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Upper House Committees
Legislative Council
Principal Council Officer

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Western Harbour Tunnel and Beaches Link - Supplementary Questions

Thank you for your recent email received 27 September 2021 regarding supplementary questions for the Western Harbour Tunnel and Beaches Link.

Question 1 - Can you please detail your environmental concerns about the project, including impacts to Middle Harbour, Burnt Bridge Creek, Manly Dam and other environments on the Northern Beaches?

The Beach Link project involves the construction of large infrastructures that has the potential to influence the surface water and hydrology of Northern Beaches local catchments.

The proposed infrastructure has the potential to directly affect three of the main catchments in the Northern Beaches including Sydney Harbour catchment, Manly Creek including Manly Dam, and Burnt Bridge Creek catchment.

Northern Beaches Council actively manages these catchments under the legislative framework of, and guidelines associated with, the Water Management Act 2000 (NSW) ["the Act"] and Northern Beaches Council's planning instruments. The object of the Act is the sustainable and integrated management of the state's water for the benefit of both present and future generations. The Act is based on the concept of "ecologically sustainable development" (the principles of which are described in section 6 (2) of the Protection of the Environment Administration Act 1991 (NSW)), which, in essence, are designed to ensure that development today will not threaten the ability of future generations to meet their needs. In summary, the Act provides for:

- the fundamental health of our rivers and groundwater systems and associated wetlands, floodplains, estuaries must be protected
- the management of water must be integrated with other natural resources such as vegetation, soils, and land

- to be properly effective, water management must be a shared responsibility between government and the community
- water management decisions must involve consideration of environmental, social, economic, cultural and heritage aspects
- social and economic benefits to the State will result from the sustainable and efficient use of water

Northern Beaches Council is concerned that the scale of the project has the potential to affect surface water runoff quantity and quality entering these catchments during construction and operational phases. The identified potential environmental impacts during the construction and operational stages are detailed below:

Construction

- Surface water quality impacts due to soil disturbance, runoff, and discharge of tunnel water. The risk level profile is categorized below:
 - Low residual risk during small storm event
 - High residual risk during medium and high intensity storm events
- Impacts on geomorphology
 - If unmitigated - high risk
 - If mitigated - medium residual risk
- Water availability and flows.
 - If unmitigated - high risk
 - If mitigated - medium residual risk

Operational

- Surface water quality impacts due to runoff and discharge of tunnel water
 - If unmitigated - high risk
 - Low residual risk for the water generated and collected from tunnel groundwater ingress and rainfall runoff in tunnel portals. The water will be treated at a permanent wastewater treatment plant at the Gore Hill Freeway, reducing the likelihood of potential impacts.
 - Medium residual risk for the runoff discharged in the stormwater system and receiving waters.
- Impacts on geomorphology
 - If unmitigated – medium risk
 - If mitigated – low residual risk
- Reduction in water availability and flows.
 - If unmitigated – medium risk
 - If mitigated – low residual risk
- Impact on groundwater dependent ecosystems and threatened ecological communities.
 - If unmitigated - high risk

- If mitigated - medium residual risk

The key activities that will directly impact the generation of runoff and hydrology are the two lane Wakehurst Parkway upgrade (tunnel portals to Warringah Road at Frenchs Forest) and the new access road between the Burnt Bridge Creek Deviation and Sydney Road at Balgowlah.

The proposed work is proposed in three catchments that drain to sensitive creek and coastal lagoons and Manly and Narrabeen Beaches which have recreational value:

- Burnt Bridge Creek catchment (moderate sensitivity) – discharges to Manly Lagoon
- Manly Creek (Manly Dam) catchment (high sensitivity) – discharges to Manly Lagoon.
- Trefoil Creek catchment (high sensitivity) – discharges to Middle Creek/Narrabeen Lagoon

During construction, the Balgowlah site wastewater (including runoff from the tunnel portal) will be treated in a treatment plan located at Balgowlah Golf Course (BL10) and discharged to the local stormwater network (up to 428 m³/day or 4.9l/s). The Wakehurst Parkway plant (BL13) will discharge treated water (up to 10 m³/day) to a new channel directed to the Wakehurst Golf Course dam (for reuse). The estimated duration of the operation is approximately four years.

