Sydney Metro (Chatswood to Sydenham) EIS

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City of Sydney submission

Sydney2030/Green/Global/Connected
city of villages

CITYOFSYDNEY 2030

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Executive Summary

The City of Sydney broadly supports the Sydney Metro (Chatswood to Sydenham) project (subject to the key qualifications in this report), and more broadly, the Government's investment in public transport capacity to support the needs of a growing greater Sydney.

In particular, the City **supports the project from an economic development perspective** and recognises the benefits of the project alignment in terms of connecting important economic hubs, including the Sydney CBD.

A project of this scale will leave a legacy, and will have an **influence on the shape and growth of the City and greater Sydney**. These influences will not only be in the travel choices that people make and the locational choices for businesses and housing development; but also for and recreational and cultural activities to help build the late-night economy and also Sydney as an international destination.

Five of the seven stations in this project are within the City of Sydney's local government area. As a result, the City has a particular interest in **ensuring the project delivers not only a superior transport and connectivity outcome, but also superior public domain and social outcomes**.

Despite its broad support, the City does have some concerns about the **design of the stations and their interface with the public domain** and the wider transport system, heritage impacts including the loss of significant items, and flooding. There are also a **number of areas where the City is not satisfied that the Secretary's Environmental Assessment Requirements have been met**.

The City also recommends that **an additional station is included in the alignment between Waterloo and Sydenham** to service the growing Erskineville and St Peters area. The stop should be developed under Mitchell Road or McEvoy Street.

1. Introduction

The City supports the customer experience being core to the design and planning of the Metro. This approach is to be commended.

The measurement of the performance of this approach will be interesting to understand how this, apart from locational choice of stations, might influence travel decisions by customers. Then, how these travel choices by customers influence strategic and service planning decisions by the Transport cluster.

2. Planning and assessment process

The City recognises the role of Government in assessing and making a determination on State Significant Infrastructure, including the Metro railway and its stations.

However, the City has expressed and maintains its position that **any Over Station Development (OSD) associated with Metro should not be deemed State Significant Development and should be assessed by the City and determined by the Central Sydney Planning Committee**,

This position is consistent with our reading of the ISEPP relating to the City and Southwest Metro, where **the ISEPP only applies to infrastructure below the ground and ancillary infrastructure**. It is unlikely that OSD would be considered 'ancillary' given this term is generally relevant to the delivery of construction compounds and other elements that are ancillary to the development of the infrastructure itself. **The intentional decoupling of the OSD and Metro infrastructure would indicate that this nexus is not present.**

The City as consent authority ensures that the OSD is assessed in the same manner as other commercial developments in the LGA. **The City as the consent authority will result in a faster planning pathway for the OSD**, and consistent application of the City's planning processes and planning controls.

It should be noted that the Central Sydney Planning Committee has been in operation since 1988 and was formed to make decisions on major developments and State Significant Development.

Recommendations:

- That the City of Sydney is consent authority for Over Station Development associated with Metro in its LGA; and
- That the Central Sydney Planning Committee makes a determination on OSD approvals.

3. Strategic need and justification

The strategic need and justification for the project is sound. The project objectives are supported.

In particular, the City supports the 'door-to-door' journey approach that has been taken for this project. This is a marked change in the maturity of organisational thinking about transport infrastructure and services in NSW.

It recognises the **centrality of the person and their journey** as linked events from origin to destination, and that these links may not be linear. It also enables a quiet evolution of the system toward greater levels of interchange to achieve a complete journey, and recognises the importance of active transport modes as important modal choices in the journey chain. The additional capacity and rail system resilience provided by the project is welcome.

Something to be mindful of, and that is not necessarily clear, is **whether this capacity will be enough for the growing city**, and particularly the intensification of residential land uses as part of the Government's Central to Eveleigh and Sydenham to Bankstown growth corridors. This is a risk with any CBD focussed program, as it is serving a peninsula and is in the context of greater demand for residential amenity within the inner suburbs.

Economic justification

The EIS states that economic growth is central to the strategic justification for the Metro project. The City of Sydney strongly supports this justification, in particular the case put forward that Sydney CBD is the dominant centre of economic growth for the state and should be serviced by appropriate public transport provision.

Sydney is the leading knowledge-based economy in the nation, home to Australia's largest and most connected finance and insurance district. Studies commissioned by the City **forecast the city economy to grow significantly and could potentially reach $166 billion in economic output by 2030**, an average increase of 2.8% per annum[1]. Poor transportation infrastructure has been identified within City of Sydney strategic documents as a primary challenge to reaching maximum potential for economic growth.

Strategic alignment with strategy and policy

Strategic alignment is shown within chapter 3 (Strategic need and justification), though this is limited to State Government policy. Local Government strategies, which place local residents and businesses at their fore, should be adequately considered.

Technical paper 3 - Local Business identifies City of Sydney's *Sustainable Sydney 2030* Community Strategic Plan as relevant government policy. It is important to note that the project also aligns with City of Sydney's *Economic Development Strategy* (2013), which is a key strategic pillar of Sustainable Sydney.

[1] City of Sydney (2013) Economic Development Strategy. Sydney's Economy: global city, local action.

The City's *Economic Development Strategy* states that **the removal of barriers to growth posed by transport and congestion within the CBD are key priorities for economic growth**, particularly in sectors such as finance and professional services.

Under this framework put in place by the City of Sydney, plans have also been released for four sector action plans, focusing on the retail, tourism, and digital tech-start-ups sectors; as well as an action plan focussing on Aboriginal and Torres Strait Islander employment and enterprise.

These Action Plans set out how the City will work with partners to maintain and further develop these important sectors in Sydney. Both the retail and tourism actions plans reference the importance of developing appropriate transportation infrastructure to service the CBD. The EIS should reference the relevant actions from the City of Sydney *Tourism and Retail Action Plans*.

Recommendation: Significant further consideration should also be placed on the potential economic opportunities created by the Metro project for Aboriginal and Torres Strait Islander communities both during the construction and operation stages of the project.

4. Project development and alternatives

The project development and alternatives are sound. For the rail options, the location of stations as the key driver for decision-making is positive. The methodology to evaluate the short-listed station options is well explained and appropriate.

The City would welcome the **business case to be made public** to understand the evaluated performance of the shortlisted scenarios.

5. Stakeholder and community engagement

No specific comments.

6. Project description – operation

The City recognises the desire of Metro to develop 'iconic' stations at each location and a cohesive narrative for the Metro brand. Yet it is important to recognise that the Metro stations will sit within an existing context and city fabric, and the need to integrate within that fabric.

Similarly, where Metro stations are the catalyst for major urban renewal; there needs to be a nexus between the services offered from that station beyond a transport function to support the future intensification of that community.

Barangaroo

At Barangaroo, the City's concerns are focussed on the impact of the operational structures on the public domain and its effect on public safety, and the heritage nature of the precinct. The station entry points should not be a pavilion but should be recessed into Barangaroo Central.

This public domain structures are addressed in more detail in the sections on Urban Design and Landscape and Visual Impact.

It will be important that the design of Barangaroo is respectful of the heritage nature of the area and its connection to Walsh Bay. Although the Metro will play an important role in servicing the business and recreational functions of the precinct, there is also an important relationship to the cultural activities at Walsh Bay and its residents who require transport access.

Martin Place

At Martin Place, our key concerns are integrating the station design the Special Character area of Martin Place, and compliance with the City's planning controls; as well as the need for some crossing and/or kerb extensions to support the pedestrian volumes at the southern entry. In this heritage precinct, the station entry should not be a generic entrance hall.

These issues are discussed in more detail in Traffic and Transport, Landscape and Visual Impact, and Urban Design comments.

Pitt Street

Pitt Street station will provide important relief to the existing Town Hall station, and a connection to the future Town Hall Square.

However, the EIS has not adequately accounted for the interchange function of this station with York Street, or the cycle connectivity with Park Street cycleway.

Central

Central is the major transport hub in NSW. Not only does it serve Sydney and intercity services, it provides the origin or destination point for regional NSW rail services and if the Commonwealth were to proceed; future High Speed Rail.

It is also important to plan for Central in the context of the growth of the broader area and future growth; including for residential, business, leisure, cultural and education purposes.

Waterloo

At Waterloo, a key opportunity that should not be missed is the ability for the station design to house uses such as retail to support the appropriate densification of the Waterloo community. The City strongly recommends introduction of a second entry to the south of the station box, and potentially a third on Botany Road.

Servicing this urban renewal area with excellent public transport, cycling and walking infrastructure will be critical to its success. It will also rely on smart whole-of-government choices around transport hierarchy and functionality as movement corridors or places.

Recommendation: Include a second entry to the south of the station box at Waterloo, and consider a third entry towards Botany Road to benefit transport interchange.

7. Project description – construction

The City's key concerns with construction are the:

- Management of pedestrians in Martin Place during the six-month closure, especially in event mode (this is discussed in more detail in Chapter 16); and
- Cumulative impacts of construction vehicles throughout the CBD and the south of the City's LGA as a result of multiple major projects being built at once (also discussed in more detail later).

8. Construction traffic and transport

While the impact on vehicular traffic in the CBD generated by Metro is forecast to be small, there is still an **ongoing concern about the cumulative impacts of this project along with all others**. The levels of vehicles in the CBD will be significant, despite the modelling showing that the impact will be negligible. That being said, the City recognises that the EIS has assessed the cumulative impacts of construction traffic to the extent that is reasonable for this particular process.

The Department of Planning and Environment should feel confident that the CBD will **continue to function effectively within its existing traffic capacity** and without loss of amenity to public transport, walking and cycling modes. It is important to maintain the city's vibrancy and function, and that **important civic uses and active transport space is not given over for traffic generating purposes**.

Martin Place temporary closure

The six-month closure of Martin Place to enable construction is expected to create a Pedestrian Level of Service F. This would indicate the area operating in a manner similar to an event flow every day. This is not accounting for the impact of events. **It is unclear whether the existing underground traffic in an east-west direction was included in the total demand, as with the closure of the underground passages, this demand will need to be accommodated at the surface.**

As has been learned by the City and South East Light Rail project, times of prolonged interruption can provide an opportunity to positively influence travel behaviour, but may also prove to be the opposite.

An outcome might be that customers choose other modes to avoid Martin Place or that they choose to arrive at Wynyard, Circular Quay or Town Hall stations depending on their destinations.

Construction safety

It is the City's understanding that the Metro intends to implement a robust safety system for management of road safety. This is supported by the City. The volumes of pedestrians at Martin Place, Pitt Street and Central are all significant and will need careful consideration and management.

Events

There are a number of events that occur in the Sydney CBD outside of those listed in the EIS. It is recommended that Metro liaise with the City's Event team to understand the forward schedule.

Construction worker parking

The EIS states that construction worker access by public transport "will be encouraged". Given the closeness of work sites to public transport at almost all the sites, during normal construction hours it should be expected that workers will travel to site by public transport, unless they require their vehicle or cannot carry their equipment.

However, it is understood that works will take place over a 24 hour period and that public transport access is not always available. The proposed mitigation of satellite parking with shuttle transfer is reasonable.

It should be noted that there is no indication of the peak worker demand at any site.

City approvals required

Construction Traffic Management Plans (CTMP) for each site within the City's Local Government Area (LGA) must reflect the City's CTMP standard requirements and must be submitted to the City for approval.

The installation of hoarding, scaffolding and protection barriers on the road reserve under the City's control requires approval from the City, and payment of any associated fees and charges, prior to the commencement of works.

All temporary road closures, lane closures and/or occupation of ticket parking on streets under the City's control requires endorsement from the Local Pedestrian, Cycling and Traffic Calming Committee (LPCTCC) and approval from the City, and payment of any associated fees and charges, prior to the commencement of works.

Any modifications to pedestrian and cycling facilities within the City's LGA must be reviewed and approved by the City with the endorsement from the LPCTCC prior to the commencement of works.

Recommendation: That any Condition of Consent requires the proponent to comply with all relevant City of Sydney policies and procedures for works during construction.

9. Operational traffic and transport

Forecast mode shares

This chapter of the EIS outlines forecast modal mode shares for arrival at each Metro station. Although in-principle, the City is supportive, it would be helpful to **outline a methodology for how these forecasts were made** to understand the analysis between how people travel now, and the expectations of how this will change given the changing land uses of the station and its over-site development, as well as the land surrounding it.

For example, the forecast future mode share for bus at Barangaroo seems high at 39%. At present, only three bus routes serve this location, with two of these originating in the eastern suburbs. It would seem logical that with a good connection at Martin Place, that would be an ideal interchange location or alternatively, customers would take a shorter bus trip to a station on the Eastern Suburbs T4 line and interchange at Martin Place for Metro. The EIS does not say how or when bus services might change into the future to influence travel choices.

Pedestrian Level of Service

It is positive to see a pedestrian Level of Service (LoS) incorporated into the EIS and its assessment of the impacts.

It will be essential that bus priority measures are implemented in the Waterloo and Green Square areas to account for the massive growth in the area. While the Metro station will cater for a large proportion of the north-south demand, there are very strong east-west trips to and from the area that rely on the bus network. Buses are also vital for shorter distance trips and provide important access for the older residents within the Waterloo social housing.

Regional cycle network

There are other important parts of the regional cycle network that have been omitted from the EIS.

1. Kent Street cycleway – providing connections to the north;
2. Bourke Road/Street cycleway – connection from the east and south;
3. Anzac Bridge cycleway connecting to Miller Street –although not separated, is high volume and connects the southern harbourside suburbs to the CBD;
4. King Street cycleway – providing a city east-west connection; and
5. Castlereagh Street – although incomplete, connects Central to Liverpool Street.

The extension of Castlereagh Street cycleway to Circular Quay is an important connection to complete in order to realise the cycle connectivity that is assumed within the EIS.

Recommendation: Complete the Castlereagh Street cycleway to Circular Quay.

Erskineville and St Peters stations

It is noted that Erskineville and St Peters stations will continue to be serviced by Sydney Trains services, even after conversion to Metro.

It should come to the Department of Planning and Environment's attention that these stations are demonstrating strain in the peaks with peak loadings at about 140%

capacity or more, according to the data in the recently released *Train Loadings* from Transport for NSW. The level of demand will only increase as development in this area continues in the Ashmore estate and in other nearby developments.

The City strongly recommends that an additional station between Waterloo and Sydenham be developed to service this area. The station should be developed under Mitchell Road or McEvoy Street.

Recommendation: Include and additional station between Waterloo and Sydenham stations, with the additional station to be located under Mitchell Road or McEvoy Street.

Station access hierarchy

The inclusion of the station access hierarchy is excellent. It will be important to ensure that there are both good and accessible paths of travel to the stations, and that the cycle network is connected to enable multi-modal trips.

It would also be beneficial for Metro to define the station precinct so that there is an understanding of what will and will not be captured by Metro works so that any tie-ins can be delivered or planned.

Bike and Ride

While it is noted that levels of bike parking will be determined from this policy, it is important to understand the quantum of parking that will be provided under that policy.

