completion of construction.²⁴

The project will not impact on the long term viability of the site to continue to be used for public recreation and open space purposes. Furthermore, the current land use zoning for Yurulbin Park being for public recreational use restricts the future development of the site for other uses. The temporary use of Yurulbin Park during construction is therefore not expected to impact on the site's future use.

Cammeray Golf Course

The more substantial changes in public open space as a result of the operation of the project would be at Cammeray Golf Course, where about 25,000 m² adjacent to the Warringah Freeway would be required for shared permanent operational facilities for both the Western Harbour Tunnel and Warringah Freeway project and the Beaches Link and Gore Hill Freeway Connection project. Change at this site would be managed to enable its ongoing operation as a nine-hole golf course, with minor amendments to the configuration of holes and their associated pars. Transport for NSW have engaged and consulted with the golf course operator and land holder

²²[Chapter 20 of the Western Harbour Tunnel and the Warringah Freeway Upgrade EIS](#)

²³[Chapter 20 of the Beaches Link EIS](#)

²⁴[Chapter 14 of the Western Harbour Tunnel and Warringah Freeway Upgrade EIS](#)

and this would continue during further design development and implementation of the project to ensure that the operation of the golf course site during construction and operation of the project is possible.

Dawn Fraser Baths

A discussion on the water quality at the Dawn Fraser Baths as a result of dredging activities has been provided by Royal Haskoning DHV in Appendix C of the Response to submissions report.²⁵

The model developed for Sydney Harbour simulates the dispersion and deposition of sediments, which are suspended due to dredging activities. The highest concentrations of suspended solids occur directly at the dredging location, as this is where contact is made between the dredging equipment and the sediment.

The Dawn Fraser Baths are located approximately 1500 metres upstream from the project dredging location. At the Dawn Fraser Baths, the concentrations of suspended solids due to dredging activities are substantially reduced by the dredging methodology proposed and safeguards to be implemented including backhoe dredge works with an environmental clamshell bucket carried out within a floating silt curtain, not allowing overflow of barges transporting dredged material, constant supervision and real time water quality monitoring as part of a monitoring program developed in consultation with the NSW EPA.

Further reduction in suspended solid concentration is predicted at the Baths with a reduced dredging intensity program planned and the predicted natural dispersion by tidal currents and natural mixing which occurs between the dredging location and the Baths. The predicted maximum suspended solids at the Dawn Fraser Baths due to dredging are therefore low, and comparable to background levels in dry weather.

The maximum values are also not likely to be sustained over time but rather represent spikes of 1-2 hours duration, and in most instances the impacts at the Dawn Fraser Baths due to dredging would not be a noticeable addition to ambient concentrations.

Based on the dispersion and deposition modelling undertaken for the EIS, impacts from dredging would not affect the ongoing operation of the Dawn Fraser Baths

Impact of the Beaches Link project on nearby public sites

The following public open space areas would be impacted during construction and operation: Cammeray Golf Course; Flat Rock Reserve; Artarmon Park; Spit West Reserve; Balgowlah Golf Course.

The temporary construction support sites at Flat Rock Reserve and Spit West Reserve would not be needed to operate the project and would be rehabilitated and returned to an equivalent state as soon as practicable at the completion of construction. The project would not impact the ability of these areas to be used in a manner consistent with their existing use as public open space.

Changes in public open space during operation of the project would be limited to the Cammeray and Balgowlah golf courses and Artarmon Park. The changes at Cammeray Golf Course would be managed to ensure it is able to continue to be used for golf-related activities, albeit in a modified form, as outlined above.

²⁵ [Appendix C of the Response to Submissions to the Western Harbour Tunnel and Warringah Freeway Upgrade EIS report](#)

Balgowlah Golf Course

The changes at Balgowlah Golf Course due to the project would preclude the continued operation of the golf course. Engagement with Northern Beaches Council has identified potential for the residual land to be developed as open space and recreation facilities that address the local community's current and future needs.

A dedicated consultation process jointly led by Transport for NSW and Northern Beaches Council would take place to give the community an opportunity to provide input on the final layout of the new and improved open space and recreation facilities at Balgowlah. As part of this consultation process, a community working group would be established, with representative stakeholder groups and the community, to support Transport for NSW and Northern Beaches Council with the development of this important public space.

Along with residual land from properties acquired along Dudley Street, the project would progressively return an area, equivalent to around 90 per cent of the current open space, to the community as new and improved public open space and recreation facilities.

Bantry Bay Reservoir site

The Wakehurst Parkway east construction support site (BL13) would occupy two portions of land east of the Wakehurst Parkway and north of Kirkwood Street currently owned by Sydney Water. The temporary construction support site would comprise both portions of land as one support site. One portion of land is surrounding the main Bantry Bay Reservoir site mostly north of the existing water tanks and would be leased by Transport for NSW from Sydney Water. The site would be temporarily used as a temporary construction support site for the duration of construction. The temporary occupation of this land would not affect the existing land use zoning that is applicable to the site. Sydney Water facility operations and the on-site Telstra tower would remain operational for the duration of construction activities at the site. All existing structures would be protected. The land to be leased would be rehabilitated in consultation with Sydney Water and returned to the landowner at the completion of construction.

The other portion of the site would be located wholly on vacant non-operational Sydney Water owned land immediately north of the existing water tanks zoned for low density residential. Transport for NSW would acquire this non-operational part of the Bantry Bay Reservoir site from Sydney Water. This land would be rehabilitated and revegetated as soon as practicable after construction and would be handed over to Northern Beaches Council to manage for use by the community as part of the Manly Dam Reserve. This would add about 4000 square metres of new public space to the Manly Dam Reserve. A smaller portion of land required for the access road to and from the support site forms part of the Manly Dam Reserve, which is Crown land. This land would be leased, and rehabilitated and returned to Northern Beaches Council at the end of construction.

Underpasses beneath Wakehurst Parkway

The Wakehurst Parkway would be realigned and upgraded to allow connection to the ramp tunnels with the surface and widened between the ramp tunnels and Warringah Road in Frenchs Forest to improve capacity and safety. The works would be carried out entirely within the existing road reserve and Transport for NSW owned land zoned for infrastructure related uses. There would be no impact on existing land uses.

The Wakehurst Parkway between Seaforth and Frenchs Forest currently creates a barrier between adjoining of the Wakehurst Parkway areas which largely severs east-west connectivity for fauna, pedestrians and cyclists where there is no dedicated crossing location. The project would provide a positive contribution to the local area by providing new and upgraded active transport infrastructure that would improve connectivity and user safety along and across underpasses beneath the Wakehurst Parkway. This would include a new shared user path along

the eastern side of the Wakehurst Parkway between Seaforth and Frenchs Forest, three new shared user underpasses of the Wakehurst Parkway, reconstruction and lengthening of the existing pedestrian overpass across the Wakehurst Parkway beneath the Wakehurst near Warringah Road, and a new shared user bridge over a drainage culvert and existing fauna underpass Parkway near Warringah Road. The project would also provide new and replaced fauna crossing infrastructure along the Wakehurst Parkway.

Other impacts in relation to public sites are included in the response to submissions report, as required.²⁶

²⁶ Part C (Response to the Community Submissions) of the [Response to Submissions to the Western Harbour Tunnel and Warringah Freeway Upgrade EIS report](#)