Waterways potentially impacted

Construction

The waterways that are potentially impacted are Burnt Bridge Creek (from Balgowlah Golf Course (BL10)), Manly Creek and Manly Dam (from Wakehurst Parkway east (BL13)).

Garigal National Park drainage lines flowing to Bantry Bay have the potential to be impacted from the realignment and upgrade of the Wakehurst Parkway

Wakehurst Golf Club drainage lines flowing to Manly Dam have the potential to be impacted from Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support site.

Note: TfNSW revised down the forecast baseflow reduction in Burnt Bridge Ck from 96% to 60% (~1-2% of streamflow) and characterised this baseflow contribution to streamflow as insignificant. However, the importance of baseflow to aquatic ecology is not directly proportional to its percentage of total streamflow. Most of the total streamflow would occur during large flow events immediately following heavy rainfall where the contribution of baseflow would indeed be inconsequential. The key importance of baseflow (groundwater contribution to streamflow) is during extended low and no-flow periods. In the absence of streamflow, the only recharge to maintain pools (& counter evaporation) is from baseflow (which is not as closely linked to rainfall). In these circumstances pool habitat is important refuge for aquatic organisms (particularly aquatic invertebrates without flight) and a source of water for sensitive animals like microbats and frogs. A 60% loss of baseflow could lead to a significant increase in no-flow days and loss of pool habitat during dry periods.

In addition, TfNSW have not addressed Council's concerns about groundwater draw-down on riparian vegetation in affected reaches nor assessed the cumulative impacts of elevated nitrogen, phosphorous and sedimentation on thresholds of sensitive fish population Climbing Galaxias in Manly Creek.

Operational

The operational stormwater system (new/modified) will receive runoff from new or modified surface roads at Balgowlah, North Balgowlah, Seaforth and Frenchs Forest. New water quality basins would be provided at Balgowlah Golf Course and along Wakehurst Parkway.

Balgowlah:

There are four sub catchments each identifying Gross Pollutant Traps, basins, swales, biofiltration vegetated swales and spills management system (PGT and 40 m3 pond). The proposed treatment chain is mostly located on the proposed open space facilities and motorway operational facilities at Balgowlah Golf Course (Jacobs Technical working paper, p78)

Wakehurst Parkway:

The proposed water quality controls consist of two permanent basins, 18 swales and two in line gross pollutant traps. The project operational water quality design targets are unlikely to be achieved at the Wakehurst Parkway. High level of constraints has been identified mainly related to space.

Burnt Bridge Creek realignment

The project is including minor in stream work with localised adjustment and bed scour protection.

Council's recommendations in the submission to the EIS process included:

- The impacts of the water table drawdown on the natural environments are critical the water dependent ecosystem. Council is supportive of mitigation measures to maintain base flow regime into the creeks. Measures to be investigated shall include additional pumping of treated groundwater ingress to Burnt Bridge creek upper reach, slow release of water through adequate detention scheme, wetlands network to in the catchment to promote slow release, implementation of WSUD strategy in the drawdown affected catchment to promote stormwater infiltration. A large wetland to maintain Burnt Bridge creek baseflow at the golf course shall be considered.
- Consideration of any environmental impacts from the proposed works should not be limited to the immediate creek environment in proximity to the works site, but should include Manly Lagoon itself, which harbours a diverse population of marine and estuarine fish species, and the final receiving waters, being Queenscliff and Manly Beach. Both beaches supporting large numbers of local and visiting recreational users all year round. Due to its tidal connection to the ocean any discharges from Manly Lagoon have the

potential to impact water quality on all Manly Beach areas including Cabbage Tree Bay, Queenscliff and Manly Beaches.