Particular stations of note are Barangaroo (as a catchment for cycling from the Anzac Bridge cycleway), Central, and Waterloo (catchment from Green Square, Alexandria, Erskineville and the Danks St precinct).

Late night transport

The introduction of Metro provides an opportunity to amend hours of operation to support the night-time economy for Sydney. Particularly, the opportunity to provide later running hours.

The City requests that Metro amend its operational profile to operate longer hours to meet the demands of the late-night economy.

Recommendation: Extend Metro running hours past midnight and 1am to service the late-night economy.

Barangaroo

Active Transport

The EIS states that an existing on-road cycleway will connect with cycleways within Barangaroo. However, a line-marked cycleway is not expected to be a reasonable facility for the demand.

The City has planned for a separated cycleway to run along the eastern side of Hickson Road, providing connections to Napoleon and Kent Streets. It is our understanding that this is consistent with Barangaroo Development Authority planning.

It will be important to maintain space within the corridor to provide for this cycleway, and for the Government to deliver a separated connection on Napoleon Street as well, particularly given the grade.

At present, the footway on the eastern side of Barangaroo is only one metre wide. It will be critical to provide a wider footpath in the future to cater for the increased worker, resident and visitor demands of the precinct as well as the expectations of event mode foot traffic.

Recommendation:

- That a separated cycleway on Hickson Road be included in all road designs;
- That adequate footway widths are provided to cater for increased demands and event mode; and
- That a separated cycleway connection is provided on Napoleon Street to connect Kent Street and Hickson Road.

It should be noted that the existing footpath along Hickson Road on the eastern side is very narrow. The EIS does not mention whether this will be widened, despite discussion of high pedestrian demand. We request clarification on this.

Martin Place

Pedestrian integration

The City notes the three locations expected to provide some safety concern or impact to movement during operation of the Metro at Martin Place. Two along Hunter Street and the third at the Castlereagh Street crossing of Martin Place.

The city supports a crossing widening at the Castlereagh Street mid-block crossing, and the introduction of a third entry at Bligh Street.

Removal of street furniture is not an acceptable mitigation.

Recommendation: Mitigate safety impacts by:

- Providing a third entrance at Bligh Street to capture the demand and take it underground; and
- Providing a crossing extension of Martin Place on the eastern kern of Castlereagh Street (and relocate the existing Mail Zone) and/or create a kerb extension to create more pedestrian storage space.

Pitt Street

Precinct definition

It will be important to define the scope of the precinct at Pitt Street station to ensure that interchange between buses at York Street in captured in any demand assessment and Pedestrian Level of Service for this station.

Future Town Hall Square

It will be important that Metro enables, or at least does not preclude the delivery of an underground access to the future Town Hall Square by providing a stub tunnel.

Recommendation: Metro to provide stub tunnels to enable future connection to the future Town Hall Square.

Central

Active Transport

The City of Sydney would support the extension of the Goods Line towards the east.

Waterloo

Active Transport

The City supports delivery of new cycle facilities on Raglan Street and Henderson Road to connect the Australian Technology Park with the Metro station. However, there needs to be an indication of what type of facility this would be (keeping in mind this is a busy road with heavy vehicles) and what side of the street it would be proposed.

It should be noted that Wellington Street to the south of the Metro station is already a well-used cycleway, connecting Erskineville and Alexandria to Waterloo and further east into Surry Hills. It also connects directly to the George Street cycleway to connect to the south. This facility should be considered as important.

10. Construction noise and vibration

Construction and operation of the Chatswood to Sydenham Metro will yield noise and vibration emissions that will have a degree of impact on the surrounding environment, including locations within the City of Sydney's local government area that have proximity to the underground tunnels and stations once in use, and an expanded impact footprint during their delivery.

Noise & Vibration Performance Metrics

The noise and vibration impact from construction and operation of the project has been assessed in accordance with relevant NSW *Environmental Protection Authority* policies being the *Interim Construction Noise Guideline* (ING) and the *Rail Infrastructure Noise Guideline* (RING).

In terms of noise assessment, these policies call for both airborne and ground-borne noise impact in addition to vibration impact associated with the project to be assessed as operations causing these effects will have potential to affect sensitive receivers.

The ING works differently to the City of Sydney *Construction Noise Code of Practice 1992* (the latter is the City's current version of construction noise policy and is not relevant to State Government Infrastructure works) in that it sets Noise Management Levels (NMLs) as opposed to a firm criteria. Whereby NMLs are breached, an escalating approach to mitigation of impact up to and including offering temporary alternative accommodation to persons whom are considerably affected is required.

The Metro Project EIS has complimented the assessment of construction noise and vibration impact through the additional implementation of the Transport for NSW practice note for infrastructure noise management, and with preliminary delivery of a *Construction Noise & Vibration Strategy*. **These documents lend an additional degree of robustness to the assessment process.**

The RING sets noise performance targets for the above defined impacts which are to be practically achieved in all circumstances.

The relative permissible degree of exposure to construction noise impact is typically higher by comparison to operational noise in respect that the exposure to construction noise is balanced off against it being a temporary activity and the benefit (considerable in this case) of the outcome deliverable (public transport).

Summary Overview of Construction Impacts against Performance Metrics

Forecast construction airborne and ground-borne noise impact is **expected to exceed NMLs, in some instances significantly**. The affect this is likely to have on people who live and work in the City's LGA will depend on exposure to the impact in the context of magnitude and duration.

Upon review of the EIS it is expected that the predominant causes of severe impact will be associated with:

- The demolition and site preparation works of some 43 buildings across the CBD and Waterloo which will take approximately a year or more to complete per site;
- Impact associated with underground cavity and tunnel boring operations; and

- The removal, predominantly by road of from what is estimated from the EIS is approximately 915,000 tonnes of spoil (excavated rock and earth) from the City's LGA at access sites.

Blasting is expected to cause momentarily high blast overpressure levels (noise) and perceptible degrees of vibration for instances that it occurs, however this activity would be carried out underground, as such:

- Fly-rock is not anticipated for blasting due to operations being carried out underground; and
- It is presumed that blast overpressure and ground vibration would be managed to be in compliance with performance metrics through control of the type and amount of charge placed, pending variables.

Road traffic noise from heavy vehicles (dump trucks) associated with the project will be a lessor factor but one which we call for the environmental footprint to be mitigated as far as possible via **further investigation into and the use of rail and port infrastructure to remove excavated spoil from The City where reasonably and feasibly possible.**

The EIS provides for such works to occur during the night period where necessary other than blasting (which is not anticipated out of hours). An assessment of **sleep disturbance** has been provided which at this point forecasts that in some locations, **considerable exceedance of the criteria** will occur.

In considering impacted locations within the City, once the demolition works and site preparatory works are completed, on the basis of the EIS the project will move beyond the works which are expected to cause the worst impacts associated with delivery of stations and infrastructure. **Tunnel boring operations will cause transient impact throughout the life of the project delivery, however this will be less prolonged** as the impact will dissipate as the boring operations move away from receivers.

It is understood that some of the buildings in the CBD earmarked for demolition are quite tall structures, and a **more detailed assessment of these operations would have been preferable as on basis of experience as demolition tends to be laborious and time intensive whilst causing meaningful impact**.

Notwithstanding the above, **the EIS provides a very solid overview of construction noise and vibration impact** associated with the delivery of the metro EIS, and proposes mitigation measures will effectively manage or deal with the majority of problems expected. The suite of mitigation options includes provision of alternative equipment and accommodation to affected persons.

Further discussion and recommendations are provided in the relative section.

Summary Overview of Operational Impacts against Performance Metrics

At this desktop assessment stage, operational noise and vibration impact is forecast to comply with relevant performance requirements at all noise sensitive receivers within the City of Sydney. However, **forecast compliance with ground-borne noise impacts are marginal at some locations**.

On the whole, the EIS shows that the environmental noise and vibration footprint associated with the project will be to a high degree of performance however a discussion and recommendations around impacts associated with the Metro operation are given in the following relevant sections.

Construction Noise & Vibration Impact Assessment

As outlined above, the construction noise and vibration impact associated with the project has been very robustly assessed. There are some issues which could benefit from further appraisal and are outlined as recommendations below. Otherwise this section provides an appraisal of the proposed works and what we think are going to be the more significant impacts associated with those works for the reader.

Construction Methodology

Metro Tunnels

The construction methodology for the tunnel will be by tunnel boring machine and ancillary equipment where necessary such as excavator, road header and other processes where necessary. The tunnel will be lined with pre-cast concrete sections and with spoil removed and deliveries supplied either by rubber tyred vehicle or a temporary construction rail transport system.

Metro Stations & Ancillary Infrastructure

The construction methodology for below ground metro stations will be via blasting, road header, excavator and other ancillary equipment. These stations will be delivered either via a “mined out” methodology or via cut and cover methodology.

Prior to undertaking these works it will be necessary to secure and prepare the site, involving the demolition of any pre-existing buildings which the proponent considers would otherwise adversely impact the ability of the project to be delivered. The methodology for these activities is referred to as “traditional top down methodologies”.

The EIS refers to other equipment such as ventilation stacks and power supply equipment which will need to be constructed in a manner similar to the above.

Removal of Excavated Spoil

Our interpretation of the report is that removal of excavated spoil (such as rock and earth) is primarily going to take place via dump truck which accesses excavation sites from the public road network. It is understood that approximately 915,000 cubic metres of spoil will be created and removed as part of the project works within the City’s LGA.

We understand that rail and barge methodologies are being considered as part of this process but conclude from the report that the primary methodology of removal of this material will likely be road. This activity has the potential to generate noise at the source where material are loaded and via noise and from vehicles carrying the material along roads and via vehicles returning (empty) to the loading points. The City is relatively less concerned about the latter but comment is provided to this effect given the magnitude of the activity.

Works expected to cause the most impact

The above activities and associated works represent those which we consider are most likely to cause noise (both airborne and ground-borne) and vibration impact onto noise sensitive locations within the City’s LGA.

The EIS associates the term noise sensitive receiver with other occupiable spaces, such as commercial office, and provides noise objectives which are applicable to other sensitive spaces e.g. child care centres.

Construction Timeframes

The over-all proposed project timeframe would be from the beginning of 2017 to the end of 2024. The above outlined works expected to have most impact will predominantly occur in the first half of the project delivery and construction stage. It is expected that **the worst impacts in terms of exposure will be associated with the site delivery, demolition and mining and excavations** activities that are proposed to occur within The City's LGA.

Barangaroo Station

Site establishment, excavation and tunnel boring operations are expected to run from Quarter 2, 2017 through Quarter 2, 2020.

Access to and from the site is to be from Hickson Road, with those noise sensitive locations in this vicinity liable to most notice noise associated with the works, in addition to those within the new Barangaroo precinct.

The station construction is to be via the cut and cover technique.

Martin Place Station

Site establishment, building demolition, excavation and tunnel boring operations are expected to run from Quarter 2, 2017 through Quarter 4, 2019.

The station construction is to be via mined technique.

Pitt Street Station

Site establishment, building demolition, excavation and tunnel boring operations are expected to run from Quarter 3, 2017 through Quarter 4, 2019.

The station construction is to be via mined technique.

Pitt Street Station

Site establishment, building demolition, excavation and tunnel boring operations are expected to run from Quarter 3, 2017 through Quarter 4, 2019.

The station construction is to be via mined technique.

Central Station

Site establishment, building demolition, excavation and tunnel boring operations are expected to run from Quarter 1, 2017 through Quarter 4, 2020.

The station construction is to be via mined technique.

Waterloo Station

Site establishment, building demolition, excavation and tunnel boring operations are expected to run from Quarter 2, 2017 through Quarter 3, 2019.

The station construction is to be via mined technique.

Standard Construction Hours & Out of Hours Works

The EIS provides base or "standard" construction hours of 7am to 6pm, Monday to Friday, 8am to 1 pm Saturdays and no work Sundays or Public Holidays.

Typically, the majority of work would be undertaken within these hours, however the EIS provides that it will be necessary to undertake the following works on an out of hours basis for which relevant stricter environmental performance criteria apply:

- Tunnelling – up to 24 hours, 7 days per week. The impact of this work will predominantly be ground borne noise however would be transient as the boring machine approaches a noise sensitive receiver and then moves away. The time that any one location is impacted will depend on many factors but significantly on the distance the boring machine progresses on any given day. This may be a considerable distance one day or not the next, but boring machine would be expected to move on and that no sensitive receiver impacted for long timeframes relevant for example to those for station excavations.
- The EIS does not commit to undertaking drill and blast works wholly within the outlined standard hours but provides that it is not intended to carry out this work in periods of heightened sensitivity. Blasting is a highly sensitive activity which must be carried out in a strictly risk averse nature where the safety is the ultimate consideration. The sensitivity of blasting chemicals can vary with small amounts of time or prolonged exposure to water and other elements. The City would accept that any carriage of blasting works during sensitive hours would not be intentional and trusts that this would be managed in good faith.
- Underground station excavations. The comments regarding necessity of works as given for blasting above are relevant here.
- Underground structural construction, road traffic and other similar works. These are less likely to have the impact on noise sensitive locations that will potentially occur for the other works as outlined above.

Construction Road Traffic Noise

It can be ascertained from the report that approximately 915,000 cubic metres of spoil (excavated rock soil) will need to be removed through the City's Local Government Area, either by road or other means.

The EIS provides that this could potentially be done via three methodologies; nominally by road, rail and barge. However, it is inferred from the EIS that this will likely be done either wholly or predominantly by road. Chapter 8 of the EIS provides a road traffic noise impact assessment however the City could not ascertain any total annual daily heavy vehicle (tip truck) figures from this section of the EIS. The EIS does however provide that the peak heavy vehicle movements under a worst case scenario would be approximately up to one vehicle every two minutes.

The EIS concludes that the total combined traffic noise impact associated (with pre-existing vehicle usage of the City's road traffic network and further heavy vehicle traffic associated with the Metro Project) will exceed the base level criterion but comply with the relative increase criteria which is in synergy with the appraisals given above and suggests that the base criteria is likely caused to be exceeded by existing traffic within the network in the absence of any construction traffic.

Environmentally, the most responsible method should always be pursued and the City would encourage barge and rail transport options for mitigation of spoil to be pursued in good faith but other than localised noise impacts at the source of spoil loadout

operations (See airborne noise impact section) road traffic impact noise en-masse should not be a significant adverse impact in a relative sense.

Recommendation: That all environmentally responsible measures to remove spoil generated by the project are pursued, although it is expected a meaningful degree of spoil generation will need to be removed by road. Where this occurs, all reasonable and feasible measures be pursued to mitigate noise and other environmental impact associated with the road transport and load out operation, particularly in relation to the vehicle fleet used.

Recommendation: The City would ask that the heavy vehicles are required to comply with contemporary EURO emissions standards for noise and air quality and incorporate add-blue catalysers from an emissions management perspective and have rubber lined bins.

Recommendation: Effective wheel washers, vehicle cleansing and load covering systems should be incorporated into environmental site management programs and vehicles should be inspected and signed off on before they leave a site.

