

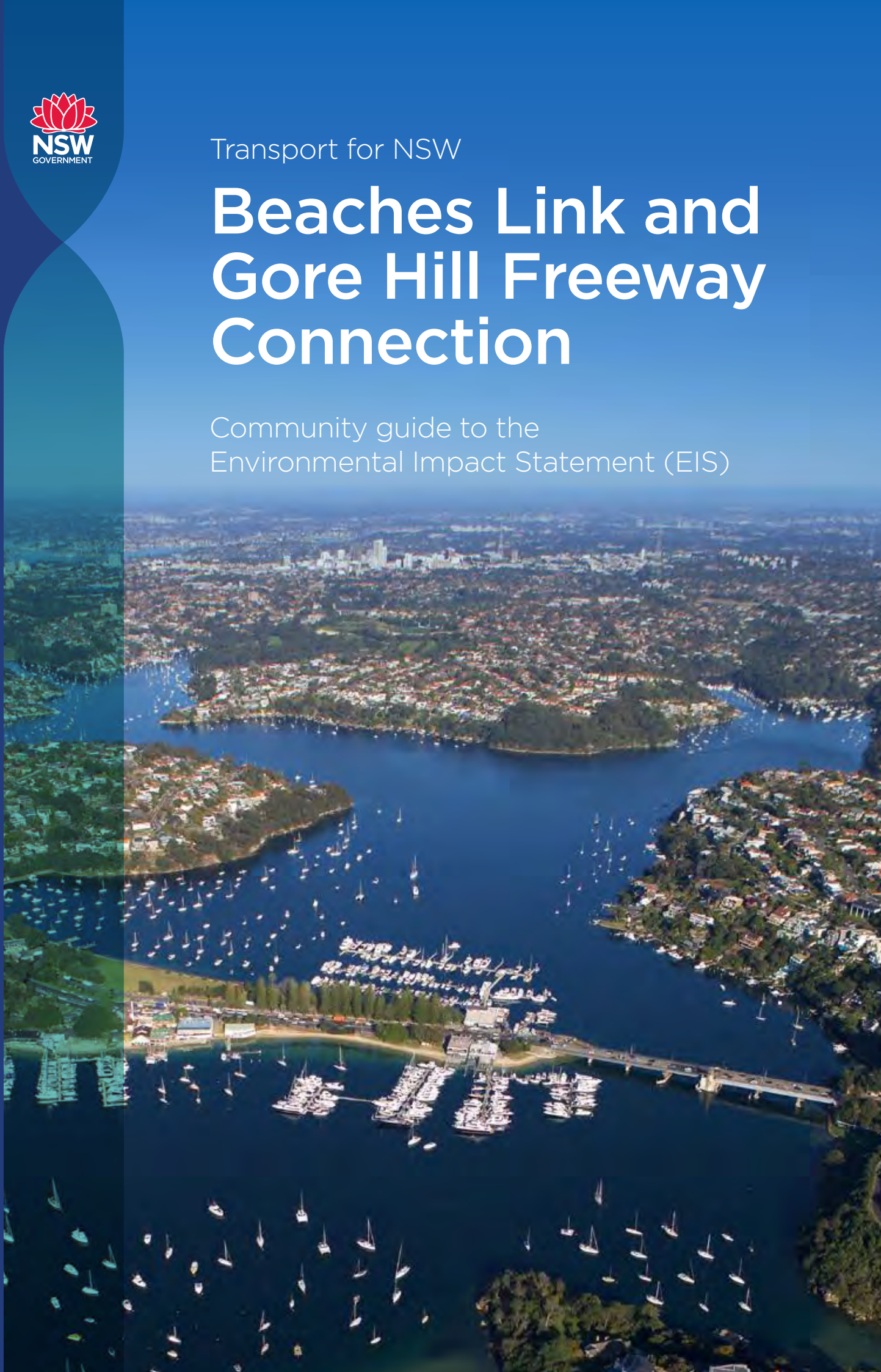


Transport for NSW

Beaches Link and Gore Hill Freeway Connection

Community guide to the
Environmental Impact Statement (EIS)

December 2020





Translating and Interpreting Service

If you need an interpreter, please call the Translating and Interpreting Service (TIS National) on **131 450** and ask them to telephone Transport for NSW on **1800 931 189**.

Chinese (simplified)

若您需要口译员，请拨打 **131 450** 致电翻译与口译服务处 (TIS National)，并要求他们转拨 **1800 931 189** 致电 Transport for NSW。

Italian

Se avete bisogno di un interprete, chiamate il servizio traduttori e interpreti (TIS National) al numero **131 450** e chiedete di telefonare a Transport for NSW al numero **1800 931 189**.

Portuguese

Se necessitar de um(a) Intérprete, por favor, ligue para o Serviço de Tradução e Interpretação (TIS National), através de **131 450** e peça o telefone do Transport for NSW, através de **1800 931 189**.

Acknowledgements

The Beaches Link and Gore Hill Freeway Connection Environmental Impact Statement (EIS) is now on public exhibition. The EIS assesses the potential impacts of the construction and operation of this project, including environmental and social impacts, proposed locations for temporary construction support sites, truck movements and how we are managing the potential impacts to local flora and fauna.

We understand people are often short on time, so we have created this guide to accompany the full EIS. This document includes information on the project's design, potential impacts from tunnelling and building facilities such as the ventilation outlets and motorway facilities, and operating the project. In addition we provide details on the environmental management measures we will put in place to manage these potential impacts.

We encourage you to visit our interactive portal, **nswroads.work/blportal**, for more information, maps and videos.

The interactive portal provides links through to the chapters and technical working papers included in the EIS. You are also encouraged to attend one of our virtual information sessions, which will be held throughout the public exhibition period.

We thank you for all the feedback you have provided so far. It has made a real difference to this project. We encourage you to submit your feedback on the EIS via the Department of Planning, Industry and Environment (DPIE) major projects planning portal:

planningportal.nsw.gov.au/major-projects/project/10456 to assist our project to deliver an outcome which balances the needs of motorists and commuters with those of our local communities.

*Please note: The potential environmental impacts and environmental management measures are described in more detail in the Beaches Link and Gore Hill Freeway Connection EIS and technical working papers. You can view these documents on DPIE's website **planningportal.nsw.gov.au/major-projects/project/10456**. Please ensure your submissions to DPIE refer directly to the actual EIS and not this document, which provides a summary only.*

Contents

Section

01

About the project	7
Sydney's future	8
Beaches Link and Gore Hill Freeway	
Connection benefits at a glance	12
Our community	14
Proposed Reference Design	18
Beaches Link indicative tunnel depths	28
About the EIS	32

Section

02

Building the project	35
Construction stages	36
Temporary construction support sites	40
Cammeray	42
Northbridge/Willoughby	46
Artarmon	50
Middle Harbour	58
Mosman	62
Balgowlah	66
Seaforth - Wakehurst Parkway South	72
Killarney Heights - Wakehurst Parkway East	74
Frenchs Forest - Wakehurst Parkway North	78

Section

03

Our assessments	81
Traffic and Transport	81
Noise and vibration	85
Air quality	91
Human health	94
Heritage	96
Urban design and visual amenity	98
Open space and community precincts	99
Biodiversity	102
Other assessments	106

Section

04

How we build the project	113
Building across the harbour	113
Building on land	120

Section

05

Next steps	125
Community consultation	125
How to make a submission	126



Section 01

About the project

About Beaches Link and Gore Hill Freeway Connection

The NSW Government's vision for Sydney is one of an integrated road and public transport network that gives you the freedom to choose how and when you get around, no matter where you live and work.

One area of focus in Greater Sydney is to complete the missing links in the motorway network to support the growth of our communities, places and economy, and enable people to move safely and reliably around our city and beyond.

We understand traffic along Military Road, across the Spit Bridge and along Warringah Road can be challenging, especially in peak hours. Beaches Link and Gore Hill Freeway Connection will change the way you travel to and from Sydney's Northern Beaches. When completed, this project will reduce travel times, enabling you to get to your destination faster, by improving capacity and reliability on critical transport routes on both sides of Middle Harbour.

This project will offer new direct connections from the Northern Beaches to Warringah Freeway and North Sydney, the Inner West (via the Western Harbour Tunnel) and St Leonards and Macquarie Park (via the Gore Hill Freeway Connection) linking people with more jobs, education and services. It will also benefit local businesses by providing more direct and efficient access to and from the Northern Beaches for the movement of goods.

You will experience more efficient public transport routes with the opportunity for new express bus services to key centres, including St Leonards, Macquarie Park, North Sydney and the Sydney CBD, and direct access to North Sydney for interchange with the Sydney Metro Victoria Cross Station (opening 2024) and Sydney Trains. Those who rely on existing surface roads will also experience faster and more reliable bus trips on Military Road and Warringah Road.

We understand open space is important to the community, which is why we will be returning some of the temporary sites we use as new areas for the community to enjoy. For example, we will work with the community to develop the layout of the new and improved open space and recreation facilities at Balgowlah. The project will also deliver improvements to pedestrian and cyclist facilities in the form of new and upgraded paths, including a new path along the Wakehurst Parkway.

We would like to sincerely thank all the local community, businesses and industry who have taken the time to meet with us to share their views on this city-shaping project. Your feedback has been valuable in helping us understand what is important to you, and in delivering changes to the design.

We are now exhibiting the Environmental Impact Statement (EIS) until **midnight Monday 1 March 2021 and are seeking your important feedback to help us continue to shape this iconic project.**



Interactive portal

 nswroads.work/blportal

Sydney's future

The NSW Government's Future Transport 2056 strategy provides a 40-year vision, directions and framework for customer mobility in NSW, which will guide transport investment over the longer term. The strategy is the first transport plan in Australia to harness technology to improve customer and network outcomes, and it starts with a long-term vision for communities. We have aligned how we plan the future of the transport network with land use planning by working closely with key stakeholders such as the Greater Sydney Commission, Infrastructure NSW and the Department of Planning, Industry and Environment.

Roads remain a critical element in this integrated transport network, servicing buses, freight, commercial and many other individual journey needs.

Beaches Link and Gore Hill Freeway Connection is a key component of this broader transport strategy. Visit future.transport.nsw.gov.au for more information.

Why is Beaches Link needed?

We are addressing congestion, improving safety and providing more choice for how you move around Greater Sydney.

Improvements to road, rail and public transport will ensure our transport network enables easier, faster and safer journeys. That's 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.



Get you
to your
destination
faster

Complete the
missing links
on Sydney's
motorway network

Save time
on your
travel

Support the
growth of our
communities

Providing new
direct routes

What is the current situation?

Only three main roads serve Sydney's Northern Beaches – Military Road/Spit Bridge, Warringah Road and Mona Vale Road. These links are congested during peak periods, which results in long and unreliable travel times. With limited alternative routes available, transport in this region is vulnerable to delays caused by incidents during peak periods, with significant increases to travel times following even minor incidents.

This impacts access for people and goods travelling to, from and within the region, and increases the time people spend commuting and restricts job access and opportunities for growth.

The population in our great city is expected to grow from five million to eight million in the next 40 years.

We also expect to see Greater Sydney's economic output double by 2031. This includes significant growth in high-skilled jobs in the Global Economic Corridor, which stretches from Macquarie Park and Chatswood to North Sydney, the Sydney CBD and beyond to Sydney Kingsford Smith Airport.

Given the current pressure on the main roads servicing the Northern Beaches region, improving existing transport networks and creating new transport connections will be essential for our city to continue to be a competitive economy and to meet the growing needs of our communities.

COVID-19

The COVID-19 pandemic has changed the way people work and their travel patterns. While it is difficult to fully assess the impact of the pandemic, evidence of Greater Sydney's resilience is already apparent. In Greater Sydney, traffic levels on most roads have returned to pre-COVID-19 levels. This indicates a relatively rapid response by the city, and suggests the movement of people, goods and services and demand for road capacity is returning to conditions similar to those before the pandemic.

While the pandemic (along with other unprecedented events such as the 2019-2020 bushfires) presents short- to medium-term challenges for Sydney (and NSW more broadly), Beaches Link 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 project remains critical to ensuring the future success of Sydney.

Current situation

Spit Bridge

the only remaining opening bridge on the Sydney road network

Spit Road

10th busiest road corridor in NSW*

Military Road

7th busiest road corridor in NSW*



Military Road and Spit Road corridor carries 69,500 vehicles per day
34,000 bus passengers per day

On average
551 incidents every year
on Spit Bridge and Military Road**



Roseville Bridge



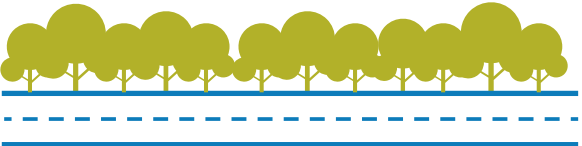
carries over
79,000 vehicles per day
9,500 bus passengers per day

Mona Vale Road

carries **56,000 vehicles per day**

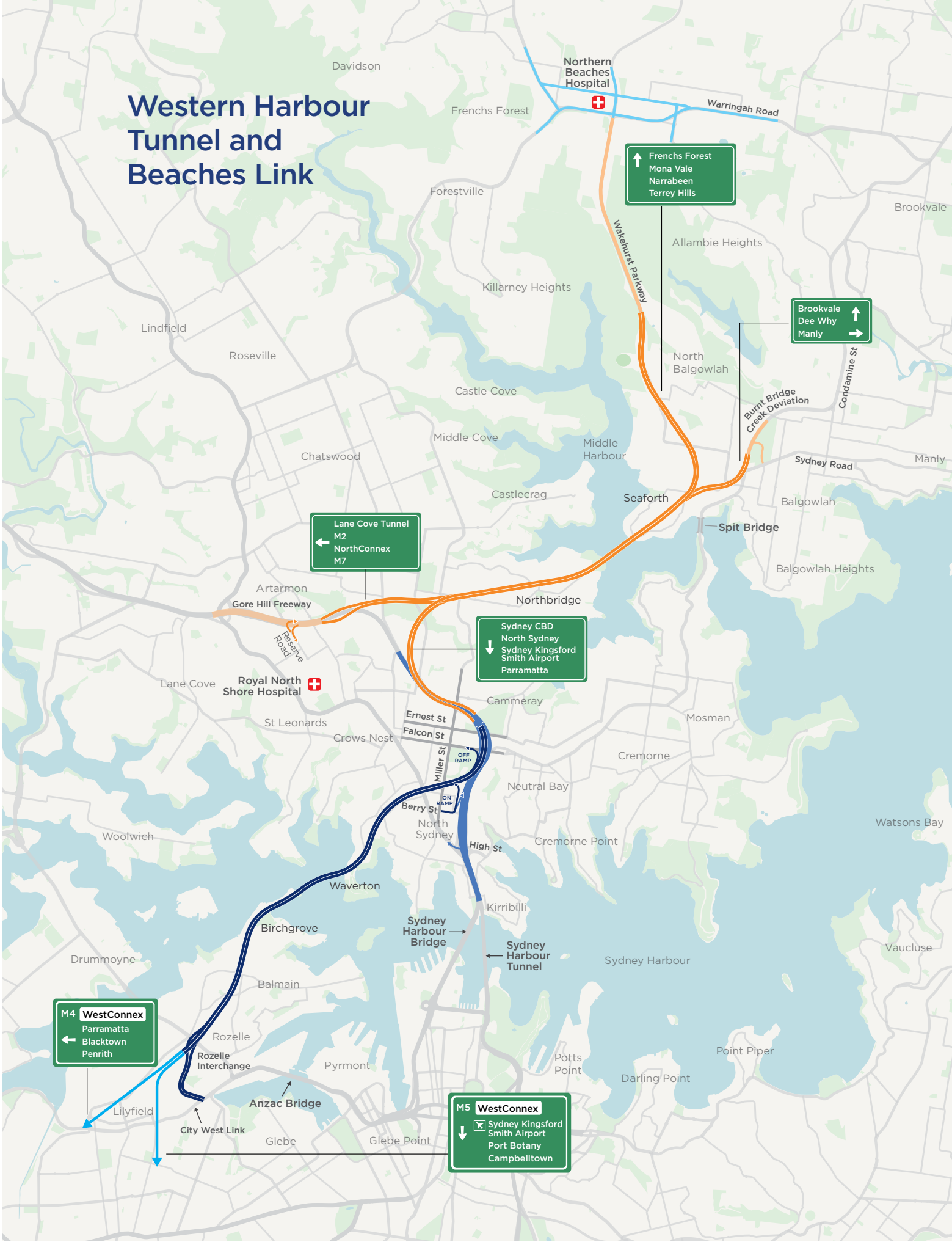
Eastern Valley Way

carries **28,000 vehicles per day**



*During the AM peak.
**Between 2014 and 2017.

Western Harbour Tunnel and Beaches Link



Legend

- Beaches Link
- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Surface work
- WestConnex
- Northern Beaches Hospital roadworks (completed 2020)

- Motorways
- Major roads

0 1km 2km



Beaches Link and Gore Hill Freeway Connection benefits at a glance

Integrated transport

Beaches Link will significantly improve access to key centres across Sydney including:

- North Sydney
- Sydney CBD
- Sydney Kingsford Smith Airport
- Southern and south-western Sydney
- Macquarie Park
- Sydney's north-west

by connecting directly to the Warringah Freeway, the proposed new Western Harbour Tunnel and the Gore Hill Freeway

We have designed the project to integrate with the broader public transport network to provide significant travel time savings and reliability benefits



You will experience **faster and more reliable bus trips** on Spit Bridge, Military Road, and Warringah Road

You will see **improvements to pedestrian and cycling routes**, providing you with more transport options

We will be **providing opportunities for new express bus routes** to and from the Northern Beaches via Beaches Link



Travel time savings

Beaches Link will provide a safer, faster and more reliable trip as you bypass:

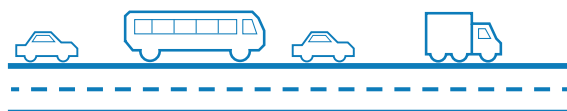
- 19 sets of traffic lights through The Spit, Mosman and Neutral Bay
- 20 sets of traffic lights from Frenchs Forest to Macquarie Park

By 2037 you will:

- ⌚ **Save up to 38 minutes**
Balgowlah to Sydney CBD
- ⌚ **Save up to 56 minutes**
Dee Why to Sydney Airport
- ⌚ **Save up to 54 minutes**
Frenchs Forest to Rozelle
- ⌚ **Save up to 32 minutes**
Manly to Macquarie Park

By 2037 you will see traffic significantly reduce on:

- Spit Road **33% less traffic**
- Military Road **10% less traffic**
- Warringah Road **23% less traffic**
- Eastern Valley Way **40% less traffic**
- Mona Vale Road **8% less traffic**



Improved surface roads

Moving traffic underground will improve urban amenity and reduce pressure on our main roads



- You will experience less congestion** on Military Road/Spit Bridge, Warringah Road, Condamine Street and Wakehurst Parkway.
- Reduced rat-run traffic on local roads**
- Improved **safety and efficiency on existing roads** with heavy vehicles travelling underground

Walking paths, cycleways and fauna crossings

We are delivering over five kilometres of new pedestrian and cycle pathways

We are providing additional shared cycle and pedestrian pathways as part of the new and improved public open space and recreation facilities at Balgowlah, integrating them into existing paths to nearby schools and shops



Our new cyclist and pedestrian pathways along and under Wakehurst Parkway will integrate with the Garigal National Park and Manly Dam Reserve trails and link the new Northern Beaches Hospital precinct with Seaforth



We are installing new wildlife crossings over and under the widened Wakehurst Parkway

to improve safe crossing for fauna (animals) and provide a safer journey for road users

Economic benefits

The Western Harbour Tunnel and Beaches Link program is expected to **support up to 15,000 full-time-equivalent jobs during its construction**. We are supporting up to 7,500 full-time-equivalent jobs during the five to six years of construction for Beaches Link and Gore Hill Freeway Connection



You will spend less time in stop-start traffic, meaning you can spend more time doing what you want to do

Improving the transport network will bring you closer to your jobs

Your local businesses will have more efficient access to Greater Sydney, making it easier to move goods, provide services and access your customers. By using the tunnels you will experience savings in vehicle running costs

Improved amenity and open space

We will return an area equivalent to around **90 per cent of the current open space at Balgowlah** to the community as a new and improved public open space and recreation facilities



We will be seeking your input to design open space areas

The temporary sites we are using at **Flat Rock Drive and Spit West Reserve will also be returned as public open space** in consultation with the local councils and community

Once open to traffic, **some areas will experience less noise** due to reduced traffic on the surface, new noise barriers and at-property noise treatments

Allowing through traffic from Spit Road and Military Road to use the **tunnel will improve the amenity of local town centres** including Mosman, Cremorne and Neutral Bay

Air quality

With traffic moving underground there will be an overall improvement to air quality. Our tunnels are designed to ensure:

- we meet strict in-tunnel air quality requirements
- no emissions from portals
- negligible impact to local air quality

Less stop-start traffic will result in a reduction of greenhouse gas emissions



Our community

We recognise a project of this scale will have an unavoidable impact on local communities. This is why we have completed one of the most extensive engagement programs for a motorway project ahead of the EIS exhibition period.

Since the release of the preferred route and concept design in 2017, we have engaged with thousands of you who live and work in and around our project area. We have listened to better understand your concerns and have incorporated your feedback and suggestions into our design where possible.

Our commitment to you is we will continue to listen and actively engage with you to hear your feedback on this city shaping project.

Overview

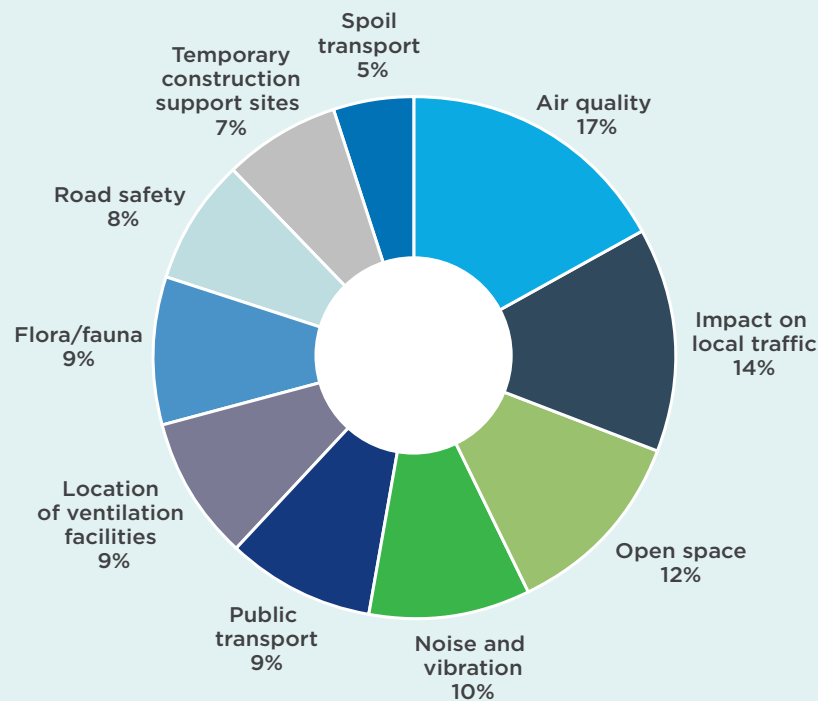
Our engagement program for Beaches Link and Gore Hill Freeway Connection included companion project Western Harbour Tunnel and Warringah Freeway Upgrade. We prepared a separate EIS for Western Harbour Tunnel and Warringah Freeway Upgrade which assessed any temporary and permanent impacts. This EIS was placed on public exhibition from 29 January to 30 March 2020.

In 2018, we carried out a wide range of consultation and engagement activities to help refine our design based on community feedback and we aimed to reduce community impact where possible.

What you told us

Your feedback on the Western Harbour Tunnel and Beaches Link Proposed Reference Design in 2018 focused on the following topics:

- air quality
- impacts on local traffic
- open space impacts
- noise and vibration
- public transport
- location of ventilation facilities
- flora and fauna
- road safety
- temporary construction support site impacts
- spoil transport.



Community information session during 2018 consultation period



Seaforth and Middle Harbour

Design changes following community feedback

We thank you for your feedback, which has helped us make a number of positive improvements to the project. They include:

Improving access to Beaches Link and the new and improved open space and recreation facilities

We have worked with the community on a number of alternatives to connect Beaches Link with Sydney Road, provide access for users of the new and improved public open space and recreation facilities at Balgowlah, and deliver a solution that provides the best outcome for the community. As a result, we have redesigned the permanent access road to reduce its length, area, and impacts, while still providing access to the new public open space and recreational facilities.

Maximising usable community space in the final layout at Balgowlah

We recognise that maximising the amount of public open space once construction is complete is important to you. We have redesigned the connection at Balgowlah to return an area equivalent to around 90 per cent of the current open space at Balgowlah to the community as new and improved open space and recreation facilities. The final layout will be determined based on community input as part of a

dedicated consultation process. We are working collaboratively with the Northern Beaches Council and plan to have over half of the recreational precinct open for you to use around two years after we start construction, three to four years earlier than we originally planned.

Reducing impacts on Burnt Bridge Creek

The proposed tunnel portal location at Burnt Bridge Creek Deviation has been shifted further to the south. This enables us to reduce traffic staging work on Burnt Bridge Creek Deviation, reduce our impacts on Burnt Bridge Creek and eliminate the need to replace the existing Kitchener Street Bridge.

Moving the tunnel connection to the Wakehurst Parkway further north to reduce impacts to the surrounding community

The tunnel entry and exit ramps at Killarney Heights have been moved about 450 metres further north along Wakehurst Parkway. This will reduce construction and operational impacts for the surrounding community as well provide an improved tunnel connection to Wakehurst Parkway. This significant design change was adopted following community engagement on the concept design in 2017.

Reducing impacts of the Wakehurst Parkway temporary construction support site on the surrounding community

Using the Sydney Water land north of Kirkwood Street as a temporary site minimises impacts to residents and Seaforth Oval. After construction, the section of this site not required for Sydney Water operations will be incorporated into the Manly Dam Reserve for the community to enjoy. Based on community feedback, we also changed our impacts to local streets, like Judith Street and Kirkwood Street.

Maximising distance between construction activities and community facilities at Willoughby/Northbridge

We need a temporary site that provides us with access to the middle section of the project to allow safe and efficient construction of the tunnel. Without it, it would be like trying to renovate a house with the only access being

through the front door. The eastern side of Flat Rock Drive was selected as a temporary site because it is both technically feasible for the tunnelling, work whilst having the lowest level of community impact, compared to the alternative site options. The temporary site will not directly impact any private property or homes. Using this location for our site provides a greater distance between the temporary site and the Willoughby Leisure Centre indoor facilities, netball courts and car park, and avoids impacts to the baseball diamond. Construction vehicles will have direct access to and from the site via Flat Rock Drive, to avoid trucks travelling through local streets. As the temporary site is surrounded on three sides by bushland, there will be low visibility of the site for the community. At completion, there will be further opportunities to provide new recreation facilities or reinstate the temporary site to bushland. We will continue to consult and work closely with Willoughby Council and the local community on the final use of the site at project completion.

Managing community concerns

We know building a project of this scale and significance does not go without impact.

We will have a community contact system in place during construction and will ensure there is a number of different ways you can contact us and raise concerns or make enquiries at any time.

We will also be working closely with teams from nearby construction projects to help minimise the construction and consultation fatigue in your local area.

Western Harbour Tunnel and Beaches Link consultation

2017 April - June

Western Harbour Tunnel and Beaches Link Concept Design

16 community feedback sessions

More than **1000** phone calls received

Email blasts to **2300** stakeholders

1700 comments on online engagement map

12 'pop up' shopping centre displays

More than **4000** face to face conversations

71 Property owners directly contacted about potential property impacts

25 meetings with community groups

More than **6300** notifications about marine and land-based geotechnical work

More than **700** emails received

2018 July - December

Western Harbour Tunnel and Beaches Link Proposed Reference Design

20 community feedback sessions with more than **2639** visitors

3892 doorknocks around proposed construction sites

37 community groups and committees actively engaged

2573 written submissions received via email

400,000 letterbox drops

392 phone calls received

4029 comments on online engagement map

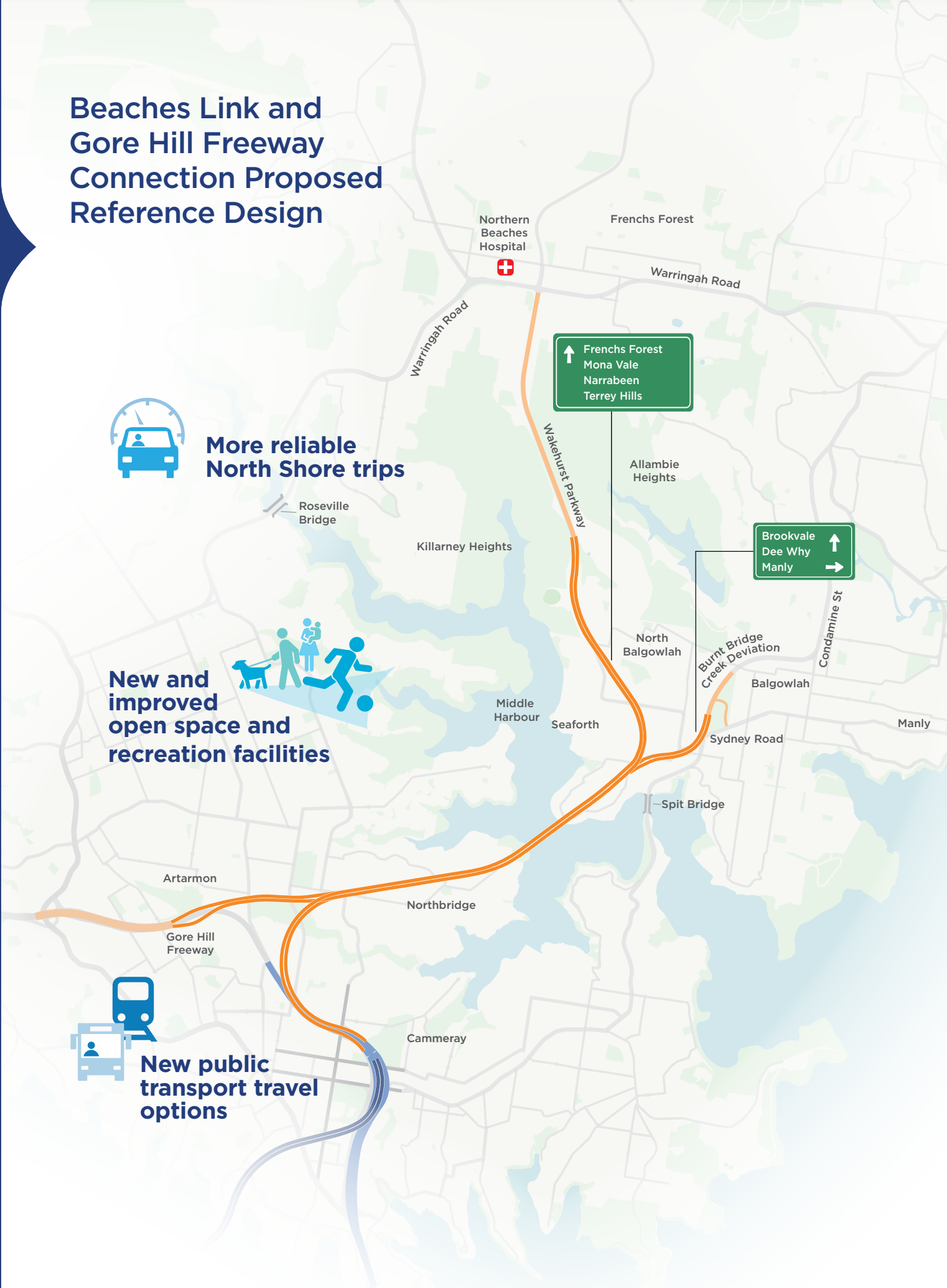
6 'pop up' shopping centre displays **591** visitors

Beaches Link and Gore Hill Freeway Connection Proposed Reference Design

 **More reliable North Shore trips**

New and improved open space and recreation facilities

 **New public transport travel options**



Following two extensive rounds of consultation in 2017 and 2018, we have refined our design to incorporate feedback and suggestions from stakeholders and the community. This refined reference design is presented in the EIS.

Our project will:

- take pressure off the Spit/Military Road and Warringah Road corridors, providing faster and more reliable journeys to, from and around the Northern Beaches and North Shore
- improve public transport travel times, reliability, and connectivity by providing a new underground bypass route for express bus services between the Northern Beaches and strategic centres across Sydney, including North Sydney, the Sydney CBD, St Leonards and Macquarie Park
- enable local businesses to have better and more efficient access to Greater Sydney, making it easier to move goods and provide services, as well as bringing employees and businesses closer together
- improve journey efficiency by allowing commuters and freight to reach their destination faster, safer and more reliably
- improve the ability of the Northern Beaches and North Shore transport network to cope with traffic incidents
- improve amenity and safety in local centres by reducing congestion, through traffic and 'rat runs' in local streets.