- Additional MUSIC (modelling) investigation to progress the understanding of the project water quality requirement to meet standards. Clarifications of the MUSIC model methodology in pre and post development scenario with clear representation of the existing conditions. A neutral or beneficial approach is recommended if the existing/post development are not meeting the pollutant reduction targets.
- A comparison representing the percentage reduction when comparing the project with and without the proposed controls is insufficient to size the water quality system.
- Management of the corridor space to ensure suitable water quality management systems are installed especially in relation the Wakehurst parkway widening. The water quality system effectiveness should not be compromise by the proposed open space and recreation facilities footprint at Balgowlah Golf Club.
- Water quality treatment should be designed with Water Sensitive Urban Design principles. Treatment chains should be sized accordingly and promote infiltration in the catchment where possible. Maintenance and access shall be integrated in the water quality structures. All swales to be vegetated and include access for maintenance.
- A riparian reconstruction on burnt bridge creek banks should be considered including (width, flooding regime, native vegetation)
- Council is a key stakeholder in the management of stormwater and natural systems and needs to be involved in the design of the permanent stormwater quality treatment device system

Middle Harbour

For more detail see Council's submission to Beaches Link EIS.

The potential environmental impacts at Middle Harbour considered by the Beaches Link EIS relate primarily to the proposed construction and operation of the immersed tube tunnel west of Spit Bridge. The area supports sensitive marine habitats and biota (including threatened species listed under NSW and Commonwealth legislation) and is popular for recreation.

Construction impacts on aquatic ecology and recreational amenity would most likely result from the dredging program due to increased turbidity (light attenuation), increased sedimentation and contamination (from contaminants in upper metre of soft sediment removed during dredging).

Operational impacts relate to the “sill effect” of tunnel that would reduce tidal flushing upstream of the works and increase severity and duration of low dissolved oxygen (DO) following rainfall. Reduced DO can cause mortality of benthic fauna and/or stimulate algal growth at the surface.

TfNSW EIS - Impact Assessment & Mitigation

Sedimentation & Turbidity

The potential impact of construction to marine ecology was assessed by modelling dredge plume dispersion and then mapping areas of ecological impact and “influence” based on tolerance limits to turbidity and sedimentation (total suspended solids, TSS) estimated for the aquatic biota. The EIS determined that significant impacts on aquatic ecology were unlikely. Proposed environmental monitoring - turbidity and TSS monitored for the 37-week dredging program as a proxy for ecological stress. Exceedance of threshold values would trigger further management action (e.g., deployment of sediment curtains around sensitive habitat).

Contaminants

The EIS found that risk to aquatic biota and human health posed by the mobilisation of contaminants was not significant because the contaminants would likely remain bound to sediment particles (and not be released into the water column) and mitigation measures would prevent liberation and dispersal of contaminated sediments (e.g., excavation with closed ‘environmental’ bucket and silt curtains).

Dissolved Oxygen

The EIS found that although duration of depleted DO events may increase upstream of the tunnel sill these areas are able to be recolonised from planktonic larvae and by fauna from shallower unaffected sediments.

Council’s Submission

Council’s environmental concerns centred on adequacy of the tunnel construction monitoring program and uncertainty about sill effects.

Council submitted that the proposed monitoring program for the adaptive dredge management plan was inadequate and that during construction the monitoring scope should be expanded to include:

- Sensitive marine habitats and biota
- Contaminants in marine waters

Observed impacts on marine ecology or presence of contaminants in water samples above identified thresholds should trigger appropriate management responses to construction works.

Given the sensitivity and importance of marine habitats and biota in proximity to the work site – and the uncertainty and assumptions involved in plume modelling, calculation of tolerance thresholds, the efficacy of mitigation measures (e.g. environmental bucket and sediment curtains) and environmental conditions during dredge operations – Council believes it would be precautionary to monitor the marine ecology directly rather than rely entirely on the accuracy and precision of the turbidity and TSS triggers as a proxy for ecological stress.