Airborne Noise Impact

As previously outlined, works associated with the site delivery and demolition and excavation works have potential to cause meaningful noise impact on sensitive locations which surround the works sites, mainly the proposed Metro stations. As these works will be prolonged, particular where demolition of large buildings will need to occur, exposure to these high noise levels over time will likely disturb the community.

The EIS openly points out that **airborne noise levels are liable to exceed noise management levels,** sometimes up to severe degrees, but that respite will eventually be delivered following completion of these works. Significant consideration is given to reasonable and feasible mitigation options to deal with excessive noise levels including preparation of works mitigation strategies which will be implemented, providing acoustic enclosures as soon as practicable, and where significant noise impact is occurring, provided a pathway for alternative accommodation.

Considering the bulk and scale of the works, the geographical size of the affected area, and the assessment is considered very thorough and in accordance with the policy. Generally speaking, there is little we are able to offer in terms of recommended improvements to the methodology at this stage. However we would like to see more **consideration of alternative methodologies for demolition of large buildings** which is discussed below.

First and foremost, the difficulty in bringing down large reinforced structures in the Sydney CBD is acknowledged. The City is responsible for regulating noise pollution associated with private development within the City and where this occurs, it is seldom an easy issue to deal with and associated noise is something that the City is very cautious about from a planning perspective.

However, the appraisal of this activity which represents a meaningful period of time in the project life seems brief in terms of assessment as compared against other activities. The EIS provides that the demolition methodology will *incorporate traditional top down methodologies inclusive excavator, bobcat cranes and other conventional methods*.

Recommendation: Demolition contractors must prepare demolition management plans which require minimising the use of conventional technologies which are known to cause mass disturbance to the community such as rock breakers as much as possible.

Ground-Borne Noise Impact

As previously outlined, works associated with the project delivery will incorporate blasting, and underground boring, excavation and mining methodologies. Blasting aside, mitigation of these activities will be difficult to achieve, particularly with mining and boring machines. We note the works mitigation packages including alternative accommodation pathways where people are significantly affected by the works.

However, this project is different from those in that it is not undertaken via private enterprise for commercial gain, but by the public authority for purpose of providing public transport infrastructure which consequently affords considerable public and state significant interest in undertaking these works.

With regards to the boring operations, other possibilities can be explored on necessity during construction operations by such as weighing up the degree of disturbance caused by operating at night versus temporarily suspending operations and working in the day only. A decision to do this will ultimately be up to the appropriate regulatory authority and the enterprise responsible for delivery the works.

Vibration Impact

The City supports the criteria and methodology established for the control of vibration associated with construction works. As separate to other major projects, the DIN 4150 has been identified as the appropriate criteria for the prevention of cosmetic damage to vibration sensitive buildings. The methodology employed is that vibration control will ideally be to a level that is less than a degree of impact that will cause perceptibility. However in practice this is extraordinarily difficult or impossible to achieve at times if works are to occur in an efficient and practical sense, or at all.

During these circumstances, it is **historically best practice to increase the criteria to a perspective that manages annoyance to a higher threshold relative to the temporary nature of works but prevents any damage to a building from occurring**. A mechanism to complete the works is almost always found under these circumstances.

In the context of preventing damage to a building, it is prudent to control vibration incident on a building to a degree that will prevent any cosmetic damage. **Prevention of cosmetic damage has historically been an effective means of preventing structural damage.**

The EIS correctly asserts that a heritage structure should not be automatically assumed to be hypersensitive to vibration rather that vibration sensitivity of a building should be assessed and appraised by an appropriate engineering professional on balance of factors such as the degree of vibration exposure and building construction methodology for example. This is as heritage buildings are constructed from very brittle materials and possess features which are **typically of ornate beauty and cannot be replaced or substituted with like for like circumstances if damaged**.

Recommendation: The City would suggest that any building within the City that is of an historic masonry construction methodology e.g. sandstone, ornate plaster or has old glazing features would automatically qualify for review by an appropriately qualified professional for potential application of the DIN4150 criteria.

Blasting Impact

The EIS presents blasting as a methodology to afford efficiency in delivery of the project whilst minimising exposure to adverse noise impacts. The City would support this as it would clearly be planned and managed by relevant industry professionals.

Whilst blasting is typically associated with high impact outcomes, the science associated with blasting in a contemporary context is relatively accurate and precise by comparison against historical assessment practices. Energy factors, ground strata and dissipation of energy over distance can be readily ascertained and appropriate charges deployed to comply with noise and vibration criteria.

Criteria for blast overpressure (noise) and vibration are higher given the impact is momentary and singular and humans and buildings are more tolerant of this type of exposure (high impact, very low duration). In terms of impact on occupants, the City supports the inherent assertion in the EIS that blasting will on balance have a lesser degree of annoyance as alternative methodologies would require use of techniques that have relatively high exposure (high impact, high duration).

Sleep Disturbance Impact

External criteria for awakenings are derived from the sleep disturbance methodology in the *Road Noise Policy* which is referred to in other NSW EPA noise policy.

The methodology provides for a screening criteria limiting that night noise impacts should not exceed the lessor of an instantaneous sound pressure level which exceeds the background noise be more than 15 dB or, frequent internal noise levels that exceed a level of 50 – 55 dB. The EIS essentially provides that a screening level of 10 dB above this internal limit will be utilised for screening purposes, implying that a façade will provide 10 dB of protection.

This is likely to occur in the Sydney CBD around Martin Place and Pitt Street where ambient noise levels are already high, even at night and windows and doors already need to be kept closed to afford a degree of internal amenity adequate for sleeping purposes. But, this is not necessarily correct for those residents outside of the CBD such as along Hickson Rd adjacent to the Barangaroo works or those around Waterloo whose residents may need to have glazing open at night to afford ventilation.

Regardless of whether the 10dB comfort factor is employed, the EIS provides that widespread exceedances of sleep disturbance thresholds, in excess of 20dB will occur which if this 10dB factor was removed would still indicate an issue for these other locations. The EIS provides a methodology to address this issue should it occur, but the extent of the problem risks being under-appraised if the screening methodology is incorrect.

11. Operational noise and vibration

Operational Noise & Vibration Impact

The entire alignment of the Metro in the City's LGA runs underground. Thus, occupiable buildings within The City's LGA are unlikely to be effected by airborne noise impact from train movements.

Airborne noise impact is however a factor for consideration where it is **generated by ancillary infrastructure associated with train stations such as power supply and ventilation equipment.** However, this can typically be adequately dealt with via readily available noise mitigation strategies and establishment of relevant performance parameters for these impacts is adequate at this stage.

Similarly, perceptible vibration impact and ground-borne noise performance limits have been established and are evidentially capable of being complied with via mitigation techniques available.

The only issue that the City would raise is that the desktop forecast of compliance with ground-borne noise criteria is borderline at places throughout the City's LGA. Caution should be taken as implementation is progressed.

12. Land use and property

Land Use

The Secretary's Environmental Assessment Requirements (SEARs) in relation to "Socio-economic, Land Use and Property" issues requires the project to:

Minimise adverse social and economic impacts and capitalise on opportunities potentially available to affected communities; and

Minimise impacts to property and business and achieve appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.

Section 12 of the EIS correctly acknowledges that:-

> *"The project presents significant opportunities for city building, particularly in being a catalyst for positive change, supporting broader economic benefits by facilitating strong business-to-business connectivity, and create attractive, vibrant and highly accessible places. This will require alignment across multiple government planning agencies.*
>
> *Sydney Metro would implement the project in an integrated manner in direct collaboration with key planning agencies, including the Department of Planning and Environment, the recently formed Greater Sydney Commission and the local Councils."*

The project aspires to:

- establish a strategic framework for urban integration;
- identify opportunities to integrate existing and future land uses within and around stations;
- set project scope around urban design and city building solutions for the station precincts;
- facilitate positive change through new stations; and
- maximise opportunities for place making and good urban outcomes.

However, Section 12 of the EIS then goes on to describe the existing land uses in a general sense, alongside the existing environmental planning instrument zoning controls, **without discussion on the mechanisms or consultations that would be required to establish and to achieve the project aspirations**.

The EIS provides a factual, high level, account of the local planning instruments and their broad effects. Some discussion is then provided on matters which are viewed as opportunities around each station, with the conclusion that these opportunities would be further developed in consultation with NSW Planning and Environment, Greater Sydney Commission and the relevant local Council. For example, in relation to the Martin Place Station, a key opportunity nominated in the EIS is *the renewal and development of a number of underutilised commercial sites between Castlereagh Street and Pitt Street north of Martin Place*. **Demonstration of how this would be achieved is necessary.**

Mitigation and local planning controls

Section 12.6 of the EIS, in relation to "mitigation measures" for Land Use and Property states as follows:

"There are no specific mitigation measures that would be implemented to address potential land use and property impacts".

The above is incorrect.

Section 12 of the EIS needs to go into **far greater detail on safeguards and mechanisms that will be incorporated into the project** to ensure that future development of the station precincts **respects the existing planning processes and requirements** of the local consent authorities.

A failure to acknowledge the existing local planning requirements (for example, the City of Sydney's requirements for competitive design processes, for "design excellence" to be demonstrated, and for design controls around key issues such as **building address, activation of ground floor, adherence to sun access planes, view sharing and use of materials** associated with new towers in the CBD) would lead to haphazard outcomes manifest in sub-optimal, un-activated, less accessible and poorly integrated aboveground structures in the City context.

Specifically in relation to the integration of the project with adjoining land uses within the CBD, the existing planning controls in the *Sydney Local Environmental Plan* 2012 (SLEP 2012) and the *Sydney Development Control Plan* 2012 (SDCP 2012) need to be acknowledged within the EIS as **policies that will be used as guiding safeguards for any future development**.

All sites except Waterloo are affected by Sun Access Planes, and any breach of those would cause **significant and unacceptable environmental impacts**. Also, if the tower setbacks above the podium are not adequate, the developments could create **highly intolerable, adverse or even unsafe wind impacts in adjacent public spaces.** The City has streamlined modelling processes for identifying various envelopes under different environmental performance scenarios.

Recommendation: Manage the environmental impacts associated with these developments by having them assessed by the City at an early stage.

Design Competition and Design Excellence

The SLEP 2012 planning control must be considered in early design decisions for the project. Project designers, be they engineers or architects, need to be **cognisant of how below ground infrastructure will shape the integration of above ground development**. They need to know what is important in the local planning controls at each station precinct.

In relation to planning process in the Sydney CBD, of particular relevance is the SLEP 2012 requirement for any site greater than 1,500sqm or any building greater than 55 metres in height, to respect a 'Stage 1' (Envelope Design), then subsequent Design Competition and Stage 2 Development Application process. The design of the stations and aboveground station buildings should specifically respond to Clause 6.21 'Design Excellence' and Clause 5.10 'Heritage Conservation' in SLEP 2012. **This should be a mitigation measure in the EIS.**

Recommendation: That all Over Station Development and facilities external to the station envelope are assessed and determined by the City (consistent with the requirements of the ISEPP), and are subject to the City's Design Competition process.

The SDCP 2012 is also a very relevant and important document in relation to the design of any towers, specifically Clauses 3.2 and 3.3. The following general requirements are relevant in regard to the design of any aboveground tower, which therefore has flow-on effects for belowground works:

- large expanses of services and fire stairs that create blank facades are to be avoided;
- there should be a good relationship between solid to void at the ground floor level;
- ground floor uses should be designed to activate street frontages;
- the ground floor of any building is to have a floor to ceiling height of 3.6m and 3.3m above;
- lift cores should not face streets/lanes and cause inactive frontages to the public domain;
- masonry elements should be integrated into the podium design;
- awnings for weather protection should be integrated into the design and should be between 3.2m and 4.4m above the footpath;
- wind tunnel testing should be carried out for any building envelope to understand wind effects;
- buildings should respond to the street context ensuring that street wall height (podium and tower) is not eroded and any proposed tower takes its cue from the context of the surrounding streetscape;
- any proposed building should not penetrate sun access planes or significantly overshadow public space; and
- flooding impacts require modelling and the establishment of flood planning levels for ground floor retail, lobby, services and accesses.

How the project captures the above essential requirements of SLEP 2012 and SDCP 2012 needs to be documented in the EIS. It is not adequate at this stage to set project aspirations for "setting strategic framework", "creating opportunities for integration", "setting scope for urban design" and "maximising place making" without demonstrating how these would be achieved.

Recommendation: Demonstrate and document how the project design objectives will be achieved.

Strategic land uses

It is important that Over Station Development (OSD) as part of Metro in the CBD is given to strategic uses (for example, commercial) rather than residential development.

Strategic uses in Central Sydney

- Commercial, retail, hotel and other productive, employment generating uses are considered strategic uses in Central Sydney;
- Strategic uses take advantage of and contribute to the substantial agglomeration productivity benefits available in Central Sydney;
- Residential uses are not considered strategic uses in Central Sydney – rather they are considered passive or productivity depleting and are not encouraged;

- In the context of Central Sydney residential buildings sterilise large areas around them due to their requirements for sunlight, outlook and views; and
- Business sentiment is negative in relation to locations that include residential buildings.

We note that Table 11-15 in the Operational Noise chapter may signal land uses in the OSD that are not consistent with strategic uses.

Recommendation: OSD in the CBD is for strategic purposes rather than residential.

13. Business impacts

City of Sydney welcomes and is supportive of the consideration of business impacts within the Metro environmental impact statement.

While identifying the broad impacts in the EIS is useful, **identification of potential mitigation strategies are underdeveloped at this stage** and require significant further development in partnership with local government, businesses and business representative groups.

Recommendation: That the proponent work in partnership with local government, businesses and business representative groups to further develop the business impacts mitigation strategies, should the project be approved.

Assessment methodology and potential impacts

The assessment methodology within Technical Paper 3 appears broadly sound, though the consultation process for the EIS involved phone calls with only 83 businesses across the project area. This is a limited number of responses for the scale of the project, especially considering the significant potential impact on a large number of CBD businesses within the financial and professional services sectors and the retail sectors. As indicated below, the City would **expect comprehensive further consultation with businesses and business representative groups to occur both prior to and throughout project development and construction**.

A summary of the City's feedback on the identified impacts on business projects is show below.

Potential construction phase impacts

Within the identified potential construction phase impacts (Volume 1 - 13.4.1) it is notable that the only aspect for each precinct that is rated 'significant negative' are mandatory property acquisitions. Within the City's LGA, Metro has identified 38 business properties that require acquisition (Martin Place- 4, Pitt St.- 11, Central- 5, and Waterloo- 18). **Significant further detailed discussions with the City and partners will be required to examine the potential impact of each of these properties on local business owners and business precincts**.