Surface road connections will integrate with the main road network to provide efficient access at:

- Gore Hill Freeway to allow road users from areas including Artarmon, Macquarie Park and beyond to access the new Beaches Link tunnel
- Warringah Freeway to allow road users from the Sydney CBD, North Sydney, and the lower North Shore to access the new Beaches Link tunnel
- Burnt Bridge Creek Deviation to provide connectivity to areas including Manly, Balgowlah, Seaforth and Brookvale
- Wakehurst Parkway at Killarney Heights to provide safe and easy access from areas including Frenchs Forest, Belrose, Terrey Hills, and Mona Vale.

Beaches Link will also include underground connections to and from the Western Harbour Tunnel. These underground connections will create opportunities to deliver new levels of connectivity for the Northern Beaches region, providing direct motorway access to the Inner West, south, and south-west via the wider motorway network.



Traffic on Manly Road, waiting for Spit Bridge to "open"

Balgowlah Connection and Access Road



Benefits

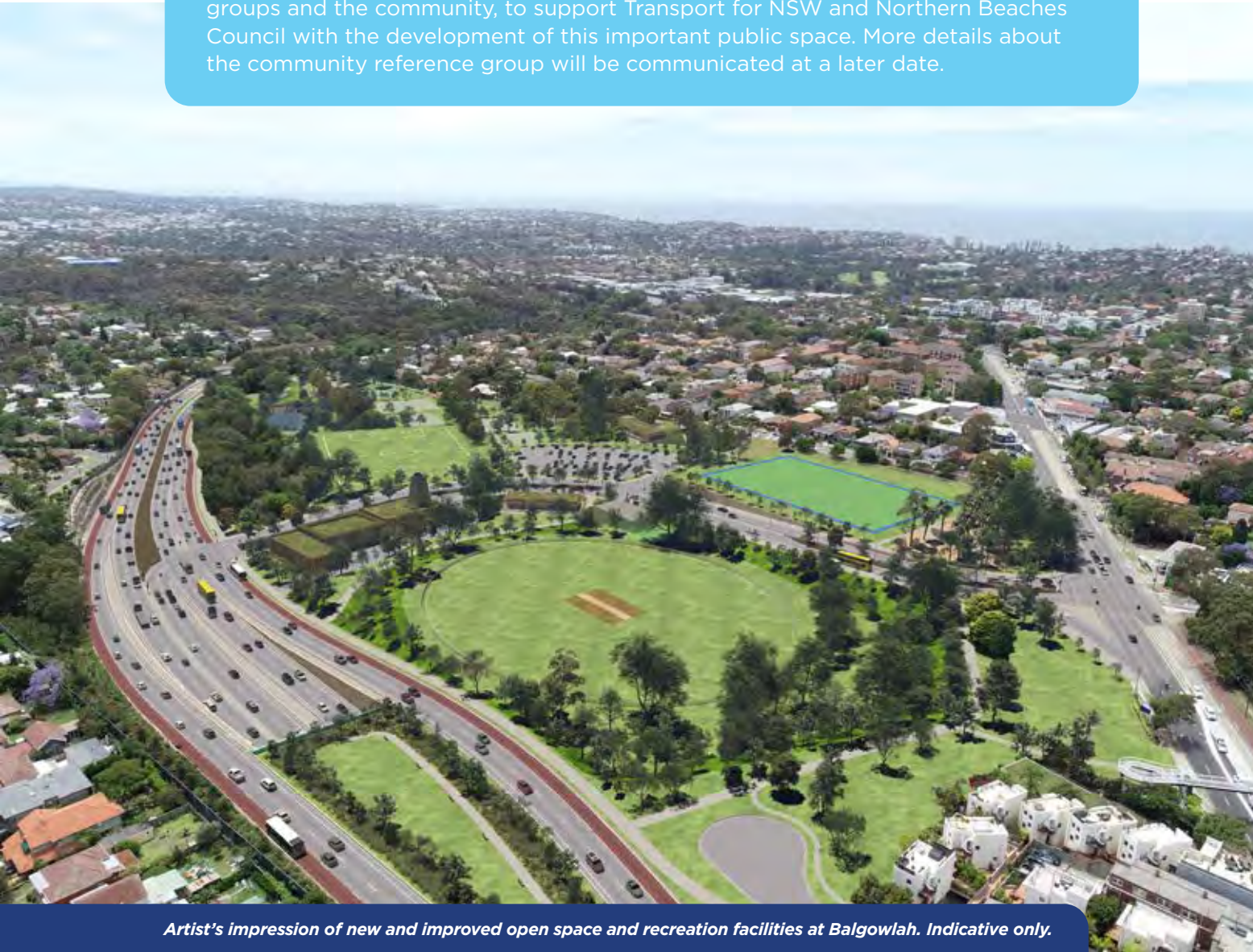
- You will enjoy direct access to Beaches Link, bypassing the Sydney Road/Burnt Bridge Creek Deviation intersection, Spit Bridge and Military Road, and provide access to the:
 - Gore Hill Freeway at Artarmon
 - Warringah Freeway near Cammeray
 - Western Harbour Tunnel.
- You will experience reduced through traffic on the Spit Road/Military Road corridor:
 - reducing congestion
 - making travel faster and easier for people travelling along the surface corridor, including many bus services
 - improving amenity in areas along the corridor, including The Spit.
- Bus users will enjoy new opportunities for express services via the Beaches Link tunnel, providing quick and reliable connections to centres including North Sydney, the Sydney CBD, St Leonards and Macquarie Park.
- You will experience access to pedestrian and cyclist paths and better connectivity to existing routes by upgrading and transforming pedestrian and cyclist infrastructure.
- You will experience significant improvements to public open space and recreation facilities at Balgowlah.

New and improved open space and recreation facilities at Balgowlah

We will return an area, equivalent to around 90 per cent of the current open space to the community as new and improved open space and recreation facilities.

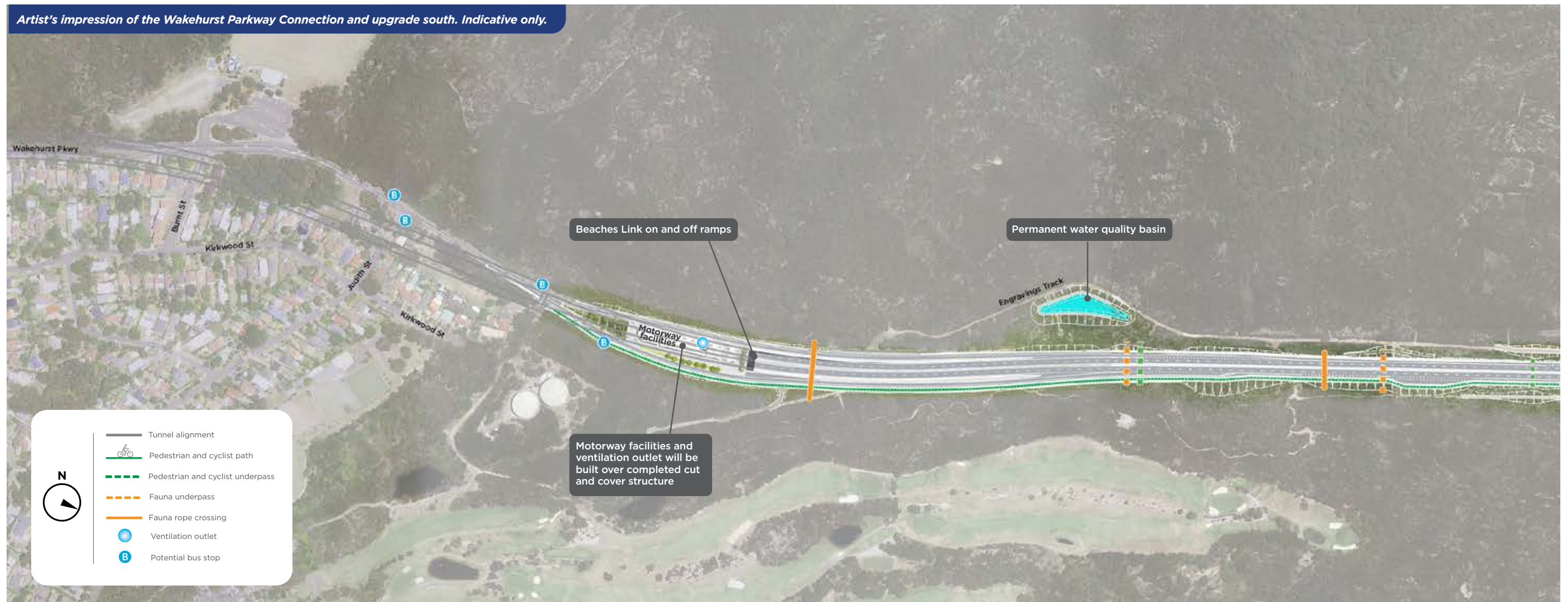
Residual land, mostly to the east and north of the new access road, will progressively become available during construction, which will allow us to turn it into the new and improved open space and recreation facilities. We are working collaboratively with Northern Beaches Council and plan to have over half of the recreational precinct open for you to use around two years after we start construction, three to four years earlier than we originally planned. The new open space and recreation facilities will be built and handed over to Northern Beaches Council after completion of the project.

A dedicated consultation process jointly led by Transport for NSW and Northern Beaches Council will take place to give the community an opportunity to comment on the final layout at Balgowlah. This consultation will be separate to the consultation for the EIS. This process will start after the EIS public exhibition period and well in advance of construction starting. As part of this consultation process, a community reference group will 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. More details about the community reference group will be communicated at a later date.



Artist's impression of new and improved open space and recreation facilities at Balgowlah. Indicative only.

Artist's impression of the Wakehurst Parkway Connection and upgrade south. Indicative only.



Wakehurst Parkway Connection and upgrade

Benefits

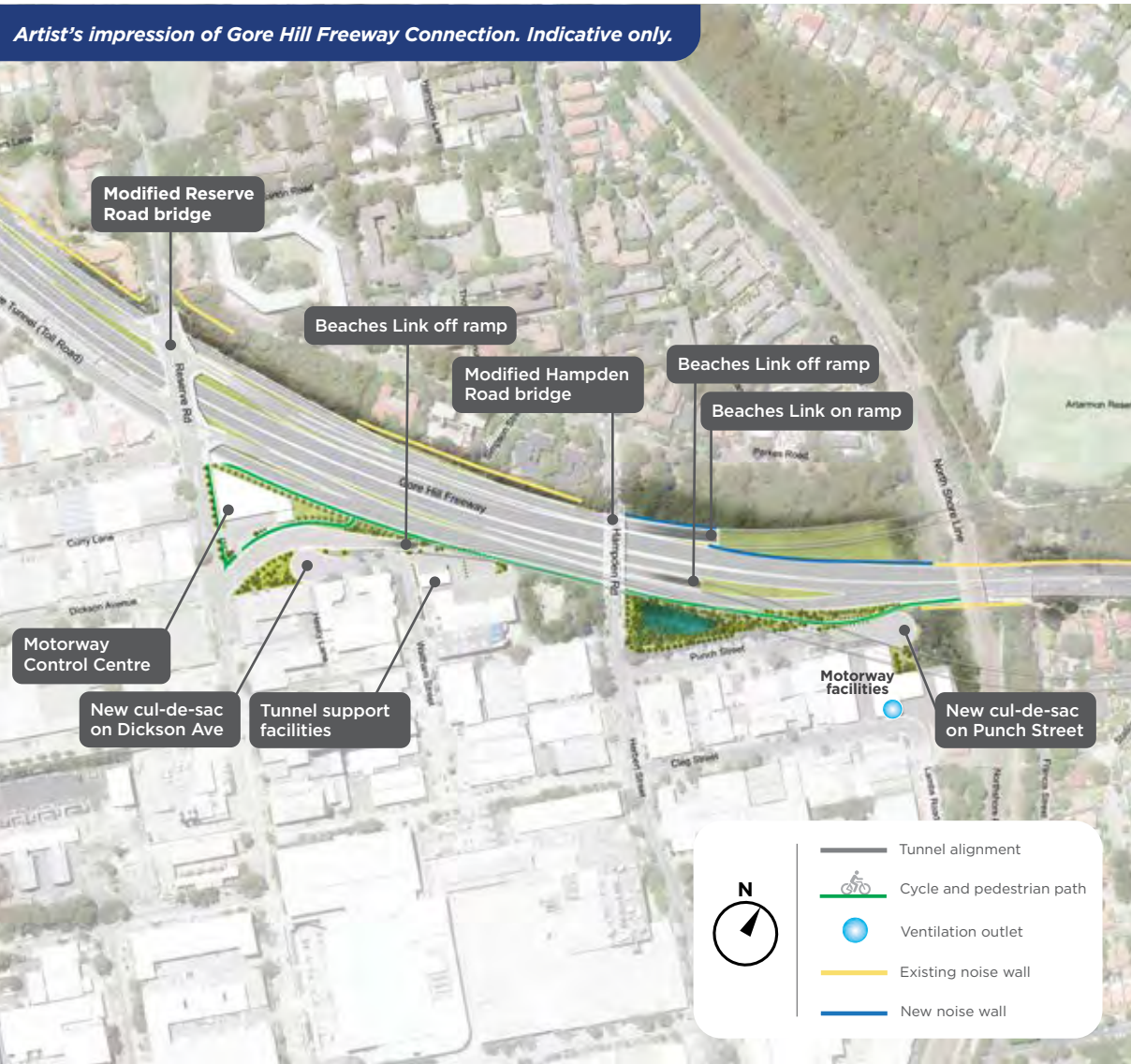
- You will experience faster, safer and more reliable journeys with the upgraded Wakehurst Parkway. This will include widening from one lane to two lanes in both directions, between Warringah Road and the tunnel portals, and various safety improvements.
- You will experience greater connectivity to and from areas including Frenchs Forest, Belrose, Terrey Hills, Mona Vale and areas further north.
- Beaches Link will provide a new underground bypass of Seaforth, reducing through traffic through this area.
- Increased access to buses for the local community with the tunnel built to accommodate single and double decker buses and four upgraded bus bays and bus stops along Wakehurst Parkway.
- New and upgraded cycling and pedestrian infrastructure along Wakehurst Parkway including a new spath along the eastern side of Wakehurst Parkway between Seaforth and Frenchs Forest, two new underpasses and connections to existing bike and walking trails.
- New and replaced fauna fencing and crossings over and under Wakehurst Parkway, improving safety for road users and animals.
- Provides opportunities for Transport for NSW to develop new and updated express bus services to access Greater Sydney's transport network.



Artist's impression of Wakehurst Parkway going south. Indicative only.



Gore Hill Freeway Connection



Benefits

- Provides an underground bypass and more direct access for trips between the Northern Beaches and strategic centres including Artarmon, St Leonards, Macquarie Park, Chatswood and the north-west.
- Improved travel times along the Warringah Road and Roseville Bridge corridor as a result of significant reductions in traffic.
- Improved connectivity and accessibility from the Northern Beaches to major employment areas, including Macquarie Park, St Leonards, Artarmon and Royal North Shore Hospital, to get you to your jobs faster.
- Provides opportunities for new express buses from the Northern Beaches to St Leonards and Macquarie Park.

Warringah Freeway Connection



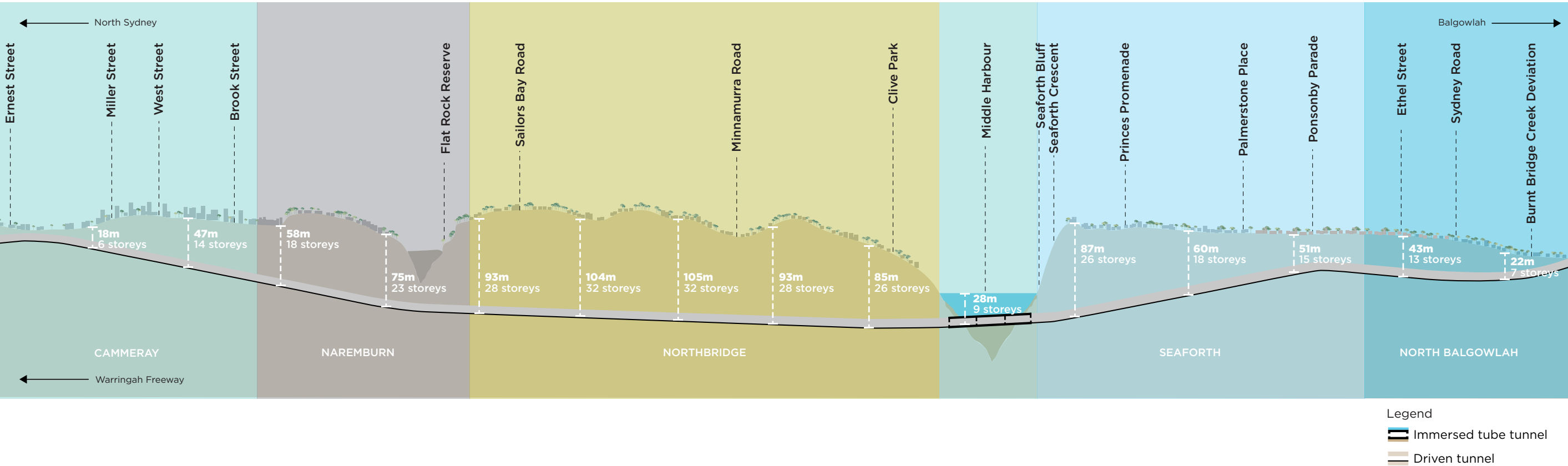
Benefits

- Beaches Link ramps at the Warringah Freeway will provide direct connectivity to the wider motorway network for customers travelling from the Northern Beaches, including to North Sydney, the lower North Shore, the Sydney CBD, and Eastern Suburbs.
- Provides an underground bypass of the Military Road and Spit Road corridor, bypassing 19 sets of traffic lights through The Spit, Mosman and Neutral Bay by using the new tunnel, allowing you to enjoy faster, safer and more reliable journeys.
- Improved bus access to North Sydney will provide the opportunity to develop new express bus services using Beaches Link. These services will be able to interchange with the new Sydney Metro and Sydney Trains, giving you more options to choose how you travel.
- Existing bus services travelling to the Sydney CBD will have direct access to the new Warringah Freeway bus lane, reducing your travel time. Any new city-bound bus routes that are developed to use Beaches Link will also benefit.
- Direct underground connections between Beaches Link and Western Harbour Tunnel will connect the Northern Beaches like never before – providing underground motorway access (via the WestConnex network) to key centres across Sydney's Inner West, west, and south-west, getting you where you want to go, faster.

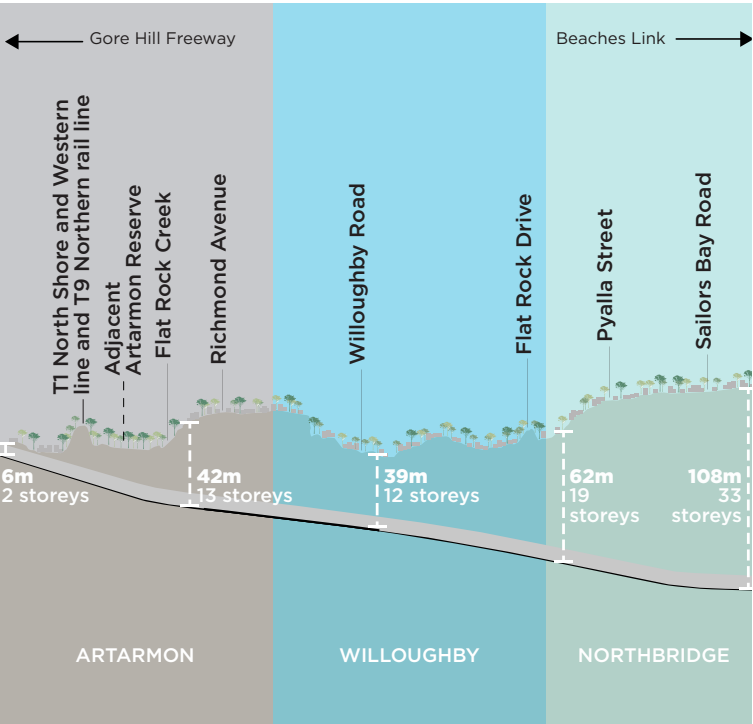
Beaches Link indicative tunnel depths

Tunnel depths are indicative and subject to detailed design. Measurement is to the tunnel road surface. The tunnel is about 8 metres in height, from road surface to roof.

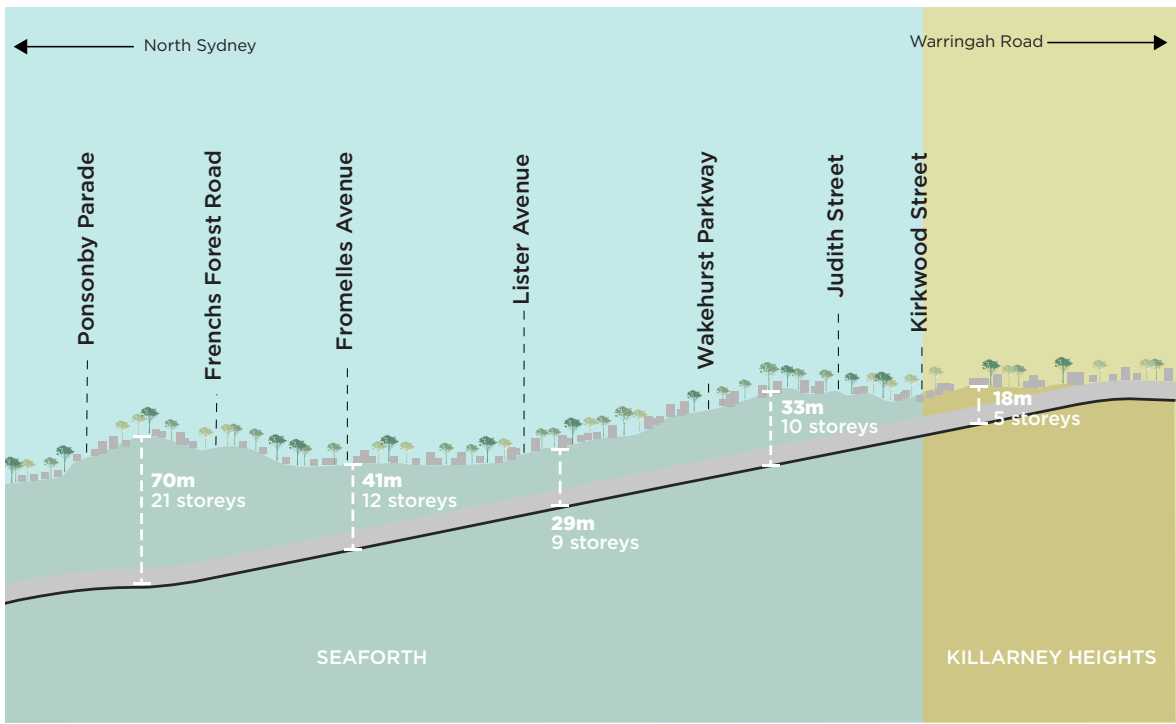
Cammeray to Balgowlah

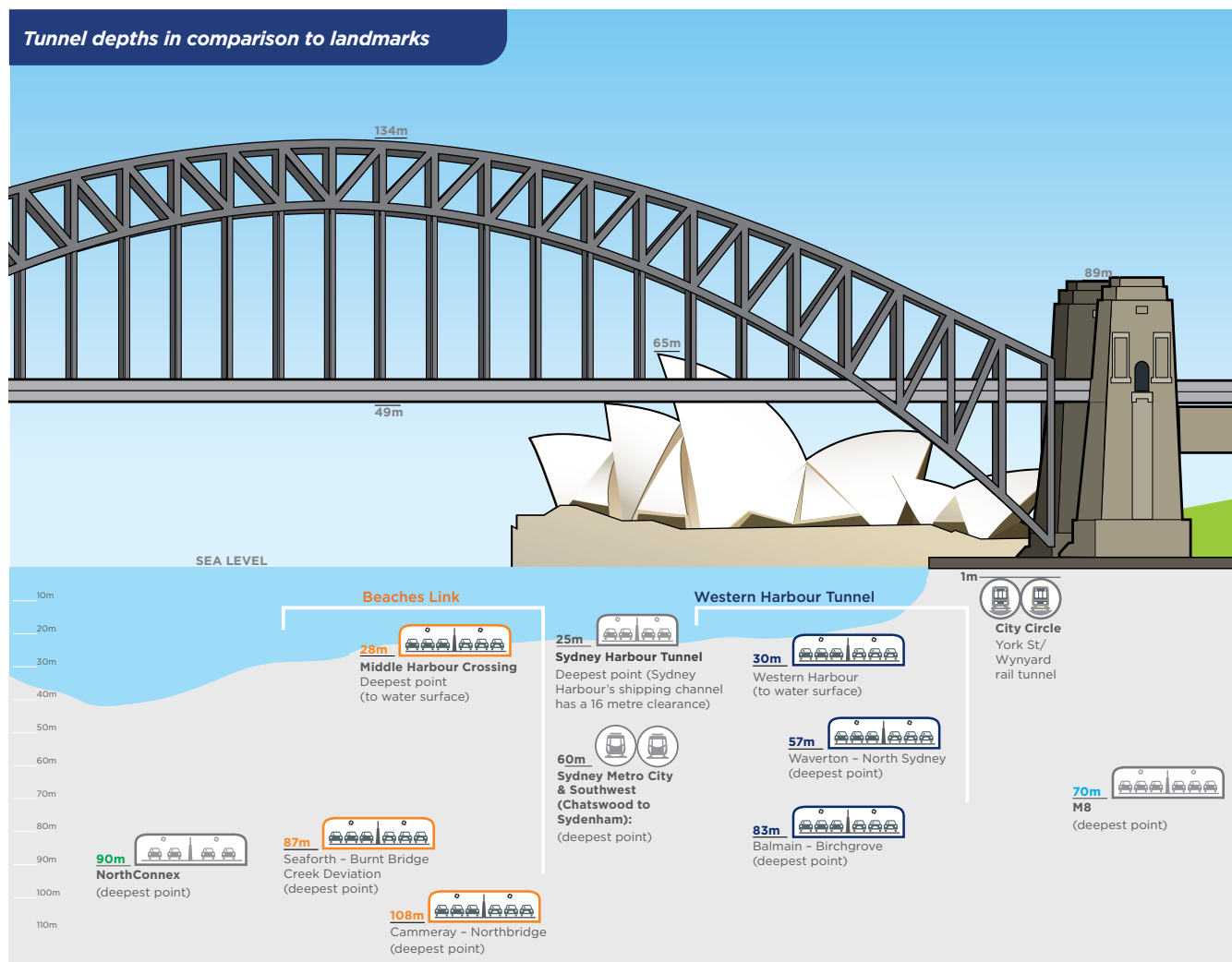


Gore Hill Freeway Connection

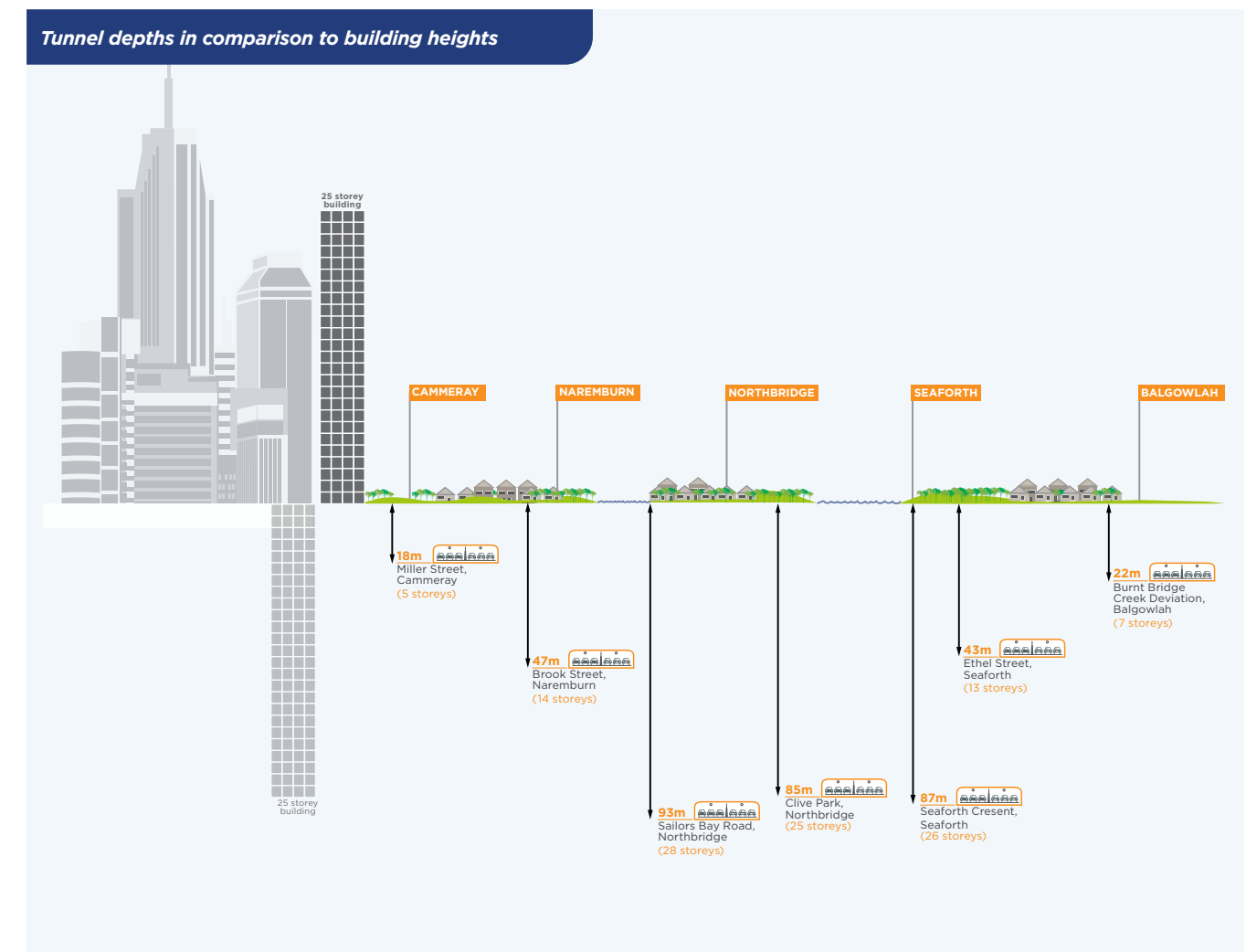


Wakehurst Parkway ramp





Across Sydney we have various different road and rail tunnels. This diagram illustrates how deep the Beaches Link tunnel is at its deepest points compared to other tunnels in Sydney.



Across Sydney we have various different road and rail tunnels. This diagram illustrates how deep the Beaches Link tunnel is at its deepest points compared to other tunnels in Sydney.

About the Environmental Impact Statement (EIS)

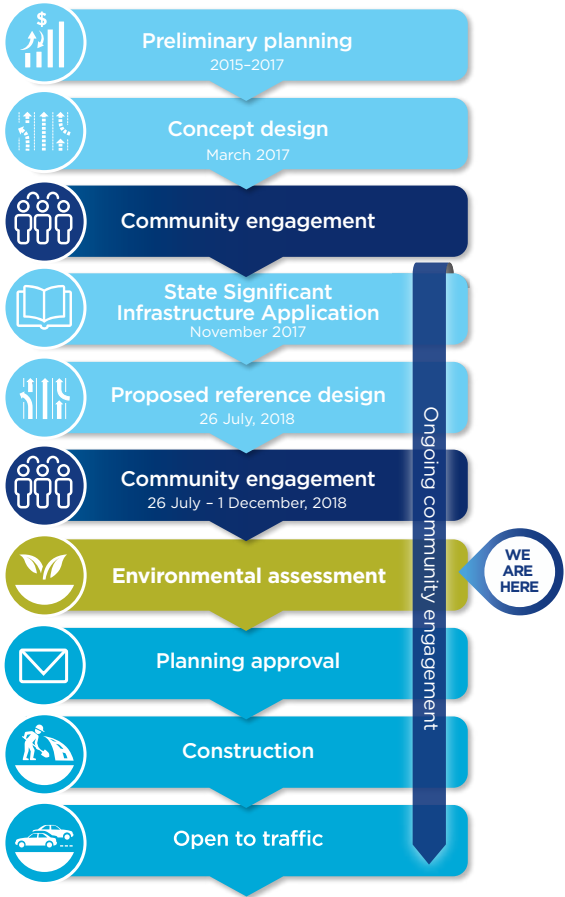
The EIS assesses the potential environmental and social impacts of the Beaches Link and Gore Hill Freeway Connection project.

