Transport for NSW

Great Western Highway Program Upgrade

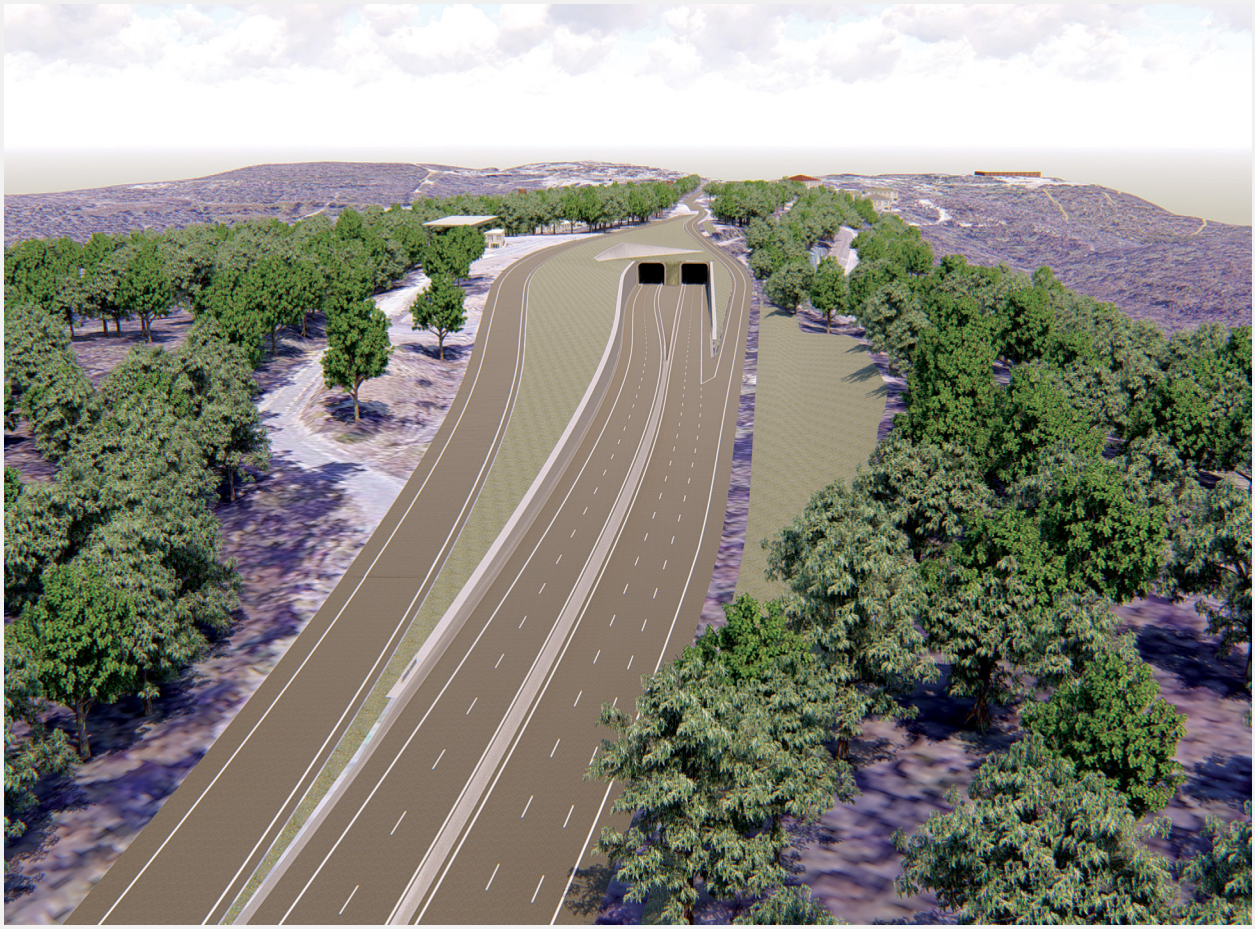
Tunnel fact sheet

October 2020

Transport for NSW is seeking community feedback on a tunnel bypass for the Great Western Highway underneath Blackheath.

A tunnel would deliver many benefits for Blackheath:

- Less congestion
- Through traffic moved underground
- Improved urban amenity and connectivity
- Safer town centre for cyclists and pedestrians
- Alternate routes for emergency services
- Giving back the Great Western Highway to the local community.



Artist's impression of the proposed northern portal

Tunnel route

There are various tunnel route options available for Blackheath, depending on which proposed tunnel portal locations are chosen. At the northern end, the Mt Boyce Heavy Vehicle Safety Station (HVSS) is the proposed location. At the southern end there are two proposed options. The first is at Sutton Park, which will be a shorter tunnel, and the second is at Evans Lookout Road, which will be a longer tunnel.

Further technical studies are needed to determine the exact alignment of the route underground.