Moderate negative impacts are identified as impacts to customer access, passing trade and servicing and delivery access. The City's recent experience as a key partner in the delivery of the George Street Light Rail project show that these impacts to business need to be carefully considered, and **detailed mitigation strategies will need to be developed to minimise negative business impacts**. A range of key partners will need to be involved in the development of effective mitigation strategies, which should include activations to increase passing trade and visibility of businesses, the ongoing provision of businesses with information, and marketing to public/customers containing information about changes and messaging that businesses are remaining operational throughout construction. **The EIS does not include sufficient information in regards the timing, process and partners involved within the development of these strategies.**

Potential operation phase impacts

The City notes that the impacts to businesses listed are shown to be mostly positive in the longer term following construction phase. While broadly agreeing with this summary, it is vital that further consultation with existing businesses and property owners is undertaken to ensure that longer term benefits of the Metro project can be maximised.

Developing mitigation strategies through consultation

The City acknowledges that Metro has conducted some limited consultation with businesses prior to the submission of the EIS and during the EIS exhibition period.

The City also acknowledges that a small number of mitigation responses are identified within the EIS, which are summarised to include measures to minimise level of disturbance, access management measures, and communication measures to proactively support businesses.

The City is supportive of the recognised need with the EIS for further business consultation and development of a **business impact risk register**. However, very limited detail is provided on the communications and consultation strategies that are proposed, especially those required prior to and during construction. The City strongly suggests that **businesses and business representative groups are comprehensively involved in the development of more detailed and extensive mitigation strategies** as the project develops.

Construction Stage – Consultation with business

Businesses and property owners will experience significant inconvenience and a range of negative impacts during construction. The City expects that further development of mitigation responses will be required. Working groups should be initiated by Metro, including the City, businesses, and businesses representative groups; along with the preparation of a number of management strategies during the construction and operational stages. There is a **requirement that businesses and representatives from all relevant Business Chambers and business representative bodies are consulted** as part of this process and included on working groups to minimise negative impacts.

Mitigation development consultation

It is recommended that when developing mitigation response and management plans (i.e. an Environmental Management Plan, Business and Landowner Engagement and Management Plan, and Access Plan) Metro should engage with City of Sydney and representatives of Business Chambers, and comprehensively invite businesses to contribute. The City of Sydney's Retail Advisory Panel, compromising key stakeholders within the CBD retail sector, will be an important panel to consult regularly during the development and implementation of management plans.

Impact Risk Register development

The business impact risk register identified should allow for ongoing one-on-one discussions with businesses and stakeholders along the route to ensure arrangements are made for direct access to properties for loading, deliveries, maintenance and parking. Ongoing engagement and consideration of issues relating

to loading and unloading generally, and particularly within the CBD, should be included within all Business/Landowner Engagement & Management Plans.

Construction Stage – Broader community consultation

The City expects that the broader residential community and visitors will be heavily consulted both prior to and during construction, in an attempt to minimise negative economic impacts, as we consider disruption during construction will be a major concern to our community.

It is recommended that Metro confirms details of communications and consultation strategies to manage issues arising from construction including: access and traffic changes, hours of works, noise, safety, and loss of amenity and public space.

Respite for residents and visitors should be built into construction programming. That clear communication is provided to the community (including visitors/tourists) on construction staging and timeframes to manage expectations, the notification and complaints handling process, and dedicated contact(s) for businesses and residents during construction. Consideration is to be given to issues arising from the visual effect of site damage, including graffiti and management of these impacts.

14. Non-Aboriginal heritage

This is a large scale project, and the impacts on non-Aboriginal heritage within the City of Sydney LGA are significant. A large number of buildings are demolished, but only one currently listed heritage item is proposed for total demolition (7 Elizabeth Street Sydney). **The demolition of this item is avoidable.** There are other significant impacts that are avoidable and others that have not been identified in the EIS. There is potential to ameliorate impacts to an extent that makes the overall heritage impacts of this project acceptable.

It is assumed that all new buildings and structures associated with the project will comply with the objectives and provisions of the Sydney LEP 2012 and Sydney DCP 2012. This particularly applies to building form and design excellence. Further detail is provided in the *Urban Design* and *Landscape Character and Visual Impact* sections of this submission.

Introduction

This review of the Heritage Impact Assessment (HIA) in the Chatswood to Sydenham Environmental Impact Statement (EIS) and related technical papers is limited to works within the City of Sydney Local Government Area (LGA).

The HIA has significant omissions as is has considered only places with statutory heritage listing and so has failed to assess impacts on places of some heritage significance or to recommend ways of ameliorating these impacts. These omissions are discussed under *Unacceptable Impacts Omitted from the HIA* below.

Given the preliminary nature of the station designs, the HIA analysis of the impacts on built heritage, and the consequent need for detailed design and conservation strategies to ameliorate impacts, is not detailed. For example, there are few recommendations for ameliorating the major impacts arising from the proposed works on the significant built fabric of Sydney Terminal and Central Station.

The HIA table 119 includes *Mitigation and Management Measures* (section 7.0 p.253). These are largely acceptable but comprise a very preliminary global overview of mitigation measures that will require comprehensive expansion as the project progresses. Recommendations included in the analysis below are intended to supplement the measures already included in table 119 of the HIA.

It is not clear that there will be further opportunities for the public, or the City of Sydney, to review design and conservation outcomes as the project progresses. The City of Sydney would welcome opportunities for future review and comment during design development.

Summary of Impacts in Study Areas Related to Stations

Barangaroo Station (refer to table 64: Overview of potential heritage constraints for Barangaroo study area)

Sixteen heritage items, including the Millers Point Conservation Area are identified within this study area. The most significant impact is the proposed cut and cover station box in Hickson Road which has the potential to yield archaeological material.

Direct Impacts, archaeological impacts and indirect impacts are largely *neutral* to *negligible* with some *minor* to *moderate* impacts to views and vistas in the vicinity of

the permanent station superstructures. These structures are, however, proposed in the vicinity of the new Barangaroo Central area and do not directly affect heritage fabric.

Recommendation: It would be preferable for the new entrance structures to be incorporated into the new building envelopes in Barangaroo Central in order to minimise built incursions into the new parkland and improve views from Hickson Road to the parkland and harbour.

Martin Place (refer to table 77: Overview of potential heritage constraints for Martin Place study area)

Eleven heritage items are identified within this study area. The most significant impact is the proposed demolition of the heritage listed 7 Elizabeth Street (see below).

Direct Impacts, archaeological impacts and indirect impacts are largely *neutral* to *minor* with some *minor* to *moderate* impacts to views and vistas in the vicinity of the permanent station superstructures. The impact on 7 Elizabeth Street is *Major – complete demolition* and this demolition is **not supported** (see *Unacceptable Heritage Impacts Identified in the HIA* below).

Martin Place is a Special Character area and a Heritage Item. All new buildings and public domain elements are to be consistent with the heritage significance of the place and the desired future character for the Special Character Area in the Sydney DCP 2012. In particular, new buildings must reinforce the street wall and stone materiality of Martin Place and satisfy all design excellence criteria (refer to detailed comments in the Urban Design and Landscape Character and Visual Impact sections of this submission). Ground level elevations should include economic active uses, in particular restaurants or bars. The site should include all of the necessary back of house for outdoor dining in Martin Place.

Pitt Street (Refer to Table 97: Overview of heritage constraints at the Pitt Street Station Site).

Seventeen heritage items, including the potential archaeological resource, are identified within this study area. The most significant impact is the demolition of eleven buildings at the north and south work areas. These buildings are not heritage items but date from the 19th and early 20th centuries. They are important elements in the settings of the heritage items in the vicinity and yet their demolition is subject to negligible analysis in the HIA and no ameliorative actions are proposed for their loss (refer to *Archival recording prior to the demolition of existing buildings that are not heritage listed* below).

Direct impacts, archaeological impacts and indirect impacts are largely *neutral* to *negligible* with some *minor* to *moderate* impacts to views and vistas due to the removal of the old contextual buildings.

The attributed *neutral* direct impact on St George's Church may be optimistic as the existing stone spire of the church is structurally weak and is currently scaffolded for safety reasons. The spire will be very susceptible to constructional and operational vibrations.

The selected site for the open shaft in the South Pitt Street work site is immediately adjacent to the heritage listed Edinburgh Castle Hotel. In order to minimise the risk of damage to the hotel, re-location of the shaft further away from the hotel should be considered.

Sydney Terminal and Central Railway Station Group (Refer to Table 99: Sydney Terminal and Central Railway Station Group Heritage Impact Assessment).

Six heritage items, in addition to the potential archaeological resource, are identified within this study area. It should be noted that some items, such as the listing for Sydney Terminal and Central, cover the whole complex of buildings and rail structures. The most substantial impact is the demolition of platforms 13-15 to make way for the underground Metro station box. These are the easternmost of the existing terminal platforms. The station box will also require removal of the related sections of underground pedestrian and service tunnels connecting the terminal platforms to the suburban platform and a section of the Devonshire Street tunnel. In the Sydney Yard, two buildings of *moderate* significance and a garden of *high* significance will also be demolished.

The proposed temporary over-bridge to link the suburban platforms will remove significant fabric from the existing station superstructure.

The proposed construction of a new access bridge from Regent Street to the Sydney yard will also have a major visual impact on the setting of Mortuary Station and on the yard itself.

Direct impacts, archaeological impacts and indirect impacts are largely *moderate* to *major*.

While the HIA makes some comment on the amelioration of the heritage impacts of the project, and invokes the conservation policies of the Central Station Conservation Management Plan (p216), a deeper analysis and detailed design will be required to ensure a successful conservation outcome for this place. This is particularly relevant in the creation of a new 'Railway Square' between Pitt Street and the Station building in the vicinity of the external roadways and ramps. This is one of the three squares in the City's public domain plans.

With the very best conservation and design advice, it is possible to introduce the new station box and related works and the future square, in manner that conserves and highlights adjacent significant fabric. There are good international precedents for this such as Kings Cross/St Pancras in London.

Waterloo (Refer to Table 113: Overview of constraints on heritage items and areas of archaeological potential).

Five heritage items, including the potential archaeological resource, are identified within this study area. The most significant impact is the proposed cut and cover station box on Cope Street which has the potential to yield archaeological material.

Direct Impacts, archaeological impacts and indirect impacts are largely *neutral* to *minor* with some *minor* impacts to views and vistas in the vicinity of the permanent station superstructures.

Unacceptable Heritage Impacts identified in HIA

The HIA identifies and assesses the following impacts. These impacts are not supported as they do not satisfy the objectives or provisions of the Sydney LEP 2012 or Sydney DCP 2012. Recommendations are provided below for the avoidance and/or amelioration of these unacceptable impacts.

Demolition of 7 Elizabeth Street Sydney

This heritage listed apartment block by the acclaimed architect Emil Sodersten, is a rare example of a 1930s *Moderne* apartment block. *It is the only block of flats constructed in the City of Sydney to have survived and still fulfil its function as a residential building* [SHI citation]. The building is substantially intact and its interiors include at least one intact original apartment interior by the eminent interior designer Marion Hall Best.

The project heritage Demolition of this building is **not supported**. The EIS Heritage impact (p162) for this item is *Major – complete demolition*.

On the basis of the information contained in the EIS, the demolition of 7 Elizabeth is **avoidable**. The building is at the south east corner of the proposed Martin Place North Work Site. The arrangement of construction site facilities shown in the EIS (p77 of summary) for this site show the south western corner of the site unoccupied. The facilities currently proposed for the 7 Elizabeth Street site could be placed here and so allow retention and conservation of the heritage item. A closer examination of the work site layout must be carried out to consider alternative layouts.

Recommendation: That demolition of 7 Elizabeth Street be **avoided** by replanning the arrangement of construction facilities on the north Martin Place Site.

Recommendation: If the demolition is unavoidable, the following actions must be carried out including:

- External archival photography
- Internal archival photography including the Marion Hall Best interiors.
- Archival Measured drawings
- Salvage of fabric of the intact Marion Hall Best interiors and other significant elements of internal or external fabric.
- Incorporation of salvaged elements into interpretative installations in the new station.

Unacceptable Impacts Omitted from the HIA

Loss of existing major art works at the former P&O Building at 55 Hunter Street

It is planned to demolish the existing building at 55 Hunter Street to create the north Martin Place work site. This building was originally built as the P&O Building and was completed in 1963. It incorporated a significant copper wall fountain by eminent sculptor Tom Bass. This fine work was the focus of the notorious *Oz* magazine obscenity trial in 1964. The fountain was restored and reincorporated in the building as part of major refurbishments in the early 1990s to a design by Hassell architects. A large bronze bas relief sculpture on the western wall of the building above street level (not attributed to Tom Bass in available literature but likely to Bass or an eminent contemporary) is clearly of significance and should also be salvaged and conserved.

A significant 1963 Douglas Annand glass screen in the interior foyer of the building was retained in the 1990s and appears to have been covered over by more recent linings. The documentation for the design of this screen is held by the Australian National Gallery http://cs.nga.gov.au/Detail.cfm?IRN=101137 and a photograph by Max Dupain is held by the Powerhouse Museum http://www.powerhousemuseum.com/mob/collection/database//?irn=362222&search=sydney&images=&wloc=&c=0&s=0.

Recommendations:

- The Tom Bass P&O wall fountain should be carefully salvaged, conserved and incorporated into the new building on the site in its existing location.
- The unattributed mid-20th century *bas relief* sculpture on the west façade of 55 Hunter Street be carefully salvaged, conserved and incorporated into the new building on the site in a location similar to its existing location.
- Investigate salvaging and re-installing/re-building the Douglas Annand glass screen in the new building or in the public spaces of the new Martin Place station.

Demolition of existing terrace shops at 56 to 64 Regent Street Chippendale.

According to figures 161 and 162 of the HIA, construction of, and access to, the proposed Sydney Yard Access Bridge requires the demolition of existing terraces at 56 to 64 Regent Street. The HIA is not explicit as to whether 56 (recently adapted with a substantial boarding house at the rear) will be retained although it is clear that the remainder of the row will be demolished. The row is not a heritage item but should be appropriately documented. If 56 is retained, it will require works to turn what is currently part of a row, into a corner building.

Recommendations:

- External archival photography
- Internal archival photography including characteristic interiors and elements.
- Archival Measured drawings
- Salvage of fabric for use in the conservation of 56 (if retained) and the resolution of its south (corner) wall.
- Use of salvaged fabric from the terraces in the public domain design in the vicinity of the new road to interpret the demolished terraces.
- Sale of salvaged fabric surplus to the requirements of the Metro project to a dealer in heritage building materials.

Acceptable Heritage Impacts

Generally

The Metro line and stations are in the vicinity of a number of significant heritage items and Heritage Conservation Areas.

These are itemised and address in the EIS and related technical papers. With the exception of the elements discussed above in Unacceptable Impacts, most heritage places in the vicinity of the project are subject to temporary, *negligible*, *minor* or *moderate*-but-acceptable impacts. Impacts included construction-related vibration, long-term vibration from the operation of the Metro, and visual impacts due to the change of setting arising from temporary or permanent Metro-related structures.

These impacts can be readily managed in accordance with the recommendation of the EIS.

An example of a *moderate* but acceptable impact is the SHR-listed Martin Place railway station. There will be some loss of original significant fabric at the point of connection to the new Metro station but the station will be otherwise conserved and the intervention will not fundamentally detract from its heritage significance.