The EIS is now on display and you have the opportunity to review the assessments and provide feedback on our findings. Your submissions will go to the Department of Planning, Industry and Environment (DPIE). Once the public exhibition period has closed, DPIE will provide us with a copy of your submissions so we can prepare a submissions report to respond to your feedback.

The report will be submitted to DPIE, which helps to inform the Minister for Planning and Public Spaces' decision on the project.

Subject to approval by the Minister, the project will be built and operated in accordance with the environmental management measures described in the EIS and submissions report, and the Conditions of Approval.

The plans proposed in the EIS may evolve depending on several factors, including community feedback, and the construction methodologies developed by the contractor/s once appointed. If a change to the project which is not consistent with the planning approval is proposed, an application will be made to the Minister to modify the approval.



What's included in the Beaches Link EIS?

The *Environmental Planning and Assessment Act 1979* and Environmental Planning and Assessment Regulation 2000 outline the requirements for EISs for State Significant Infrastructure projects in NSW. These pieces of legislation specify the project is issued with Secretary's Environmental Assessment Requirements (SEARs). You can view the project's SEARs on DPIE's Major Projects portal at

www.planningportal.nsw.gov.au/major-projects/project/10456

As part of the SEARs, we have assessed and provided information on topics such as:

- strategic context
- project description
- stakeholder and community consultation
- construction work
- traffic and transport
- noise and vibration
- air quality
- human health
- Aboriginal and non-Aboriginal heritage
- biodiversity
- geology, soils and groundwater
- socio-economic
- urban design and visual amenity
- cumulative impacts.

The EIS also includes strategies to avoid, mitigate and manage the potential impact of the project.

Consultation and engagement have been carried out with the community and stakeholders during the design development process and environmental assessment to ensure key potential impacts are identified at an early stage and, where possible, avoided or appropriate environmental management measures developed.

Our approach

The approach we have presented in the EIS reflects our Proposed Reference Design and construction methodology.

We have used a conservative approach with investigation and assessment of potential impacts based on worst-case scenarios. For example, when we assess construction noise, we have assumed all machinery and equipment is used at the same time, at its loudest and in the location on site where it would have the highest impact on residents. This scenario is unlikely to ever occur though as we will stage work to reduce overlap of noisy work activities, where possible.

The final design presented by our construction contractor will need to be consistent with any environmental management measures and Conditions of Approval from DPIE. Any changes to the project will need to be assessed for consistency with the assessment made in the EIS and if not consistent, a planning modification will have to be submitted to DPIE for their consideration and approval. You will have the opportunity to provide feedback on any modification.

We have developed Beaches Link and Gore Hill Freeway Connection along with its companion project, Western Harbour Tunnel and Warringah Freeway Upgrade. We prepared a separate EIS for Western Harbour Tunnel and Warringah Freeway Upgrade, which was placed on public exhibition between 29 January and 30 March 2020. More information is available in the Western Harbour Tunnel and Warringah Freeway Upgrade EIS and submissions report. You can view these documents on our interactive portal: nswroads.work/whtportal

Managing cumulative impacts

We understand the community will want to see the cumulative impacts of the Western Harbour Tunnel, Warringah Freeway Upgrade and Beaches Link and Gore Hill Freeway Connection program managed in a coordinated way.

The Beaches Link and Gore Hill Freeway Connection EIS cumulative scenario presents the impact of the Western Harbour Tunnel and Warringah Freeway Upgrade, Sydney Metro City & Southwest Project (Chatswood to Sydenham section), Sydney Metro Victoria Cross over station development, and other relevant major projects.

We have been collaborating with Sydney Metro to understand the impacts of both projects and how we can align our work to minimise the impact on you. We will continue to work closely throughout the planning and delivery of our projects, along with our industry partners, to achieve this outcome.

Assessing our impact

We assessed the potential environmental and social impact of our project. In general our assessments looked at:

- the existing environment
- how the project may change this
- what is predicted in the future without the project
- what is predicted in the future with the project
- how we propose to manage or mitigate any potential impacts.

Section 02

Building the project

Building the project

When planning our work, our priority is reducing the impact of our project and maintaining the safety of you and our workers.

We will be using roadheader technology for our land tunnels similar to that used on the newly opened WestConnex and NorthConnex tunnels. Our crossing of Middle Harbour will use twin immersed tube tunnels, which was the same process used for the existing Sydney Harbour Tunnel. This method is commonly used around the world and is a well understood and safe way to build a tunnel under the water.

For more information on how we will build the project, please see our interactive portal or Section 4 of this document.

Our EIS describes the proposed approach to construction of our project and our timeline, footprint, methodology, working hours, materials, equipment, traffic management, temporary site access routes, and temporary construction support sites.

You may see some changes once our selected contractor carries out detailed design and construction planning. The final design presented by our contractor will need to be consistent with any environmental management measures and Conditions of Approval from DPIE. If not consistent, a planning modification will be submitted to DPIE for their consideration and approval.

This section provides details of our construction work. If you are interested in additional technical information, we encourage you to read the EIS and visit our interactive portal.

For more information about the location and operation of each temporary site, please refer to Chapter 5: Project description, Chapter 6: Construction work and Chapter 8: Construction traffic and transport in the EIS.

Timing

Subject to planning approval and procurement, work is planned to start on Beaches Link and Gore Hill Freeway Connection in 2023 and be finished by end 2027. Work on the new and improved open space and recreation facilities at Balgowlah will allow for the space to be progressively opened for community use and work to be completed by 2028. The building of this project will occur in different stages and the impact will change depending on the type of work being completed at the time. Timing will vary depending on where you live. For more information on how long we will be working near you please read about our temporary sites in this section.



**Interactive
portal**

 nswroads.work/blportal

Construction stages

Early work and setting up our temporary sites



- survey work and investigations
- moving and relocating utilities like electricity, water, gas and communications cables
- temporarily relocating swing moorings
- preparing temporary sites for heritage and conservation work
- setting up temporary sites with safety, property and environmental controls
- building temporary site access roads
- building the temporary construction support sites.

Major construction work to build the project



- excavating and building tunnels
- building on and off ramps
- building two temporary cofferdams in Middle Harbour
- building the immersed tube tunnel units
- dredging the seabed to lay the immersed tube tunnel units
- installing the piling to support the immersed tube tunnel units
- installing the immersed tube tunnel units
- building the motorway facilities
- fitting out the tunnel, including lighting, fans, safety systems and signage
- installing in-tunnel architectural finishes.

Surface road work



- building retaining walls and stormwater drains
- carrying out earthworks and pavement work
- building cut and cover structures
- installing and relocating utilities
- building new bridges and making changes to existing bridges
- upgrading surface roads, making them wider in some cases, and marking new lines
- installing fauna (animal) crossings and underpasses
- installing traffic signals, lighting, signage, noise barriers, and kerbs and gutters
- building new shared user paths
- integration work to connect the new tunnels to the surface road network.

New and improved public open space and recreation facilities



- at Balgowlah these may include pedestrian and cyclist paths, open space areas, amenities, carparks, playgrounds, and various sporting facilities to meet community needs. The exact facilities to be provided are subject to further community consultation in collaboration with Northern Beaches Council
- staged construction of the new public open space and recreation facilities at Balgowlah
- there will be opportunities to provide new recreation facilities or reinstate the temporary site at Flat Rock Reserve to bushland, this will be determined in consultation with Willoughby Council and the local community
- the portion of the Wakehurst Parkway East temporary site not required by Sydney Water for ongoing operations will be handed over to the Manly Warringah War Memorial Park Reserve Trust for the community to enjoy
- rehabilitating our temporary site and areas not required for permanent facilities at Cammeray.

Testing, commissioning, finishing and post completion work



- testing tunnel operational systems and safety equipment
- installing final landscaping
- removing all temporary construction facilities
- rehabilitating temporary sites.

When we will be working

Standard construction hours are:

Monday to Friday	7am to 6pm
Saturday	8am until 1pm
Generally no work on Sundays or public holidays	

The EIS construction program and assessments have been based on standard construction hours of 7am-6pm Monday to Friday and 8am-1pm on Saturdays and the expected out of hours work described in Section 6.9.1 of Chapter 6: Construction work in the EIS.

Recent planning approval conditions by the Minister for Planning and Public Spaces have included an extension to standard construction hours on Saturdays, allowing certain activities to be carried out until 6pm. This approval condition has been provided on other recent major infrastructure projects such as Sydney Gateway, M6 Motorway (Stage 1) and WestConnex M4-M5 Link.

Should the project construction contractor elect to use this additional allowance on Saturdays to shorten the construction program and reduce the overall duration of impacts to amenity, site specific construction noise and vibration impact statements prepared for the project will need to assess any associated noise impacts and adopt appropriate noise mitigation measures accordingly. In addition to our standard construction hours, when we are working:

- underground tunnelling will be 24 hours per day, seven days a week. We will generally be tunnelling deep underground with access to the surface enclosed within an acoustic shed designed to minimise noise, dust and light spill. This will allow us to continue tunnelling at night, with less impact to you. Please see pages 28 and 29 for more detail on how deep the tunnel will be under your local area
- spoil transport in trucks will only occur within standard construction hours
- dredging, excavation of the seabed and piling work in Middle Harbour will be carried out during standard construction hours
- some early work, barge movements, worker transport and deliveries, and some rock breaking will need to be carried out outside of standard construction hours



- to keep people moving on the busy Warringah Freeway, Gore Hill Freeway, Wakehurst Parkway and Burnt Bridge Creek Deviation during peak travelling times, some of our work will need to be carried out outside of standard construction hours. We will work closely with affected residents to minimise the impact of our work
- we will notify affected residents before starting any work outside of standard construction hours.

Managing noise and vibration

We know our work can be noisy at times which is why we will use a range of measures to reduce the impact of our work when we are close to communities.

We will work with you to help minimise the impact of our work. This includes developing a Construction Noise and Vibration Management Plan to identify the potential impacts and set out a suitable approach to mitigate and manage the potential impact on you.

We encourage you to read our noise and vibration section on page 85, which explains how we measure noise and what you may experience, depending on which parts of our work you are near.

For more information about how we will be managing noise and vibration, please refer to Chapter 10: Construction noise and vibration in the EIS or visit our interactive portal:

nswroadswork/blportal

Managing traffic

You can expect to see a variety of vehicles around our temporary sites including heavy vehicles such as trucks and light vehicles including cars and utes around our work. For assessment purposes, a vehicle travelling in and out from the site is considered as two vehicle movements.

Maintaining the safety of the community and our workers is our highest priority.

We will manage the potential impact of our construction traffic on the road network by:

- locating most of our temporary sites with direct access to main roads
- continuing to consult with Greater Sydney Operations, the Port Authority of NSW, local councils, emergency services and bus operators to minimise traffic and transport impacts
- notifying you in advance of any proposed transport network changes or maritime restrictions
- managing shift changes to minimise workforce traffic movements during peak traffic periods in and around our temporary sites, where possible
- managing vehicle access to and from temporary sites to maintain pedestrian, cyclist and motorist safety
- providing signage, barriers and/or line marking as required to direct and safely guide road users, cyclists and pedestrians past our temporary sites and around the local road network

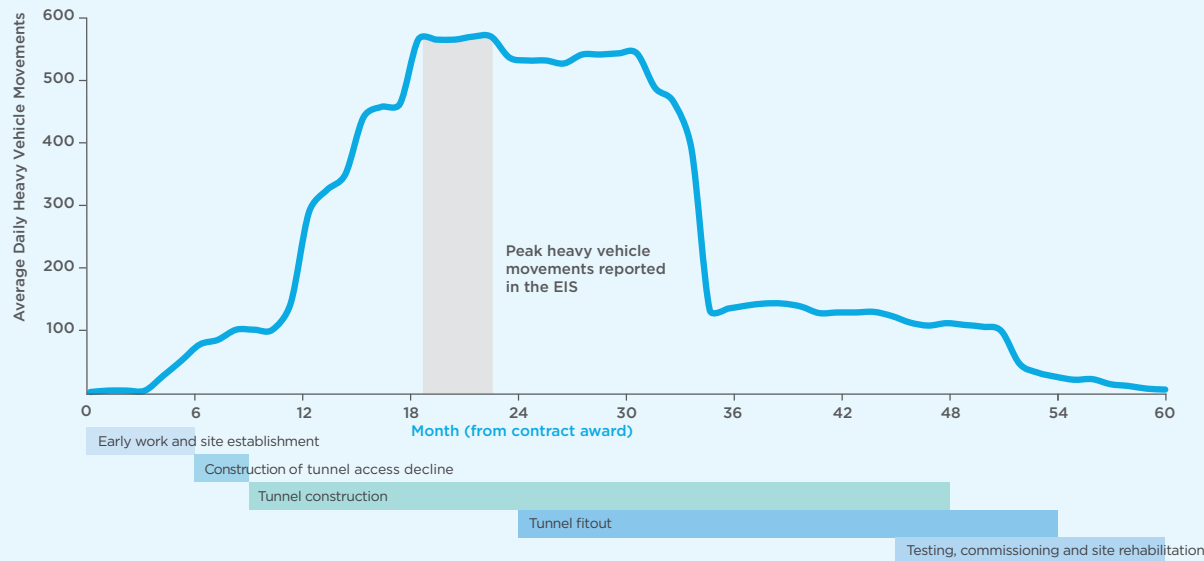
- minimising potential truck queueing near our temporary sites, where possible
- carrying out partial road closures outside of peak periods or at night to minimise the impact for road users, and for the safety of our workers and the public, where possible
- working closely with councils and local residents if we need to impact parking spaces or property access.

For more information on traffic during construction, please see Section 3 of this document. Or, please refer to Chapter 8: Construction traffic and transport in the EIS.

Throughout this section we have outlined the peak vehicle movements for each temporary construction support site. As shown in the graph below, this peak is generally for a relatively short time during the overall construction period.

To help you understand the number of heavy vehicle movements in the graph below, we consider a vehicle travelling in and out from the site as two vehicle movements.

Flat Rock Drive temporary construction support site - typical daily heavy vehicle movements



Managing air quality

We know how important it is to manage the potential impact on air quality during construction for your health and the health of everyone working on site. We will have measures in place to minimise this impact and will monitor air quality every day.

As with any building work, creating some dust is unavoidable. We will have an experienced construction team who will work to minimise dust. They will use well accepted dust suppression methods, including stabilising loose material and watering the temporary site and the wheels of the trucks.

Most of the material we excavate will be clean, crushed sandstone. This will be removed in covered trucks to reduce dust.

Sometimes when we excavate we encounter contaminated materials. This is quite common for many projects within urban and former industrial areas. There are established and stringently regulated processes for this work. We will ensure that any contaminated materials are managed by contractors experienced in meeting these strict management measures.

You can be assured that air quality monitoring will be carried out at all stages of the Beaches Link and Gore Hill Freeway Connection project, including once it is operational.

The tunnels will be built to meet strict air quality standards using state-of-the-art ventilation and tunnel design. You may be interested to know the independent NSW Chief Scientist and Engineer has 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

For more information on air quality, please see Section 3 of this document or Chapter 12: Air quality in the EIS.

 **Air quality portal**
nswroads.work/airquality

Managing spoil and waste

Before we start building, a detailed Construction Environment Management Plan (CEMP) will be developed to detail how the project will preserve, protect and manage any potential impact to the local environment. The CEMP will need to be approved by DPIE before we can start any major construction work.

The CEMP will be a working document, subject to ongoing change and updated as necessary, to respond to specific requirements or issues. All handling of materials will be carried out in accordance with the CEMP and an Environment Protection Licence issued by the NSW Environment Protection Authority.

We will continue to have a dedicated team of environmental specialists who oversee this process.

We will be using trucks to transport most of the spoil from the temporary tunnel sites and surface work. Before these materials leave the site, they will be classified in line with the NSW and Australian standards and guidelines. We expect most of this material will be re-used at development construction and remediation sites across Greater Sydney. Any materials not suitable for re-use will be taken to a licenced waste facility.

Acoustic sheds will be installed at our temporary tunnelling sites to manage the potential impacts of noise and dust. We will be stockpiling tunnel spoil inside the sheds and within the excavated tunnels and will only transport spoil off site during standard construction hours. We will load tunnel spoil onto the trucks inside the acoustic shed to minimise noise and dust generation.

Dredged and excavated materials removed from Middle Harbour will be transported via barge to either the designated offshore disposal site or a designated loadout facility and then transported by truck, depending on the type of material removed. We have submitted an application to the Commonwealth Department of Agriculture, Water and the Environment for offshore disposal of suitable dredged and excavated material. One third of the material is excavated from within the cofferdams. For more information about how we manage different materials, please see page 115 in Section 4 of this document.

For more information on spoil removal, please see our Resource use and waste management section on page 109 or Chapter 24 in the EIS.

Temporary construction support sites

We have carefully selected each of our temporary sites to limit our impact on you while we are working and to keep your neighbourhoods and streets safe during construction.



To minimise impacts on the community, our temporary sites generally:

- are located as close as possible to the tunnels or surface work they support to minimise unnecessary tunnelling or heavy vehicle movements
- have direct access to main roads or water so our vehicles will not be travelling on your local streets, where possible
- reduce the amount of private property we need to acquire or impact
- avoid sensitive environments and community locations where possible
- are designed not to intrude on open space any more than is absolutely necessary
- avoid impact on heritage sites or items
- have acoustic sheds to reduce impacts when we will be tunnelling
- maintain access to public facilities such as pedestrian and cyclist paths, where possible.

Beaches Link and Gore Hill Freeway Connection project indicative construction program

Construction activity	2023	2024	2025	2026	2027	2028
Early work and site establishment						
Construction of driven tunnels						
Immersed tube tunnel construction and installation						
Tunnel fitout and finishing						
Construction of operational facilities						
Surface road work						
Testing and commissioning						
Site rehabilitation and demobilisation						
New and improved open space and recreation facilities at Balgowlah (subject to further consultation)						

Cammeray Golf Course

The site will then support construction of the Beaches Link component of the project.

- setting up the site for Beaches Link, including building and operating site facilities such as an acoustic shed, staff offices and amenities, workshops, and car parking
- excavating a temporary tunnel access, providing access for equipment, materials and workers, and spoil removal
- tunnelling, including the main tunnels towards Naremburn and ventilation tunnels

- construction and fitout of the Beaches Link motorway facilities and fitout of the ventilation outlet at the Warringah Freeway (the ventilation outlet will be built as part of the Western Harbour Tunnel project)
- building cut and cover and trough structures and connections to the Warringah Freeway
- building flood walls, substation and operational support facilities
- treatment of wastewater from tunnelling activities
- utility work
- storing, handling and transporting materials, including tunnel spoil
- tunnel fitout and finishing work
- testing and commissioning of the tunnel
- landscaping and rehabilitating the temporary site.

Construction activity	2024	2025	2026	2027
Early work and site establishment				
Construction of tunnel access decline				
Tunnel construction				
Construction of cut and cover and trough structures				
Fitout of cut and cover and trough structures				
Tunnel fitout and finishing				
Construction of motorway facilities and fitout of ventilation outlet (civil work constructed by Western Harbour Tunnel)				
Testing, commissioning and site rehabilitation				

42

Morden Street

Warringa Road

CAMMERAY

Cammeray Golf Course

Retained vegetation

Laydown

Site office/accommodation

Acoustic shed

Workshop/storage

Staged Warringah Freeway site access (primary)

Warringah Freeway

Construction of underground connection to and from Western Harbour Tunnel

Beaches Link ventilation outlet

Western Harbour Tunnel ventilation outlet

Beaches Link motorway facilities building

Western Harbour Tunnel motorway facilities

Landscape treatment

Beaches Link deluge and fire hydrant pump

Shared water supply

Ernest Street

Ernest Street site access (secondary)

Merlin Street

0 50 m

- | Legend | | | | | |
|---|-------------------------------------|---|--|---|------------------------------------|
|  | Construction footprint |  | Warringah Freeway Upgrade surface work |  | Ventilation outlet |
|  | Temporary construction support site |  | Construction site buildings |  | Site access - in |
|  | Ventilation tunnel (underground) |  | Western Harbour Tunnel motorway facilities |  | Site access - out |
|  | Access decline (underground) |  | Temporary site access |  | Indicative temporary noise barrier |
|  | Tunnel (underground) | | |  | Cut and cover and trough work |
| | | | |  | Carpark |

Cammeray

Cammeray Golf Course

Duration



You may see us in this area for around three and a half years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for its future use.

We are currently working with the Cammeray Golf Club to reconfigure the golf course and minimise our impact on users of the golf course during construction. We will work with relevant stakeholders on how best to rehabilitate the site when our work is complete.

The construction peak at this site will be when we are tunnelling, which will be for up to two years.

Hours of work



We will be tunnelling up to 24 hours a day, seven days a week. Once we are tunnelling, the majority of the work will take place underground and activity on the surface will reduce. Based on our planned tunnelling rate and depth, we expect the impact from tunnelling to be minimal for residents as we will only be working directly under each property for about one week, and will generally be quite deep.

When tunnelling, our work will be as deep as about 47 metres (14 storeys) at Cammeray. Please see pages 28 and 29 for more detail on the indicative depth of the tunnel in your local area.

The majority of the tunnelling work on the surface at this site takes place inside the acoustic shed, which manages the potential impacts of noise, dust and light spill. These sheds are closed at night to further reduce noise. There may be occasional deliveries and some light vehicle movements outside of standard construction hours.

General activities and spoil transport will only take place during standard construction hours.

This site will also support night traffic staging and construction work. For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Primary access to and from the site will be via the Warringah Freeway.

We will also have an alternative access via Ernest Street, Cammeray. This will be via the Ernest Street/Merlin Street intersection, which will be modified as part of the Warringah Freeway Upgrade.

At our construction peak, there will be around 275 heavy vehicle movements and around 305 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). This will increase traffic in the area by 3 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.



Northbridge/Willoughby

Flat Rock Drive

We will be setting up a temporary construction support site at Flat Rock Reserve, at Northbridge on the eastern side of Flat Rock Drive. We will use this temporary site to support the excavation and fitout of the tunnels west towards Artarmon, east towards Middle Harbour and south towards Cammeray.

We need a temporary site that provides access to the middle section of the project, to allow safe and efficient construction of the tunnel. Due to the size and scale of the project, it is not practical to only carry out tunnelling from the end points of the tunnel.

The project team undertook an extensive assessment of the options for the mid-tunnel site and considered community feedback. The eastern side of Flat Rock Drive was selected because it is both technically feasible for the tunnelling work, whilst having the lowest level of community impact.

The temporary site at Flat Rock Drive will:

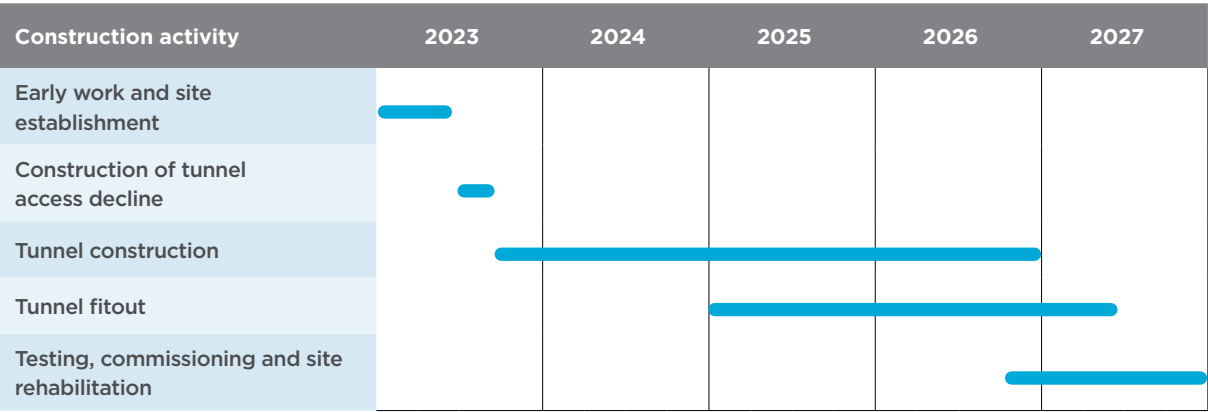
- have no directly impact any private property or family homes
- have no impact on community sports facilities such as the baseball diamond, Willoughby Leisure Centre or the netball courts and car park
- have direct access to Flat Rock Drive, to avoid trucks travelling through local streets

- be surrounded on three sides by bushland minimising visibility of the site for the local community.

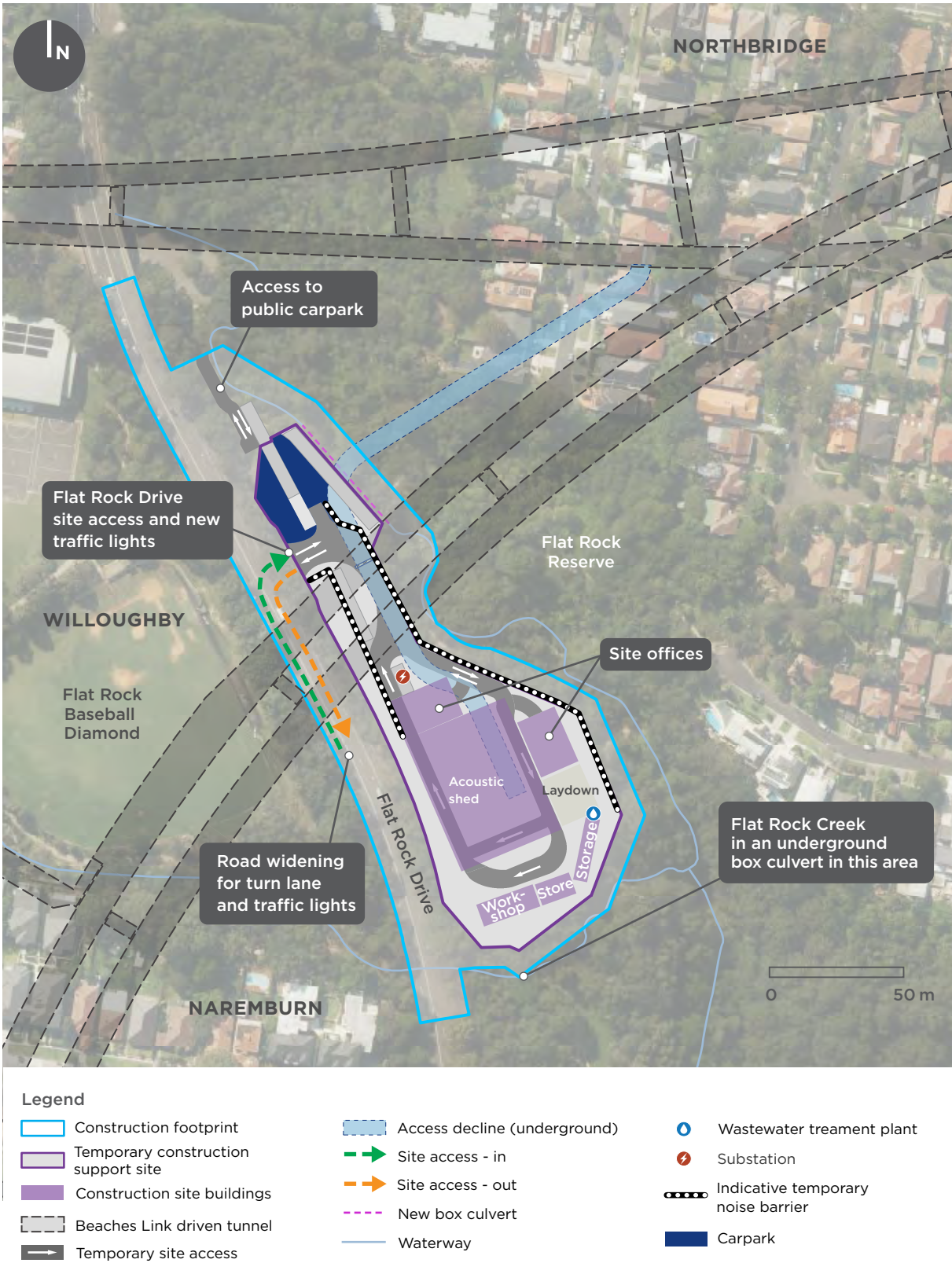
Our key activities include:

- setting up the site, including temporary diversion of existing pedestrian and cyclist paths and walking tracks, removing vegetation and carrying out earthworks
- widening Flat Rock Drive to the east and providing temporary traffic light signals to allow vehicles to safely enter and exit the site
- building and operating temporary site facilities, including an acoustic shed, temporary noise barriers, wastewater treatment facility, staff offices and amenities and car parking
- utility and drainage work
- excavating the tunnel access decline
- treatment of wastewater from tunnelling activities at the onsite treatment facility
- storing, handling and transporting materials, including tunnel spoil
- tunnel fitout and finishing work
- testing and commissioning of the tunnel
- landscaping and rehabilitating the temporary site

Flat Rock Drive temporary construction support site indicative construction program



Flat Rock Drive temporary construction support site



Duration



You may see us in this area for up to five years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use. The construction peak at this site will be when we are tunnelling, which will be for up to three years.

Hours of work



We will be tunnelling up to 24 hours a day, seven days a week. Once we are tunnelling, the majority of the work will take place deep underground and activity on the surface will reduce. Based on our planned tunnelling rate and depth we expect the impact from tunnelling to be minimal for residents as we will only be working directly under each property for about one week, and will generally be quite deep.

When tunnelling, our work will be as deep as about 105 metres (32 storeys) at Northbridge. Please see pages 28 and 29 for more detail on the indicative depth of the tunnel in your local area.

The majority of the tunnelling work on the surface at this site takes place inside the acoustic shed, which manages the potential impacts of noise, dust and light spill. These sheds are closed at night to further reduce noise. There may be occasional deliveries and some light vehicle movements outside of standard construction hours.

General activities and spoil transport will only take place during standard construction hours.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Access to the site will be via a temporary signalised intersection on Flat Rock Drive. From Flat Rock Drive/Brook Street, heavy vehicles will have access to the Warringah Freeway.

Local surface work for road widening, pedestrian and cyclist path and utility adjustments will be required on Flat Rock Drive to build the signalised intersection and turning lane. Road widening work will be carried out on the eastern side of Flat Rock Drive.

At our construction peak, there will be around 545 heavy vehicle movements and around 355 light vehicle movements per day in this area (a vehicle travelling in and out of the site is counted as two movements). This will increase traffic, in the most impacted locations, by 3.1 per cent per hour during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Waste management



Work in former landfill sites is not uncommon in Sydney, and there are established methods for safely constructing within such sites.

We have considered this in the design and planning for our tunnel access ramp, which aims to minimise disturbance of landfill.

Only about one per cent of the landfill material we need to remove at this site is landfill – the rest will be clean sandstone. The landfill is mainly old building materials and the removal will have no impact to local air quality or nearby waterways.

In accordance with the Environment Protection Authority's (EPA) preferred treatment methods, it is likely we would keep the landfill material onsite and re-bury it within a specially designed layer, a process called capping. Any landfill removal will be carried out in a controlled manner by experienced contractors. The work will adhere to well-established policies and procedures for removal of potentially contaminated materials including an Environmental Protection Licence (EPL) regulated by the NSW EPA, and a Construction Waste Management Plan which will be developed for the project. For more information, please see Chapter 16: Geology, soils and groundwater in the EIS.

Impacts to community use of Flat Rock Reserve



The total site area is just under 1.2 hectares, which is less than five per cent of the Flat Rock Reserve bushland. We have located the temporary site in an area where the vegetation is generally around 20 years old to minimise impacts to old growth trees. The remainder of Flat Rock Reserve will continue to be available for use by the community during construction.

The pedestrian and cyclist paths will remain connected around the eastern side of our site and the underpass of Flat Rock Drive will remain open throughout construction.

We will be minimising our impact on Flat Rock Creek and surrounds. Our Environmental Protection Licence (EPL), which is regulated by the NSW Environment Protection Authority (EPA), will include strict measures related to the quality of water leaving our site.

Final form



We understand the importance of the Flat Rock area to the local community and we are committed to rehabilitating the site once our project is completed.

There will be opportunities to provide new recreation facilities or reinstate the site to bushland, depending on Council and community preferences.

We will work closely with Willoughby Council and in consultation with the local community on the final form of the site..