Early investigations indicate that a tunnel is feasible under Blackheath and can be constructed at an average depth of 30–40 metres below the surface, the height of a 10 storey building.

A long tunnel route option, between the proposed Evans Lookout Road location and the Mt Boyce Heavy Vehicle Safety Station would provide a 4.5km underground bypass of Blackheath.

The long tunnel was chosen by the Blackheath Co-Design Committee as their preferred route option.

A shorter tunnel, between the proposed Sutton Park location and Mt Boyce Heavy Vehicle Safety Station would be approximately 4km in length.

Transport for NSW will aim to have the tunnel follow the route of the highway if possible. During the next phase of design and investigation we will look at ways to remove any need for ventilation outlets, such as minimising changes in tunnel gradient, and placement of portals in locations where they do not affect local residents.

Land impacts

The proposed portal south of Evans Lookout Road would have an impact on a section of National Park and Sydney Water catchment area.

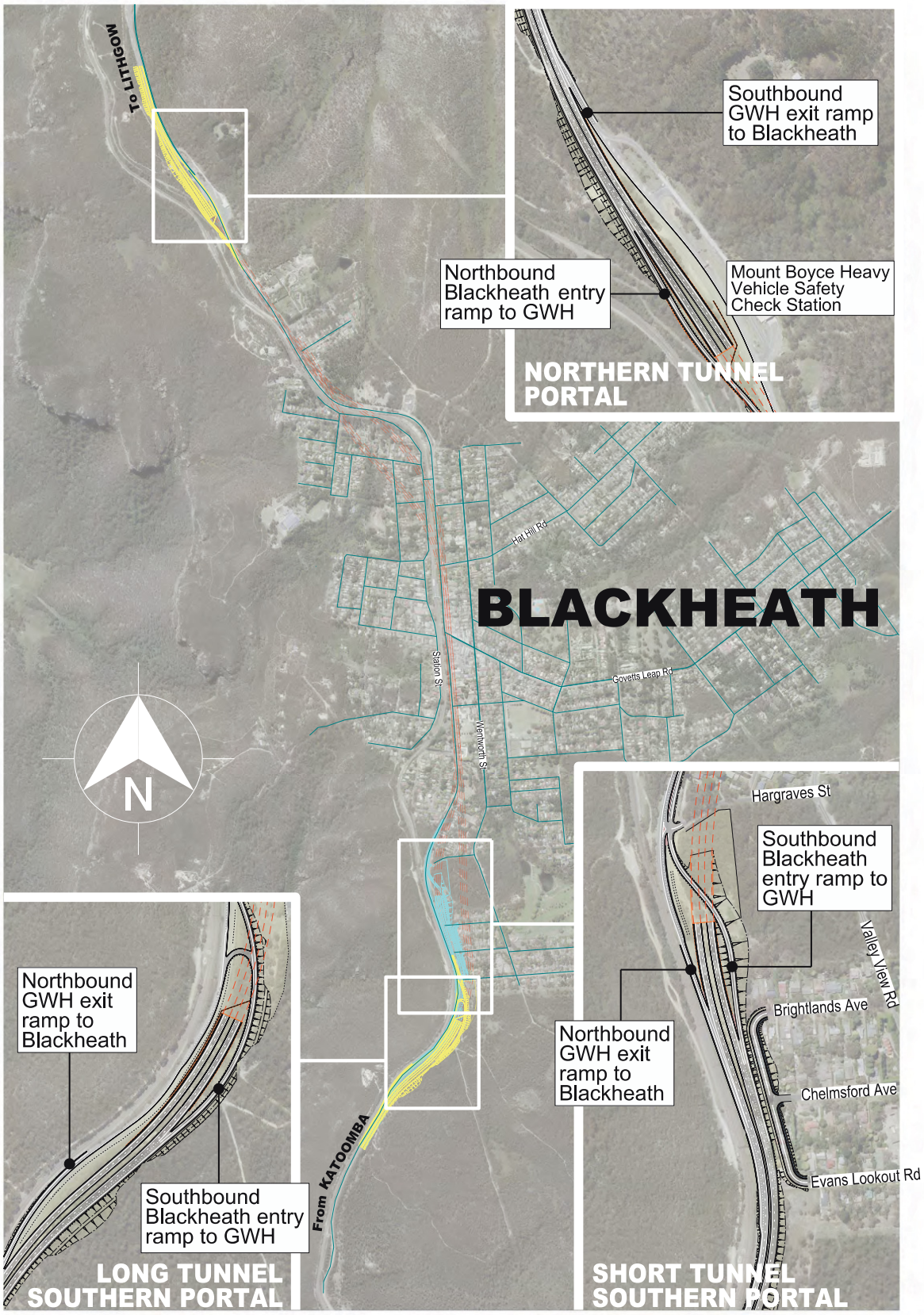
The proposed portal at Sutton Park would have an impact on recreational land and residential properties at the end of Evans Lookout Road, Brightlands Avenue and Chelmsford Avenue. Transport for NSW is speaking directly with any potentially affected property owners.