Recommendation: For all heritage places identified in the report, the following measures will be necessary to ameliorate impacts and facilitate repairs to any damage resulting from the project:

- Dilapidation surveys of affected properties including a comprehensive photographic record of the pre-construction state of the place;
- Installation of 'tell tales', laser/electronic monitoring devices or other suitable structural monitoring systems to existing structural cracks or faults to allow assessment of any structural movement or failure during or after the works.
- Detailed structural investigation of St George's Church is required to determine necessary measures to prevent damage or collapse of the structure during or after the Metro Works.

Archival recording prior to the demolition of existing buildings that are not heritage listed

It is a long-standing City of Sydney policy that **all** buildings within the LGA are photographed prior to demolition for the record and that the photographs are included in a report lodged with the City of Sydney Archives. These photos form a crucial record that is an important research tool for historic and administrative purposes.

A number of buildings proposed for demolition as part of this project, while not being statutory listed heritage items, are older than 50 years and form significant components in existing streetscapes. These must be photographed in their context, externally and internally.

Some of these buildings also warrant archival measured drawings and the salvage of significant fabric for re-use in the conservation of similar buildings. Archival recordings can also be used as part of the heritage interpretation for the demolished buildings.

Recommendation: Undertake detailed archival recording for all buildings prior to their demolition, regardless of heritage listing.

Table 1 – Buildings requiring archival recording prior to demolition

In addition to the places recommended for archival recording under item NAH1 in table 119 of the HIA, the following are recommended:

Building address	Archival photography	Measured Drawing	Salvage of fabric
55 Hunter Street	Yes	No	Yes. Three artworks, including those by Bass and Anand, discussed above.
5 Elizabeth Street	Yes	No	No
7 Elizabeth Street (included in NAH1 but drawing and salvage necessary)	Yes	Yes	Yes. Include Marion Hall Best apartment interiors.

Building address	Archival photography	Measured Drawing	Salvage of fabric
8A-12 Castlereagh Street	Yes	No	No
12A Castlereagh Street	Yes	No	No
37-51 Martin Place	Yes	No	No
Martin Place public domain	Yes	No	Paving stone and other elements for re-use elsewhere by the City of Sydney
Martin Place Underground Railway Station	Yes	No	Salvage ceramic tiles and other fabric for re-use in conserving retained sections of station
250 Pitt Street	Yes	Yes	Yes
252-254 Pitt Street	Yes	No	Yes
256-256A Pitt Street Sydney	Yes	No	Yes
40-40A Park Street Sydney	Yes	No	No
42 Park Street Sydney	Yes	No	No
44 Park Street Sydney	Yes	No	No
46 Park Street Sydney	Yes	No	No
48-48A Park Street Sydney	Yes	No	No
125-129 Bathurst Street Sydney	Yes	No	No
131-135 Bathurst Street Sydney	Yes	No	Yes
300 Pitt Street Sydney	Yes	Yes	Yes. Include *faience* decorative elements on Pitt Street façade.

Building address	Archival photography	Measured Drawing	Salvage of fabric
302 Pitt Street Sydney	Yes	Yes	Yes. Include fabric related to Druids' Lodge ceremonial spaces (plaster cartouches) and timber structural members.
56-64 Regent Street Chippendale	Yes	Yes	Yes. Include shop front elements and building materials.
49-109 Botany Road Waterloo inclusive (i.e. all buildings within the block including the Church at 103-105 Botany Road).	Yes	No	No
124-174 Cope Street Waterloo inclusive (i.e. all buildings within the block).	Yes	No	No

Interpretation of demolished buildings that are not heritage listed

A number of buildings proposed for demolition as part of this project, while not being statutory listed heritage items, are older than 50 years and form significant components in existing streetscapes and as the setting for retained heritage items.

Recommendation: The demolished buildings should be the subject of permanent, high quality interpretative displays in the vicinity of their locations.

The interpretation can take the form of historic and contemporary photographs, graphic and documentary material but could also incorporate salvaged sections of significant elements of fabric. Interpretation could potentially inform, or form part of, the public art component of new stations or public domain. There are excellent international precedents for heritage interpretation as a means of place-making and integrated development.

These installations should be located in conspicuous, publicly accessible places.

Recommendation: A consent condition should be included to require heritage interpretation of demolished or changed places that are heritage items or more than 50 years old.

Design Quality of the New Buildings Required for the project.

The Sydney LEP 2012 Design Excellence provisions (cl.6.21) requires new development (amongst other things) to address *any heritage issues and streetscape constraints* [(4)(d)(iii)]. It is assumed that all new buildings and structures associated with the project will comply with the objectives and provisions of the Sydney LEP 2012 and Sydney DCP 2012. This particularly applies to building form and design excellence. Further detail is provided in the *Urban Design* and *Landscape Character and Visual Impact* sections of this submission.

Archaeology

The impacts on the archaeological resource identified and discussed in the HIA appear to be realistic. With appropriate research design, and appropriate monitoring of excavation, areas subject to *major* impact may yield important archaeological information that will add to the knowledge base and artefacts that could potentially form part of the heritage interpretation for this project.

15. Aboriginal heritage

Introduction

The Council of the City of Sydney acknowledges Aboriginal people – and particularly the Gadigal people of the Eora Nation – as the traditional custodians of the land through which the propose Metro will pass. The City of Sydney is actively engaged with the living Aboriginal and Torres Strait Islander culture of Sydney and its *Innovate* ***Reconciliation Action Plan*** *2015-2017* (RAP) was adopted in 2015. One key actions in this plan is to *increase knowledge within the broader community of the history, heritage, cultures and social values of the Aboriginal and Torres Strait Islander communities of Sydney.*

The proper and respectful treatment of any sites of aboriginal cultural significance affected by the Metro project is an obligation and should be seen as an opportunity for the promotion of knowledge of aboriginal history and the reconciliation with living aboriginal culture.

The Metro project requires large scale excavation at a number of worksites in the Sydney LGA. The potential for impacts on sites of Aboriginal Cultural Heritage is assessed in *Sydney Metro Chatswood to Sydenham Technical Paper 5 – Aboriginal Heritage – Archaeological Assessment* (AHAA) by Artefact, dated May 2016.

The report below is a response to this technical paper.

Any recommendations below are in addition to heritage mitigation measures proposed in the body of the AHAA, the executive summary or in *Table 4: Aboriginal heritage mitigation measures* (p106).

Eora Journey

During construction, should the Metro uncover any items of Aboriginal cultural heritage, these items could be used to inform the City's Eora Journey initiatives.

Any items should be respectfully treated, include an interpretation of the sites where they were found, and be recorded.

Recommendation: Consider use of any found Aboriginal cultural heritage items in the City's Eora Journey initiatives.

Impacts on Known places of Aboriginal Cultural Heritage in the Sydney LGA

Currently known sites of Aboriginal cultural heritage are identified in the Aboriginal Heritage Information System (AHIMS). This system logs and maps site knowledge accumulated over years of archaeological investigation and community input.

The AHAA studies each of the Metro worksites within the Sydney LGA and establishes that *there are no recorded sites within the study area* (p104) and that none of the sites is within 100m of a known site of Aboriginal cultural heritage identified in the AHIMS.

The technical paper goes on to assessed each work site based on existing knowledge of the topography, geology, pre-European history and post 1788 history of each site. It has referenced historical maps, photographs and other documentary evidence. Of particular interest is a summary of previous archaeological digs in the Sydney LGA discussed in section 6.4.1 pp24-28. This gives an idea of the kinds of

archaeological conditions and artefacts that could be anticipated during excavations for the Metro in the Sydney LGA.

The AHAA ranks the work sites in the LGA on both their archaeological potential and archaeological significance on a scale of *Low/Moderate/High*. The archaeological significance of any discoveries within the Sydney LGA is *potentially high.* This is because the area has been significantly disturbed during its long European occupation: finding intact aboriginal artefacts is rare and they would be of high research significance.

Table 3: Overview of archaeological potential and archaeological significance (pp101-102) summarises the sensitivity of each site. All sites within the LGA are ranked of *moderate to high* archaeological potential and *potentially high* archaeological significance.

Mitigation and Management Measures

Section 8 of the AHAA recommends measures for the mitigation and management of impacts and these are summarised in *Table 4: Aboriginal heritage mitigation measures.*

These measures are appropriate and are supported. The first measure (AH1) is particularly crucial as it requires that *Aboriginal stakeholder consultation be carried out in accordance with the NSW Office of Environment and Heritage's Aboriginal Cultural Heritage Requirements for Proponents 2010.*

It is very important that research, site investigation and mitigation measures be carried out to the highest standard. In addition to the obvious probity and community benefits, this is particularly important for the risk management of the project. The recent uncovering of extensive aboriginal artefacts at Randwick Racecourse during Sydney CBD and South East Light Rail project works gave rise to community concerns and generated adverse press on the management and scope of the project. Regular and comprehensive contact with appropriate stakeholders is essential to satisfy the community that Aboriginal cultural heritage is respected and promoted by the project.

Recommendations:

- Engage with and inform the Metropolitan Local Aboriginal Land Council, and any stakeholders nominated by them, at all times during the planning and implementation of the project
- Consider all elements of aboriginal cultural heritage encountered by this project as opportunities for understanding and promoting Aboriginal and Torres Strait Islander culture.
- Actively anticipate the research, site investigation, salvage and culturally appropriate safekeeping of Aboriginal cultural heritage uncovered by this project.
- Develop an Aboriginal Cultural Heritage Interpretation Plan that incorporates knowledge and artefacts uncovered by this project in a culturally appropriate way to explain the Aboriginal history of the affected places and inform the place making of the new stations (refer to Mitigation Measure AH4).
- For areas within the City of Sydney LGA, Metro should contact the Metropolitan Local Aboriginal Land Council directly for cultural advice.
- The Metropolitan Local Aboriginal Land Council is the custodian of Aboriginal culture and heritage within the Sydney region. The website is: http://metrolalc.org.au.

- City of Sydney staff refer to the Metropolitan Local Aboriginal Land Council for any cultural advice or representation under the Principles of Cooperation signed by the Metropolitan Local Aboriginal Land Council and the City of Sydney in 2006 (http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0020/113672/Principles-of-cooperation.pdf).
- For more information about Sydney's Aboriginal and Torres Strait Islander communities, please see the City's website: http://www.cityofsydney.nsw.gov.au/community/community-support/aboriginal-and-torres-strait-islander-communities.

16. Landscape character and visual amenity

It is noted that this chapter does not fully address the requirements of the SEARS for Urban Design.

The City is supportive of the delivery of a new Metro service for Sydney, with stations in the CBD. It is understood that the construction of this infrastructure requires some substantial disruption to the City's public places, streets and roads. As part of an ongoing relationship with Metro, **the City can assist with the successful management of these disruptions and help to reduce the impacts visual and landscape amenity** throughout the construction period.

Recommendation: That ongoing liaison be formalised through a Design Review Panel or similar with the City in any Conditions of Consent to manage the impact of construction on the character and activity of the City, particularly in the CBD.

Methodology

Landscape Impact Assessment

The methodology of assessing the landscape impact is effective only in assessing impact on landscape character, not on urban design, and **does not adequately account for the important functional roles of the public domain**.

The Urban Design Chapter of our submission deals with this issue in more detail.

Visual Impact Assessment

The methodology of assessing the visual impact is sound. However, in many cases, the link between the existing condition, the degree of change and the determined visual impact is not complete. In the absence of plans illustrating extent and nature of works, it is difficult to determine the degree of change and this is noted anecdotally instead.

The City has listed concerns in response to the changes depicted in visualisations, but should be consulted further as part of a design reference group or design review panel to agree modifications to the public realm.

Envisaged Future Landscape

The Landscape Impact Assessment must consider the envisaged or future landscape character beyond the *Sydney Local Environmental Plan* 2012 (SLEP) and *Sydney Development Control Plan* (SDCP). The City's public domain strategies, plans, policies and codes should also apply.

- Sustainable Sydney 2030 Big Moves
- City North Public Domain Plan (Martin Place)
- Harbour Village North Public Domain Plan (Barangaroo)
- Lighting Code (and Creative Lighting Strategy)
- Liveable Green Network
- Chinatown Public Domain Plan (Central Station)
- City of Sydney Open Space and Recreation Needs Study
- Urban Forest Strategy

Recommendation: Any Conditions of Consent are to require that the proponent comply with all relevant City of Sydney policies during detailed design, construction and operation of the Metro.

In the case of Barangaroo and Waterloo Stations, the future context will be significantly changed from the existing as a result of major development managed by State Government Authorities.

The reinstatement of the landscape, streetscape and urban realm in general, should be designed appropriately. Materials, furniture and finishes should be installed as per the City of Sydney Streets Design Code.

At Waterloo Station, the City expects the quality of reinstated streets and public spaces to be of the same quality as Green Square Town Centre, or better. This minimum standard is described in the City's *Streets Code* as a Village Centre or Activity Strip. **Set out of all streets are to be consistent with the *Streets Code*, allowing sufficient pedestrian movement and circulation space.**

At Barangaroo, the City Centre standard of materials and finishes should be applied, or better, to integrate with Hickson Road.

Recommendation: That all final street design, fixtures, materials, finishes and trees are agreed to and approved by the City of Sydney.

Unmitigated Impacts (general)

Trees

The City would consider any tree loss to be a negative impact and must be mitigated by replacement. All new trees to be supplied and installed to City Standards and be a minimum 400L specimen. Species as per the *Street Tree Masterplan* or as agreed with the City.

Under the *Urban Forest Strategy*, any redevelopment is required to contribute to the Urban Canopy by planting new, additional trees.

Recommendation: Any new trees are to be of a size and species consistent with the City's policies and are to be approved by the City prior to installation.

Night-time Visual Impact - Construction

The proposed night time visual impact though construction is likely to be higher than determined by the EIS, in all cases. Construction lighting through the night could be distracting to office workers and residents. This should be managed on a site-by-site basis with shading or directional lighting devices.

Metal-clad Acoustic Enclosures

It is expected that these structures will have an external finish that is visually recessive and non-reflective. It is expected that Metro or Transport for NSW will maintain a high quality appearance of these structures throughout the construction period, as they will be very obvious in the landscape setting of the station. Integration of public art may assist with this.

Heritage Item - demolition

Many heritage items will be lost and these have been an integral part of the landscape character.

Interpretive design consideration for proposed development and station design.

Thomas Bass Sculpture

Should be integrated into new building and remain a part of the streetscape, as originally intended.

Activation of the Street

All development fronting the street, including but not limited to the station entries, will have an impact on the landscape and streetscape. **The most beneficial impact this development can have is to activate the street, with fine grain retail frontages or community uses in the ground floor.** Long blank facades do not make a positive contribution to the streetscape and are generally out of context in an urban environment.

Pedestrian Management

Pedestrian guard-railing is often considered in engineering terms as a suitable intervention to manage pedestrian flows and guide pedestrians to suitable crossing points. However, pedestrian guard-railing has many negative effects including safety implications and poor urban domain outcomes that need to be robustly assessed prior to any consideration of installation.