Artist's impression of temporary construction support site on Flat Rock Drive looking north

Artarmon

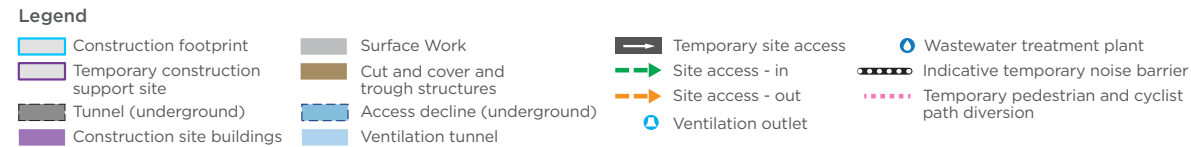
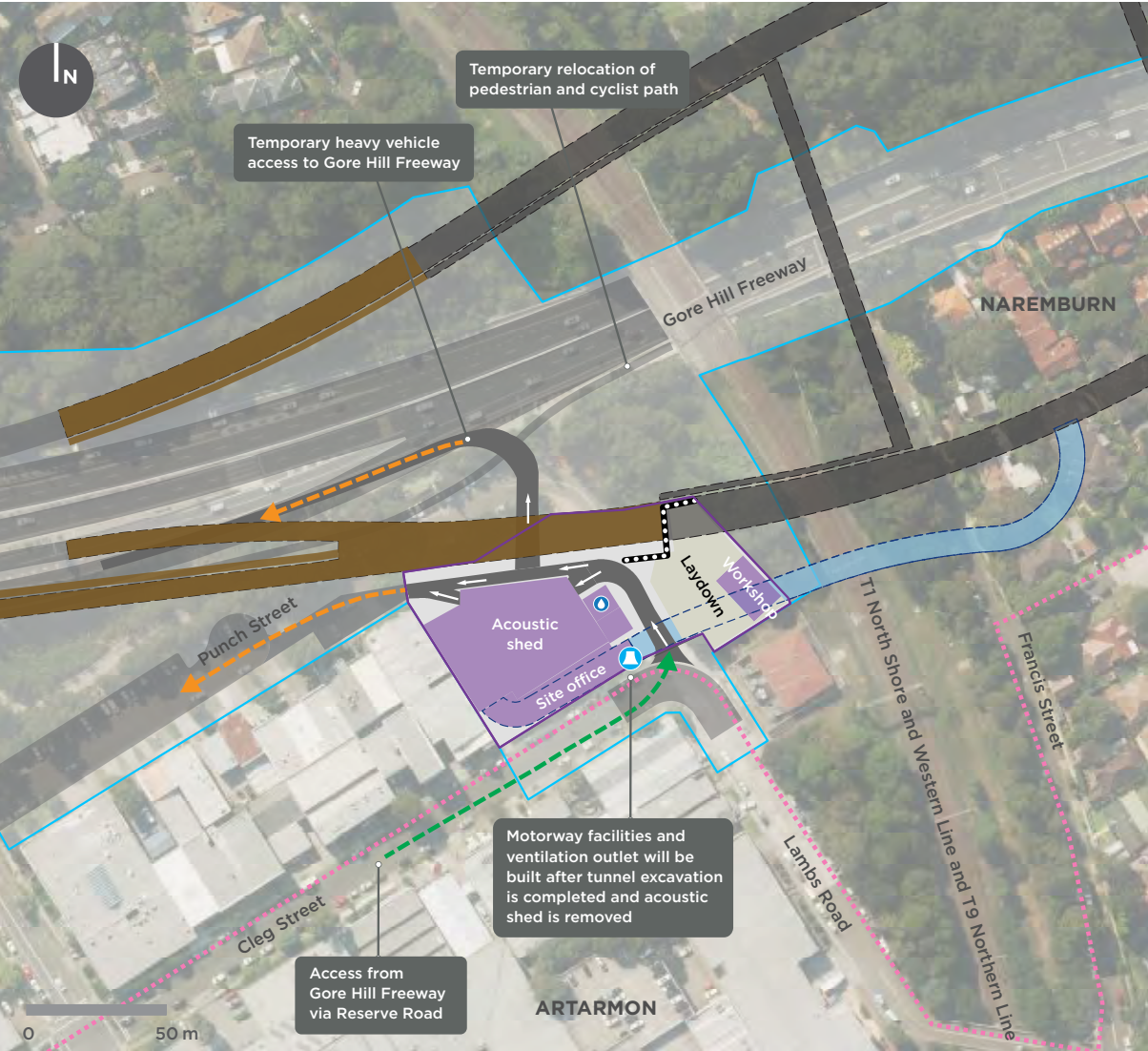
Punch Street

We will be setting up a temporary construction support site at Punch Street within the Artarmon industrial area. We will use this site to support the excavation and fitout of the tunnels east towards Northbridge, the construction of the Beaches Link cut and cover and trough structures and the permanent motorway facilities for Beaches Link.

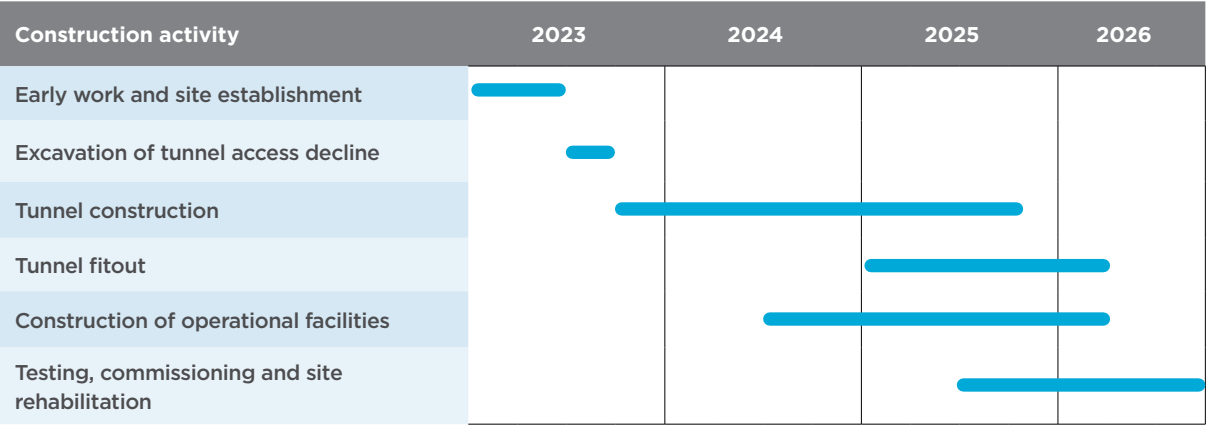
Our key activities include:

- removing existing structures
 - utility work
 - building and operating temporary site facilities, including an acoustic shed, temporary noise barrier, wastewater
- treatment facility, air intake, and staff offices and amenities
 - excavating the tunnel access
 - tunnelling, including the ramp tunnels towards Northbridge
 - treatment of wastewater from tunnelling activities
 - storing, handling and transporting materials, including tunnel spoil
 - tunnel fitout and finishing work
 - building the permanent motorway facilities
 - testing and commissioning of the tunnel
 - rehabilitating the site.

Punch Street temporary construction support site



Punch Street temporary construction support site indicative construction program



Duration



You may see us in this area for up to four years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use. We will be building permanent infrastructure to support the operation of Beaches Link at Gore Hill Freeway, including motorway facilities and a ventilation outlet.

The construction peak at this site will be when we are tunnelling, which will be for up to two years.

Hours of work



We will be tunnelling up to 24 hours a day, seven days a week. Once we are tunnelling, the majority of the work will take place underground and activity on the surface will reduce. Based on our planned tunnelling rate and depth we expect the impact from tunnelling to be minimal for residents as we will only be excavating directly under each property for about one week, and will generally be quite deep.

When tunnelling, our work will be as deep as about 42 metres (13 storeys) at Artarmon. Please see pages 28 and 29 for more detail on the indicative depth of the tunnel in your local area.

The majority of the tunnelling work on the surface at this site takes place inside the acoustic shed, which manages the potential impacts of noise, dust and light spill. These sheds are closed at night to further reduce noise. There may be occasional deliveries and some light vehicle movements outside of standard construction hours.

General site activities and spoil transport will only take place during standard construction hours. For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Access into the site will be via Cleg Street and out of the site via Punch Street.

An alternative heavy vehicle exit will be constructed to connect directly to the Gore Hill Freeway heading west to reduce heavy vehicles on local streets.

At our construction peak, there will be around 370 heavy vehicle movements and 580 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Artarmon temporary sites will increase traffic in the area by 7.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Artarmon

Dickson Avenue

We will be setting up a temporary construction support site at Dickson Avenue within the Artarmon industrial area to support construction of Beaches Link and Gore Hill Freeway Connection.

Our key activities include:

- setting up the site by removing existing structures
- building and operating temporary site facilities, including laydown areas, staff offices and amenities and car parking.

For the Beaches Link construction work:

- the site will be used to support tunnelling activities at the Punch Street construction site and construction of operational facilities.

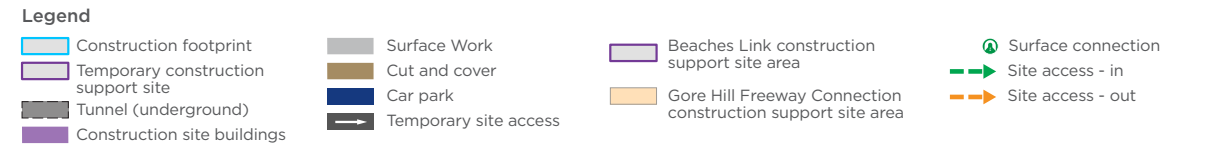
For the Gore Hill Freeway Connection construction work:

- the site will be used for equipment laydown, car parking for construction workers and temporary site office buildings to support surface work
- once most of the surface and tunnelling work has been completed, the site will be rearranged to build the off ramp structures, surface work onto Reserve Road, the motorway control centre and the tunnel support facility.

Dickson Avenue temporary construction support site indicative construction program

Construction activity	2023	2024	2025	2026
Beaches Link construction work				
Early work and site establishment	■			
Additional tunnel support at Punch Street	■	■	■	■
Construction of operational facilities			■	■
Testing and commissioning				■
Gore Hill Freeway Connection construction work				
Early work and site establishment	■			
Construction of Gore Hill Freeway surface work and bridge modifications	■	■	■	■
Construction of the off ramp trough and surface work to Reserve Road			■	■
Site rehabilitation				■

Dickson Avenue temporary construction support site



Duration

You may see us in this area for about four years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use. We will be building permanent infrastructure to support the operation of Beaches Link at the Gore Hill Freeway, including motorway facilities and a ventilation outlet.

The construction peak at this site will be when we are tunnelling and carrying out Gore Hill Freeway surface work, which will be for up to three years.

Hours of work

Our general site activities including most surface work and building the motorway control centre and tunnel support facilities will be carried out during standard construction hours.

There will be some activities, such as complex surface work and utility adjustments which occur outside of standard construction hours due to site access restrictions, traffic staging and safety requirements.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements

Access to site will be via Dickson Avenue.

At our construction peak, there will be around 90 heavy vehicle movements and 500 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Artarmon temporary sites will increase traffic in the area by 7.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Artarmon

Barton Road

We will be setting up a temporary construction support site on Barton Road to support construction of the Gore Hill Freeway Connection.

Our key site features include:

- equipment laydown facilities
- car parking for construction workers
- temporary site office buildings.

Barton Road temporary construction support site



Legend

Construction footprint

Temporary construction support site

Surface Work

Construction site buildings

Site access - in

Site access - out

Temporary site access

Carpark

Barton Road temporary construction support site indicative construction program

Construction activity	2023	2024	2025	2026	2027
Early work and site establishment					
Construction support for surface work					
Site restoration and demobilisation					

Duration



You may see us in this area for up to four years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use. The construction peak at this site will be when we are carrying out surface work, which will be for up to three years.

Hours of work



Our general site activities including most surface work will be carried out during standard construction hours. There will be some activities, such as complex and constrained surface work and utility adjustments, which occur outside of standard construction hours due to site access restrictions and traffic staging requirements. For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Access to site will be via Reserve Road. At our construction peak, there will be around 35 heavy vehicle movements and around 120 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Artarmon temporary sites will increase traffic in the area by 7.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.



Lane Cove tunnel

Artarmon

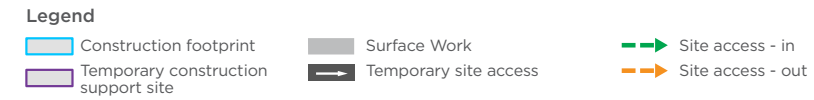
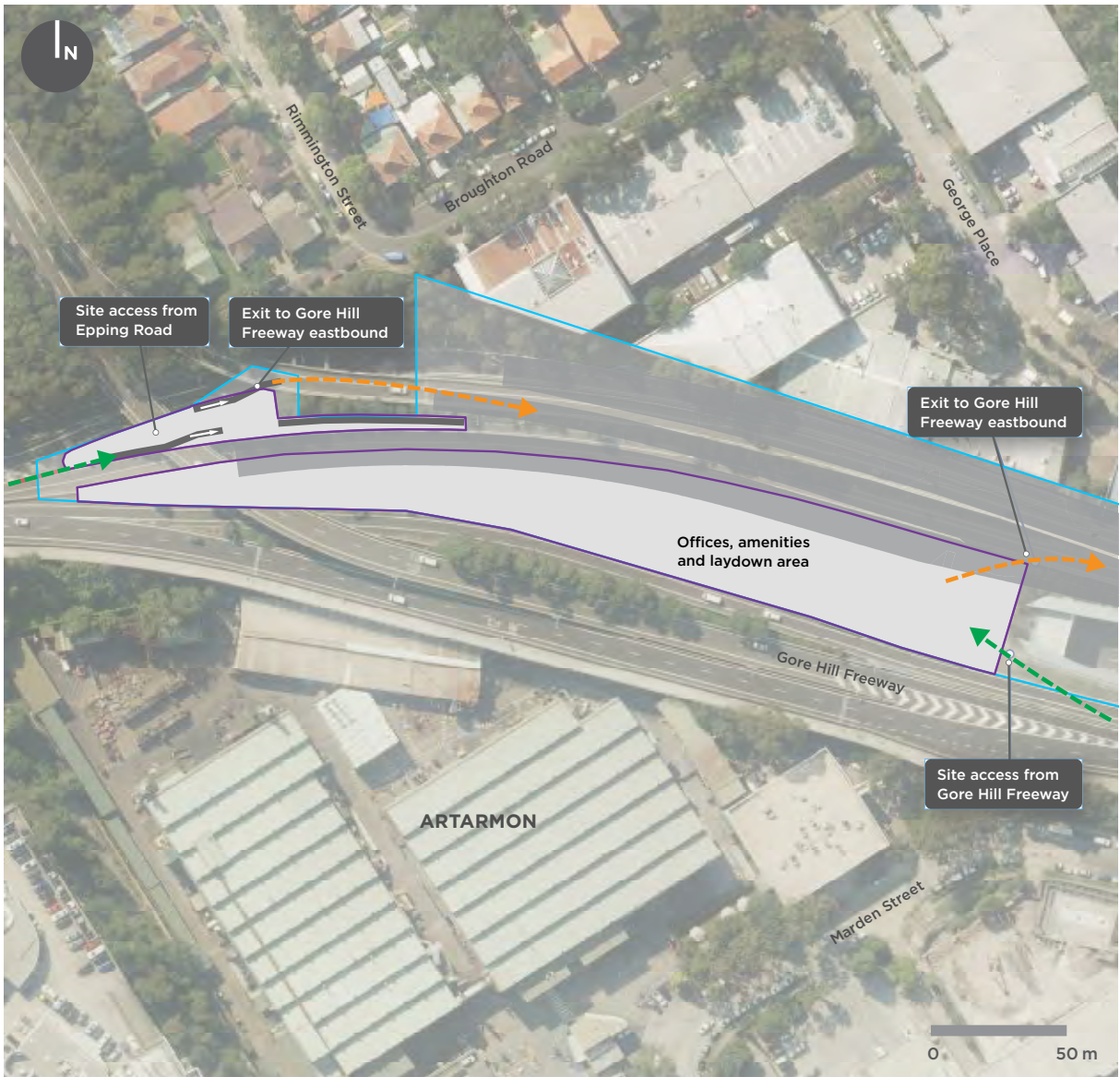
Gore Hill Freeway median

We will be setting up a temporary construction support site on the median above the Lane Cove Tunnel, within the Gore Hill Freeway to support construction of the Gore Hill Freeway Connection.

Our key site features include:

- equipment laydown facilities.

Gore Hill Freeway median temporary construction support site



Gore Hill Freeway median temporary construction support site indicative construction program

Construction activity	2023	2024	2025	2026	2027
Early work and site establishment					
Construction support for surface work					
Site restoration and demobilisation					

Duration

You may see us in this area for up to four years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use.

The construction peak at this site will be when we are carrying out surface work, which will be for up to three years.

Hours of work

Our general site activities will be carried out during standard construction hours.

There may be occasional activities, such as complex surface work, utility adjustments, and oversized deliveries which occur outside of standard construction hours due to site access restrictions, traffic staging and safety requirements.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements

Access into the site will mainly be via the Gore Hill Freeway. A secondary access will be provided via Epping Road. Access out of the site will be via the Gore Hill Freeway (eastbound).

At our construction peak, there will be around 10 heavy vehicle movements and 100 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Artarmon temporary sites will increase traffic in the area by 7.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Middle Harbour

Middle Harbour temporary cofferdams and crossing

We will be building temporary cofferdams in the harbour to support our tunnelling work. These cofferdams will be temporary and help connect the land tunnels with the immersed tube tunnels, in the harbour. These cofferdams will each be about the size of an Olympic sized pool. They are temporary and we will remove them once the work is finished.

For more information on cofferdams see section 4 of this guide.

These temporary sites will be water based, serviced by barges from the Spit West Reserve site at Mosman.

Our key activities include:

- building the temporary cofferdams including ground treatment, piling, and installation of internal structural steel supports
- removing the water from inside the cofferdams so we can work in dry conditions
- excavating within the cofferdam to reach the base level of the tunnel
- building the interface structures (the connection between the tunnels built underground and the immersed tube tunnels)

- supporting construction from the water, including the use of a work barge, barge movements for transfer of dredged material, deliveries and staff transport
- installing the immersed tube tunnel piled supports
- removing the cofferdams
- floating the completed immersed tube tunnel units to a temporary mooring site east of Clive Park in Middle Harbour for temporary storage
- installing the immersed tube tunnel units
- rehabilitating the site.

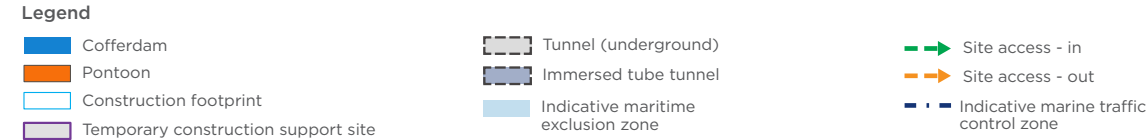
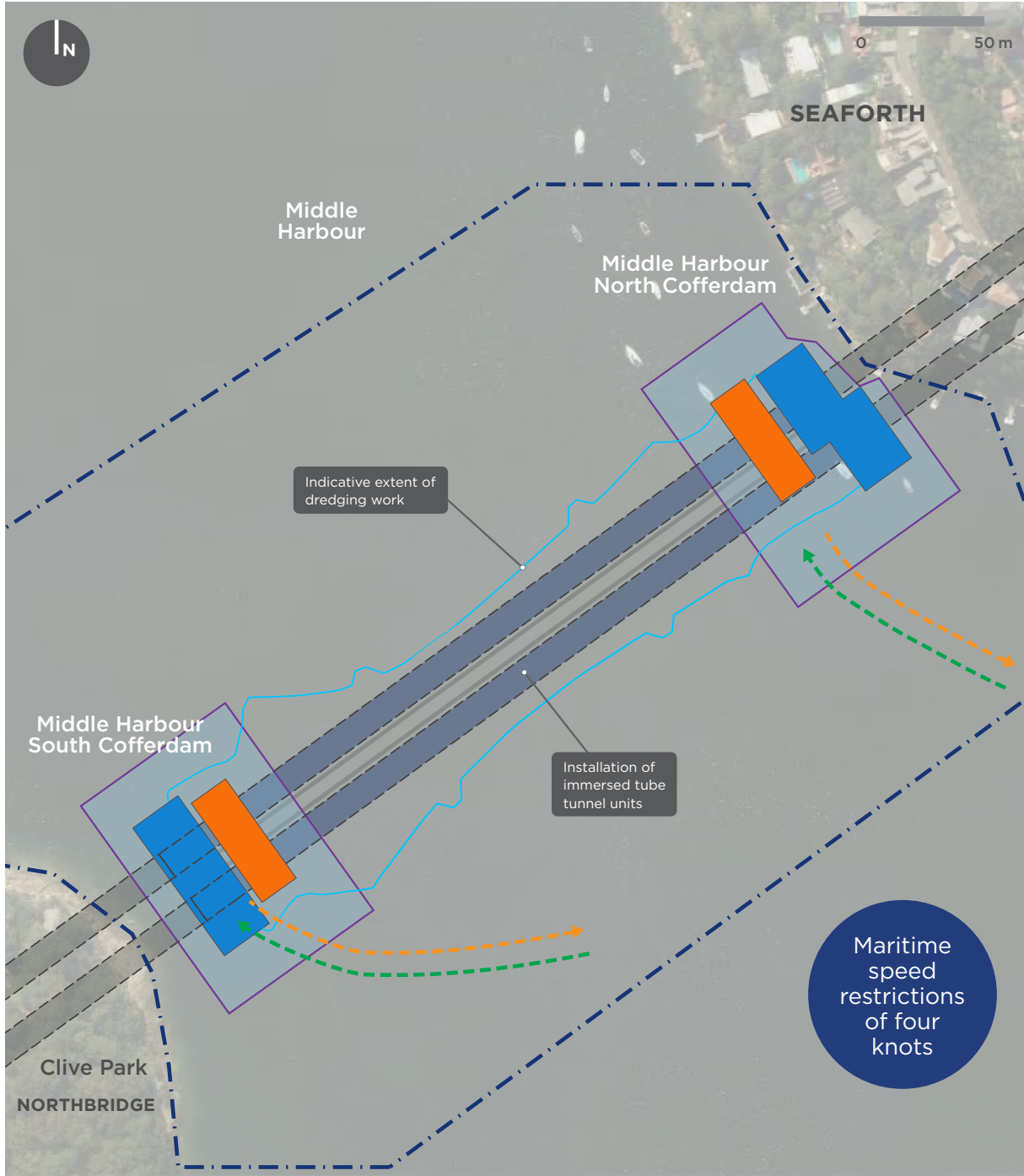
Temporary changes to navigational channels

We will be placing exclusion zones around the sites, for the safety of harbour users and our workers when on the water. Except on very limited occasions, a controlled and designated navigation channel for public watercraft will be available at all times.

Northbridge Sailing Club may be required to relocate some sailing courses away from the harbour crossing site.

We will have maritime speed restrictions of four knots in place around construction equipment. This will result in additional travel time of about three minutes, based on a worst-case scenario.

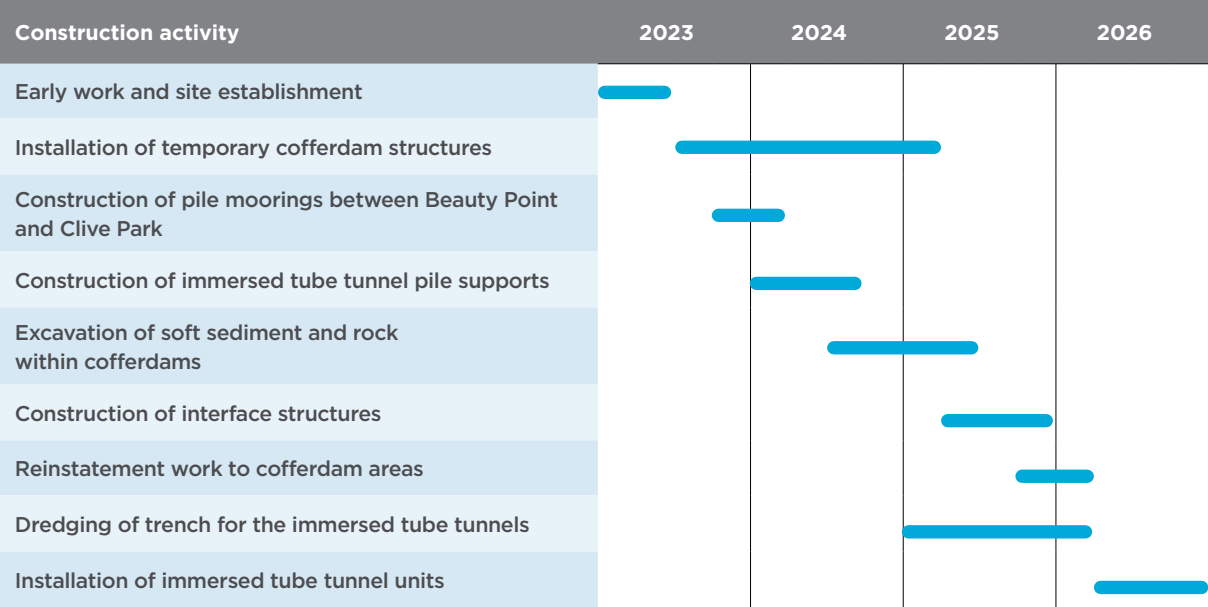
Middle Harbour cofferdams temporary construction support site



Artist's impression of backhoe dredge and south cofferdam work in Middle Harbour



Middle Harbour Cofferdams temporary construction support site indicative construction program



Duration



You may see us in this area for up to four years as we set up, carry out our construction work, then demobilise the site.

The construction peak at this site will be when we are dredging and constructing the cofferdams, which will be for up to two and a half years.

Hours of work



Our general site activities, rock hammering, piling, dredging and spoil haulage will be carried out during standard construction hours.

Some activities may be carried out up to 24 hours per day, seven days per week. This will include dewatering of cofferdams.

Casting of the concrete interface structures may require some out of hours work for the larger concrete pours.

Some transport by barge to the designated offshore disposal site may take place outside standard construction hours.

We recognise weekends are the busiest times for recreational boating, and this will be considered during detailed construction planning to minimise impact to recreational activities.

For any work outside the standard construction hours, the community will be notified in advance.

Vessel movements on the water



- Around 12 small boats movements per day (about the size of a water taxi) to ferry our workers between Spit West Reserve and the crossing location.
 - Four barge movements per day to support cofferdam construction, dredging, piling and tunnel unit immersions.
 - Around three barge movements per day for transportation of spoil to the designated offshore disposal site. This may be carried out outside of standard construction hours.
 - Around 48 barge movements per day for concrete deliveries (at peak of the concrete pour), which could take place outside of standard construction hours.
- One boat or barge travelling into and out of the site is counted as two movements.

Moorings



Some moorings will be temporarily impacted during operation of our temporary sites.

Alternative facilities (swing mooring or marina berth) will be provided nearby for the users of the three fixed jetties below Seaforth Bluff that will have access restricted during construction.



Aerial view of the Spit Bridge and Middle Harbour

Mosman

Spit West Reserve

We will be setting up a temporary land- and marine-based construction support site at Spit West Reserve.

The land-based site at Spit West Reserve will provide a small car park, access road, laydown area, office, amenities and storage to support construction work.

The marine-based site will include a temporary floating immersed tube tunnel casting facility that will be connected to Spit West Reserve by two temporary jetties.

The floating facility and jetties will require the installation of temporary piling and associated marine structures. The site will also provide barge support for the cofferdams, interface structures, tunnel unit support piles, dredging works, tunnel unit immersion and tunnel unit granular locking fill placement.

The Spit West Reserve and associated marine work will be supported also from the Balgowlah Golf Course temporary site including the concrete supply from a temporary concrete batch plant and worker parking, with workers being shuttled to the Spit West Reserve site. This is to minimise the land required at Spit West Reserve.

Our key activities include:

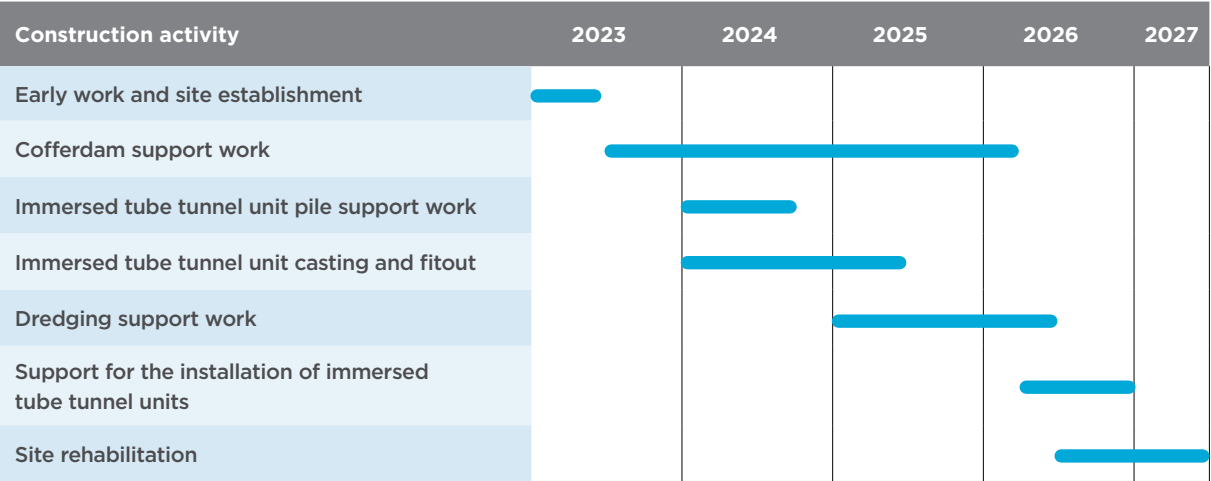
- casting of the immersed tube tunnel units. The facility will support casting of two units at a time
- transporting the completed immersed tube tunnel units to the temporary mooring location in Middle Harbour for temporary storage before they are placed in position
- storage and transport of equipment, plant and personnel for the marine work
- providing support facilities for the marine work including limited storage area
- providing support for work associated with:
 - building the cofferdams
 - interface structures
 - immersed tube tunnel unit support piles
 - dredging
 - immersed tube tunnel installation
 - immersed tube tunnel backfill placement
- rehabilitating the marine- and land-based sites.

Temporary changes to navigational channels

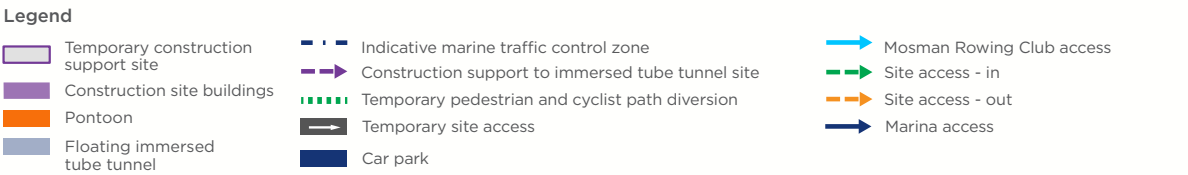
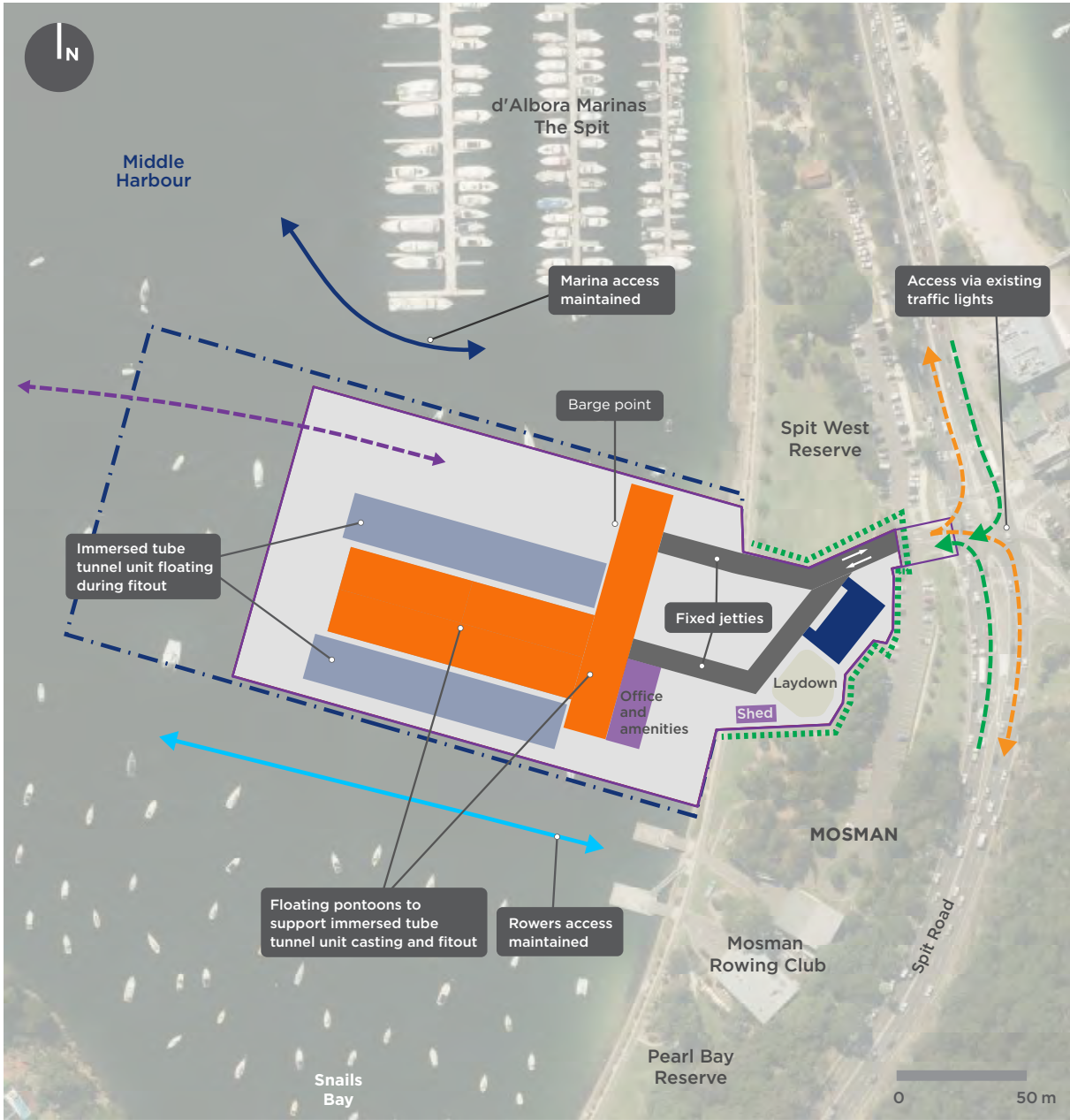
We will be placing exclusion zones around the sites, for the safety of you and our workers when on the water. Except on very limited occasions, a controlled and designated navigation channel for public watercraft will be available at all times.