The proposed portal at Mt Boyce Heavy Vehicle Safety Station may impact access to the picnic area and may also require relocation of the scar tree (the tree has been moved previously).

If we need to relocate the tree, this will be done in conjunction with local Aboriginal and environmental organisations.

Artist's impression of the proposed southern portal near Evans Lookout Road

Blackheath route options



Additional structures

Either option would require the construction of buildings to house equipment and personnel needed for tunnel operation. Such facilities could include a Tunnel Operational Control Room, water tanks for the fire suppression system and electrical sub-stations. The location of these facilities is still to be investigated, however these are often located near tunnel portals.

Groundwater

We have already received feedback regarding the importance of surface features such as hanging swamps, as well as underground water features such as aquifers.

We are committed to minimising impacts on the environment, including groundwater sources, and will develop an option that has minimal interference with these. A full assessment of impacts will form part of the Environmental Impact Statement.

Dangerous goods

Currently in NSW some tunnels allow transit of some classes of dangerous goods. A Transport for NSW Policy is being developed to inform whether any dangerous goods vehicles would be allowed through a Blackheath bypass tunnel.

Preliminary studies indicate that around 4% of daily current heavy vehicle movements in Blackheath are dangerous goods.

Surface level impacts

Transport for NSW is committed to minimising impacts on the community and the environment.

As with any construction project, there will be some noise and vibration impact when work is being undertaken. Transport for NSW will be in contact with residents about individual concerns and needs throughout the planning process and construction.

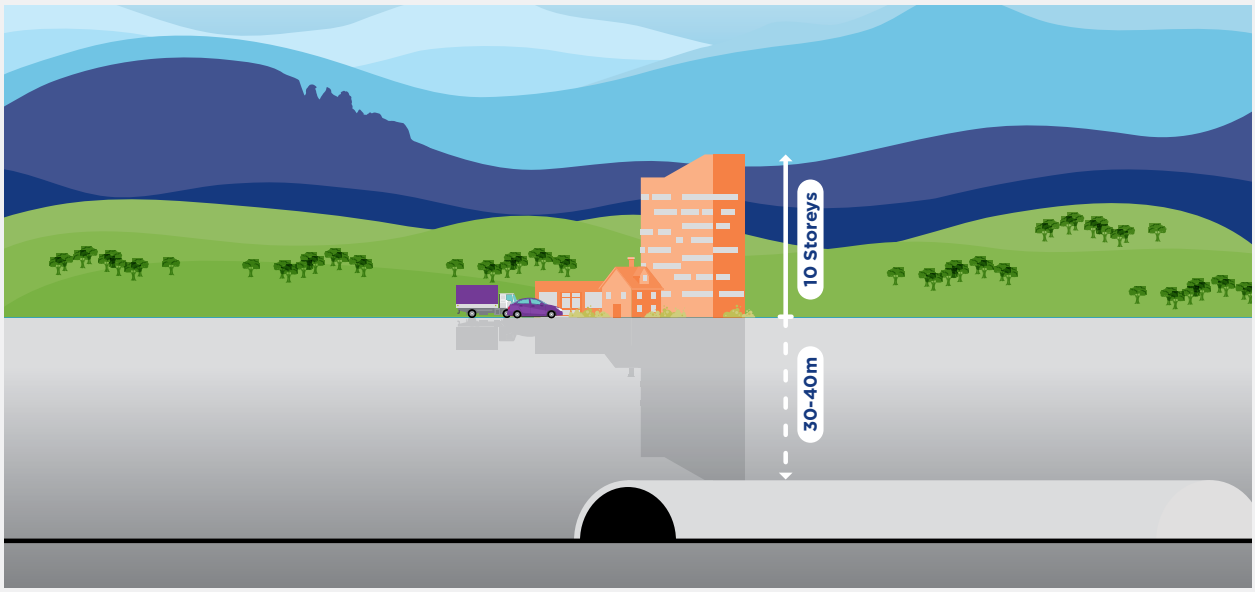
Independent reporting will be carried out on all properties deemed to be potentially impacted by tunneling works, including vibration. However, given the depth of the tunnel, impacts are likely to be minimal.

Further investigations and studies are required to determine the exact route of any tunnel under Blackheath. The route being proposed for the Blackheath bypass tunnel would be located an average of between 30 and 40m below ground, rising to shallower depth at the tunnel portals.

Spoil removal

Transport for NSW will investigate a suitable location to reuse any spoil material extracted during construction. It could be used on other stages of the Great Western Highway upgrade, for other road projects or for quarry fill.

The method for the removal of spoil, and the minimisation of impacts on the local community, would form part of the environmental assessment.