Transport for London has undertaken a program of engineering assessments to determine a safety case for either keeping existing pedestrian guard-railing in place, or when considering new guard-railing. It is known as the GRAF Programme. In early 2009, over 30% of the guard-rail in the Transport for London network had been removed.

In July 2011, Transport for London put forward a paper to its Surface Transport Panel to explain the program. Its main focus was three key areas;

1. The intention of the program to remove guard-rail to provide 'better streets';
2. How design engineers were recommending that guard-railing be installed on projects regardless of an assessment of whether it was needed; and
3. That the future direction will be a briefing to Road Safety Auditors stating that all pedestrian guard-railing is to be removed, and following a road safety audit, determining whether it is in fact appropriate for safety reasons to install it.

More information on this paper can be found here: http://content.tfl.gov.uk/Item05-STP-12-July-2011-Guardrail-Removals.pdf

It remains the City's position that pedestrian guard-railing should not be installed and instead, where some kind of safety intervention is required; that it is consistent with providing a more amenable and attractive public domain.

Original studies for the London program also found that where guard-railing was removed, provided for a safer street environment as all road users became more aware of their environment and other road users.

Barangaroo

Landscape Impact

The Assessment should have considered the City's *Harbour Village North Public Domain Plan* in the end state of landscape.

The development of the station at Hickson Road and works to the eastern edge of Hickson Road represent an **opportunity to improve connections from the Millers Point area to Barangaroo Parklands via a lift**. This would significantly improve

east-west connectivity for existing and future residents, workers and visitors of Barangaroo Central, Parklands, Millers Point and City North.

Station exits

The proposed northern station exit is supported but its location in the parkland is not supported. An exit structure in this location will:

- limit views of the park
- reduce the overall amount of open space available for recreation
- reduce the openness of the parkland to the street
- create awkward and potentially unsafe spaces at night.

The City understands Metro's intention to create an iconic structure that opens out to the iconic Headland Park. It is the City's view that this aim can be achieved and still reduce the encroachment of the station entry in the park. However, it is **not a suitable outcome to lose valuable open space for infrastructure purposes** when it is reasonable to contain that infrastructure completely within a development site envelope.

Similarly, the EIS proposes that operational structures including ventilation shafts and skylights are to be positioned on the eastern footway on Hickson Road. **The City does not support the location of these structures in the public domain.**

Our reasons for not supporting the ventilation shafts are for safety (abutments into the public domain provide places to hide and limit access during event mode), access (the width of the footpath will be reduced) and future demand reasons. There may be potential to recess this operational infrastructure inside the eastern wall of Hickson Road or at some other location within a Barangaroo development site that still supports the function of the Metro station.

Alternatively, if these structures cannot be relocated, they should be subject to a design excellence process to ensure a positive outcome.

Recommendations:

- Consider alternative design arrangements for structures in the public domain to site them wholly within a development site;
- Any structures in the public domain should be subject to a design excellence process; and
- A CPTED analysis should be conducted on the final proposition.

Visual Impact

The visual impact assessment indicates some substantial physical interventions along the eastern wall of Hickson Road. **Further detail is required to understand the impact on Hickson Road arrangements for pedestrians, cyclists and vehicles.**

Any tree removal would require replacement and embellishment.

The proposed station in the parkland should not impede sight lines of the park from Millers Point, or views into the park from Hickson Road.

Recommendations:

- Consider the installation of a lift to connect Millers Point and Barangaroo, and this should integrate with the Barangaroo Central development; and

- Integrate the Metro station entry wholly into a development envelope and not encroach into the parkland.

Martin Place

Landscape Impact (construction)

Pedestrian level of service

Pedestrian level of service F on the remaining station exit stair is not acceptable in this busy commercial centre of national significance. **A temporary stair exit should be installed in the temporary plaza throughout construction** to relieve this.

The detouring of pedestrians moving east-west along Elizabeth and Castlereagh Streets is awkward and potentially circuitous. **The level of demand for an east-west movement may require that a temporary arrangements are put in place to give over some of the parking lane to pedestrian movements.** Any loading zones or other economic parking functions that are impacted should be relocated.

It should be considered that maintenance of a pedestrian thoroughfare through Martin Place is preferred to the provision of a temporary plaza.

Temporary pedestrian plaza

If a temporary plaza is to be provided, it should be activated with **temporary uses, including seating, planting and public art.**

Events

Many cultural and civic events are held in Martin Place. The EIS identifies that the Pedestrian Level of Service falls to 'F' during construction. This does not account for events and is likely to have a significant safety implications for pedestrians.

The EIS also does not account for the other events that are frequently held in Martin Place or in the streets adjacent that will affect pedestrian movements. The City has a full schedule of upcoming events and will provide information to assist with planning for events in the vicinity during the construction period.

Metro must employ alternative solutions for managing pedestrians during events in the construction phases, and coordinate with the City to ensure that all planned events are covered.

Recommendation: Liaise with the City to plan for and provide better pedestrian amenity in and around Martin Place during construction.

Landscape Impact (operational)

Envisaged Landscape: Martin Place Masterplan (*City North Public Domain Plan*)

The City has a vision for Martin Place that is well-documented by the *City North Public Domain Plan* (Martin Place Masterplan) and the SLEP and SDCP.

The base case Landscape condition described in the EIS does not include the *City North Public Domain Plan,* which includes a Masterplan for the whole of Martin Place. The Masterplan envisages the following interventions in the vicinity of the station:

Additional trees and seating opportunities for Martin Place;

- Closure of the shopping circle and relocation of station entries into buildings;
- Extension of pavement over intersections; and

- Continued pedestrian movement along the edges of Martin Place with event space focussed on the centre.
- The City supports Metro's proposals to relocate the existing station entries, and expects that works associated with the new station and rectification works would be delivered as per the City's Masterplan.

Any landscape outcome that does not reflect the aspirations and works of the Masterplan would be considered a detracting impact.

Recommendation: Include in any Condition of Consent a requirement of the Metro project to reinstate Martin Place as per the Martin Place Masterplan, including trees, topographic works and furniture.

Landscape Impact described by EIS

The EIS indicates that station exits at Martin Place would open to Castlereagh Street and Martin Place directly.

The **provision of an exit opening directly on to Martin Place is problematic** for two reasons:

1. *Negative impact on all other pedestrian movements through Martin Place*. The pedestrian movements through Martin Place are aligned with the edges and generally occupy the full five metres of pavement at each side. During events, event infrastructure occupies the central portions of Martin Place and pedestrians are concentrated to the edges further. A direct exit to Martin Place would disrupt these movements.
2. *The levels are steeply sloping in this block of Martin Place and this would create difficult threshold junctions at entries to the station*. Level changes in Martin Place such as steps, ramps or retaining walls, are not supported because they would affect pedestrian movement through the space as described above, and represent a significant departure from the existing and envisaged landscape setting of Martin Place.

The imagery in the EIS indicates a blank façade fronting Martin Place. **Small, fine grain retain tenancies should be considered along all frontages of the Station development**, including the frontage to Martin Place, where tenancies may step up with the topography and activate the space outside of peak travel times. Note that there is only one other building entry and exit on to this block of Martin Place.

Recommendation: That an exit directly to Martin Place is not included in the station design to enable (and not conflict with) the predominant east-west pedestrian movements along the edges of Martin Place.

Visual Impact (construction)

Recommendation: Hoardings over Martin Place should be overlaid with imagery depicting a realistic view of Martin Place from that location, be that historic or future. The hoarding imagery may include both or change over the period of construction as the station develops. Any hoarding design is to be agreed with the City.

Visual Impact (operational)

Martin Place is the City's premier civic and ceremonial public space. It is characterised by long axial views, and a consistent edge defined by primarily masonry and stone buildings. The public space itself is formal in arrangement, with various activities and memorials arranged along the centreline of the space.

The scale, form, articulation and materiality of the buildings defining the space is managed by a **special set of controls for the Martin Place Special Character.** A

consistent street wall height is observed, and **new buildings are required to support the heritage character with stone and masonry facades beneath the street wall**, and articulation that speaks to the detailing of other nearby heritage items.

The City supports the redevelopment of the site at 39 Martin Place, with a new station that defines the edges of the space and **contributes to the Special Character Area qualities.**

The visualisation contained within the EIS represents a significant departure from the objectives of the Special Character Area and would create a detracting visual impact on the character of Martin Place.

Station design

The design of the station **must to be developed further to better contribute to the Special Character Area** and ensure a beneficial impact of the Metro project. The Station building design should be amended to have:

- Much reduced glazing and light emission to Martin Place;
- Significantly more masonry, particularly in the expression of columns, to match other heritage buildings and to hold the edges of the public space at the intersections. The station is fronting a short block of Martin Place and strong definition of the edges is important; and
- Reduction in the extent of Martin Place fronted by the station, fine grain retail tenancies should step up along the length of Martin Place.

Each of these points would also help to manage light emission into the public space at night. This is an important consideration in that there is a **lighting masterplan for Martin Place that allows for a comfortable, consistent and safe ambient light level through the public domain**, with up-lighting of memorials, trees and building facades as appropriate to their significance.

Metro should also ensure that any dynamic advertising within the station, or advertising visible from the street is not commercial in nature.

In keeping with the implementation of the *City North Public Domain Plan*, new buildings along Martin Place have been required through their Conditions of Consent to provide back-of-house facilities within the development (including kitchen and storage) for future food and beverage service to Martin Place.

Recommendations:

- That the Martin Place Special Character is maintained by ensuring the built form of the station sits within the existing and future fabric of Martin Place;
- Provide back-of-house facilities within the station development for future food and beverage service to Martin Place;
- That signage visible from the street, dynamic or static, is not commercial in nature; and
- That a strong sandstone masonry presence is incorporated into the station design.

Pitt Street

Landscape Impact

Pitt Street station will continue to provide an important transport interchange environment, and this I acknowledged in the EIS. Park Street will continue to be an important bus thoroughfare and interchange location. The Sydney Light Rail will also be in operation with a stop at Town Hall.

The EIS has not captured the interchange function of York Street buses with the future Pitt Street station and this should be rectified. Buses using the York Street interchange service provide an important connection for customers from the inner-western harbour-side suburbs and the north to service to the east and south.

The design of **the station should not include any exits to a corner**, and this appears to have been reflected in the EIS. This should carry through to any further designs.

Public Domain

Given the interchange function described above, pedestrian numbers on Park Street are expected to be high in morning and evening peaks. If the York Street interchange is included, the numbers should be higher than reported in the EIS. Metro will need to undertake further pedestrian modelling to ensure the movements from York Street and the light rail are captured and accounted for in the design of the public domain.

The **City does not accept that a suitable mitigation measure to provide for more pedestrian space is the deletion of trees or street furniture**, as has been suggested in the Traffic and Transport assessments. Trees are important for shade and urban amenity, and street furniture is important to provide for clean streets and places to sit for older or mobility impaired pedestrians, or people waiting. Rather, a better outcome might be to amend SCATS to include more green time for pedestrians, or the implementation of scramble crossings, or some other intervention that assists movement without removing important streetscape elements.

However, should the replacement of any trees be necessary, this should be done in consultation with the City and any new or replacement street trees are to be in accordance with the City's Street Tree Masterplan.

Recommendation: New or replacement trees should be considered in consultation with the City and are to be in accordance with the City's Street Tree Masterplan.

Visual Impact

Assuming that the streets will be reinstated to City standards, including replacement of trees lost; it is anticipated that the greatest visual impact that the Metro will have in this part of the City is that created by the new buildings erected on the development sites, including the stations.

In determining the visual impact of the northern station exit, **the envisaged landscape should include the future Town Hall Square**. When the Square is delivered, the Metro station would be one of the defining edges, along with the Town Hall, QVB and the Citibank building. Views to the Metro Station will be available directly from the steps of the Town Hall, and from adjacent Sydney Square.

Recommendation: Given the significance and visibility of the station on the corner of Pitt and Park Streets, the building design should be reflective of the scale, form, articulation and materiality of other buildings around the future Square, particularly those listed above.

The development sites at both the north and south station exits are adjacent to listed heritage items under the SLEP and SDCP and the built form scale, articulation and materiality of all buildings erected on these sites must comply with the City's built form controls in order to minimise a visual impact, and ensure that any visual impact is beneficial.

The Station building will occupy a large proportion of the frontage to Park Street on that street block. **Façade design must be considered as a mitigating measure**, where opaque sections of the façade would enable a reduction of light spill into Park Street beyond an ambient level. **High levels of light emission along that frontage would distract from the lighting design on building facades of heritage buildings around Town Hall**, and draw the focus away from Town Hall for pedestrians in the future Square. **Consideration of a more masonry character to these facades should be given.**

The visualisations provided do not show awnings.

Recommendation: Awnings are required on all street facades and should be of a height matching the surrounding developments.

Central

Landscape Impact

The proposed access bridge to Sydney Yard will have a vehicular entry at Regent Street. The Landscape Impact is potentially significant for pedestrians, if the intersection is not adequately designed.

Recommendation: The Sydney Yard Bridge should be designed to minimise impact on pedestrians, by:

- Utilising a shared zone solution between Regent Street and the bridge, where one or more trucks may wait for passage across the bridge;
- Providing a footpath continuation across the vehicular crossing; and
- Minimise extent of vehicular crossing by allowing the turning circles of vehicles crossing into and out of Regent Street to overlap.

Visual Impact

Visual impact of the permanent Sydney Yard Access Bridge must be further considered in design development.

The bridge will be highly visible in significant views including from Prince Alfred Park and from the Cleveland Street Bridge towards the Central Station Clock tower.

The bridge will be part of the views from trains arriving and departing Central Station. The bridge will obscure views from the train of the Mortuary Station.

Recommendation: There may be opportunities, given the proposed size and scale of the bridge, to incorporate interpretive or artistic elements to the design such as can be found on the southern side of the Goulburn Street carpark building as trains travel north from Central.

Waterloo

Both the landscape and visual impact of the Metro at Waterloo could be significantly improved if the eastern edge of the development block was to be set back from Botany Road.

A road widening has been partially implemented on the opposite side (western side) of Botany Road, but a heritage item at the corner of Henderson Street and Botany Road precludes the widening being achieved along the full, desired length. Any road widening should facilitate improved urban amenity with appropriate footpath widths and cycle facilities that is consistent with a dense urban renewal context.

The existing Church at 103-105 Botany Road is a heritage item proposed for retention in the project description. The setback to the Church would represent an appropriate alignment for the setback along the full length of the development block.

A setback from the eastern edge of Botany Road would have the following positive landscape impacts:

- Enable widening of Botany Road as planned;
- Enable retention of important heritage structures, particularly at the gateway intersections for adjacent neighbourhoods;
- Enable new and replacement tree planting on both sides of Botany Road to significantly improve the amenity for all people in the public domain
- Enable a better separation and outlook for development either side of Botany Road.

Landscape Impact

It is proposed that 16 trees are to be removed, and the **City expects that the mitigation measures for this station would include replacing all trees**.