We will have maritime speed restrictions of four knots in place around construction equipment. This will result in additional travel time of about three minutes, based on a worst-case scenario.

Spit West Reserve temporary construction support site indicative construction program



Spit West Reserve temporary construction support site



Duration



You may see us in this area for about four and a half years as we set up, carry out our construction work, then demobilise the site.

The construction peak at this site will be when we are casting tunnel units and providing barge support for cofferdams and dredging work, which will be for up to three years.

Hours of work



Our general site activities will be carried out during standard construction hours.

Concrete pours will be scheduled to take place within standard construction hours where possible, however casting of the tunnel units may require some out of hours work.

Support work (immersion and installation) for the immersed tube tunnel installation will be required on six occasions for continuous periods lasting between 24 to 48 hours for each unit.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Road access to site will be via Spit Road.

At our construction peak, there will be around 220 heavy vehicle movements and 200 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). This will increase traffic in the area by 7 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

To minimise impacts to traffic during peak periods and minimise the construction footprint, some workers and construction materials will be transported to the site from the Balgowlah Golf Course construction site, where required.

Vessel movements on the water



- Around 12 small boats movements per day (about the size of a water taxi) to ferry our workers to and from the cofferdams.
- Around four barge movements per day for support of cofferdam dredging, piling and tube tunnel immersion.
- Around 48 barge movements per day for concrete deliveries (at peak of concrete pour), which could take place outside of standard construction hours.

One boat or barge travelling into and out of site is counted as two movements.

During construction recreational water craft will have right of way over maritime construction vessels near the project.

Moorings in Middle Harbour



The site will require the temporary relocation of about 45 moorings in Middle Harbour for about two years.

Alternative swing mooring facilities will be provided.

We will be consulting with mooring users/boat owners to minimise the impact of relocation.

Mosman Rowers Club

We will work with Mosman Rowers Club to limit impact to the club and maintain safe access to the water via a designated and controlled navigation channel.

Northbridge Sailing Club

We will work with the Northbridge Sailing Club regarding the potential relocation of some sailing courses away from the harbour crossing site, for the safety and practicality of any racing events.

Impacts to Spit West Reserve

A floating worksite will minimise impact to Spit West Reserve. The majority of the park will remain open during construction. An area of the public, recreational space will be temporarily closed during construction. Once our work is complete, we will rehabilitate the area and return this space to the community.

Foreshore access

Pedestrian access along the foreshore will be detoured around the site and provision will be made for a safe crossing of the construction access road.

Final form

We understand the importance of the Spit West Reserve and we are committed to consulting with Mosman Council and the community to restore our construction site and return it to the community.



Spit West Reserve

Balgowlah

Balgowlah Golf Course

We will be setting up a temporary construction support site at Balgowlah Golf Course and Dudley Street. This will be a tunnel support site, surface work support site and project management site.

Our key activities include:

- setting up the site by removing existing structures and vegetation, where required
- building and operating temporary construction facilities, including an acoustic shed, temporary noise barriers, wastewater treatment facility, air intake, staff offices and amenities, car parking and a concrete batch plant
- localised adjustment of a small section of Burnt Bridge Creek for road widening and drainage work
- excavating tunnel access
- tunnelling, including ramp and main tunnels toward Middle Harbour
- treatment of wastewater from tunnelling activities
- storing, handling and transporting materials, including tunnel spoil

- support for tunnel fitout and finishing work
- utility work
- traffic staging to enable us to keep traffic moving while we carry out work within Burnt Bridge Creek Deviation
- support for cut and cover work, trough work, surface work and road widening work
- construction of a new access road between Burnt Bridge Creek Deviation and Sydney Road to provide access to the tunnel and the future new and improved open space and recreation facilities
- construction of the operational motorway facilities and ventilation outlet
- additional support for construction of the immersed tube tunnels
- construction of the new active transport links
- testing and commissioning of the tunnel
- building new and improved open space and recreation facilities, including parking
- final landscaping and rehabilitating the site.



Design changes at Balgowlah

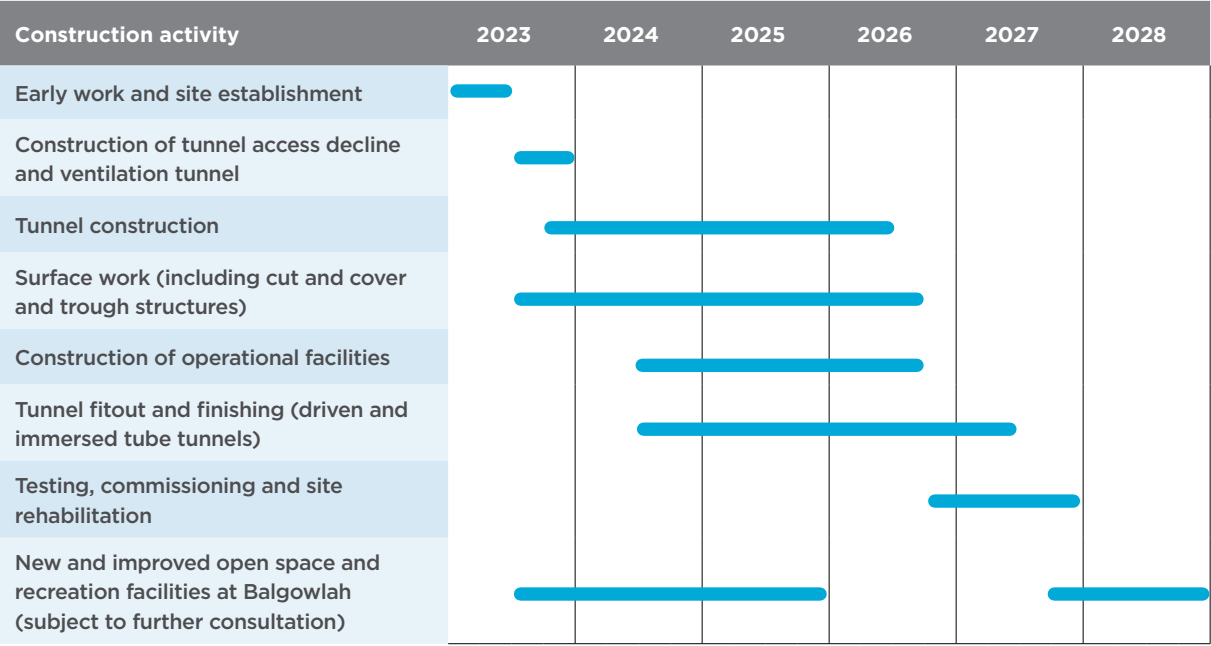
We have worked with the community on a number of alternatives to connect Beaches Link with Sydney Road. We have redesigned the permanent access road to reduce its length, area, and impacts, while still providing access to the new public open space and recreational facilities.

The proposed tunnel portal location at Burnt Bridge Creek Deviation has been shifted further to the south. This enables us to reduce traffic staging work on Burnt Bridge Creek Deviation, reduce our impacts on Burnt Bridge Creek and eliminate the need to replace the existing Kitchener Street Bridge.

Balgowlah Golf Course temporary construction support site



Balgowlah Golf Course temporary construction support site indicative construction program





Duration

You may see us in this area for up to six years as we set up, carry out our construction work, then demobilise the site and build the final recreation facilities.

The construction peak at this site will be when we are tunnelling and carrying out surface work, which will be for up to three years.



Hours of work

We will be tunnelling up to 24 hours a day, seven days a week. Once we are tunnelling, the majority of the work will take place underground and activity on the surface will reduce. Based on our planned tunnelling rate and depth we expect the impact from tunnelling to be minimal for residents as we will only be excavating directly under each property for about one week, and will generally be quite deep.

When tunnelling, our work will be as deep as 43 metres (12 storeys) at Balgowlah. Tunnel depths are indicative only and subject to further refinement as the project design develops. Please see pages 28 and 29 for more detail on the indicative depth of the tunnel in your local area.

The majority of the tunnelling work on the surface at this site takes place inside the acoustic shed, which manages the potential impacts of noise, dust and light spill. These sheds are closed at night to further reduce noise. There may be occasional deliveries and some light vehicle movements outside of standard construction hours.

General site activities and spoil transport will only take place during standard construction hours. Surface work in the area will need occasional night or out of hours work. For any work outside the standard construction hours, the community will be notified in advance.



Traffic/vehicle movements

Access to site will be via Burnt Bridge Creek Deviation and Sydney Road.

At our construction peak, there will be around 495 heavy vehicle movements and 1195 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). This will increase traffic in the area by 2.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.



Artist's impression of sporting facilities at Balgowlah

Your new open space in Balgowlah

We will return an area equivalent to around 90 per cent of the current open space as new and improved public open space and recreation facilities for the community.

We are working collaboratively with Northern Beaches Council and plan to progressively deliver some of the recreational precinct for you to use before construction is complete.

We are committed to working with you to understand your views, so we can provide new and improved public open space and recreation facilities for everyone to enjoy.

How you can be involved

We will have a dedicated consultation period to give you an opportunity to have your say on the final layout of the sporting and recreation facilities. This consultation will be separate to the consultation for the Beaches Link and Gore Hill Freeway Connection EIS.

This consultation will be delivered in collaboration with Northern Beaches Council. We will start this process in 2021 once the EIS public exhibition has closed and well in advance of construction starting.

As part of this consultation process, we will establish a community reference group, with representative stakeholder groups and the community, to support us and the Northern Beaches Council with the development of this important open space in Balgowlah. More details about the community reference group will be communicated at a later date.

Balgowlah

Kitchener Street

We will be setting up a temporary construction support site at Kitchener Street to support construction work along Burnt Bridge Creek Deviation.

Our key site features include:

- site offices
- staff amenities
- car parking for staff
- laydown facilities
- space for storage of plant, materials and equipment.

Kitchener Street temporary construction support site indicative construction program

Construction activity	2023	2024	2025	2026
Early work and site establishment				
Support surface road work at Burnt Bridge Creek Deviation				
Support utility relocation work				

Kitchener Street temporary construction support site



Legend

Construction footprint

Temporary construction support site

Tunnel (underground)

Surface Work

Construction site buildings

Temporary site access

Waterway

Site access - in

Site access - out

Duration

You may see us in this area for up to four years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use.

The construction peak at this site will be when we are carrying out surface work, which will be for up to two years.

Hours of work

Our general site activities will be carried out during standard construction hours.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements

Access to and from the site will be via the existing southbound lanes of Burnt Bridge Creek Deviation.

At our construction peak, there will be around 10 heavy vehicle movements and around 65 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). This will increase traffic in the area by 2.5 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.



Burnt Bridge Creek Deviation and Kitchener Street, Balgowlah

Seaforth

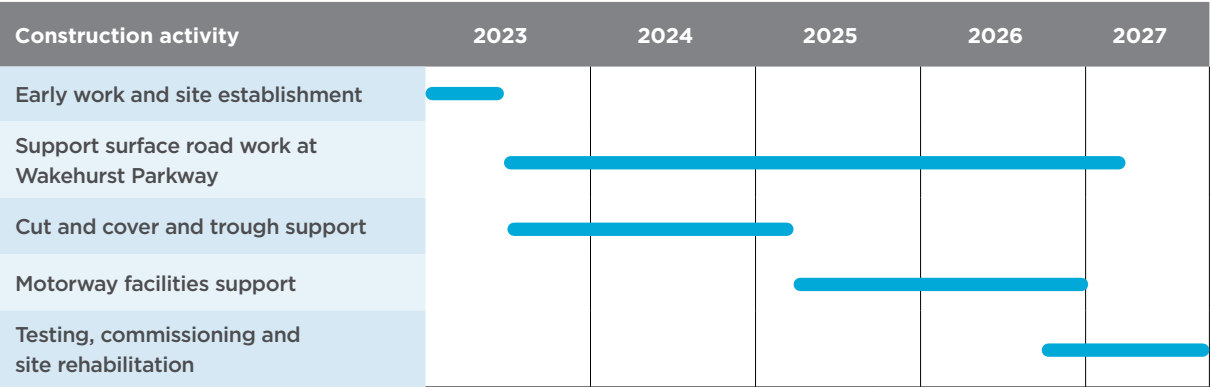
Wakehurst Parkway South

We will be setting up a temporary construction support site along Wakehurst Parkway to support the upgrade of Wakehurst Parkway, the construction of the cut and cover structure and motorway facilities, and provide additional support for tunnelling work at the Wakehurst Parkway East construction support site.

Our key activities include:

- setting up the site by removing existing vegetation, where required
- building and operating temporary construction facilities, including workshops, staff offices, amenities and car parking for staff
- providing support for the upgrade of Wakehurst Parkway and the construction of the cut and cover tunnel and trough and motorway facilities at Wakehurst Parkway
- providing additional office support for tunnelling work at the Wakehurst Parkway East construction site.

Wakehurst Parkway South temporary construction support site indicative construction program



Duration



You may see us in this area for up to five years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use.

The construction peak at this site will be when we are carrying out surface work, and building the motorway facilities, cut and cover and trough work, which will be for up to two and a half years.

Hours of work



Our general site activities including most surface work will be carried out during standard construction hours.

There may be occasional activities, such as traffic staging and switches on the Wakehurst Parkway and intersection modifications during site establishment, which will occur outside of standard hours.

For any work outside the standard construction hours, the community will be notified in advance.

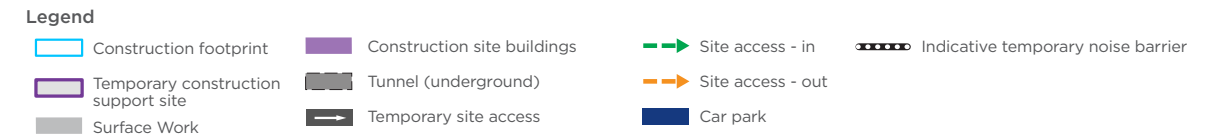
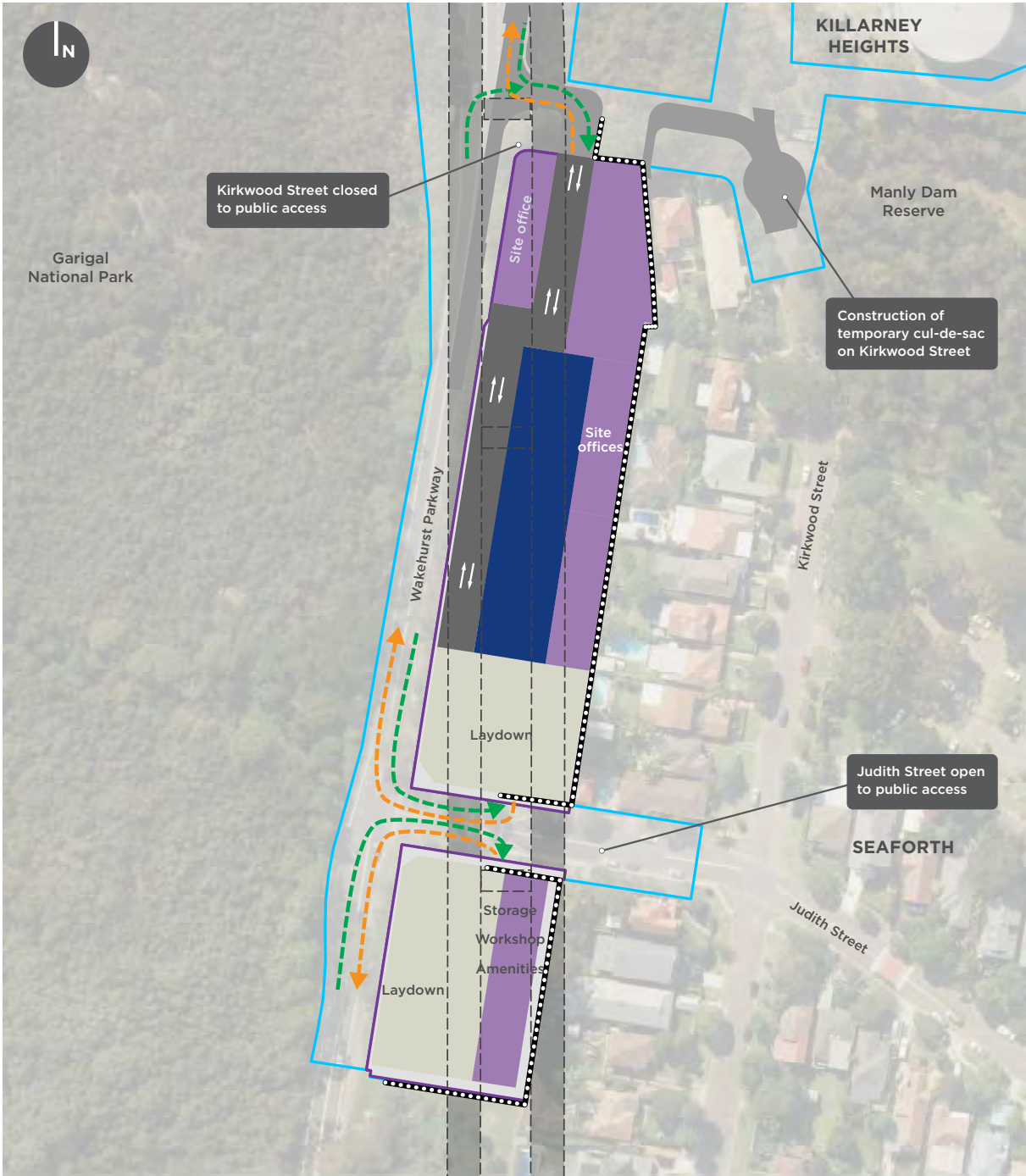
Traffic/vehicle movements



Access to site will be via Wakehurst Parkway.

At our construction peak, there will be around 15 heavy vehicle movements and 285 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Wakehurst Parkway temporary sites will increase traffic in the area by 4 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Wakehurst Parkway South temporary construction support site



Killarney Heights

Wakehurst Parkway East

We will be setting up a temporary construction support site at Wakehurst Parkway on land within Sydney Water’s Bantry Bay Reservoir site, west of the Wakehurst Golf Course.

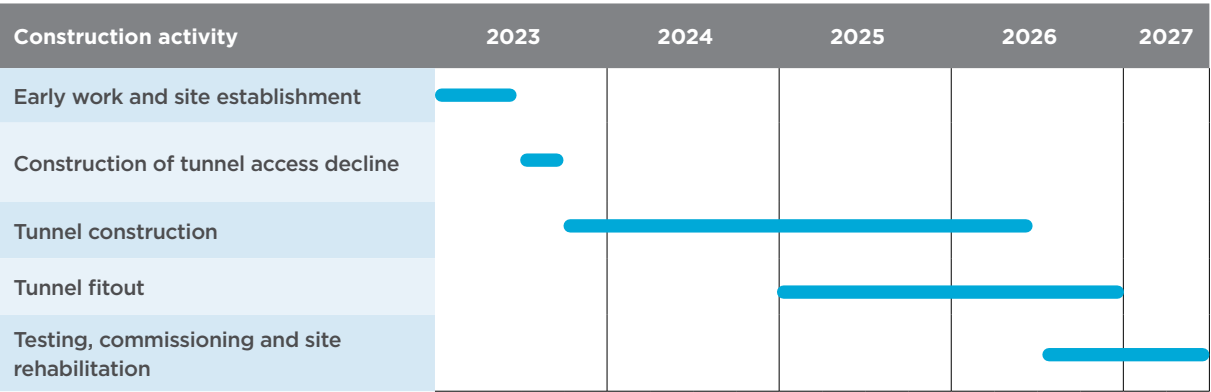
This site will support the construction of the tunnel ramps between Wakehurst Parkway and the underground connection to the main tunnel.

Our key activities include:

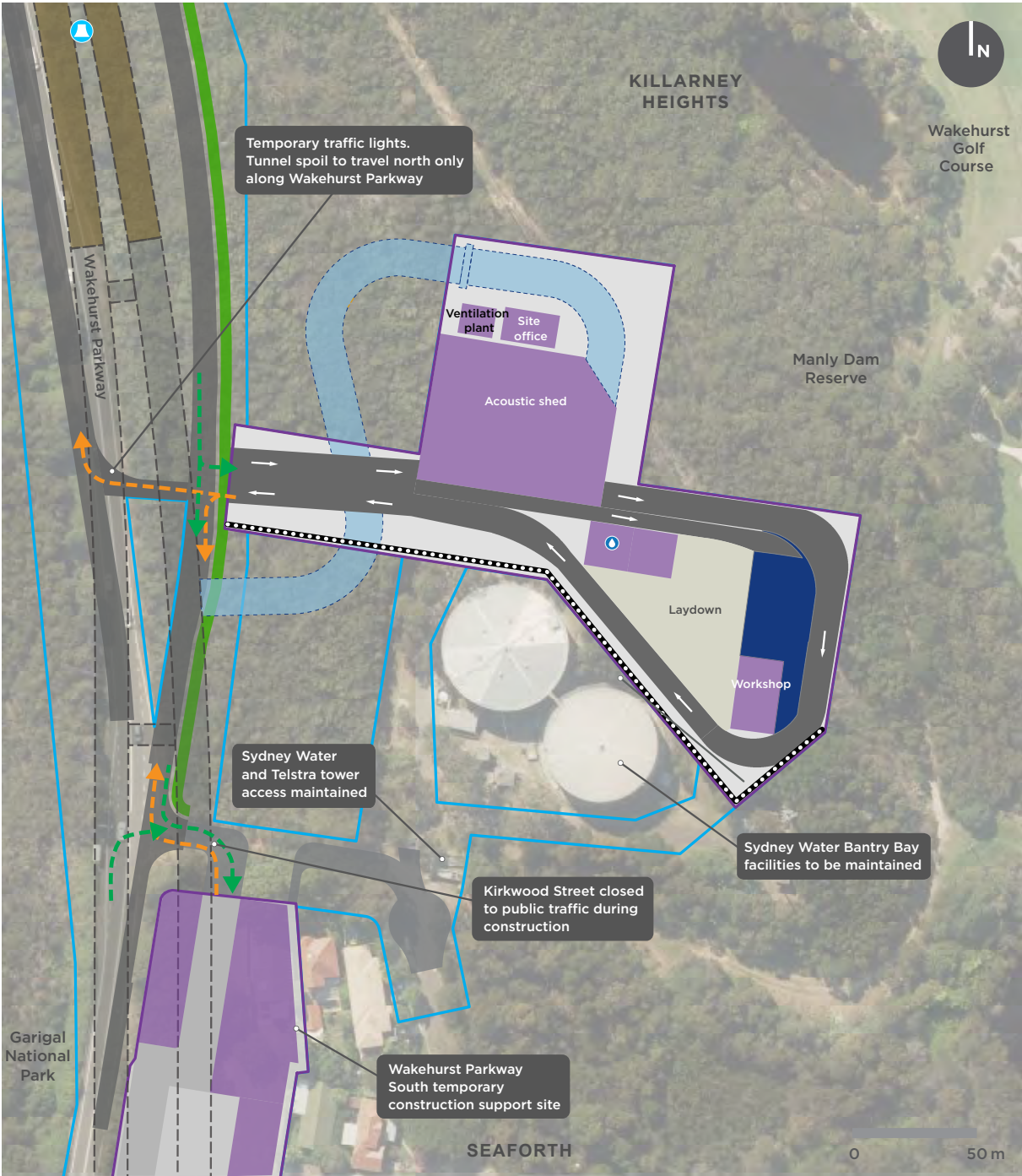
- setting up the site, including carrying out earthworks
- building and operating of temporary construction facilities, including an acoustic shed, temporary noise barrier, wastewater treatment facility, air intake, staff offices and amenities, and car parking

- excavating the temporary tunnel access
- tunnelling, including joining the Wakehurst Parkway tunnel ramps to the main tunnel
- treatment of wastewater from tunnelling activities at the onsite treatment facility
- utility work
- storing, handling and transporting materials, including tunnel spoil
- tunnel fitout and finishing work
- testing and commissioning of the tunnel
- rehabilitating the site.

Wakehurst Parkway East temporary construction support site indicative construction program



Wakehurst Parkway East temporary construction support site



Legend

Construction footprint

Temporary construction support site

Construction site buildings

Carpark

Beaches Link driven tunnel

Temporary site access

Surface work

Cut and cover

Pedestrian / active transport links

Access decline (underground)

Indicative temporary noise barrier

Site access - in

Site access - out

Wastewater treatment plant

Ventillation outlet

Killarney Heights

Wakehurst Parkway East

Duration



You may see us in this area for about four and a half years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use. The construction peak at this site will be when we are tunnelling, which will be for up to two and a half years.

Hours of work



We will be tunnelling up to 24 hours a day, seven days a week. Once we are tunnelling, the majority of the work will take place underground and activity on the surface will reduce. Based on our planned tunnelling rate and depth we expect the impact from tunnelling to be minimal for residents as we will only be excavating directly under each property for about one week, and will generally be quite deep.

When tunnelling, our work will be as deep as 87 metres (25 storeys) at Seaforth Bluff. Tunnel depths are indicative only and subject to further refinement as the project design develops. Please see pages 28 and 29 for more detail on the depth of the tunnel in your local area.

The majority of the tunnelling work on the surface at this site takes place inside the acoustic shed, which manages the potential impacts of noise, dust and light spill. These sheds are closed at night to further reduce noise. There may be occasional deliveries and some light vehicle movements outside of standard construction hours.

General site activities and spoil transport will only take place during standard construction hours.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements



Access to site will be via a new temporary connection to Wakehurst Parkway. At our construction peak, there will be around 275 heavy vehicle movements and around 305 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Wakehurst Parkway temporary sites will increase traffic in the area by 4 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Construction traffic changes



Your previous feedback has helped us refine how our construction vehicles will access the site.

Spoil trucks will be required to travel northbound only on Wakehurst Parkway to ensure local residential areas to the south including the Seaforth shopping area are not impacted by trucks hauling spoil material.

Based on your previous feedback, we are proposing to keep the intersection of Wakehurst Parkway and Judith Street open and close the intersection of Wakehurst Parkway and Kirkwood Street for the duration of construction.

Final form



After construction, the portion of the site not required by Sydney Water for ongoing operations will be handed over to the Manly Warringah War Memorial Park Reserve Trust for the community to enjoy.



Frenchs Forest

Wakehurst Parkway North

We will be setting up a temporary construction support site on Wakehurst Parkway at Frenchs Forest to support surface road work, intersection work and to build a permanent tunnel support facility. This site was recently used as a construction site for the Northern Beaches Hospital road upgrade project.

Any areas that have been rehabilitated and returned to the community from the road upgrade project will not be used for Beaches Link. The rehabilitated area will be fenced off and protected from our work.

Our key activities include:

- building and operating the temporary construction facilities, including a temporary noise barrier, staff offices and amenities, car parking and concrete batch plant
- supporting construction of the Wakehurst Parkway surface road work, minor intersection work at Wakehurst Parkway/ Warringah Road and Wakehurst Parkway/ Frenchs Forest Road East and construction of the permanent tunnel support facilities.

Wakehurst Parkway North temporary construction support site indicative construction program

Construction activity	2023	2024	2025	2026	2027
Early work and site establishment					
Surface road works					
Construction of operational facilities					
Testing, commissioning and site rehabilitation					

Duration

You may see us in this area for up to five years as we set up, carry out our construction work, then demobilise the site and rehabilitate it for future use.

The construction peak at this site will be when we are carrying out surface road work, which will be for up to four years.

Hours of work

Our general site activities will be carried out during standard construction hours.

There may be occasional night staging work to support the upgrade of Wakehurst Parkway between Seaforth and Warringah Road at Frenchs Forest. Occasional night time deliveries to the site may also be required.

For any work outside the standard construction hours, the community will be notified in advance.

Traffic/vehicle movements

Access to site will be via Wakehurst Parkway and Warringah Road.

At our construction peak, there will be around 95 heavy vehicle movements and 180 light vehicle movements per day (a vehicle travelling in and out of the site is counted as two movements). The combined activity for all Wakehurst Parkway temporary sites will increase traffic in the area by 4 per cent during peak construction. Overall, this is a small increase to current traffic volumes. Please see page 38 for information about peak vehicle movements during construction.

Protecting revegetation

The same site was used as the main construction support site for the Northern Beaches Hospital road upgrade project, which was completed in August 2020. Revegetation work was carried out within the Northern Beaches Hospital road upgrade project's main construction support site as part of decommissioning. This included planting with species consistent with the Duffys Forest endangered ecological community within the eastern section of the decommissioned construction support site.

During site establishment of the Wakehurst Parkway North temporary construction support site, this revegetated area will remain fenced off and protected from disturbance. Due to the timing of this recent revegetation work, the current site layout of the Wakehurst Parkway North temporary site does not show the revegetation area. During further design development and construction planning, the temporary site layout will be refined to show the revegetation area, and ensure it is avoided and protected during construction.

Wakehurst Parkway North temporary construction support site



Chapter 03

Our assessments



Our assessments

This section provides an overview of the key environmental impacts during construction and operation of the project, and our mitigation measures to manage these. We have generally used a conservative approach in our assessments with impacts presented based on worst-case scenarios.

Traffic and Transport

The Beaches Link and Gore Hill Freeway Connection project will provide a new underground motorway bypass of the Spit and Military Road corridor and Warringah Road and Eastern Valley Way corridor. The project will significantly reduce journey times, reduce congestion on surface roads and improve reliability for commuters, service vehicles, freight and public transport users who rely on these critical transport links each day. It will also provide opportunities for new public transport links.

Assessment

As part of the planning process for the project, we have collected and analysed a significant amount of data to understand how people currently use the road network, and carried out a detailed traffic and transport assessment to help us make predictions about future traffic conditions. Our assessments looked at existing road traffic, local roads and parking, public transport, pedestrians and cyclists, and maritime traffic. In addition to the benefits the project will deliver, we also investigated and assessed the potential impact to the local and wider road network and to vessels on the harbour, both while we are building and when we are open to traffic at project completion.

The assessment process included traffic modelling that considers future population growth, land use, and other major road network and public transport projects to understand how the project will integrate with the broader transport network today and into the future.

When we are building

Transport changes near you

Sydney is expanding and the NSW Government is working hard to deliver an integrated transport system that meets the needs of customers now and in the future. Shaping the future of our city is a significant task and you may notice some temporary changes to the transport network while we are working. We know our work can be disruptive and delays can be frustrating for you and we are committed to reducing our impact where we can.

Where possible, our temporary construction support sites have been located on motorways and main roads to minimise the use of local streets by trucks moving materials to and from the sites. Our priority during construction is to ensure the community, road users and pedestrians all remain safe around our temporary sites and activities.

We will continue to work closely with the Greater Sydney Operations Team in Transport for NSW, Port Authority of NSW, local councils, emergency services, and bus operators to ensure we work together to minimise traffic and transport impacts.



To manage construction traffic impacts we will be:

- managing construction vehicle traffic to minimise movements and impacts during peak traffic times
- minimising heavy vehicle movements on local roads
- managing vehicle access to sites to ensure pedestrian, cyclist and motorist safety
- redirecting pedestrians and cyclists to provide safe passage around our sites, where required
- using clear signage, barriers and/or line markings as required to make it easier for you to navigate around our construction sites
- carrying out partial road closures outside peak times or during the night where possible
- working with other transport projects and other major developments to coordinate our work where possible.

Communicating with you about our work and any proposed changes is very important. We will be making information available through a variety of means including digital, phone and notifications, to keep you informed about our work and help you plan your journey.