Similarly, it would be prudent to verify the EIS predictions that project works, and mitigation measures would not contaminate surrounding waters and include sampling for relevant contaminants as part of the water quality monitoring program.

Council was concerned by potential effects of an additional sill in Middle Harbour. It is possible that the worsening of seabed DO conditions upstream of the tunnel could reduce the capacity of Middle Harbour to recover from significant low DO events. Also, it was conceivable (but ultimately unknown) that the increased residence time and severity of low DO events may reach a threshold that could significantly increase mortality of benthic fauna.

a. What changes if any have been made to the project to mitigate these risks?

TfNSW addressed Council's environmental concerns in a one-hour presentation. More detail will undoubtedly be present within the subsequent report but as Council has not seen this we can only comment on the presentation.

TfNSW considered "Sill effect" of tunnel would not significantly impact nearshore aquatic ecology or lead to increase in mortality of benthic marine organisms.

TfNSW considered dredging adaptive management plan (incl. mitigation measures) - as outlined in the EIS and unchanged - as adequate to address potential water quality impacts on aquatic ecology and recreational use.

Council stands by its initial recommendations to increase construction monitoring to include marine ecology and contaminants. Council also seeks confirmation from TfNSW that the tunnel sill effect would not increase the frequency or intensity of algal blooms in the area.

Question 2 - What volume of trucks are leaving the Northern Beaches and what are their main routes currently?

On average there are approximately 5000 heavy vehicle (vehicles over 4.5 tonne GVM) trips leaving the Northern Beaches via Mona Vale Road, Warringah Road and Manly Road towards the City. These figures are provided from the permanent vehicle counters on the major road corridors by TfNSW.

Each corridor generally has a consistent origin/destination descriptor when previous surveys have been undertaken. Transport vehicles generally heading towards the main distribution hubs in western Sydney use the Mona Vale Road corridor, whether they are leaving from Brookvale (via Warringah Road and Forest Way) or Warriewood and areas north. Vehicles heading to the southern suburbs may use Manly Road or Warringah Road, however these trips are more time-of-day dependant given the congestion on these routes.

a. Is it predicted that more freight will use Mona Vale Rd now that it has been upgraded?

The upgrade of Mona Vale Road will only benefit some trips and is unlikely to see a broad shift from Warringah Road and areas south as the upgrade is currently only on the Eastern section between Ingleside and Mona Vale. The increase in volumes is

only expected to be in line with the usual background growth in trip generation and will not increase significantly.

Question 3 - What guarantees do you have that there will be a separate lane for buses in the tunnel?

Council has not been given any guarantees that there will be a dedicated lane for buses in the tunnel. The expectation is that the tunnel will provide a faster travel time for all vehicles, including buses travelling to the City and North Sydney.

Whilst ideally a dedicated lane would be provided and could be in the future through dedication of a peak period bus lane the current proposal will meet the current needs of the community.

Question 4 - What do the project documents model in terms of the increase in traffic volumes on the Northern Beaches?

The traffic modelling undertaken as part of the project development and documentation assumes the increase in traffic generation based on the typical background growth plus the growth generated by the current planned development in the Frenchs Forest, Brookvale and Dee Why areas, with limited impact from any potential in the Ingleside precinct.

The modelling indicates that the demand will increase 12% and 27% depending on which corridor is investigated over the period 2016 to 2037, which appears to be a substantial increase in volumes, however, is well below the annual growth figures used for the area being modelled.

a. What will be the expected growth in traffic with and without the tunnels?

The predicted background growth with or without the tunnel is similar and is driven by two main factors, the desire to spend the weekend on the beaches and the level of development occurring both on the Northern Beaches and in Greater Sydney. Vehicular traffic generally increases between 1% and 1.5% annually across the network.