The average depth of the tunnel tunnel would be 30–40 metres, the height of a 10 storey building

Investigations on impacts to existing National Park and biodiversity will be carried out as part of the environmental assessment.

National Park

The NSW Government has ruled out any impact on the Greater Blue Mountains World Heritage Area.

The Greater Blue Mountains World Heritage Area and the Blue Mountains National Park overlap significantly, but are not always the same area.

The proposed outermost southern portal would impact on a section of the National Park. A full investigation of these impacts and mitigations would form part of the environmental assessment.

Cost

The NSW Government has committed $2.5 billion towards upgrading the Great Western Highway between Katoomba and Lithgow. This includes planning for projects such as Blackheath and delivery of other sections of the 34km project.

The construction cost of a tunnel will depend on the final alignment, depth and length and is still to be determined.

Partial or staged funding of a project of this magnitude is common and the team is working to develop the project and will seek additional funding as required.

Construction

The construction of a tunnel option could take up to four years from construction contract award to opening date.

Ventilation

Ventilation outlets, sometimes referred to as “stacks”, are designed to take tunnel air up away from populated areas around tunnel portals.

The outermost proposed portals are located away from where people live and work, which may mean ventilation outlets are not required. Further studies are required to determine the ventilation needed for either of the tunnel options and where, if at all necessary, any ventilation outlet/s might be located.

Tunnel ventilation systems work by ensuring sufficient air flows within the tunnel to extract emissions. Ventilation outlets eject tunnel air high into the atmosphere, where it is diluted hundreds of times as it mixes with the surrounding air.

Tunnel air expelled from ventilation outlets very quickly becomes indistinguishable from background levels of existing air pollution. Each outlet is custom designed to take account of local tunnel air flows, traffic, terrain, surrounding buildings and weather to ensure tunnel air is dispersed effectively under all conditions.

Tunnel ventilation systems generally work most efficiently and effectively when the ventilation outlet is positioned near the exit ramp.

The outermost proposed portals are away from where people live and work, so ventilation outlets might not be required

Air quality

The NSW Government recognises that air quality and human health is a key priority when designing road tunnels.

Modern tunnel ventilation design ensures the operation of our tunnels meets strict air quality requirements set by the Department of Planning, Industry and Environment and the Environment Protection Licence issued by the Environment Protection Authority (EPA).

Air quality within major NSW tunnels is continuously monitored to control the ventilation system. This ensures the strict air quality limits outlined in the approval conditions are complied with at all times. Australia's requirements are amongst the most stringent in the world. The EPA regulates the ventilation outlets for all tunnels to ensure they meet air quality limits.

Filtration systems

Australian tunnels are required to meet stringent air quality standards using state-of-the-art ventilation and tunnel design.

The NSW Government has over 20 years' experience in assessing and operating long motorway tunnels, and has used that experience to ensure that tunnels built today incorporate world's best practice.

Studies have found that filtration systems do not provide any measurable improvement to the air quality in the surrounding community.

With extraction systems dispersing the tunnel air high into the atmosphere, there is little to no health benefit for surrounding communities in installing filtration and air treatment systems in tunnels.

To find out more you can download the Initial Report on Tunnel Air Quality from the Advisory Committee on Tunnel Air Quality, found here **http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0017/51911/060814-FINAL-Initial-Report-Tunnel-Air-Quality-WEB.pdf**

Vehicle emissions

Vehicle emissions continue to decrease, despite there being more cars on the road. This is a result of advances in vehicle technology and design, improvements in fuel quality, and government initiatives to reduce emissions by improving the maintenance of heavy vehicles.

As new, cleaner vehicles replace older cars on the road, the total emissions from motor vehicles will continue to fall over the next decade. This is despite an expected increase in the total number of cars as the population grows.

Emergencies

The final tunnel design would include many safety systems and equipment to deal with incidents. These might include visual and audible communication systems; emergency escape passages; access for emergency services vehicles; a water deluge system to suppress fire, and emergency smoke extraction systems. Communications systems and CCTV are used to monitor tunnel activity and respond to incidents as they occur.

NSW Emergency Services will be consulted throughout the design process and during construction, to ensure that Blackheath has the safest tunnel possible.

Speed

The proposed tunnels would be designed to the highest safe speed possible with an 80km/h posted limit.

Cyclists

With the construction of a tunnel bypass of Blackheath, cyclists would be unable to use the tunnel, but would be able to use the existing Great Western Highway route above ground, connecting with the Highway at either end of the town.

With through traffic using the tunnel, the surface road would become a much safer environment for cyclists, as well as pedestrians.

Aerial view across Browntown Oval towards the proposed tunnel portal location near the Mount Boyce Heavy Vehicle Safety Station

Aerial drawing of proposed portal near Sutton Park

Contact the Great Western Highway Upgrade team

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