Travel times

We are not expecting substantial changes to your travel times while we are working. Some areas may temporarily experience impacts such as:

- an increase of construction related vehicles sharing the road, particularly around worksites
- localised increases in traffic volumes and traffic delays
- temporary lane and road closures
- minor adjustments and to some bus stops and bus infrastructure
- temporary adjustments to pedestrian and cyclist infrastructure
- temporary reduction of speed limits
- temporary impacts on maritime speeds and travel times in Middle Harbour mostly west of the Spit Bridge.

Road users and local residents will be notified well in advance of any disruptions or changes, and we will do our best to make any disruptions as short as possible.

Our assessment shows we will have a limited impact on the existing public transport network around our project during construction, but there will need to be some small adjustments in areas.

During the work we will need to make some short-term temporary changes to bus stop locations. This may include temporarily moving bus stops to the closest practical alternative location while work is being carried out or temporarily changing routes to avoid construction work. This may cause some minor increases in bus travel times at certain phases of our work. Bus users and local residents will be notified well in advance of any disruptions or changes.

Worker parking

We know from our earlier engagement you are concerned about workers parking in local streets and community car parks.

We are providing dedicated worker parking at most of our sites, and actively encouraging workers to avoid parking on the surrounding road network, to reduce the need for worker vehicles to park in local streets.

This will include encouraging our workers to use public transport to access the temporary sites. Worker shuttle buses may also be provided where public transport availability to construction support sites is limited. However due to the nature of their work, some workers will still need to drive to and from the temporary sites to carry the tools they need to work.

Keeping you informed about transport changes

We will continue to engage with you when we are building. This will include communication before the start of work to keep you informed of what we are doing in your area and on our roads, and any likely impact.

Maritime movements

You will notice an increase in harbour maritime traffic when we are building the Middle Harbour crossing.

If you spend time on the water you may notice us:

- moving around on barges, tugboats and smaller vessels
- temporarily restricting maritime speeds by providing controlled navigation routes to ensure safe passage through our temporary sites
- temporarily relocating swing moorings off Seaforth Bluff and Spit West Reserve during construction
- establishing and operating a partially floating and fixed temporary site off Spit West Reserve

- establishing two temporary cofferdams - one off Clive Park at Northbridge, and one off Seaforth Bluff at Seaforth (both accessed by water, not by land)
- implementing temporary exclusion zones around the cofferdams off Northbridge and Seaforth Bluff - temporarily reducing navigational width
- seabed dredging (profiling) activities in preparation for the installation of immersed tube tunnel units
- restricting maritime traffic between Northbridge and Seaforth headlands for a period of up to 48 hours at a time (but not on weekends) while we install the six immersed tube tunnel units.

Traffic on the Spit Bridge



**Keeping trucks
off local
streets** 



Reducing our impact

We have designed the project and developed our construction methodology to reduce interruptions to the navigation of boats and watercraft within Middle Harbour.

We will work closely with recreational users, community groups, commercial enterprises, and other government agencies while we set up our construction sites, make any changes to the navigation channels and build in the water. We will:

- operate our vessels to minimise wash to the shoreline
- schedule our activities to avoid times and locations where there is high recreational marine traffic, where feasible and reasonable, for example on weekends, Australia Day and New Year's Eve
- implement temporary maritime traffic restrictions in consultation with relevant stakeholders
- temporarily relocate moorings impacted during construction elsewhere in Middle Harbour in consultation with the lease holder(s) and owners
- Consult with surrounding water-based users of Middle Harbour including Mosman Rowing Club and Northbridge Sailing Club to minimise construction impacts, where possible.



For more information please refer to Chapter 8: Construction traffic and transport and Chapter 9: Operational traffic and transport in the EIS.

When we are open to traffic

Travel times

Beaches Link will deliver significant transport improvements for a range of road users including; bus users, service vehicles, freight and commuters. Users of the new tunnel and existing surface routes will benefit from reduced congestion and travel times. The project will deliver opportunities for new underground express bus links to North Sydney, Sydney CBD, St Leonards and Macquarie Park, providing you with more options to choose how you move around Greater Sydney. While there will be some changes to traffic in local areas, this will be small and offset by the overall travel time savings across the journey.

We will carry out a review of the operational road network 12 months after the project is open and again at five years after the project is open. This is to confirm the network is operating as we expected and identify any mitigation measures required to manage any additional traffic impacts.

Travel time savings



*Scenarios assume vehicles are travelling via Beaches Link and the wider motorway network, including Western Harbour Tunnel, WestConnex and Sydney Gateway

Noise and vibration

We have assessed the possible noise and vibration impacts when we are building and when we are open to traffic. Once the project is open to traffic some areas will benefit from less noise due to reduced traffic on the surface and the new noise walls and at-property noise treatments we will install.

Assessing noise and vibration

We know our work can be noisy which is why we will use a range of measures to reduce the impact of our work when we are close to communities.

We have carried out a thorough noise and vibration assessment examining the potential impact to you when we build and operate the project.

These assessments involved identifying areas which may experience changed levels of noise or vibration as a result of our work and assessing the type, level and duration of potential impacts and how we will manage them.

Our assessments are conservative and always assess the worst-case scenario such as all equipment being used at the same time. We often find when we are working the noise generated is less than we predicted.

Reducing our impact

While we are building, we will monitor noise and vibration to check levels are less than predicted and identify if any additional mitigation measures are required. All our work will be carried out in line with the project's Conditions of Approval, Environment Protection Licence (EPL) and Construction Environmental Management Plan, which are overseen by the Department of Planning, Industry and Environment (DPIE) and the NSW Environment Protection Authority (EPA).

We will be using a range of measures to keep the community informed of our work and to reduce the impact of our work, including:

- providing notification about upcoming noisy and night work
- laying out our sites so the noisy equipment is shielded by other buildings and/or stockpiles, where possible
- using acoustic sheds to support 24 hour tunnelling activities, but only moving spoil by trucks during standard construction hours
- ensuring our equipment is serviced and maintained up to standard

- turning off machinery and equipment when not in use
- working within standard construction hours, where possible
- managing construction activities to minimise major noise-generating work being done at the same time at the same location, where possible
- staging our work to avoid extended periods of consecutive night work in one area to manage our impact on our neighbours, where possible
- installing hoardings and temporary noise barriers, where required
- offering at-property acoustic treatment, where required
- providing temporary alternative accommodation for high noise-generating activities, where required.

We will also use noise and vibration monitoring to ensure our measures are effective in complying with our licence conditions, and help us identify if we need to make changes to our construction methodology, to minimise impacts.



When we are building

Noise

If you live near where we are working you are likely to hear us. This may be when we are working on the road, delivering materials, setting up temporary construction support sites or removing spoil from tunnelling sites.

How noise is perceived is personal and can depend on the environment, because of this sound may also seem louder to you in some situations than others. For example a loud car horn in the middle of the night will seem louder than during the day.

The information on this page explains how we measure noise and what this will mean for you depending on which parts of our work you are near to.

How we measure noise

We measure noise in decibels. Our ears generally do not notice changes of one to two decibels. On the decibel scale, a change of 10 decibels sounds like about half or double the previous noise. For example a lawnmower is about 90 decibels and a motorcycle is about 100 decibels but a motorcycle seems almost twice as loud to the ear as a lawnmower.

Noise is measured, predicted and assessed in accordance with the relevant legislative guidelines.

When we predict you may experience noise levels over the guidelines, we will implement additional mitigation measures and monitor noise levels to assess that these measures are effective.

Day and night Noise Management Levels (NMLs)

The assessment process for noise uses reference noise levels for areas, known as NMLs, to assess the noise impact of our work.

The residential NML for an area is equal to the background noise level at the quietest time of the day or night, plus 10 decibels during the day or five decibels at night. You are considered to be affected by the noise generated by our work if it results in noise at your house being above the relevant NML.

There are different NMLs for non-residential properties which may be more sensitive to changes in noise levels. This includes hospitals, schools, places of worship, childcare centres and recreation areas.

We will work closely with any sensitive receivers to identify possible solutions to manage the potential impact of our work on your personal circumstances.

Sleep disturbance and awakening criteria

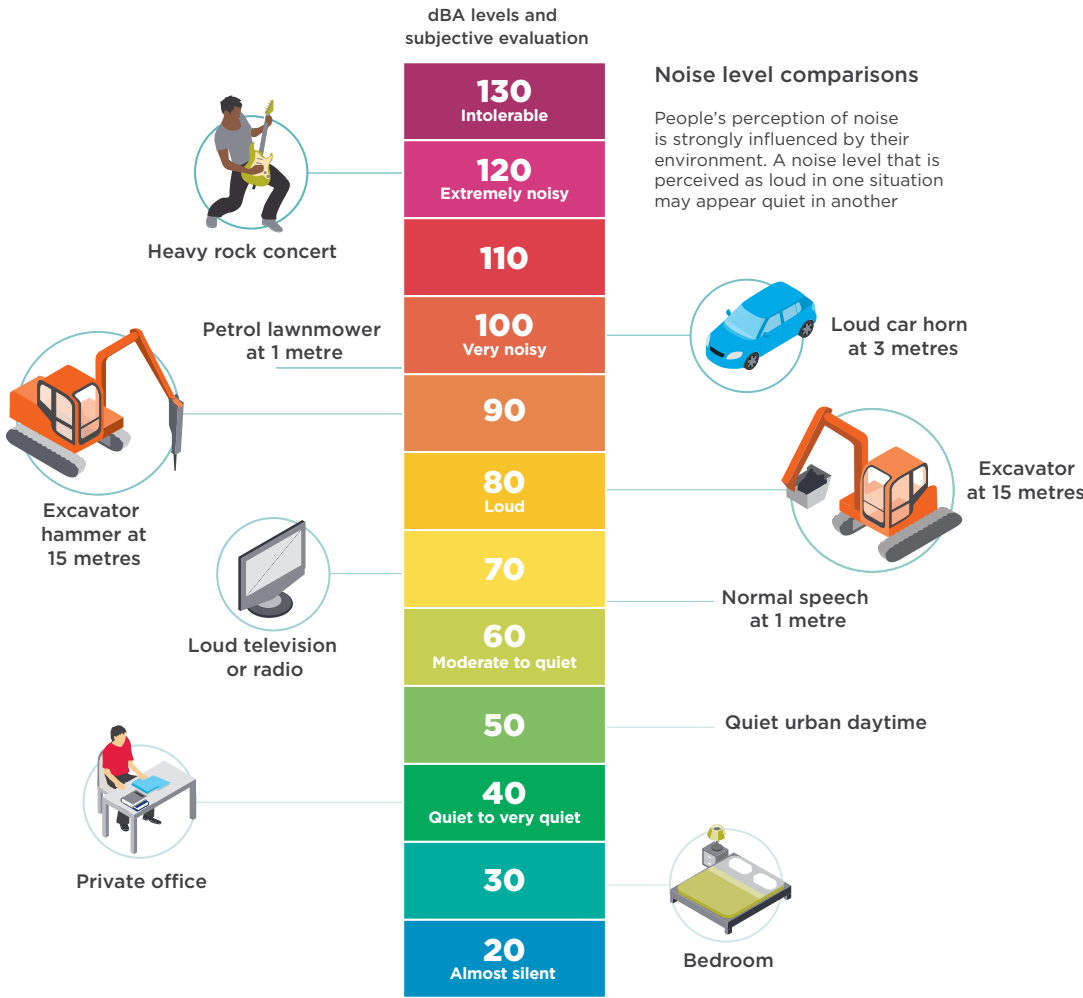
We know some of our work can be frustrating if you live nearby, particularly when we need to work at night. As a result, we are required to assess “a sleep-disturbance criteria”, which looks at whether the noise from the work might disturb your sleep. The criteria used to identify where there is the potential for sleep disturbance is 15 decibels above the background night time noise level, which is the background noise level without our construction work.

If we go above this criteria, we also look at an additional “awakening reaction level”, which is the level above which your sleep may be disturbed to the point you actually wake up. These assessments help us to identify if we need to implement additional mitigation measures such as providing respite or alternative accommodation, where applicable.

Highly noise affected

You are considered to be highly noise affected when noise levels are predicted to be over 75 decibels at your house – which is comparable to the noise made by a vacuum cleaner running inside your house. We will look at ways to further mitigate noise if you have been assessed as highly noise affected, such as carrying out additional consultation and notification, providing respite periods, and offering alternative accommodation, where required. We are committed to working with you to understand your personal circumstances.

We are committed to working with you to understand your personal circumstances.



Note:

- A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect.
- A 3–5 dBA change corresponds to a small but noticeable change in loudness.
- A 10 dBA change corresponds to an approximate doubling or halving in loudness.



Noise from construction traffic

Our work will temporarily generate more trucks and light vehicles on the road. We expect the increase in road traffic noise will generally be less than two decibels in most areas, which is within our guidelines and you are not likely to notice any change. Some changes in traffic noise may be more noticeable if you live near the construction sites.

While we will be tunnelling 24 hours per day at some sites, we will not be hauling spoil from these sites outside of standard construction hours. This means that heavy vehicles movements during the night will generally be limited to a deliveries (such as concrete trucks) entering and exiting the acoustic shed.

What does this mean for you?

The potential noise impact varies depending on the location and type of work we are doing in your area.

The below provides you with a general overview of what work will be happening and when you may be able to hear us when you are near to one of our sites.

If you live near a temporary tunnelling site

We will be tunnelling underground 24 hours a day, seven days a week.

The majority of noisy activity at these sites will be when we are setting the site up, building the acoustic shed and getting ready for tunnelling. This can take about six months to complete, weather permitting.

Once we are tunnelling, the majority of the work is underground. While the depth of our tunnels varies along the alignment, the tunnels are generally very deep, and most people will not notice tunnelling passing beneath them. The spoil generated by the tunnelling will be loaded into trucks inside the acoustic shed. The acoustic shed helps us manage noise, dust and light spill from our work.

Outside of standard construction hours, the acoustic shed door is closed except when deliveries are being made. This allows us to continue working through the night while minimising noise and light impacts.

We will only remove spoil from the site within the acoustic shed during standard construction hours. All tunnelling support sites will require limited night deliveries and some light vehicle access to enable tunnelling to continue 24 hours, seven days a week.

If you live above the tunnel

We will be tunnelling underground 24 hours a day, seven days a week. During this work, ground-borne noise might be heard at times within buildings near the tunnelling location. Ground-borne noise is a bit different to air borne noise in that you can sometimes feel it. Ground-borne noise is sometimes mistaken for vibration. A good example of what ground-borne noise sounds and feels like is an old refrigerator humming. This noise might be heard for one to two weeks as the tunnelling excavation approaches and then moves away. This is based on our tunnelling equipment moving an average of 25-30 metres per week and equipment needing to make several passes through the same area to

complete the initial excavation and tunnel support and lining work.

Apart from tunnelling excavation, other work to complete the tunnels, including localised rock excavation for drainage work and the installation of mechanical equipment, might be carried out for short periods directly under your property. Ground-borne noise might also be heard during this intermittent work.

When the tunnelling is deep underground (which is the majority of the time), it is unlikely you will be able to hear the tunnelling equipment. However when we are tunnelling at shallower depths, close by or directly under your property, you may experience ground-borne noise generated by our work.

The depths of the tunnel will vary depending on where you live. Please see pages 28 and 29 for more detail on the indicative depth of the tunnel under your local area. We will work with individual properties to keep them informed of the progress and how we can address any concerns they may have.

If you live near a smaller support site

We will have to establish a number of smaller temporary sites to support our work during construction. These sites are generally used for storage of machinery, materials and equipment, worker amenities, site offices and worker parking. One smaller site, at Frenchs Forest, will also have a concrete batching plant to reduce the need for concrete trucks travelling large distances to several sites.

The hours we work will vary depending on the type of work these sites are supporting, however, they are smaller and have less activity and impact than our main sites.

Noise on site will generally be quite low, however, you may notice our teams coming and going, and storing materials. We will be consulting with the immediate community during the development of these specific sites. Several construction support sites will have the purpose of supporting multiple works. For example, the Kitchener Street temporary site will support construction work along Burnt Bridge Creek Deviation and provide site office, staff amenities, car parking for staff, laydown facilities and space for storage of plant, materials and equipment.

Acoustic shed at Rozelle for M4-M5 Link, Rozelle Interchange



If you live near our surface work

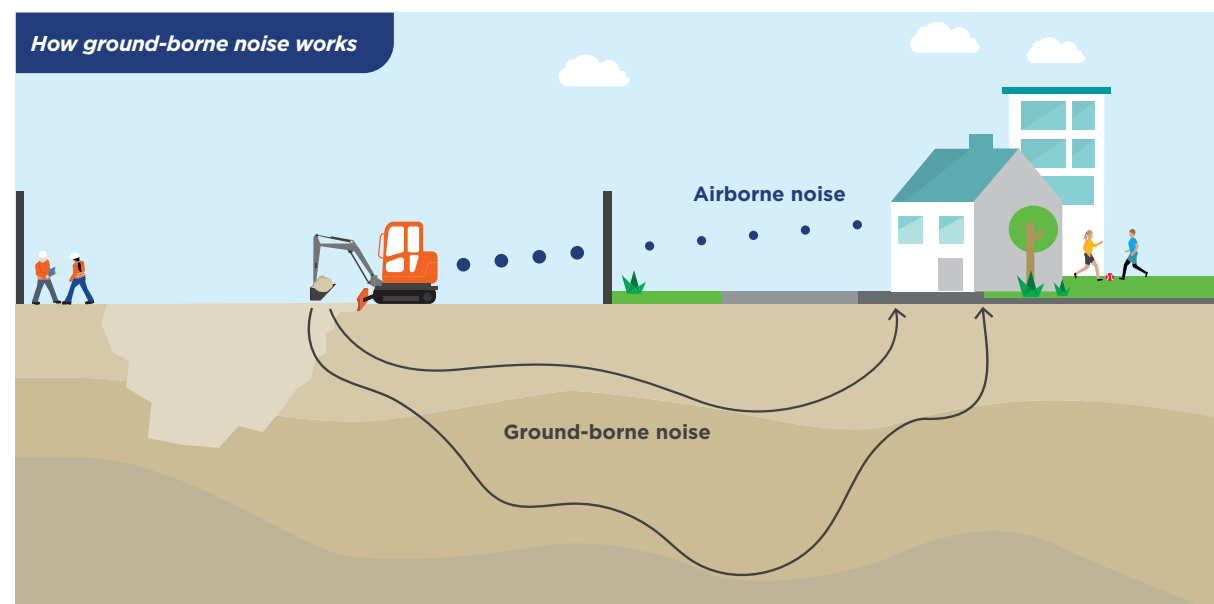
Surface work will be required to connect the tunnel into the existing road network. This will include upgrading existing roads, building new bridges, upgrading existing bridges and building the tunnel entry and exits. You will likely be able to hear some noise from these activities.

Work at these sites will be carried out in stages and some activities will be louder than others. For example, site set up and earthworks tend to be louder than finishing work like line marking and installing street lights.

If you live near temporary sites that operate out of hours

We will need to carry out some work out of hours, including during the night, as this is when traffic numbers are generally at the lowest and the work can be safely carried out with less disruption to traffic on key routes such as the Gore Hill Freeway.

An out-of-hours work protocol will be developed in consultation with DPIE and the EPA, and will be implemented throughout construction. This will outline appropriate noise management and mitigation measures and include measures such as providing respite, installing temporary noise barriers and staging our work where possible so we are not working near the same residents for large durations of time. Further details on measures that can be used to reduce noise are provided on page 85.



Vibration

We are sensitive to vibration and can feel vibration even at very low levels. This is why the vibration criteria we need to meet during our work to avoid annoyance to you is more stringent than the criteria to prevent damage to your property.

Our assessment considers the type of work we will be doing and whether there are any properties which may be at risk. It is more difficult to 'predict' vibration impacts than noise impacts. This is because there are many variables including soil type and conditions, the type of rock below the surface, building types and foundations, and the plant and equipment being used on site. Because of this, we take a conservative approach in estimating our impact.

We assessed the following types of vibration impact:

- disturbance to you in your property causing temporary discomfort
- potential damage to buildings (both cosmetic damage, like small cracks, and structural damage, like damage to foundations)
- potential damage to sensitive equipment in some buildings, such as sensitive electrical equipment or large internet servers.

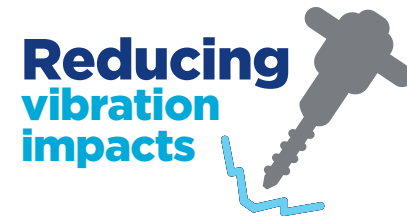
Property damage

We understand there has been a lot of concern about the potential for vibration and settlement when we are tunnelling to cause damage to properties.

Our objective is to ensure your safety and that your property is protected while we are building our tunnels and carrying out surface work.

We will offer a pre-construction property condition survey to properties eligible in accordance with the planning approval conditions for the project. This will provide a clear record of your property's condition before our work starts. We strongly encourage you to take up this offer. If you have a pre-construction property condition survey completed, you will automatically be contacted when work that has the potential to impact your property is complete to confirm if you would like a post-construction property condition survey carried out. These surveys are at no cost to you and you will be provided a copy of the report.

We will establish an Independent Property Impact Assessment Panel (IPIAP) 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 project.

If any damage is found to be directly related to our project, the damage will be fixed at no cost to you.

If your property is potentially eligible for noise assessment, you do not need to contact us as we will be in touch with you directly before construction starts. You do not need to contact us as we will be in touch with you directly, if you are eligible.

Working with you

We know there will be some noise and vibration impact when we are working in your area. If you live above the tunnel or adjacent to surface work you may also be able to hear and feel our work happening as our machinery passes below or near your home in some areas. We will be in contact with you about your individual concerns and needs throughout construction.

When we are open to traffic

We have identified and assessed all properties which may be affected by noise from the project when it is opened to traffic. The project is predicted to reduce traffic noise for almost 60 per cent of properties near our surface roads. Even though the project will improve noise levels for many properties, they might still remain above our thresholds due to existing road noise.

We acknowledge there will be some parts of the community who live near our surface road upgrades who may notice some more noise as a result of changes to traffic movements.

We will be offering at-property noise treatment to anyone's property that is predicted to remain over

the noise limit (by more than 2 dB(A) as detailed in our guidelines) even if the noise is reduced overall by the project.

We always try to mitigate traffic noise at the source first, including installing low-noise pavement, where appropriate. If this does not reduce the noise to in line with the guidelines, we then look at other options for you. This may include measures like building noise walls or providing at-property noise treatments.

For more information, please refer to Chapter 10: Construction noise and vibration, Chapter 11: Operational noise and vibration in the EIS.

Air quality

We recognise that air quality is important. Our commitment is that the tunnels will be built and operated to meet strict air quality standards using modern ventilation and tunnel design. All ventilation systems will be built and operated to strictly comply with any conditions specified in DPIE's Conditions of Approval, and the EPL to be issued by the EPA.

You may be interested to know the independent NSW Chief Scientist and Engineer has released a report in relation to road tunnel air quality. The report found that using ventilation outlets and avoiding portal emissions are the most effective methods of mitigating the air quality impacts of road tunnels. These methods result in 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. You can learn more about ventilation systems, filtration and air treatment systems by visiting www.chiefscientist.nsw.gov.au or nswroads.work/airquality.

Despite there being more cars and trucks on the road, vehicle emissions have fallen over the past 20 years, as a result of improved fuel quality and engine designs, such as hybrid and electric vehicles.

Assessing air quality

We have carried out a detailed assessment of air quality in consultation with independent specialist agencies including the EPA, Office of the NSW Chief Scientist and Engineer, Ministry of Health and the Advisory Committee on Tunnel Air Quality (ACTAQ) to ensure compliance with regulatory requirements and manage the potential impacts on air quality. Our air quality assessment was subject to an independent review by international technical experts, coordinated by the NSW Chief Scientist and Engineer. It is now published on DPIE's major projects planning portal: planningportal.nsw.gov.au/major-projects/project/10456

How we regulate air quality from tunnels

In NSW, DPIE monitors, analyses and publishes information about air quality. The EPA regulates air quality and implements measures for managing and reporting on air pollution.

We understand community concerns about air quality, which is why in 2018, the NSW Government announced stronger measures on emissions from motorway tunnels.

These measures include the EPA regulating the ventilation outlets for all current and future operating motorway tunnels to ensure they meet air quality limits. As part of these measures additional checks are required as part of the environmental assessment process. Before the EIS can go on public display the:

- ACTAQ coordinates a scientific review of the project's air emissions from ventilation outlets
- NSW Chief Health Officer releases a statement on the potential health impact of emissions from tunnel ventilation outlets.

Both documents for the Beaches Link and Gore Hill Freeway Connection are available to view on DPIE's major projects planning portal: planningportal.nsw.gov.au/major-projects/project/10456

Air quality portal

Visit our air quality portal to see how Sydney's air quality compares with the world and how the ventilation systems work nswroads.work/airquality

When we are building

We know how important it is to manage air quality during construction for your health, and the health of everyone working on site. Managing dust is a priority so we are implementing a series of measures to suppress dust and monitor air quality every day.

Like with any building work, a certain level of dust generation is unavoidable. However, dust management is stringently regulated as part of construction licences and conditions. Construction activity at each site is carried out under an Environmental Protection Licence (EPL), issued by the EPA, which will include requirements relating to air quality and dust.

We will have an experienced construction team who will work to minimise dust. They will use dust suppression methods, including stabilising loose material, watering the site and washing truck wheels when required. These measures, in addition to management of potential odours, will be detailed in construction management documentation and implemented during construction.

Most of the material we excavate will be clean, crushed sandstone. This will be removed in covered trucks to minimise dust falling from trucks.

When we are building, we will be monitoring dust around the sites to ensure our methods are allowing us to meet the terms of our EPL and Conditions of Approval and inform us if we need to make changes to our construction methodology.

When we are open to traffic

Surface air quality

You will experience an improvement in air quality along Military Road, Spit Road, Manly Road and Warringah Road as a result of vehicles using Beaches Link, reducing traffic on these roads.

Our studies have shown there will be a small impact on the local air quality along some of the surface roads we are building and upgrading, as well as some existing roads due to increased local traffic.

Overall, traffic emissions in Sydney are predicted to be reduced by up to 50 per cent by 2027 and up to 65 per cent by 2037, when compared to 2016.

Our human health study also shows the change in incidence of the relevant health effects associated with exposure to PM2.5 in the community is very small and would not be measurable within the community or at a local government area or suburb level.

Our motorway facilities use elevated ventilation outlets to eject tunnel emissions high into the atmosphere where they mix with the surrounding air, dispersing and being diluted hundreds of times, quickly becoming indistinguishable from background levels.

Our assessments have shown emissions from the ventilation outlets for the project will have a negligible contribution to surrounding air quality and will be generally undetectable. The ventilation outlets will be continuously monitored. The EPA will regulate the ventilation outlets to ensure they meet air quality limits.

You will see our motorway outlets at the following locations:

- within the Warringah Freeway at Cammeray (the structure will be built as part of the Western Harbour Tunnel and Warringah Freeway Upgrade project)
- the industrial area adjacent to the Gore Hill Freeway at Artarmon
- next to Burnt Bridge Creek Deviation at Balgowlah
- within Wakehurst Parkway at Killarney Heights.

Our ventilation system is designed to ensure there are zero emissions from the tunnel portals.

In-tunnel air quality

Modern tunnel ventilation systems are designed to ensure in-tunnel air quality is maintained to meet strict air quality requirements, avoid emissions from the portals, and manage smoke during fire incidents.

We have carried out modelling on in-tunnel air quality based on:

- expected traffic volumes
- maximum traffic volumes
- breakdown or major incidents in the tunnels.

The results of our modelling show the ventilation system for the tunnel will be able to manage the tunnel air to meet the air quality criteria in all of these situations.

Air quality in Sydney has improved over the last few decades due to initiatives which have reduced emissions from industry, motor vehicles, businesses and residences. Motor vehicle emissions are predicted to decrease significantly as a result of improvements in emission control and vehicle engine technology.

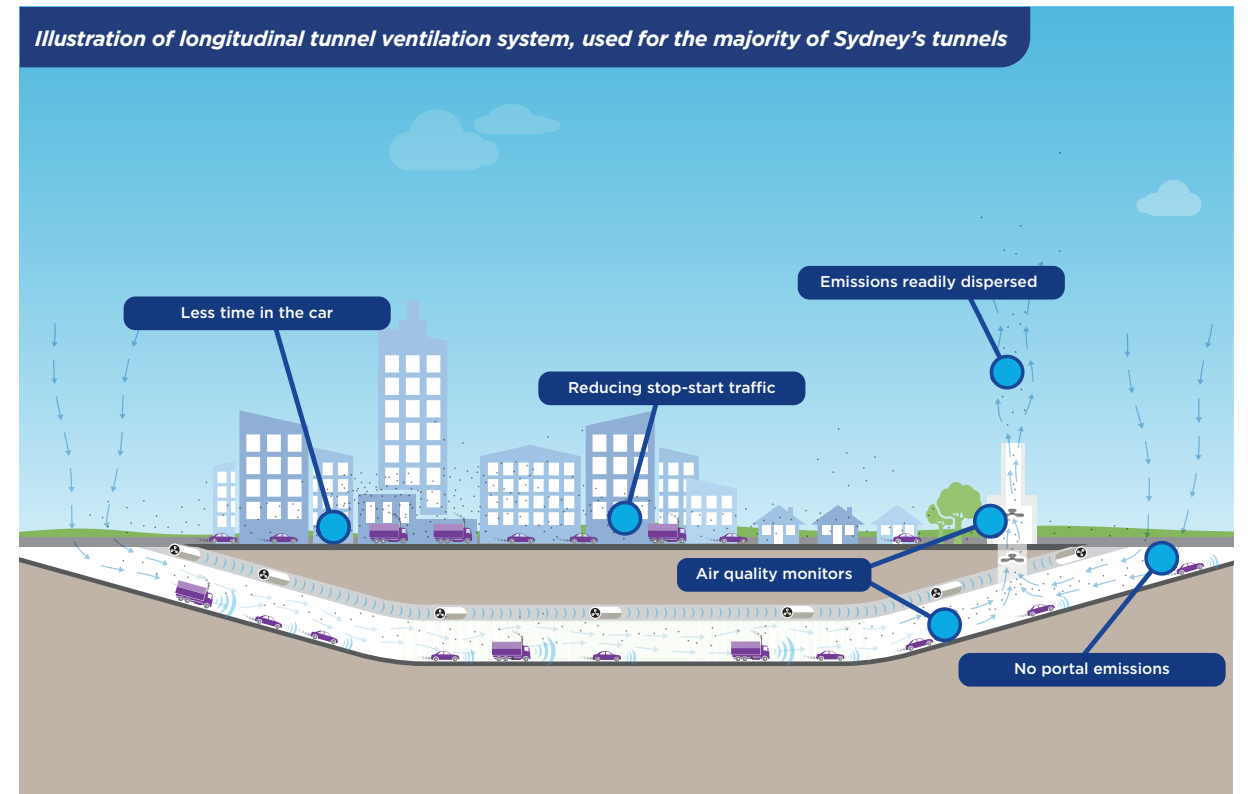
Future air quality monitoring

We will continuously monitor air quality within the ventilation outlets and tunnel 24 hours a day during operation, and use real-time data to ensure we are meeting strict air quality criteria. Air quality data will be available to the public to view on a dedicated webpage showing the tunnels are achieving the required levels of air quality.

In addition, ambient air quality monitoring will also be carried out for 12 months before, and a set period of time, likely at least 24 months, after the tunnel opens to verify everything is performing as expected and confirm we are meeting air quality standards.

The location of these monitoring stations and duration of monitoring will be determined by the Beaches Link Air Quality Community Consultative Committee (AQCCC), which will be comprised of representatives from the local council, local community and tunnel operator. The Beaches Link AQCCC will be independently chaired by a chairperson appointed in consultation with DPIE. We expect the AQCCC will be a Conditions of Approval requirement for Beaches Link, based on other recently approved projects that had this requirement, including M6 and M4-M5 Link.

For more information, please refer to Chapter 12: Air quality in the EIS.



Human health

We want to assure you the health and safety of our communities and stakeholders is our priority.

Assessing human health

The human health chapter in the EIS looks at the assessments carried out on air quality; construction and operational noise and vibration; socio-economic factors; construction and operational traffic and transport; land use and property; urban design and visual amenity; and cumulative impacts. These assessments and their findings identify the potential risks and impacts of the project on human health.