Consideration of the existing landscape character should include the scale of redevelopment proposed by Urban Growth at the Redfern and Waterloo sites. These two sites are in close proximity and have a relationship to each other, including as an active transport corridor between the Redfern high street and Zetland.

Development of this scale and intensity requires a higher quality public domain to cope with the additional pedestrian volumes and circulation. Reinstatement of streetscapes should consider this and apply a quality of finish from the City of Sydney Streets Code appropriately, including furniture.

Depending on the development outcomes for the Urban Growth sites to the east, a through site link mid-block between Raglan and Buckland Streets would assist with pedestrian permeability.

It is **expected that Cope Street will be a slow zone with pedestrian and cycle priority**, providing access to the services contained in the station development and integrating with the adjacent residential precinct. **Cope Street should be reinstated to meet that desired outcome.**

While outside the envelope of Metro itself, the development of the station as the catalyst for the Waterloo renewal has an influence on the wider area. **The City strongly recommends that Metro consider implementing a second entrance to the south of the station box** to capture demand from the south of the intensified Waterloo estate, to customers along McEvoy Street (including workplaces, social destinations and many medium density residential blocks), and to the north of Zetland. Coupled with this, it is important that McEvoy Street to the south of the Metro station enables and provides excellent pedestrian and cycle connectivity on a north-south axis to help customers travel from the north of Zetland to Waterloo station, and provide some relief to the overcrowded Green Square station particularly in the AM peak.

Recommendation: Strongly consider implementation of a second entrance at Waterloo to the south of the station box, to cater for demand to the south and at the southern end of the dense Waterloo site.

Visual Impact

The design of the station and the associated buildings should consider the scale and form of the northern and southern intersections with Botany Road.

17. Groundwater and geology

The City supports the mitigation measures proposed.

18. Soils, contamination and water quality

Overview

In accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the project, the proponent must assess whether the land subject to this development is likely to be contaminated and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines.

The relevant guidelines are outlined in section 1.8 of the report.

The guidelines referred to include NSW Office of the Environment and Heritage *Guidelines for Consultants Reporting on Contaminated Sites 2000* the purpose of which is to ensure that reports prepared by consultants on the investigation and remediation of contaminated land contain sufficient and appropriate information to enable efficient review by regulators, Site Auditors and other interested parties. The Guidelines also outline the investigation stages that should be followed when undertaking a land contamination assessment which generally commence with a Preliminary Site Investigation. This considers past and present potentially contaminating activities that have occurred on the subject land , the potential contaminants of concern and the need for further detailed site investigations to be undertaken which would involve soil and ground water sampling in order to determine if the land will require remediation in order to make it suitable for the proposed land use.

Technical Paper 8 now submitted is the Preliminary Site investigation for this project.

In undertaking the Preliminary Site Assessment a review has been undertaken of NSW EPA Contaminated Sites Register and Record of Notices (under Section 58 of the *Contaminated Land Management Act 1997*). This has highlighted the former gasworks site at Hickson Road, Millers Point located in the City of Sydney CBD area which is subject to a Management Order served by the EPA under the Contaminated land Management Act1997 in relation to the Barangaroo station development.

Barangaroo Station

A number of contamination investigation reports were provided by the Barangaroo Delivery Authority as outlined in part 2.10.3 of the report which included the JBS Environmental (May 2013) *Remedial Action Plan (Final Draft) Barangaroo Central and the* Environ (July 2013) Site Audit Report Remedial Action Plan, Barangaroo Central.

The location of the former gasworks along Hickson Road at Barangaroo is a known source of contamination including hydrocarbons, heavy metals and metalloids in soil and groundwater and potential vapour issues considering the proposed station construction.

Specific investigations and the existing Remedial Action Plan targeting the Barangaroo Central Development Area (which incorporates the construction footprint of the proposed Barangaroo station) have been reviewed and it has been confirmed that a number of contamination issues are present in the proposed construction footprint of Barangaroo Station including contaminated soils, groundwater and

vapour intrusion. Based on the information provided and reviewed the report states that the main contamination issues which need to be considered during design and construction of the proposed Barangaroo Station are as follows:

- Appropriate management, treatment and/or disposal of contaminated soils excavated to facilitate subsurface construction of station elements.
- Management of contaminated groundwater and vapours into subsurface excavation and structures. This would be especially relevant for excavations occurring in the southern portion of the construction footprint located closer to the declaration area. Migration of contaminated groundwater and vapour would need to be considered as part of the design phase and managed during construction.

Risks associated with contamination extending deeper than 10 meters below ground level have not been considered as part of the remediation detailed in the above information. Tar contamination could be a concern in the deeper strata. It is understood that construction elements below Barangaroo Station could extend to 30 metres below height datum.

Recommendation: Potential contamination risks below 10 meters will therefore need to be addressed by design and managed during construction.

The report concludes that contamination poses a high risk to the construction and operation of Barangaroo Station given that soils and bedrock would be excavated and groundwater may need to be managed to facilitate construction of the station. Gasworks wastes can also be odorous. These odours (if present) may need to be managed during construction activities and vapours may need to be monitored within sub-surface spaces during operation of the station (dependant of the design of the station). Further investigations are therefore required to better understand the potential risks.

Other areas of concern within the City of Sydney LGA have been referenced in the report including the railway at Central Station, Regent Street Service Station (Potential leaks and spills from fuel storage infrastructure) and former and current land commercial/industrial land use at Waterloo such as dry cleaners and automotive industries.

Mitigation Measures

The report states that updated desktop contamination assessments would be carried out for the identified Potential areas of environmental interest (AEI) including Barangaroo Station, Central Station and Waterloo Station.

If sufficient information is not available to determine the remediation requirements and the impact on potential receivers, then detailed contamination assessments, including collection and analysis of soil and groundwater samples would be carried out.

Detailed contamination assessment would also be carried out for the Barangaroo power supply route within Hickson Road and the Marrickville power supply route adjacent to Sydney Park and Camdenville Oval.

In the event a Remediation Action Plan is required, these would be developed in accordance with *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land (*Department of Urban Affairs and Planning and Environment Protection Authority, 1998) and a NSW EPA accredited site auditor would be engaged.

Prior to ground disturbance in high probability acid sulfate areas at Barangaroo Station, Waterloo Station and Marrickville dive site, testing would be carried out

to determine the presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998).

The City endorses the engagement of a NSW EPA accredited site auditor to review site specific contamination reports and approve any proposed remedial strategy in order to confirm through the Site Audit statement process that these sites can and will be made suitable subject to implementation of the approved Remedial Action Plan. On completion of the remediation process, the remediation will then be subject to validation by the site auditor and a Section A site Audit statement obtained confirming the specific sites are suitable for the proposed use.

19. Social impacts and community infrastructure

The proposal will provide significantly enhanced connectivity and access both at a metropolitan level and within the City of Sydney's LGA. The overall proposal supports the City's broad social sustainability directions as set out in the City's *Social Sustainability Draft Policy and Discussion Paper* (http://sydneyyoursay.com.au/socialsustainability), particularly regarding social inclusion and liveability.

Inclusion and accessibility

There are a number of key impacts and opportunities from a social sustainability perspective that should be incorporated into the planning for this proposal.

Access at Barangaroo

We note that an important catchment for the station is Millers Point, The Rocks and North CBD. We note a significant grade separation of approximately 10-13 metres between the station entrance and Millers Point, which will form a substantial barrier for many rail users who are older, mobility impaired or have small children including those with prams. We note that while there are a range of pathways and connections from Barangaroo to the east from the station area, all involve significant grade difference. This will reduce the overall accessibility and connectivity of the station to these areas. This is likely to also have an important influence on broader pedestrian circulation flows around Millers Point, the Rocks, Circular Quay and the north CBD, including during large events such as New Year's Eve and Vivid.

Recommendation: There is an important opportunity to investigate the inclusion of a station entrance with elevator linking the station to the elevated area of Millers Point, (e.g. in the vicinity of Kent Street) and the CBD North so there is better on-grade accessibility to the east of the station catchment.

Access at Waterloo Station

We note that the block from Raglan to Wellington St is a long block, approximately 215m which would benefit from a mid-block through site link to enhance connectivity and provide a supplementary link to south bound bus stops. As discussed in the Landscape and Visual Impact comments, this is best suited at the location of the retained Church building.

Recommendation: Include an on-grade, mid-block, through-site link between Cope Street and Botany Road at Waterloo Station.

Access to public toilets

Access to public toilets supports older people, and people with mobility impairments and medical conditions to pursue active transport as it allows to travel further by foot or bike with confidence. Recently, Sydney Trains reconfigured Town Hall and Wynyard Stations so that only people with Opal cards could access public toilets. This undermines the Government's overall position of supporting active transport[2].

[2] Transport for NSW (2013) Sydney's Walking Future, p18

Likewise, for stations to play an effective role as a key community hub, public toilets at key stations should be available to station users, whether travelling or not, without needing to enter ticket gates.

It is noted that the City of Sydney's *Public Toilet Strategy* specifically identifies two key locations for additional public toilets in places where stations are planned. These locations are:

- Barangaroo; and
- George St light rail corridor – which could be serviced from Pitt Street station.

Recommendation: That new station toilet facilities are accessible to people both travelling at that time and those who are using the station generally without needing to enter ticket gates.

'Changing Places' Toilets

The City encourages Metro to include the provision of a 'changing places' toilet facility in at least one of the new CBD metro stations.

Changing Places toilets are specialised accessible toilets that include an adult change table and larger circulation space. **They are designed to meet the needs of people with profound disabilities and their carers**, who currently are often forced on the floor of accessible toilets for changing and cleaning purposes. See specifications and further information at: www.changinglaces.org.au

Changing Places facilities are not currently required under the Building Code of Australia or the Access to Premises Standards and therefore are not mandatory in any building. **However, there has been a growing movement to provide these kinds of facilities in major public urban developments.** In the UK there are now over 1,000 facilities in a variety of public buildings and facilities.

The Victorian Government has recently funded seven facilities, included at the Melbourne Cricket Ground and public hospitals. The NSW Department of Family and Community Services, through its 'Lift and Change Project' is working to collaborate with local governments and major state government organisations to identify locations where these facilities could be provided within public buildings. They have identified the Sydney CBD and tourists precincts in Darling Harbour and Circular Quay as preferred areas. **A changing places facility in the Sydney CBD is a high priority**, as the only other changing places facility in greater Sydney is in Penrith.

While there are numerous accessible public facilities in Darling Harbour, none of these meet the needs of people with profound disabilities. Changing places facility would likely be easier installed in a new build, than retrofitted in some of our heritage community assets. **The Metro presents a unique opportunity to demonstrate leadership in NSW on changing places**, by providing the first facility of its kind in the CBD. The facility would make it possible for people from all over greater Sydney and beyond to visit the City, participate in the rich cultural and social activities on offer in the CBD that the metro line will enhance access to.

Recommendation: Inclusion of at least one 'Changing Places' toilet facility at the Pitt Street, Central Station and/or Martin Place Stations; with the primary preference being Pitt Street. These would need to be accessible from in front of ticket gates.

Supply chain and workforce development

We strongly support the inclusion of the development of a *Sustainable Procurement Strategy* and the initiatives and targets to achieve workforce development. The initiatives around employment for Aboriginal and Torres Strait Islander communities are consistent with the objectives of the City's *Draft Eora Journey Economic*

Development Plan.[3] Employment of additional key needs groups include: long term unemployed and young people is also a key priority and is aligned with the City of Sydney's *Sustainable Procurement Policy and Guidelines*.

This is also consistent with the NSW Government's work in Social Impact through the Department of Premier and Cabinet.

Recommendations:

- Include City of Sydney in the development of the *Sustainable Procurement Strategy* to link to local partners and inform the targeting of initiatives at key employment inclusion objectives for the LGA. This is of particular relevance in Waterloo where there are key employment needs particularly for Aboriginal and Torres Strait Islander people and is a key focus area for the City's Eora Journey Economic Development Plan.
- Include additional key population groups for targeted employment inclusion in the Sustainable Procurement Strategy and workforce development plan. These should include: people with a disability (including those with mental health issues), asylum seekers and older people[4].

Supplementary options

The City recommends that Metro explore opportunities to bring NSW into line with Victorian precedents to provide space for a 'Travellers Aid' style service as part of upgrades to Central Station to enhance accessibility to the Metro.

At Flinders Street Station in Melbourne, Travellers Aid provides a range of services that assist people with disability as visitors including: hire of mobility services, storage of luggage and mobility equipment, medical companions, supports use of accessible toilets or provides a place for rest.

The service, "Provides simple, practical travel-related support and aid that helps them travel independently and confidently, no matter what their background. The service assist travellers at their point of need, and to ensure that they reach their destination safely and confidently. For travellers at the point of need to have easy access to services which are relevant and assist in providing solutions with dignity"[5].

Recommendation: Consider inclusion of a 'Travellers Aid' service at Central Station.

Liveability

The inclusion of a direction around place-making in the Design Guidelines is strongly supported. Stations are both transport and community hubs and are a significant opportunity to deliver important people-centred places and spaces.

The project aligns with several of the City's key directions in our Social Sustainability Discussion Paper and draft Policy – *A City for All*.[6] These include:

Delivering infrastructure that supports growth

[3] City of Sydney Council (2016) Eora Journey: Economic Development Plan, Draft May 2016.
[4] These groups are included, along with others, in the City of Sydney Sustainable Procurement Policy.
[5] Travellers Aid (2016) About us [online], Available at: https://www.travellersaid.org.au/about-us (last accessed: 8/6/16)
[6] City of Sydney (2016) Social Sustainability Discussion Paper and Draft Policy (http://sydneyyoursay.com.au/socialsustainability)

Integrated planning is important so new housing and commercial buildings are developed along with adequate infrastructure such as transport and utilities.

Quality places and spaces for flourishing lives

Physical design plays an important role in successful high-density neighbourhoods. Higher-density development offers benefits, including the opportunity for people to live close to jobs, transport and many services and facilities. But it must be designed and managed well to make it work.

Likewise, the *Social Sustainability Discussion Paper* highlights the importance of an ongoing role for local government in the design of major projects such as this.

Local governments have a role to plan and manage integrated development in their communities. They must work with other levels of government to coordinate the delivery of significant urban renewal and development that meets future communities' needs.

Local governments can foster lively local precincts with places to meet, shop, learn, create and work that provide a focal point for community life. They can create inviting public spaces, such as laneways with quality street furniture, landscaping and public art, which encourage people to stop rather than pass through.

While generally good, there are a several changes that may enhance the Design Guidelines and the design process they inform.

Community benefit

We note the Sustainability Chapter includes positive inclusions around community benefits (p875), as per below:

Community benefit	*Contribute to the delivery of legacy projects to benefit local communities*	• *Investigate and implement feasible opportunities to use residual land to benefit local communities.* • *Establish and achieve targets for the amount of new public open space*

However, the Design Guidelines do not provide guidance on how this will be achieved.