The main difference in the growth with or without the tunnel is the entry points into the Northern Beaches from the greater Sydney area, without the project the main entry points will remain the three road points as used today. With the project it will be more convenient for visitors to access the area from the motorway network instead of using Mona Vale Road and Warringah Road. This change is outside the parameter of the current project modelling however as the usual summer traffic origin/destination indicates that the majority of visitors that are travelling by car enter the area via the Mona Vale Road corridor. The other corridors show a net decrease (between 5% and 10%) in volumes on public holidays compared to the 7-day average volume, whereas the Mona Vale Road corridor remains constant or slightly elevated by <5% on the 7-day average.

b. How does a growth in traffic on the Northern Beaches fit with your policy to reduce vehicle use on the Northern Beaches?

The Move Transport Strategy advocates for an overall reduction in car trips of 30%, which can still be achieved locally through the provision of improved public transport and active transport connections. Current vehicle usage on short trips and single occupant trips needs to be reduced across the area to improve the operation of the network.

The beaches link project can assist in achieving this goal by providing improved connections to the employment centres via public transport and potentially reducing the need to drive when coupled with other programmes to enable the significant modal change required to achieve this outcome.

Question 5 - Do you think you will see an increase in work from home and local work hubs as a result of COVID-19?

There may be a shift towards working from home or local co-working spaces in the future, however this was already underway to some degree prior to Covid 19 making it a necessity in time of significant community transmission.

There will always be the need to attend the traditional office-based employment for at least part of the working week as the situation normalises in the near future, with research showing that most office-based employees will likely return to the office at least 3 days per in the initial transitioning period.

Question 6 - Do you have concerns about the large number of workers that will need to commute to the Northern Beaches and the impact on local traffic?

The actual number of workers needed to undertake the project has not been confirmed at this stage, and the level of detail in Transport and Traffic technical report is limited to the number of vehicle movements in and out of each site. Whilst most dayshift staff would likely be travelling in the counter peak direction this may adversely impact the state road network.

The documentation provided indicates significant thought has gone into the provision of both on-site parking and connectivity for workers travelling to the sites via public transport. Council's Transport Network Team will continue to work with the project team to develop a series of suitable Construction Traffic Management Plans for each site and the support Vehicle Management Plans through a similar process that was undertaken during the construction of the Northern Beaches Hospital and the road connectivity project to support its development.

Question 7 - Do you have concerns about the additional Spit Bridge opening times and how they will impact traffic during construction?

The increase in the number of opening for project construction will be outside of the peak traffic flow periods and whilst they are likely to cause some disruption to traffic

along Manly and Spit roads the traffic flow normalises quickly after the bridge closes. Council will monitor the impacts and raise any concerns on behalf of the community during the planned Transport Coordination Group meetings with the project team.

Any major impacts can be managed in partnership with the project team and the Transport Management Centre to provide early warnings along the network and manage the delay on the approaches through the potential redirection of traffic away from the area where there are other route options available.

Question 8 - Do you have concerns about the contaminants that need to be dredged and transported by barge along Middle Harbour and past beaches and residents?

The EIS dredging methods (Table 6-4 Chapter 6, p6-19) state that *“soft sediments not suitable for offshore disposal (anticipated to be the top 0.5 - 1.0 metre of the bed of the harbour.....would be loaded directly into nearby self-propelled split hopper barges (with no overflow allowed). Once fully loaded, the vessel would transport the dredged material to a load out facility. This material would be made spadable, loaded onto trucks and then disposed of at a suitable land-based licensed facility.”*

Council would welcome more detail on transport methodology and load out location and seek assurances from TfNSW that no dredge material (including potentially contaminated water) would leach from the vessel during loading and transport.

Question 9 - Has the Northern Beaches Council looked into the Climate and Sustainability profile of the projects and do you have any concerns?