Reducing our impact

Your health and safety is important to us. We will have a number of measures in place to manage and minimise the potential impact to your health while we build and when we operate the project. Some of the key measures to be implemented include:

- working closely with our construction contractors to ensure the safety of our workers and community and compliance with all relevant work health and safety requirements
- using construction sites with direct access to the motorway or main road networks so our trucks do not need to travel on local roads, where possible
- managing vehicle movements to and from construction sites to ensure pedestrian, cyclist and motorist safety
- installing directional signage, barriers and/or linemarking as required to direct and guide drivers, cyclists and pedestrians past construction sites and on the surrounding network, to maintain access at all times
- managing and mitigating construction noise where possible
- designing the tunnel ventilation system to meet the in-tunnel air quality criteria so there are negligible effects on local air quality and zero emissions from the tunnel exits
- noise mitigation measures (such as road pavement treatments, noise barriers and/or at-property noise treatments where necessary) to address operational noise
- improving pedestrian and cycleway connections to make it easier for you to get around
- keeping you informed about our upcoming work so you know what to expect.

For more information, please refer to Chapter 13: Human health in the EIS



Henry Lawson Cave, Willoughby

Heritage

Sydney has a rich blend of Aboriginal and non-Aboriginal cultural heritage. We know there are significant heritage items along the project corridor and are committed to preserving this heritage as a legacy for future generations.

Assessing non-Aboriginal heritage

We know there are many important non-Aboriginal archaeological and historical sites along the project alignment.

We identified 77 non-Aboriginal heritage items within the study area, including four items of state heritage significance and the remainder of local heritage significance. This includes four potential heritage items: ANZAC Park at Cammeray, Henry Lawson's Cave within Flat Rock Gully, Balgowlah Golf Course and Burnie (House) at Balgowlah, however Burnie (House) did not meet the thresholds for heritage significance for local or state listing.

We have determined the project will have no impact on 48 of the items identified. Of the other 28 items, there would be a negligible impact on three items, and three are within low impact work areas. These six items have not been carried through for further assessment.

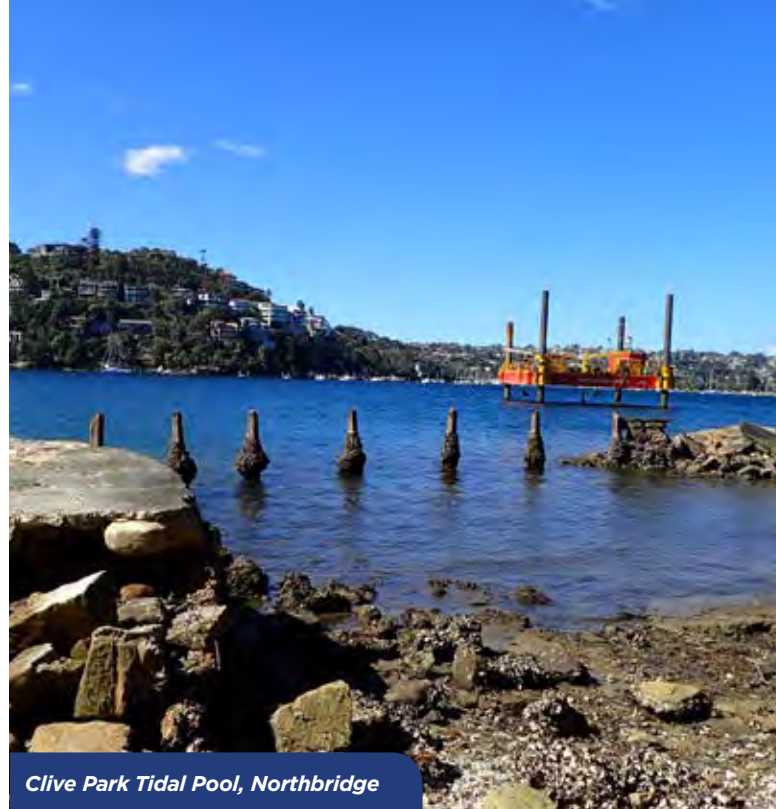
We have completed a Statement of Heritage Impact for each of the remaining 22 heritage items and conservation areas which could potentially be impacted by our project.

What we found

Our project has been assessed as having an overall minor non-Aboriginal heritage impact. This is because we are building underground tunnels which seek to avoid impacting above-ground heritage items, and we have selected our alignment to avoid heritage items as much as possible.

Impact to the items above the tunnel alignment or adjacent to surface work, due to indirect impact from settlement, vibration or changed views related to operational facilities such as noise barriers, has been assessed as being negligible to minor.

There would be impacts on Cammeray Park and at Balgowlah due to temporary use of these areas as construction support sites, and permanent use for operational facilities. At Balgowlah, the project would 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.



Clive Park Tidal Pool, Northbridge

Minor impact would occur at Frenchs Bullock Track due to permanent infrastructure, but the track would be reformed as close as possible to the existing alignment. This minor impact to the track may be reduced further during the detailed design phase.

Reducing our impact

We recognise heritage preservation goes beyond physical protection and we will be using photographic and digital technologies to capture archival recordings of key sites on the land and in the water for future generations. Other strategies we will have in place include:

- establishing exclusion zones around heritage items to minimise risk of impacts
- managing potential archaeological or heritage items we find during construction in accordance with standard procedures
- adjusting our work methods to prevent damage to heritage structures
- seeking advice from a heritage conservation architect if any at-property treatment is required at heritage listed properties
- carrying out property condition surveys for any heritage items at risk from vibration
- cultural and heritage induction will be provided to all staff before work starts.

For more information, please refer to Chapter 14: Non-Aboriginal Heritage in the EIS

Assessing Aboriginal heritage

We have engaged with many local Aboriginal parties throughout the development of our design and assessments. We held an Aboriginal focus group in 2017 to seek input, which has been invaluable to the development of our management measures. A second Aboriginal focus group was held in November 2020 as part of our consultation requirements before the EIS went on exhibition.

We have engaged several Aboriginal groups throughout 2020 with the aim of improving our knowledge of the culture, history, stories and song lines of the Aboriginal communities across the region and how these might be celebrated through elements of the project.

What we found

Our studies confirm evidence of Aboriginal occupation along and around the project area, particularly relating to historical areas of plentiful food resources, movement pathways, and meeting and camping sites located near locations such as Clive Park, Burnt Bridge Creek and Flat Rock Creek.

We identified 11 Aboriginal Heritage sites within the study area:

- five sites located within 50 metres of surface work
- five sites are located above or within 50 metres of the tunnelling work
- one Aboriginal site could not be confirmed through site inspections but may be within the construction footprint. Further efforts to locate this site will be carried out ahead of construction.

For more information, please refer to Chapter 15: Aboriginal Heritage in the EIS

Reducing our impact

We are committed to understanding and mitigating any impact to Aboriginal cultural heritage and will continue to work with Aboriginal stakeholders throughout the project. We will work to protect vulnerable sites by:

- adjusting our work methods to prevent damage at Aboriginal sites
- carrying out monitoring during vibration intensive work near Aboriginal Heritage Information Management System (AHIMS) sites to ensure we are effectively protecting the sites
- using photographic and digital technologies, including 3D capture technology, to create archival recordings of key sites to ensure they are recorded for future generations
- managing unexpected discoveries of potential Aboriginal archaeological or heritage items in accordance with the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services 2015)
- ensuring all of our staff take part in cultural and heritage induction before work starts.



Aboriginal rock shelter at Clive Park, Northbridge

Urban design and visual amenity

We understand the character and visual amenity of your local area is important to you. We carried out an urban design, landscape character and visual assessment, which considered the potential for impact to the overall landscape and visual amenity as a result of our project.

Our project has been designed to make the most of existing transport corridors and built-up urban areas. This is so our project can blend into the surrounding environment and reduce the character and visual impact in local areas, where possible.

Due to the large scale of our project, there will be some permanent changes to the local landscape and visual amenity.

The most noticeable visual changes relate to the:

- landscape changes to open space at Cammeray Golf Course to allow for the construction of new permanent facilities like the motorway facilities. We are committed to keeping screening vegetation along the boundary of the golf course to reduce visual impacts. The removal of trees in this area will be carried out by the Warringah Freeway Upgrade project, as that project will carry out its work first. The Beaches Link project will carry out the final landscaping of the area after construction is completed
- new motorway facilities located next to the Warringah Freeway at Cammeray
- new tunnel portals at Cammeray, Artarmon, Killarney Heights and Balgowlah
- new access road at Balgowlah
- new and improved public open space and recreation facilities at Balgowlah including new and improved pedestrian and cyclist paths
- ventilation outlet and motorway facilities next to the Gore Hill Freeway at Artarmon, and near Burnt Bridge Creek Deviation at Balgowlah
- motorway facility and ventilation outlet at Killarney Heights and tunnel support facilities at Frenchs Forest
- upgraded Wakehurst Parkway, including new and upgraded pedestrian and cyclist paths and fauna crossings.

An urban design and landscape plan will be prepared during further design development and implemented in line with the strategic urban design framework for the project. The urban design and landscape plan will detail built and landscape features to be implemented during construction and rehabilitation of disturbed areas during construction of the project. The urban design and landscape plan will be on public exhibition for feedback.

In addition to public open space improvements, we will also be providing new and improved pedestrian and cyclist paths. As part of this project we will be providing:

- new and upgraded public and active transport infrastructure along Burnt Bridge Creek Deviation and as part of the new and improved open space and recreation facilities at Balgowlah
- new active transport infrastructure along Wakehurst Parkway from Seaforth to Frenchs Forest, improving pedestrian and cyclist connectivity between these two areas including the Northern Beaches Hospital precinct, and to recreation areas including the Garigal National Park and Manly Dam Reserve.

We will be further developing the urban design and landscape plan as part of the detailed design process with the construction contractor. We will seek your important input to integrate our project with the unique character of your surrounding land and creates spaces which match the aspirations of local communities.

We will be inviting you to take part in a range of opportunities to provide input and feedback on the urban design and landscaping as the project progresses.

For more information, please refer to Chapter 20: Land use and property and Chapter 22: Urban design and visual amenity in the EIS



Artist's impression of Ernest Street and the operational facilities at Cammeray, 10 years after project completion

Open space and community precincts

We recognise how important open space is, which is why we will be returning as much of the temporary sites we use for construction as improved areas for you to enjoy. We will work with councils and local communities to identify the best possible use of this space once we have finished our work, and will be seeking your input to help design these legacy projects.

Where possible we will deliver these areas as early as we can, in some instances earlier than planned.

Cammeray

To minimise the number of private properties we need for the project, we will be using part of the Cammeray Golf Course, which is on land leased from the NSW Government, during construction and for some permanent motorway facilities.

We are working closely with the Cammeray Golf Club to develop a strategy to minimise our impact on people who use the course. We have adjusted our sites and included provisions for the golf course to remain open as a compliant nine-hole course during construction and after opening, if desired by the Club.

Cammeray Park sportsground, tennis club, croquet club and skate park will remain

operational during construction and operation and will not be directly impacted.

Work to reduce the capacity and re-configure the golf course for the period of construction will be carried out by the Warringah Freeway Upgrade project and re-instated if desired by the golf club after construction is completed by the Beaches Link project.

Artarmon

During construction we will temporarily occupy a section of Artarmon Park to allow for construction activities for the eastbound on-ramp from Lane Cove Tunnel/ Longueville Road. Access to the park will be maintained. We will not be impacting the oval.

We will need to permanently acquire a portion of land at Artarmon Park to accommodate road infrastructure associated with the Gore Hill Freeway Connection. This is not expected to impact on the overall use or functioning of the park and facilities within the park.

The temporary and small permanent impact to the park will not change its ongoing recreational use, as the area required for the project is steeply sloped and vegetated with dense scrub.

Northbridge

We will lease land from Willoughby City Council to set up a temporary support site in Flat Rock Reserve to support tunnelling for the project. The community will be able to continue using the wider Flat Rock Reserve area and Flat Rock Gully area for public open space and recreational use during construction. We will maintain access at all times.

In establishing our site, we will avoid older, more established trees where possible. The impacted section of the reserve, comprises mainly re-generated growth, and will be rehabilitated after construction is complete. Consultation will be carried out with Willoughby City Council and the community to determine future use of the site.

Mosman/The Spit

We will set up a temporary construction support site at Spit West Reserve to support the construction of the immersed tube tunnel crossing Middle Harbour. This will include pontoons on water, and some facilities on land.

Recreational users of Spit West Reserve will still be able to use other parts of the reserve, north and south of the construction support site. The existing pedestrian and cyclist path along the foreshore will remain open and will be temporary diverted around the site.

We will rehabilitate this site in consultation with Mosman Council once construction is complete.

For more information, please refer to Chapter 22: Urban design and visual amenity in the EIS

Artist's impression of Wakehurst Parkway near Kirkwood Street



Balgowlah

We will 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. Residual land, mostly to the east and north of the new access road, will progressively become available as open space throughout the construction period, for use by the community. Land to the south and west of the access road not required for operation will also be re-purposed as new open space and recreation facilities following completion of the project.

A dedicated consultation process jointly led by Transport for NSW and Northern Beaches Council will 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. This consultation will be separate to the consultation for the EIS.

This process will start after the EIS public exhibition period and well in advance of construction starting. As part of this consultation process, a community reference group will 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. More details about the community reference group will be communicated at a later date.

Use of the land for these facilities aligns with the Northern Beaches Sportsground Strategy (Northern Beaches Council, 2017) and addresses the current short supply of sporting grounds available for public use in the local area.

Seaforth/Killarney Heights/Frenchs Forest

To reduce impacts to private property, we will set up a temporary support site at Wakehurst Parkway East, on a non-operational part of the Sydney Water Bantry Bay Reservoir site. We will rehabilitate and revegetate the site after construction is complete. Land not required for ongoing Sydney Water operations will be added to the Manly Dam Reserve. This will add about 4000 square metres of new public space to the Manly Dam Reserve.

We will set up a temporary construction site in Seaforth, Wakehurst Parkway South, on land owned by Transport for NSW, to support the construction of the tunnel and surface work along the Wakehurst Parkway. The site will be rehabilitated once construction is complete. Any future use will be subject to separate assessment and approval, and is outside the scope of this project.

We will set up a temporary support site at Frenchs Forest, Wakehurst Parkway North, to support the upgrade of Wakehurst Parkway and tunnel construction. The site was previously used as a construction support site for the Northern Beaches Hospital Road upgrade project. After construction is complete, the site will be used to support the operation of permanent project infrastructure, the Northern Tunnel Support Facility.



Artist's impression of Balgowlah open space

Biodiversity

Sydney has a rich biodiversity with a variety of native plants and animals that form thriving ecosystems both on land and in the water. We are committed to protecting the local flora and fauna during construction and operation of this project.

Assessing biodiversity

We have carried out extensive biodiversity surveys in the study area and have completed a detailed Biodiversity Development Assessment Report to understand the biodiversity impact of the project. To read the report, please refer to Appendix S in the EIS.

What we found on land

A large amount of our project is working within an area which has been changed by people over the years and contains exotic species, weeds and planted native or non-indigenous species.

We identified seven native vegetation communities within the study area, which covers around 15.05 hectares:

- Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest of moist sandstone gullies, eastern Sydney Basin Bioregion
- Water Gum - Coachwood riparian scrub along sandstone streams, Sydney Basin Bioregion
- Red Bloodwood - Scribbly Gum/Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast
- Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region
- Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin
- Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region
- Smooth-barked Apple - Red Bloodwood - Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney.

We identified several patches of one threatened vegetation community, the Duffys Forest endangered ecological community, along Wakehurst Parkway in the study area.



Ringtail possum within the project area

We identified two threatened flora species within the study area:

- Magenta Lilly Pilly (*Syzygium paniculatum*)
- Netted Bottle Brush (*Callistemon linearifolius*).

We found three other threatened flora species close to the study area. In addition, there is the possibility of 14 threatened species within the project area but these were not identified during our studies.

We found the following threatened animals during our field studies:

- Powerful Owl (*Ninox strenua*)
- Rosenberg's Goanna (*Varanus rosenbergi*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*).

There is the possibility of eight listed threatened species within or next to the project area including Eastern Pygmy-possum, Red-crowned Toadlet, Glossy Black-cockatoo, White-bellied Sea-Eagle, Varied Sittella and Eastern Coastal Free-tailed Bat. One endangered population of Little Penguins in the Manly Point area, is known to occasionally be found within the project area.

What we found in the fresh water

We assessed five main waterways and two waterbodies as part of the project at:

- Willoughby Creek
- Flat Rock Creek
- Burnt Bridge Creek
- Manly Creek (also known as Curl Curl Creek)
- Trefoil Creek
- Manly Dam
- Wakehurst Golf Club west dam 1 – a site downstream of the Wakehurst Parkway east construction support site.

Additional smaller creeks and dry waterways within the construction footprint were also assessed. No threatened freshwater fauna, flora species, ecological communities, endangered populations or freshwater migratory species were found to be likely to live within the construction footprint.

What we found in Middle Harbour

We carried out an assessment in the Middle Harbour waterway between Yeoland Point and Grotto Point.

We identified 11 threatened marine species that are known or likely to occur in the study area:

- Black rockcod (*Epinephelus daemeli*)
- White's seahorse (*Hippocampus whitei*)
- New Zealand fur seal (*Arctocephalus forsteri*)
- White shark (*Carcharodon carcharias*)
- Grey nurse shark (*Carcharias taurus*)
- Australian fur seal (*Arctocephalus pusillus doriferus*)
- Loggerhead turtle (*Caretta caretta*)
- Green turtle (*Chelonia mydas*)
- Leatherback turtle (*Dermochelys coriacea*)
- Hawksbill turtle (*Eretmochelys imbricata*)
- Flatback turtle (*Natator depressus*).

We also identified two threatened marine ecological communities within the study area:

- Seagrass (*Posidonia australis*)
- Subtropical and temperate coastal saltmarsh.



Burnt Bridge Creek

Reducing our impact

We understand the importance of the natural environment and are committed to minimising our impact, protecting the local plant and animal life and implementing monitoring programs.

On the land

Most of the sites we will use for our construction either already contain trees and plantings which have been planted by people (ie, they are not remnant) or have already been otherwise disturbed. We will re-establish any exotic trees and plantings impacted as appropriate following construction.

The project will not have a significant impact on any of the threatened flora species based on the very low numbers to be removed, most of which are planted (ie, they are not remnant).

Some of the other key measures we are implementing to reduce the impact of our work include:

- offsetting vegetation removed as part of the project, resulting in no net loss of vegetation
- replanting vegetation within the project area where possible
- configuring the Flat Rock Drive site to be mainly located in the area replanted since 1998, and avoid the old growth sections
- selecting an alignment for the ramps to Burnt Bridge Creek Deviation that avoids major clearing of older growth vegetation in the Burnt Bridge Creek corridor both along and to the west of Burnt Bridge Creek Deviation
- reconfiguring the Wakehurst Parkway South site to reduce the impact on Duffys Forest
- minimising vegetation removal during further design development and detailed construction planning, where possible.

We will further develop management strategies in consultation with DPIE and/or appropriately qualified experts.

In the water

We have specifically designed the vertical alignment of the proposed Middle Harbour crossing to take advantage of the deeper water and minimise dredging required.

Our seabed dredging (profiling) methodology has been designed to minimise impact on the marine environment and has been used safely in some very sensitive marine environments around the world. This includes the use of a closed environmental clamshell bucket and silt curtains to minimise sediments containing contaminated material going into the water. Please see section 4 of this document for more information on how we safely remove materials from the seabed.

We have designed and located the cofferdams offshore to reduce the impact on more sensitive ecosystems at the shoreline, and the sensitive areas of seagrass.

Before we start major construction, a Construction Environmental Management Plan (CEMP) will be developed to detail how the project will preserve, protect and manage any potential impact to the local environment. The CEMP will need to be approved by DPIE before we can start any major construction work.

We will continue to have a dedicated team of environmental specialists who oversee this process.

For more information, please refer to Chapter 19: Biodiversity in the EIS



Middle Harbour

Other assessments

Assesment	Summary
Geology and soils 	Our design has carefully considered the diverse local conditions which traverse our project, such as existing geology, groundwater and soil landscapes. The majority of our tunnelling will be through Hawkesbury Sandstone, which has a long-proven history of supporting excellent, structurally sound, tunnels with minimal surface level impacts. We have carried out detailed assessments into possible impacts from erosion, sedimentation, contamination, acid sulfate soils, and urban soil salinity, and looked at the potential impacts on groundwater while we are constructing as well as during the first 100 years of the tunnel being open. The impact from our project is expected to be minimal. <i>For more information, please refer to Chapter 16: Geology soils and groundwater in the EIS.</i>
Hydrodynamics and water quality 	Our assessments considered how the project may impact on hydrodynamics, such as tidal and current movements within Middle Harbour, and water quality in waterways and marine environments. Site investigations and hydrodynamic modelling has been completed to assess and refine our approach to building the immersed tube tunnels on the bed of Middle Harbour. Our key environmental management measures during dredging or work to profile the seabed, profiling work include the provision of three sets of silt curtains which hang in the water, to enclose the dredging plant and control the spread of fine sediment into the adjacent waterway. The plant works within a smaller silt curtain. It is then surrounded by deeper silt curtain 10-12 metres in depth (which is the equivalent of around 3-4 storeys below ground). The third shallow curtain is placed just out from the nearby shoreline as added protection for the sensitive shoreline ecosystem. These measures are designed to direct fine sediments downwards and minimise transfer to the nearby waterway. Fine sediments entering the adjacent waterway during construction would be no worse than during typical high rainfall events.  The assessments show our proposed management controls and procedures will prevent major impact on hydrodynamics and water quality while we are building and operating the project. <i>For more information, please refer to Chapter 17: Hydrodynamics and Water Quality in the EIS.</i>

Assesment	Summary
Flooding 	Our assessment considered the potential impact to flooding as a result of the project both when we are building and open to traffic, including potential impact of future climate change and of a partial blockage of the local stormwater drainage system. Detailed construction planning will consider flood risk at construction sites. We will manage potential impact during construction. Managing flooding risk for the tunnels and surrounding properties was considered carefully in the development of the Burnt Bridge Creek Deviation connection, with flooding behaviour in this area being sensitive to changes in landform and drainage. Overall the project will generally have neutral or beneficial change to flooding behaviour external to the road corridor as a result of the project up to and including the 1 in 100 year flood event. The impact of the project on flood behaviour will be continually assessed as the detailed design develops, and impacts will be managed as appropriate. <i>For more information, please refer to Chapter 18: Flooding in the EIS.</i>
Land use and property 	The property and land use assessment identifies the potential impact of the project on affected properties and open space. We have designed the project to minimise the need for private property acquisition, where possible. The project has balanced impacts to private property with temporary and permanent impacts to areas of open space. Key factors considered in identifying potential temporary construction support sites included: • locating the temporary construction support sites as close as possible to the tunnels or surface work they support to minimise unnecessary tunnelling or heavy vehicle movements • avoiding sensitive environments and community locations where possible • avoiding direct impacts on heritage sites or items • maximising opportunities for direct access to motorways and main arterial roads or water transport opportunities for construction traffic, and avoiding the need to use local roads if possible. We will use space efficiently and make the most of our work areas, enabling us to reduce the overall temporary and permanent operational footprint of our project. We will also need to acquire or temporarily lease a number of properties along the project alignment. These are a mixture of residential, commercial and open space. We will need to acquire land below the surface to build the tunnels. This process is known as 'subsurface acquisition'. The surface area and any dwellings or other structures on a property will not be affected by subsurface acquisition and is not expected to prevent future development of the surface above, for example building a swimming pool or a basement garage. We are managing the property acquisition process in accordance with legislative requirements and reforms. We will send letters to affected property owners to confirm subsurface property acquisition is required. The letters are sent progressively, according to the construction schedule and when access to the subsurface land is required. Consistent with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i>, generally no financial compensation is provided for subsurface acquisition. <i>For more information, please refer to Chapter 20: Land use and property in the EIS</i>

Assesment	Summary
Socio-economic 	We know a project of this scale will create some changes in the community during construction and operation. Together with the Western Harbour Tunnel and Warringah Freeway Upgrade this project will support around 15,000 full-time equivalent jobs, and will provide significantly improved access to jobs and services when completed. Beaches Link and Gore Hill Freeway Connection is expected to support 7,500 jobs. Construction workers are also expected to generate additional opportunities for businesses around construction sites. We will avoid, minimise or manage social and economic impacts as a result of the project by: • minimising the permanent impact on open spaces through our design, where reasonable and feasible • returning open spaces for community use after construction where they are not required for permanent infrastructure • continuing to engage with local schools, places of worship, child care, aged care, health and medical facilities about the timing and duration of construction work and management of potential impacts • continuing to engage with businesses potentially impacted by construction to identify specific impacts and reduce or manage these throughout construction • maintaining business access, visibility and parking where possible. Additional management measures are outlined in other sections of this guide, including traffic and transport, noise and vibration, air quality, human health, biodiversity, open space, and urban design and visual amenity. <i>For more information, please refer to Chapter 21: Socio-economics in the EIS.</i>
Hazards and risks 	We understand there are concerns about the removal, transportation and storage of hazardous materials. We are prioritising your safety and health and the welfare of our workers while protecting the environment. Our hazard and risk assessment considers the potential hazards arising from incidents during construction and operation that could pose a risk to public safety, the surrounding community or the environment. This includes hazards and risk relating to issues such as: • the storage, transportation, handling and use of dangerous goods and hazardous substances • traffic incidents relating to the construction or operation of the project on land or on the water • ground movements and geological conditions • damage or disruption to underground utilities • bushfires. We will carry out associated work in accordance with the relevant legislation and guidelines to ensure the safety of communities, workers, and the environment while we are building and after the project opens to traffic. <i>For more information, please refer to Chapter 23: Hazards and risks in the EIS</i>

Assesment	Summary
Resource use and waste management 	Building infrastructure to transform a city requires large amounts of materials and energy. Where possible we will recycle our resources and seek efficient ways of working to minimise the amount of waste generated. Most of our waste will take the form of spoil from tunnelling work on the land (about 3 million cubic metres). In general, we will re-use this spoil on site or transport it by truck to other developments to be recycled, or, if not suitable for re-use, dispose of it at licensed locations. We will also be removing around 163,000 cubic metres of materials from the Middle Harbour crossing to install the immersed tube tunnels. Around 153,000 of this material is likely to be suitable for offshore disposal at an existing regulated offshore disposal site. Around 10,000 cubic metres may be unsuitable for disposal offshore. This material will be made spadable (a consistency which allows the material to be spaded or shovelled) and transported by barge outside Middle Harbour to be loaded into sealed and covered trucks for transport to a suitably licenced onshore facility for disposal. <i>For more information, please refer to Chapter 24: Resource use and waste management in the EIS</i>
Sustainability 	The project is part of the Future Transport 2056 Strategy and is designed to contribute to long term environmental, social and economic outcomes while being committed to the NSW Government's aspirational objective of achieving net-zero emissions by 2050. The tunnel will support operation of electric buses and other low or no emission vehicles. We have developed a sustainability framework which provides the overarching vision, objectives, targets and implementation approaches for the project. The vision commits us to achieving excellence in sustainability and builds sustainability thinking into all stages of design and delivery. We will implement a Sustainability Management Plan to manage and minimise the potential impact of the project as well as enhance the natural environment and local heritage. Our project will contribute to better liveable local communities, ease congestion and provide opportunities to revitalise urban areas. It will provide faster connections to other communities and contribute to Sydney's long-term transport goals while improving land use. <i>For more information, please refer to Chapter 25: Sustainability in the EIS</i>

Assesment	Summary
Climate change and greenhouse gasses 	An assessment has been carried out to understand the vulnerability of the project in relation to climate change and its contribution to future climate change as a result of the construction and operation. Our assessment showed greenhouse gas emissions from traffic volumes on the road network will become more efficient once the project is operational, due to less congestion, less stop-start driving and a greater average vehicle speed, and as a result of expected improvements in fuel efficiency and increases in electric vehicles. Average speeds will increase due to the efficiency of the tunnels. Greenhouse gas emissions will be managed and minimised during construction as part of the Sustainability Management Plan. Energy efficiency will be considered during further design development with energy efficient systems installed where reasonable and practicable. <i>For more information, please refer to Chapter 26: Climate change risk and greenhouse gas in the EIS</i>
Cumulative impacts 	We know there are a range of construction projects and private developments happening across Sydney and we want to minimise the cumulative impact of our work as much as possible. The following projects were considered in the cumulative impact assessment: • Western Harbour Tunnel and Warringah Freeway Upgrade • Sydney Metro City & Southwest (Chatswood to Sydenham) • Sydney Metro City & Southwest (Victoria Cross over station development) • several major private developments. As several of these projects will overlap with our project we want to minimise the construction fatigue for people living nearby. There is the potential for increased and longer term construction traffic on the local road network, increased construction noise and vibration, and visual impacts for residents and businesses due to the cumulative impact. We have considered other projects close to the project alignment in the design and timing of our project to reduce the cumulative impact on our community, where possible. We will continue to collaborate with the relevant teams on nearby projects to manage impacts of potential cumulative impacts. <i>For more information, please refer to Chapter 27: Cumulative impacts in the EIS</i>



Nippers at Manly Beach

Section 04

How we build the project



Interactive portal

nswroads.work/blportal

Visit our interactive portal to see how we will construct the tunnel in Middle Harbour



Artist's impression of dredging work in Middle Harbour

Building across the harbour

We will be using twin immersed tube tunnels to cross Middle Harbour. Immersed tube tunnels have been built in many locations around the world, including for our existing Sydney Harbour Tunnel. This technique will allow us to safely and efficiently build the crossing of Middle Harbour.

Cofferdams

We will be building a temporary cofferdam at each end of the harbour crossing, one off the shoreline of Northbridge and the other off the shoreline of Seaforth. These temporary cofferdams are required so we can build the connection between the land tunnel and the immersed tube tunnels. These cofferdams will each be about the size of an Olympic sized pool. They are temporary and we will remove them once the work is finished.

Cofferdams are made up of interlocking piles (like round hollow metal pipes) to form an enclosed watertight wall. Each pile will be vibrated down through the sediment and then driven into the sandstone below the seabed until it is secure and cannot move. Piling will take place from a barge using a crane fitted with a hydraulic vibrating hammer, offshore pile driving hammer and/or a similar piece of construction equipment.

Once each cofferdam is in place, we will pump the water out of the cofferdam and install the structural steel framework to make the cofferdam structurally sound and safe to work inside.

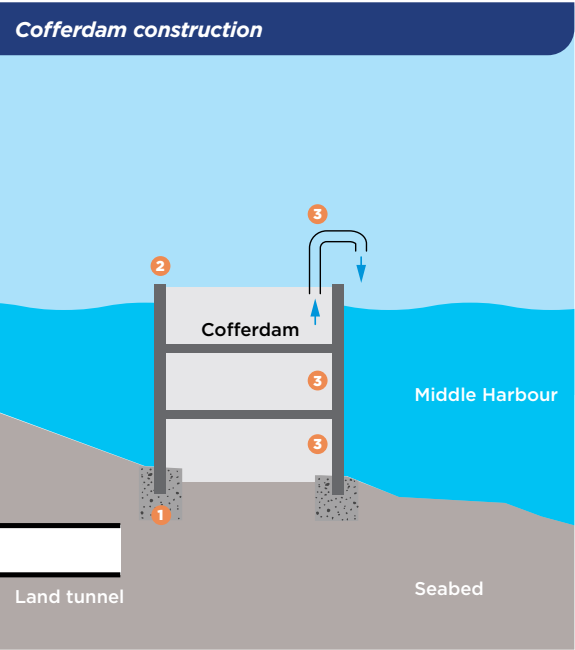
Building within the cofferdams

Once the cofferdams are in place and drained of water, we will remove the sediments and sandstone within each cofferdam using excavators with rockhammers to form a flat base at the tunnel level. We will then build a concrete structure (known as an interface structure) in each of the cofferdams. This will connect the tunnel under the water to the tunnel under the land.

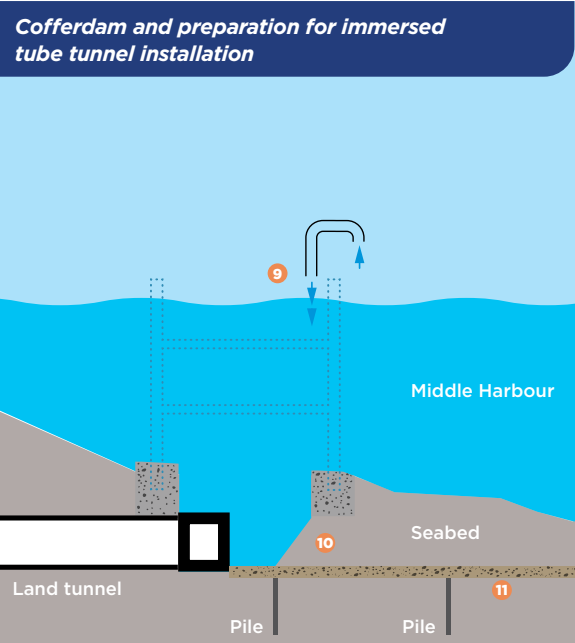
Removing the cofferdams

Once we have finished building the interface structures, the cofferdams will be removed. This process involves filling them with water to the same level as the water level outside and removing the structural steel framework and piles. The marine environment will be rehabilitated as needed.