The sustainability chapter discusses high level vision and objectives and leaves much of the detail to the Sustainability Management Plan (SMP). In order to ensure that appropriate detail is included in the SMP, a review by Council prior to finalisation is requested. The detail in the SMP is also relevant to the GHG emission reductions discussed in Section 26-7.

Further target themes are suggested for inclusion in Table 25-5:

- Minimise energy use and greenhouse gas emissions – include a target theme on Ventilation
- Optimise resource efficiency and waste management – resource recovery for demolition materials – buildings etc.

Concrete, and more specifically, the Portland cement content within concrete mixes is the most greenhouse gas intense component of the material. Steps to reduce Portland cement content will achieve a lower embodied carbon outcome. This can be achieved through either reduced amount of concrete on the project, or through supplementary cementitious materials (SCM's) such as fly ash or slag as well as many others. A target, such as reducing 30% reduction in Portland cement content measured by mass across the project compared to a base case could be suggested in the response.

Asphalt pavement material is typically 95% mineral aggregates (such as sand or gravel) mixed with 5% petroleum-based bitumen – with bitumen functioning as the glue

binding the aggregates in a cohesive mix. Traditionally, asphalt is produced at temperatures around 160 – 180°C to optimise the coating of aggregate with bitumen and its laying manageability. Many innovations that attempt to lower the environmental impact of asphalt production centre on reducing the production temperature which reduces the energy (and consequently fuel) that is traditionally required to heat both the binder and the aggregates. Where practicable, use:

- Alternative processes to traditional 'hot mix asphalt' such as warm or cool mix asphalts which have reduced energy requirements and reduced greenhouse gas emissions
- Recycled/reclaimed aggregates such as recycled asphalt pavement, glass and / or concrete.

Streetlighting upgrades across the project are requested to use the recommended 4000k colour temperature LED lights for main roads and 3000k for residential roads. Delivering the LED streetlighting with the inbuilt smart control technology will also for reduced energy costs, less light spill into the environment, reduce impact on the fauna in the area and allow for the future proofing of the installed infrastructure.

a. Do you think a toll road tunnel option should be compared to alternatives given the profile?

When considered against the cost of other types of transport infrastructure and the benefit of the tunnel being a multi-modal transport solution, which does not cater for just one type of journey.

Previous discussion around whether a rail link should be the preferred over the current project scope seemed to focus on the public transport connection only, without regard to the economic benefit of the potential freight connectivity, or the impact on the community of this type of mass transit system.

Council's Transport Network team raised this possible solution during the public consultation on Council's Transport Strategy and there was significant opposition to the proposal of a heavy rail or metro connection as they saw it may significantly increase development on the beaches and impact the current local amenity of the area.

It was also seen as perpetuating the existing linear thinking when it comes to transport provision on the Northern Beaches, where historically all the services providing sufficient capacity for the needs of the community appeared to only consider the workforce that needed to travel to the Sydney CBD and did not cater for the rapid developing employment centres of Macquarie Park, and Parramatta, where a significant number of residents now travel to work each day.

It was noted that the responses calling for a rail option, generally came from areas where the construction impacts would be greatest, are generally well serviced by public transport services, and unlikely to see the redevelopment needed to support rail from an economic basis should that option be chosen.

10. What evidence do you have that congestion on Warringah Freeway will be reduced, especially given that other groups have submitted that traffic will increase significantly along the corridor as a result of the project?

The congestion of Warringah Road at Forestville was referenced in the evidence provided by Northern Beaches Council, where the modelling shows that there is likely to be a redistribution of traffic towards Wakehurst Parkway to enter the tunnel.

The impacts on the Warringah Freeway from the project would be a matter for Transport for NSW to provide a response. From the modelling provided there is an increase in volumes over the modelled period, however there is also an improvement in travel time.

Should you require further information about matters raised in this letter please contact Council's, Transport Network Manager, Phil Devon on

Yours faithfully

Craig Sawyer - Executive Manager – Transport and Civil Infrastructure