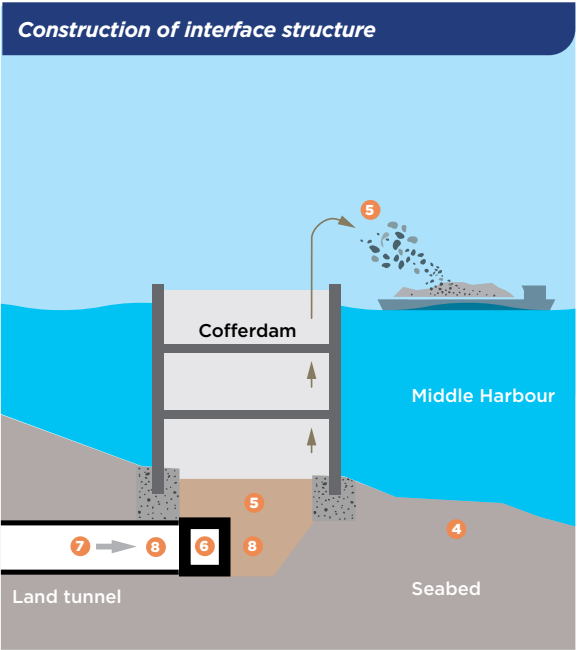
Building the cofferdams



- 1 Ground treatment to improve the strength of the seabed
- 2 Installation of piles to create the outer structure of the cofferdam
- 3 Dewatering and installation of structural support



- 9 Filling of cofferdam with water and removal of structure support
- 10 Finalise dredging adjacent to the cofferdam
- 11 Installation of a gravel bed and supporting piles within the trench in preparation for immersed tube tunnel installation



- 4 Commence dredging of the seabed, where required, to create a trench for the immersed tube tunnel
- 5 Excavation of sediment and rock within the cofferdam to final design level of the tunnel
- 6 In-situ construction of the tunnel interface structure
- 7 Breakthrough of mainline tunnel into interface structure using roadheaders
- 8 Installation of bulkhead structures at tunnel interface structure to provide a waterproof seal

Seabed dredging

Before we place the immersed tube tunnel units we will need to prepare the seabed. This will involve creating a partial trench for the immersed tube tunnel to lie in. Most of the middle section of the immersed tube tunnels crossing Middle Harbour will be located on the existing seabed. This means we will not require a trench for the middle portion, reducing the amount of dredging required for the Middle Harbour crossing.

The dredging method we use will depend on what type of material we are removing, for example we use different equipment to remove rock than we do for sediment.

In planning our work and selecting our equipment, we have carried out marine ecology surveys, sediment testing and modelled water movements to confirm we have a strong understanding of the marine environment. We will be using a number of safeguards to manage the potential impacts to ecologically sensitive areas.

Removing materials from the seabed

We will use one of two methods to remove materials from the seabed depending on what type of material we are removing.

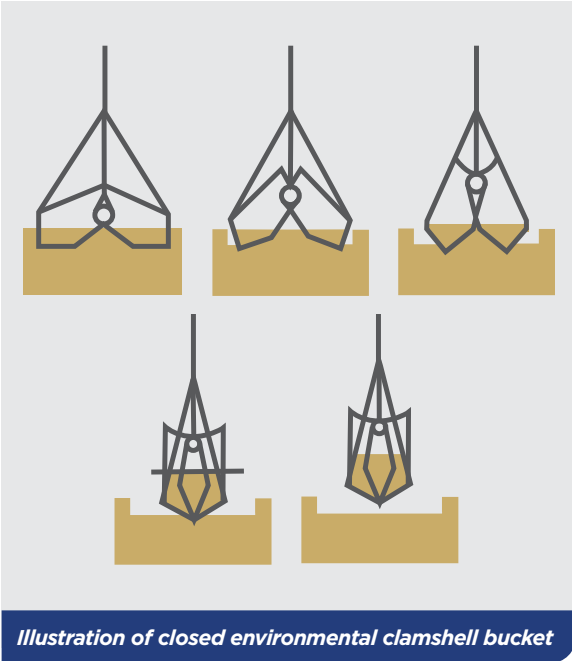
1. Backhoe dredge with closed environmental clamshell bucket

To remove some of the softer material from the seabed a closed environmental clamshell bucket will be used. This is a closed bucket attached to a large backhoe dredger. This is used to minimise the spread of material into the water as it is being removed and to allow for materials to be loaded directly onto barges.

Type of material

There will be two different types of material being removed by this method:

- soft sediments which are not suitable for reuse or offshore disposal. They will be tested and treated before being disposed of at a licenced facility on land.
- clean soft sediments suitable for offshore disposal. They will be transported by barge to be disposed of at the offshore disposal site.

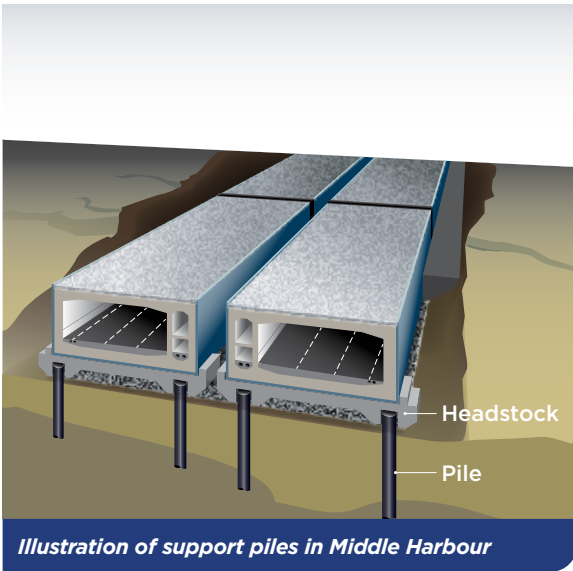
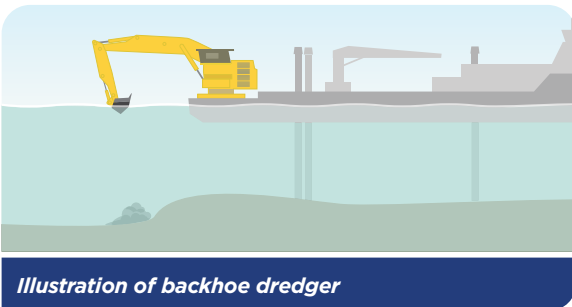


2. Backhoe dredge with rotating cutter head

A rotating cutter head will be used to cut and fragment rock underwater. After the material is cut using the cutter head, a backhoe will lift the materials from the water and load it into a barge. This material will be transported by barge to the approved offshore disposal site for disposal.

Type of material

- rock suitable for offshore disposal.



Installing support piles

Due to very soft marine sediments in Middle Harbour, the immersed tube tunnel units will need to be supported on piles near the middle of the crossing. Installation of these piles will be carried out using similar equipment used to build the cofferdams.

Steel casings (round hollow metal pipes) will be vibrated through the sediments and then driven into the rock below the seabed and filled with reinforced concrete. The piles will be cut to the required level and a concrete headstock will be placed on top of the piles and locked in place. A headstock is a precast horizontal concrete piece which sits on top of the piles to support the weight of the tunnel. This forms the foundation for the middle section of the tunnels.



Traffic on the Spit Bridge

Building the immersed tube tunnel units

The twin immersed tube tunnels will be around 340 metres long and have three individual pieces (called units) for each carriageway, with six units in total. The outer steel shell of the units will be made offsite, towed via tugboats to the Spit West Reserve temporary construction support site, where they will be fitted out with steel reinforcement and concrete. An additional concrete layer will be provided to protect the top of the completed tunnel units from damage during operation, such as potential damage from falling or dragging anchors.

Once completed, each unit will be floated to a temporary mooring site east of Clive Park in Middle Harbour for temporary storage.

The temporary mooring location will allow us to store the first four immersed tube tunnel units before they are installed. The final two units will be towed directly to the immersion site.

Once we have built the interface structures and completed the seabed dredging and support piling, we will move the units via tugboats one at a time to the immersion site.



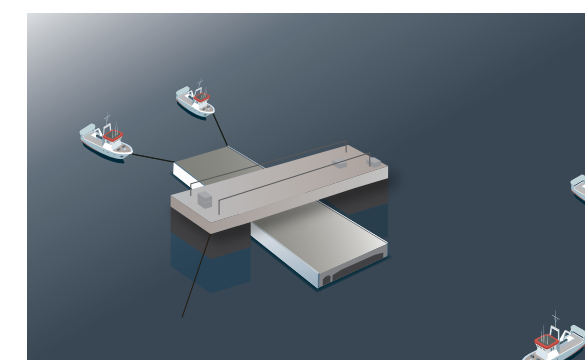
1. Transport of steel shell unit through Spit Bridge.



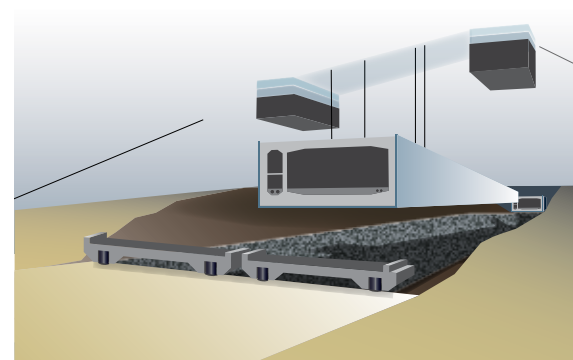
2. Steel shell unit arrives at construction site casting facility.



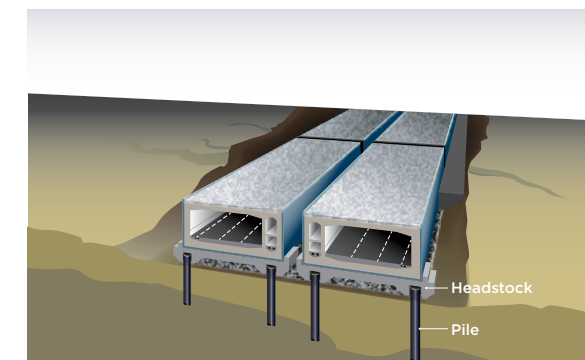
3. Floating steel shell unit arriving at casting facility for concrete construction.



4. Transport of completed unit to immersion site.



5. Immersion of a completed tunnel units.



6. Completed units partially within trench with locking fill.

Immersing the tunnel units

We will be positioning the immersed tube units using pontoons, tugboats and a navigational guidance system. Each unit is immersed by remotely pumping water into tanks within the units – similar to a submarine. The units have large seals on each end to create a watertight joint with the adjacent unit.

After each unit is immersed, concrete pavement is cast inside the unit to ensure it can no longer float. Locking fill is placed around the unit to lock it into place.

We will be placing units one at a time. It will take around 24 to 48 hours to install each unit. There will be some localised temporary harbour closures in the area when this is happening.

Managing spoil and waste when building in the water

Before we start building, a detailed Construction Environment Management Plan (CEMP) will be developed to detail how the project will preserve, protect and manage any potential impacts to the local environment. The CEMP will need to be approved by DPIE before we can start any major construction work.

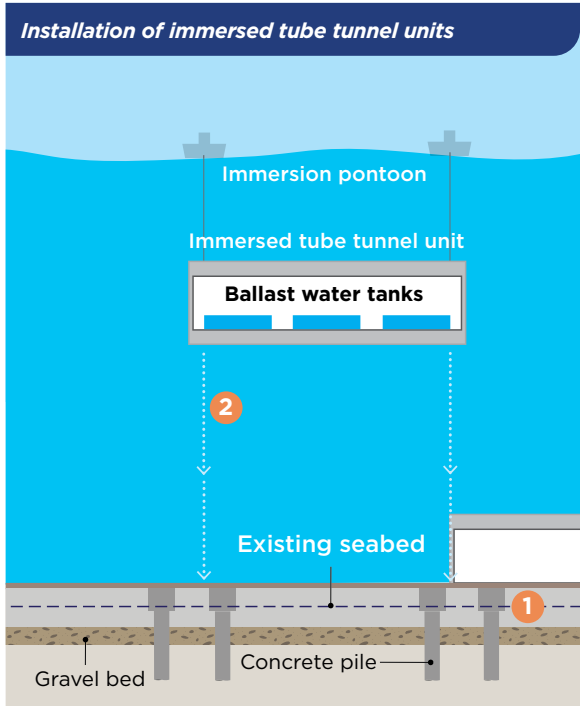
The CEMP will be a working document, subject to ongoing changes and updated as necessary, to respond to specific requirements or issues. Any handling of contaminated sediments will be carried out in accordance with the CEMP and an Environment Protection Licence issued by the NSW Environment Protection Authority.

We will continue to have a dedicated team of environmental specialists who oversee this process.

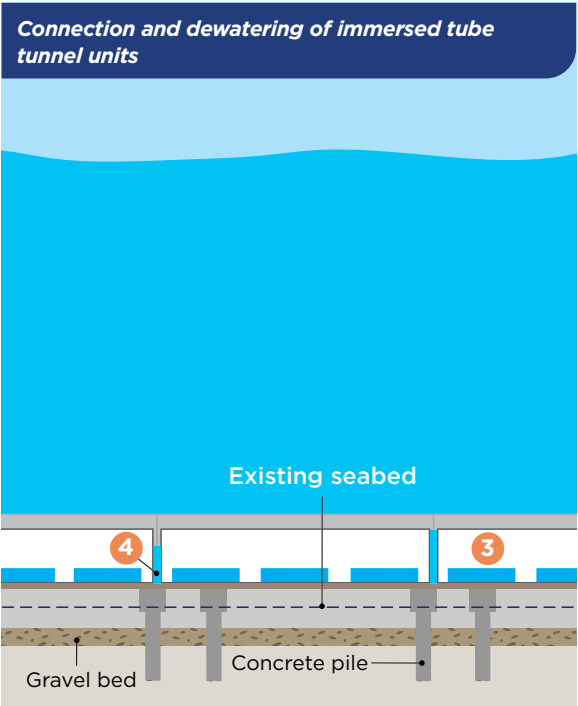
We will be removing materials from the seabed and immersed tube tunnel construction by using barges. Some dredged material associated with the construction of the crossing of Middle Harbour will be suitable for offshore disposal. We have submitted an application to the Commonwealth Department of Agriculture, Water and the Environment for offshore disposal of suitable dredged material. We will transport suitable dredged material to the offshore disposal site using barges.

We will transport any dredged material not suitable for offshore disposal to a facility outside Middle Harbour where it will be made spadable (a consistency which allows the material to be spaded or shovelled) and then loaded onto trucks for disposal at a land-based, licensed facility.

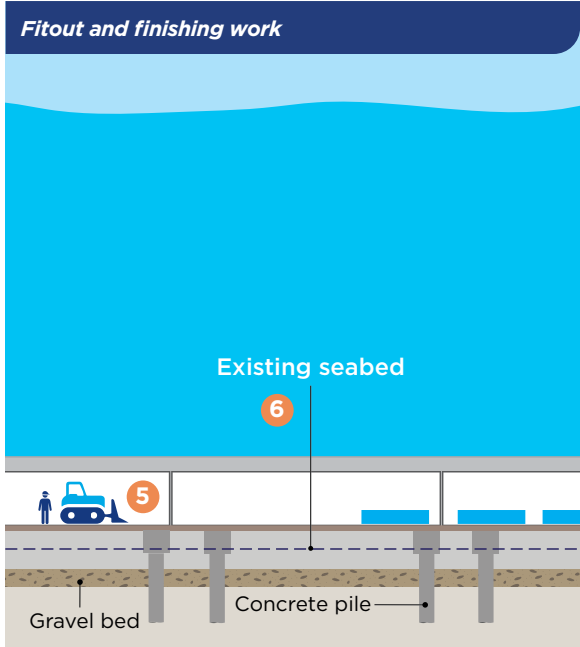
Tunnel unit immersion



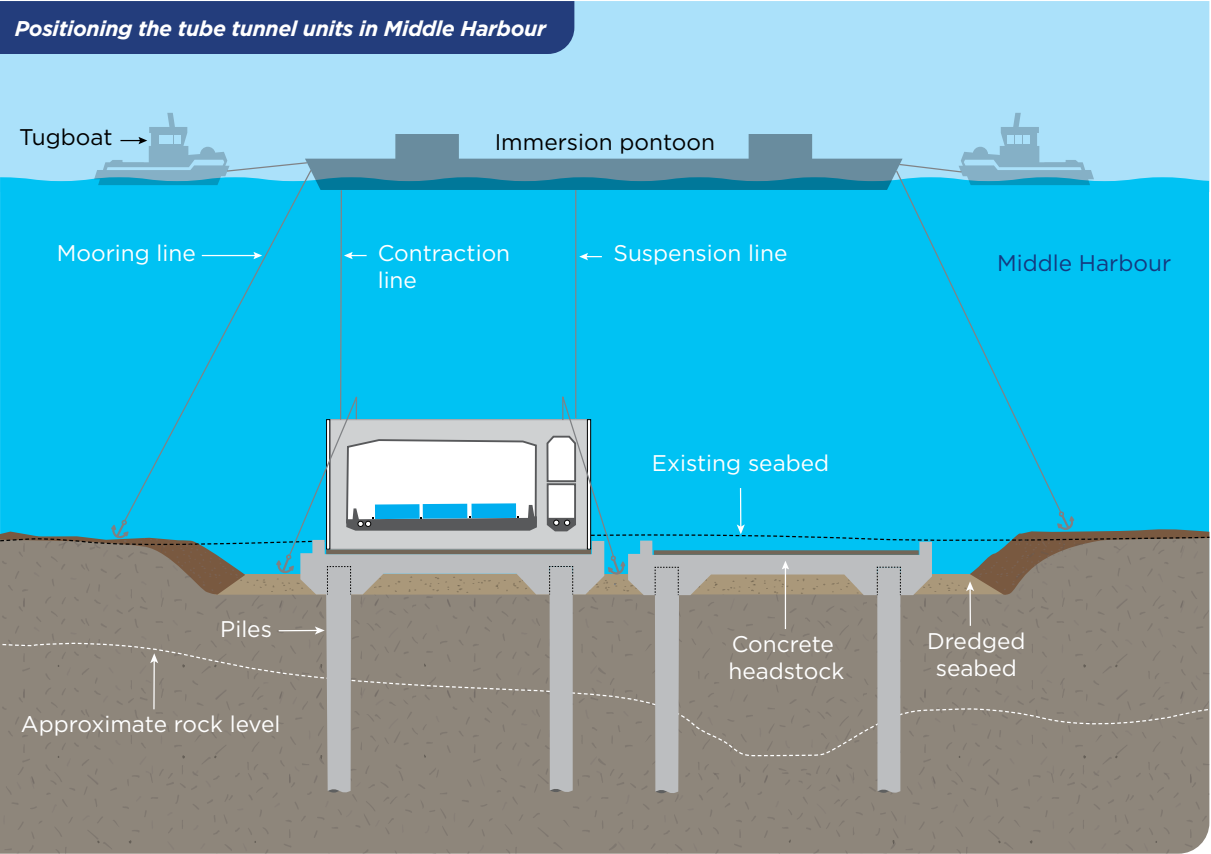
- 1 Installation of gravel bed and/or supporting piles
- 2 Immersion of immersed tube tunnel unit against previous unit
- Water ballast



- 3 Connection of immersed tube tunnel unit with interface structure or adjacent immersed tube tunnel unit and installation of waterproof joint between units/structures
- 4 Dewatering of immersion joint



- 5 Casting the closure joint
- 6 Removal of water ballast tanks, casting of pavement and fitting out



Building on land

Tunnelling

We will be tunnelling using roadheaders. Roadheaders are extremely powerful and advanced rock-cutting machines designed to excavate tunnels and caverns. They are almost always used for tunnelling on major road projects in Sydney including the recently completed WestConnex M8, New M4 tunnels and NorthConnex.

Rock hammering and rock saws may be used in some areas for excavation of the tunnels, cross passages and areas of sandstone within the cut and cover and trough structures.

Cut and cover

We will be building cut and cover tunnels when there is not enough rock cover to support the construction of the tunnels from underground. This is generally where the tunnels come to the surface.

Cut and cover is a tunnelling method generally involving excavating downwards from the surface of the ground, and installing a tunnel structure including a base, walls and a roof. Once the roof is in place, the tunnels are generally covered with fill and re-vegetated.



Roadheader tunnelling for M4 East

Controlled underground blasting may also be used, subject to confirmation during detailed design construction planning.

Cut and cover tunnels will be built where the Beaches Link tunnel:

- emerges within the Warringah Freeway, to the north of the Ernest Street bridge
- emerges within Gore Hill Freeway, to the east and west of Hampden Road bridge
- off ramp to Reserve Road emerges from beneath Gore Hill Freeway
- emerges within Burnt Bridge Creek Deviation, to the north of Sydney Road
- emerges within Wakehurst Parkway, to the north of Kirkwood Street



Waterproofing for NorthConnex

Tunnelling stages

Stage 1. Excavation

We will be excavating road tunnels and building on ramps and off ramps. The depth of the tunnels varies across the alignment (please see pages 28 and 29 for more details on indicative tunnel depths in your local area).

At our deepest point we will be around 108 metres (33 storeys) underground and will come to the surface for the on ramps and off ramps. Also, we will start building the permanent operational facilities.

Stage 3. Finishing

Following the fitout work, we will then install the electrical equipment and systems within the tunnel and carry out the final finishing work. This includes:

- installing:
 - electrical cabling
 - signage and lighting
 - ventilation, tolling, safety and control systems within the tunnel and operational facilities
 - water treatment equipment
- pavement work to connect to surface roads
- line marking.

Stage 2. Fitout work

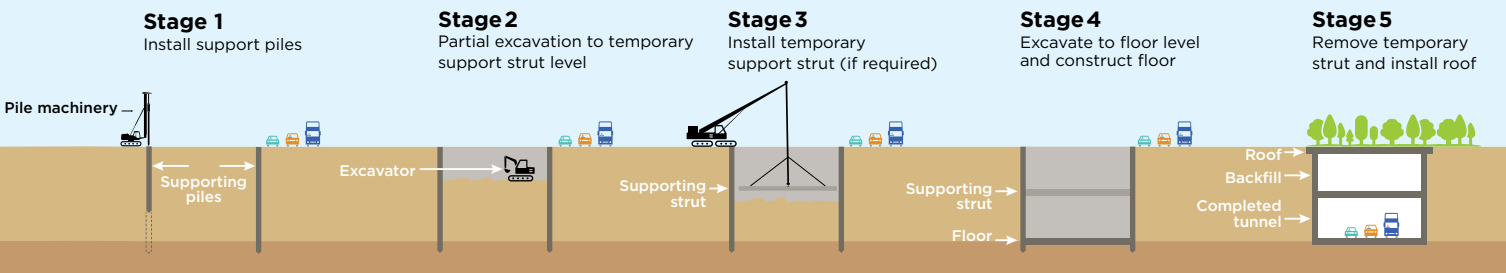
Once sections of the tunnel are excavated, we will commence the fitout work for the tunnels. This includes:

- installing drainage systems
- installing pavement
- installing barriers
- construction of buildings for operational equipment
- installing electrical conduits (plastic pipes for electrical cables to be pulled through), road signage.

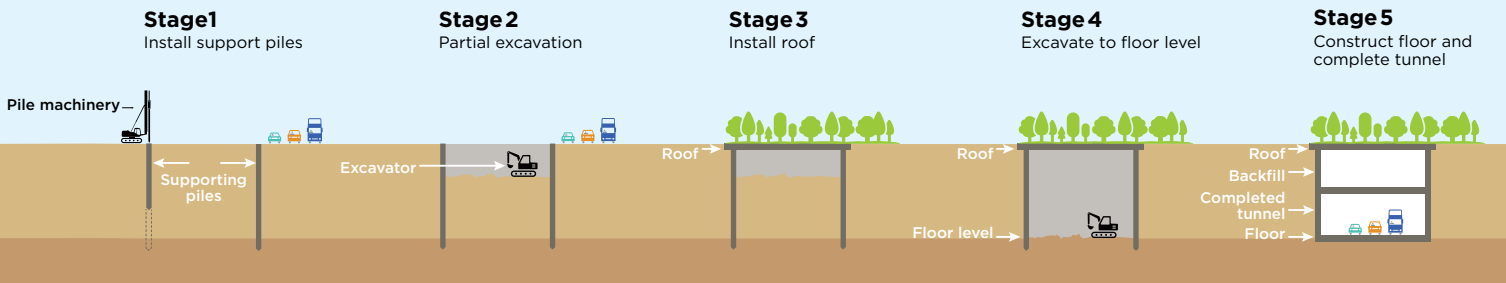
Stage 4. Testing and commissioning

We have a strong history of designing and building some of the safest tunnels in the world. We will carry out extensive testing before we open to traffic to make sure the motorway is safe for road users and the community.

Bottom-up construction



Top-down construction





Artist's impression of upgrade work and pedestrian and cycle path on Wakehurst Parkway

Surface roads

We will be building some new roads and upgrading a number of existing roads as part of the project.

The main areas of surface road work will include:

- integration work to connect the new tunnels into the Warringah Freeway
- upgrade and integration work along the Gore Hill Freeway and within the Artarmon industrial area
- upgrade and integration work at Balgowlah
- upgrade and integration work along Wakehurst Parkway, between Seaforth and Frenchs Forest.

This work also includes new and upgraded public transport, pedestrian and cyclist infrastructure at Artarmon, Balgowlah, Killarney Heights and Frenchs Forest.

Work will vary depending on the type of work required, but may include activities such as:

- traffic staging to safely carry out work on the surface road while minimising our impacts on traffic
- removing existing kerbs and pavement
- managing any contaminated materials encountered during the work
- relocating and protecting utilities like power and water
- earthworks including excavation and preparing the foundations of the road by placing and compacting materials and rock
- building retaining walls, noise barriers, traffic barriers and flood walls
- building and diverting drainage including adjusting existing and building new drains and pits, and installing pipes and culverts
- laying pavement, which generally includes a couple of layers of base foundations with a top of either asphalt or concrete
- building fauna crossing infrastructure
- carrying out finishing work (including line marking, installing signage and road furniture like lights and landscaping).

Bridges

We will be building, upgrading, modifying and replacing a number of bridges across the project including modifying the existing Reserve Road bridge and Hampden Road bridge in Artarmon, and replacing the existing pedestrian bridge across Wakehurst Parkway south of Aquatic Drive. Work will vary depending on the type of bridge being built, but may include activities such as:

- relocating and protecting utilities like power and water
- relocating and managing traffic, pedestrian and cyclist lanes and installing traffic and environmental controls
- construction of the foundations, such as piling and pier installation
- using cranes to place pre-built concrete or steel beams to form the bridge
- modifying or upgrading the existing bridge structures
- laying asphalt or concrete on the top of the bridge
- marking lines, installing barriers, drainage and road furniture as required.

Operational facilities

We will be building permanent operational facilities for the ongoing management and operation of the tunnel. These facilities will be located at Cammeray, Artarmon, Balgowlah, Killarney Heights and Frenchs Forest.

The facilities will include:

- a motorway control centre (Artarmon)
- tunnel ventilation systems
- tunnel support facilities
- an operational wastewater treatment plant
- substations.



Artist's impression of operational facilities and entry and exit points at Artarmon

Section 05

Next steps



Community consultation

You can view the State Significant Infrastructure (SSI) Application, EIS and accompanying documents from Wednesday 9 December 2020 to midnight Monday 1 March 2021.

Working with you during COVID-19

The safety and wellbeing of our workforce and the wider community is our highest priority.

We are committed to continuing to work with you and adapting to the changing circumstances around COVID-19.

We have been implementing new and different ways to engage with the community and our stakeholders, while following the NSW Health guidelines to keep you and our teams safe. As a result we have focused our engagement on providing more online engagement such as virtual information sessions and our interactive portal, which features a virtual information room.

If COVID-19 restrictions and current advice specify NSW Health advise on gatherings change during the EIS exhibition period we will look at carrying out face-to-face engagement, where possible.

Meet and talk with our team

We invite you to join the Beaches Link Team for a virtual information session. You will have the opportunity to ask questions to the project team. Please check the session times below. You can RSVP to these sessions via our interactive portal. The sessions will be recorded and made available after the session on our interactive portal.

We will ask at time of registration if you have any specific areas of interests, as this provides us with the opportunity to have the right experts available to you at the session.



Interactive portal

nswroads.work/blportal

We encourage you to visit our interactive portal to find out more about the project.

Our interactive portal features include:

- an interactive map to find out how the project impacts your area
- a virtual information room to find out more about key topics
- videos and animations to help you visualise the project
- the full EIS chapters
- RSVP to a session.

Contact the team

Our team is also available to assist you and we encourage you to contact us via:

Email: whtbl@transport.nsw.gov.au

Phone: 1800 931 189

Please note the Beaches Link office will be shut between 25 December 2020 – 10 January 2021 (inclusive), during which time the phone and email inbox will be unattended. We will get back to you as soon as possible after the break.

View a copy of the EIS

An electronic copy can be viewed at:

planningportal.nsw.gov.au/major-projects/project/10456

Virtual information sessions

Artarmon

4pm–5pm, Thursday 14 January

Cammeray

5.30pm–7pm, Thursday 14 January

Northbridge/Willoughby

4pm–5.30pm, Tuesday 19 January

Seaforth/Killarney Heights/Frenchs Forest

6pm–7.30pm, Tuesday 19 January

Mosman/Middle Harbour

4pm–5.30pm, Wednesday 20 January

Balgowlah

6pm–7.30pm, Wednesday 20 January

Additional sessions are being planned for February 2021. please visit our interactive portal for more information.

Scan the QR code to RSVP to a virtual information session



How to make a submission

We encourage you to make a submission on the Beaches Link and Gore Hill Freeway Connection EIS. DPIE has placed the EIS on public exhibition from **Wednesday 9 December 2020 to midnight Monday 1 March 2021**.

Once the public exhibition period has closed, DPIE will provide us with a copy of all the submissions received. We will then prepare a submissions report to respond to the issues raised.

The submissions report will be submitted to DPIE and be available to view on their website. This report and the EIS help inform the Minister for Planning and Public Spaces' decision on the project. If the project is approved it will be built and operated in accordance with the plans described in the EIS and the Minister for Planning and Public Spaces' Conditions of Approval.

We are always looking for opportunities for innovation in our design and to further reduce the impact of our work. This means the plans proposed in the EIS may need to evolve further. Other factors which can influence the development of the design and how we build the project include community feedback received during exhibition and the construction methods developed by the construction contractor once they are appointed.

You may see some changes once our selected construction contractor carries out detailed planning and design before the project starts. Any variances will be assessed for consistency with the assessment made in the EIS and if not consistent, a planning modification will have to be submitted to DPIE for their consideration and approval. You will have the opportunity to provide feedback on any modification.

How to make an online submission

1. Visit DPIE's Major Projects website at planningportal.nsw.gov.au/major-projects/projects/on-exhibition
2. Create a user account by clicking the 'Sign In' icon in the top right of the homepage or under the 'Services' tab and then click the 'Have Your Say' link
3. When you are logged in, find the Beaches Link and Gore Hill Freeway Connection project and click the 'Make a Submission' icon.

How to make a hard copy submission

You can also submit a hard copy of your submission. If you want DPIE to delete your personal information before publication, please make this clear at the top of your letter.

You need to include:

1. your name and address, at the top of the letter only
2. the name of the application and application number: SSI_8862
3. a statement on whether you support or object to the proposal
4. the reasons why you support or object to the proposal
5. a declaration of any reportable political donations made in the previous two years.

You can post your submission to:

Attention: Director, Transport Assessments
Planning & Assessment, Department of Planning
Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Submissions must be received by DPIE before midnight Monday 1 March 2021.

Donations and Gift Disclosure

Anyone lodging submissions must declare reportable political donations made in the previous two years. To find out what is reportable, and for a disclosure form, go to planning.nsw.gov.au/donationsandgiftdisclosure or phone 1300 305 695 for a copy.

Note: the disclosure requirements apply however a submission is made.

Privacy

Before making your submission, please read DPIE's Privacy Statement at planning.nsw.gov.au/privacy or phone 1300 305 695 for a copy. DPIE will publish your submission on its website in accordance with their Privacy Statement.





transport.nsw.gov.au

Disclaimer

While all care is taken in producing this work, no responsibility is taken or warranty made with respect to the accuracy of any information, data or representation. The authors (including copyright owners) expressly disclaim all liability in respect of anything done or omitted to be done and the consequences upon reliance of the contents of this information.

© Transport for New South Wales

Users are welcome to copy, reproduce and distribute the information contained in this report for non-commercial purposes only, provided acknowledgement is given to Transport for NSW as the source.



nswroads.work/blportal



1800 931 189



whtbl@transport.nsw.gov.au



**Customer feedback
Transport for NSW, Locked Bag 928
North Sydney NSW 2059**

**Visit our interactive web portal
Read the EIS, find out more or ask our
team a question.**



nswroads.work/blportal

**Our phone line is monitored 24 hours
when work is taking place.**