Recommendation: Include guidelines on using residual land for community benefits, and setting targets for amounts of new public open space.

Design Guideline section: 3.2.2 Place-making

This inclusion of place-making is strongly supported and we recommend the City of Sydney is involved throughout the design phase to ensure integrated place outcomes.

Recommendations:

- Suggested additional point, "Include spaces for community and cultural uses and facilities in station and over station development to enhance the character, distinctiveness and inclusiveness of the station precincts". This can support the achievement of the sustainability objective noted on page 875 of "implement feasible opportunities to use residual land to benefit local communities." Waterloo Station will be a key opportunity for provision of spaces for community and cultural uses or facilities.
- Suggest separating out 'retail and night time economy' from other elements mentioned here to be its own guideline. Design considerations for this are quite distinct from events and pop-ups, which should also have their own guideline point.

Design Guideline section: 4.2.3 Furniture

Alternative and integrated seating designs should be considered in high pedestrian traffic areas where the need for circulation spaces may otherwise preclude stand-alone seating. This is an important element of combining high activity zones with resting and meeting places to enhance opportunities for incidental social interaction and the social dimensions of place.

Recommendation: Include 'In high traffic areas, additional opportunities for seating is to be integrated into entrances, walls, fences, and circulation elements and spaces'.

Design Guideline section: 3.1.5: Customer safety

The Design Guidelines in relation to safety are clear and pay particular attention to the application of Crime Prevention Through Environmental Design (CPTED) principles. They also cover other key aspects of a safe commuter experience including wayfinding and legibility, passenger comfort and amenity, lighting, commuter circulation, all ages and abilities access, identity and surrounding precinct requirements and local place-making opportunities. There are several opportunities to enhance the guidelines in relation to the recommendations below.

Recommendations:

Intermodal connections

- The Design Guidance could include reference to fast and convenient intermodal transfer points, particularly station interfaces with potential bus and taxi services. This should also consider: hours of operation and vehicle and station operating requirements.
- Design Guidelines should make reference to how timetables will be linked for the expected intermodal transfers at different times of the day and what design responses there may be in light of this. This is to manage crime risks associated with different wait times for certain modes at different times of day.
- The Guidelines could also include more specific information in relation to minimum service frequency and the proposed number of number of staff at each station to meet customer expectations. They should also reference the likely standards of security across different modes and possible design responses.

Maintenance

- The Guidelines could also provide more specific information with regard to materials used and proposed maintenance and management regimes as transport interchanges are commonly targets for graffiti, vandalism, anti-social behaviour and loitering.

20. Biodiversity

Overview

Overall the biodiversity assessment has been prepared in accordance with the SEARs and is detailed in its analysis for the types of works involved.

The key issue of concern in relation to the assessment and report is that there was no discussion or identification of possible improvements to the local urban biodiversity. While this might not be considered a particular requirement of the FBA, such opportunities have the potential to compensate for some of the adverse and unknown impacts and should therefore be documented.

Recommendation: Opportunities to propose novel habitat creation within the urban landscape such as illustrated by the artist's impression to create a green roof with habitat value on Waterloo Station (Figure 6-29) is encouraged and strongly supported.

The City of Sydney Council has adopted in large part its *Urban Ecology Strategic Action Plan* in response to its community members desire to conserve and enhance habitats to promote local biodiversity. Therefore when opportunities arise to see further habitat created and greening opportunities, this would be welcomed.

Mitigation measures

The City supports the identified mitigation measures but would like to **emphasise the need to ensure the provision of awareness and training to workers on site if fauna is identified** or encountered during construction. Wildlife rescues in the CBD of microbats have been observed and therefore the City would like to emphasise that due diligence and care be taken during construction. Further to this, if any work around drainage areas that have large openings (in addition to potential roosting sites at the stations), that pre clearance checks be carried out to ensure that the microbat species identified in the report are considered during works that may disturb potential roosting sites typically found in highly disturbed areas.

21. Flooding and hydrology

Overview

Overall the Flooding and Hydrology assessment in the EIS incorporates a very high level broad scale flood impact assessment **that does not adequately address the assessment requirements as listed in the SEARs**. The report appears to reflect the author's own view with **no rational detailed assessment on the flooding impacts**.

Recommendation: That a full scale flood impact assessment be carried out either as part of this EIS or as a separate exercise for each flood prone site within the project area that will adequately address the requirements of the SEARs.

Flooding

Table 21-4 "Description of existing flood behaviour" summarises existing flood behaviour around or within each station location.

However, this section **failed to articulate the flood impact of the proposed stations on the surrounding floodplain, existing assets, and infrastructures and, private and public properties and vice versa**. This understanding of the flood impact should have been carried out as per the NSW State Government's *Flood Prone Lands Policy* as set out in the NSW State Government's *Floodplain Development Manual*.

Recommendation: That a flood impact assessment be carried out for each flood prone site and documented prior to any determination being made on the proposal.

Potential Impacts – Construction

Section 21.4.1 'Surface hydrology and drainage infrastructure' of the EIS report includes general statements about redistribution of surface runoff during construction activities.

The EIS report or any of the supporting documents **does not present how surface runoff is going to be redistributed**, and its associated impacts on the existing stormwater behaviour within immediate surrounds of the five station sites in the City's LGA.

Similarly, the flood impact assessment/statement in Section 21.4.2 'Flooding Stations and Ancillary Infrastructure' of the EIS report **is not based on site specific assessments**.

It appears that mitigating flood impacts at the Barangaroo station construction site will rely heavily on the Central Barangaroo development drainage infrastructure upgrade works. **There is no mention of the ability of the upgrade works to accommodate the additional stormwater flows from the Barangaroo station development**. Nor is there discussion on the timing of the two construction projects. Poor timing between the drainage infrastructure upgrade works and the station construction may cause adverse stormwater effects to the surrounding downstream areas.

We also note that substantive drainage infrastructure recently built for the Barangaroo development in Hickson Road is likely to be affected by the proposed works.

Mitigation Measures

Flood mitigation measures for both construction and operational phases are proposed to be considered in the detailed design phase. The general approach listed in Table 21-7 and Table 21-8 to address flood impacts appears to be acceptable.

Recommendation: That the detrimental flood impacts and feasibility of potential flood mitigation measures are assessed as part of the concept design, prior to the detailed design phase of the project.

Note that further to this, the City's *Interim Floodplain Risk Management Policy* regards **any entry /opening/ vent etc. to the underground infrastructure needs to be above the PMF.** We draw particular attention to the Barangaroo and Martin Place sites.

Our experience with major projects in recent years suggests the **floodplain issues are often not properly considered early in the project's development, and this has then had detrimental impacts to the timing and outcomes of these projects**. The City has full 2D flood models of the entire Council area and is willing to provide these to any party involved in this project.

22. Air quality

Barangaroo ventilation shafts

The EIS does not provide a description of the air quality impacts, if any, of the proposed ventilation shafts on Hickson Road. It is unclear what their height or exact function will be, including any potential for impact on the residential properties along High Street.

The City has proposed that these structures are either relocated into the development envelope, or recessed into the wall. These should be considered with a proposed response.

Recommendation: The Response to Submissions report should provide further information on the proposed ventilation shafts on Hickson Road.

COAG Ambient Air Quality standards

Recommendation: The City would expect that any ambient air quality requirements were consistent with the amended Council of Australian Governments (COAG) National Ambient Air Quality particle standards.

23. Hazard and risk

No specific comments.

24. Waste management

See comments on Sustainability, Contamination and Noise for the City's response.

25. Sustainability

The chapter is relatively high level and short, which the City hopes does not reflect the relative importance given to sustainability during the construction, operation and in the station infrastructure of the Metro system.

The values, framework and content are all to be commended. The sustainability themes and objectives are consistent with delivering a significant piece of sustainable infrastructure in a sustainability manner.

However, it is very concerning that the wording in places does not offer a strong platform for the project to excuse non-delivery against "*potential* sustainability initiatives and targets". A further example of this language is that some targets are to be established while others are to be established *and* tracked.

The key challenge will be to convert the intent of the quoted policy and written commitments into practice and project outcomes and **to make sure that the inevitable *value engineering* process does not weaken the sustainability features of the project**.

Recommendation: To ensure that the sustainability objectives will be met, if the project is approved, the Conditions of Consent must make a clear and strong commitment to deliver the project against the Infrastructure Sustainability Council of Australia (ISCA) framework.

Transport for NSW is familiar with this recognised third party accountability mechanism, having successfully used the ISCA rating tool in the recent Wynyard Walk infrastructure.

Sustainability overview

This overview is well written and aligns with mainstream definitions and thinking on sustainability. The policy mechanisms capture the important legal framework regarding sustainability for the project.

We note reference to the *NSW Aboriginal Participation in Construction Policy* and would like to draw Metro's attention to City of Sydney's *Reconciliation Action Plan* in case the City is able to collaborate in the delivery of employment and training opportunities for our Aboriginal and Torres Strait Islander residents on the project.

Environment and Sustainability Policy

The overarching framework set out in the *Environment and Sustainability Policy* takes a suitably broad approach to sustainability and its incorporation into "project governance, design, construction and operation". In particular, that **Metro seeks to demonstrate "industry leadership" in the delivery of the project is to be commended.** It is crucial that this intention is kept and translates into contractor management through both **incentives to champion outperformance and enforcement in cases of non-compliance**. The desire to demonstrate such leadership adds further weight to use of the ISCA rating tool.

Sustainability objectives and initiatives

This section sets out a structured and clear set of objectives and initiatives, however the table heading "potential sustainability initiatives / target" is of concern. Although providing an indication of what might become targets, the word *potential* weakens

the whole table, and with it the entire position on sustainability, as all the content could be rejected at a later date. Comments on noteworthy components include:

Governance

Having stated that the Sydney Metro project will seek to demonstrate "industry leadership" in the Environment and Sustainability Policy, this section on Governance is the only place in the entire document that references ISCA, whose framework provides the industry standard against which to measure and report sustainability performance against industry standards. It is good that is mentioned here, but insufficient that it forms one line item in the table, rather than a key initiative with a firm commitment.

It is important that accountability and public reporting are addressed here but the wording needs to go further. It is vital that this becomes a commitment, not merely a "potential initiative".

Carbon and energy management

The City strongly supports the suggested initiatives and targets.

To strengthen the objective "reduce energy use and carbon emissions during construction", the table should include a bullet stating that low-carbon concrete will be used in construction where it's structural integrity is not negatively affected (noting that the pylons of the ANZAC Bridge contain 65% ground granulated blast furnace slag to offset the Portland cement content). This is mentioned briefly on p874 in the table looking at "Consider embodied impacts in material selection" but a more specific commitment is required.

The project team should refer to the research undertaken by Arup in 2009 to investigate this opportunity as part of the PBACH consultancy team which supported the first Sydney Metro Project.

Against the objective "Reduce energy use and carbon emissions during operations", the wording of the potential initiatives / targets is inconsistent. The first bullet will be *established*, the second bullet will be established *and tracked*. The City would like the document to be amended so that all initiatives / targets are not only established, but tracked as well. *This need to avoid non-committal wording applies to all of Section 25.*

The City commends the project in (potentially) offsetting the greenhouse gasses associated with electricity used during operations. Continuing the sustainability policy work undertaken as part of first Sydney Metro Project in 2008-9 will be a very positive environmental outcome.

Climate change resilience

Against the Climate Resilience theme, the objective is worthwhile but would be strengthened by stating the timeframe over which the planning and design intends to factor in climate resilience. Considering the stated asset life of 60 to 100 years, this should guide the objective. (See full comments on climate change adaptation in 25.4 below).

Resources waste and materials

Against the objective to "minimise waste through the project lifecycle", the City would like to see these initiatives extend to the selection of rolling stock to consider the end of life material impacts.

Against the objective "Consider embodied impacts in material selection" the wording is encouraging in direction, though not strong enough in commitment.

Similarly, to “establish targets to reduce embodied energy and high impact materials” would be a terrific initiative, but when other initiatives state they will be established *and* achieved (as with biodiversity conservation), the language used in this example undermines the City’s confidence that this will be delivered.

Liveability

Against the objective “Provide comfortable accessible, safe and attractive stations and precinct”, the bullet states that the project will have the potential initiative/target to “provide thermal comfort including consideration of local control for occupants”. This is a good objective but should be broadened to factor in the changing climate and the likely increase in extreme heat days. The NARClim tool (overseen by NSW Office of Environment and Heritage) predicts more extreme heat days that are hotter than in the past and that occur over longer durations. Sydney Metro infrastructure design must take this likelihood into account. Table 25-6 does address this risks of increased future temperatures, but it is important to consider this from the liveability and customer perspective, not just the engineering.

Workforce development

The last five bullet points against this theme and objective could be significantly strengthened through the engagement of a group training organisation (GTO – such as the not-for-profit WPC Group http://www.wpcgroup.org.au/).

Economic

“Optimise over station development” is a very broad target. In terms of sustainability it should be made more specific and measurable by setting 5 Star Green Start and 5 Star NABERS targets.

Climate change adaptation

The City **commends Sydney Metro for recognising that “some level of climate change is inevitable”** and for setting the objective that “the project infrastructure and operations are resilient to the impacts of climate change”. The City also recognises that we face significant changes, risks and opportunities and has addressed these in our own Climate Adaptation Strategy.

During the development of the City’s Adaptation Strategy, we learned that a comprehensive understanding of climate risks and the best responses to them requires an **interdependency analysis** to take account of the knock-on impacts of other infrastructure systems and organisations. The methodology of the Sydney Metro risk assessment, although multi-disciplinary **does not appear to have involved external stakeholders or a consideration on other types of infrastructure systems.**

Metro, although a linear piece of infrastructure, will not operate in isolation from the transport network. It will also depend on electricity, water, IT and communications infrastructure as well as other transport modes, all of which are run by different organisations, yet must all collaborate to ensure comprehensive approach to climate adaptation and resilience.

Although interdependency analysis is an emerging technique, it provides valuable breadth to the risk assessment process and should be applied as the next level of detail is applied to the project. The City is happy to discuss our experiences in developing our own interdependent approach to adaptation.

Recommendation: The City recommends that Metro undertake an interdependency analysis and would welcome the opportunity to participate in such a multi-stakeholder process.

Construction resources use

The resource consumption in the construction of the Metro will be significant. This is a reality of such a large infrastructure project. However, the **City suggests that a stronger position is taken to mitigate as much of the impact from the lifecycle of these materials.** Based on the figures on p882, 770 million m^3 of concrete will be required, yet scant detail is given on how alternatives to Portland cement will be considered.

In a recent (11/05/2016) presentation to the City of Sydney, the Cooperative Research Centre for Low Carbon Living's Professor Stephen Foster quoted that up to seven per cent of global greenhouse gas emission is attributable to the manufacture of concrete. The City requests that the Metro project team makes contact with this Sydney-based CRC to explore the latest opportunities and application of lower carbon concrete to ensure this is indeed an industry leading demonstration of sustainability infrastructure.

Consideration of the availability, fit-for-purpose and cost of re-cycled content in steel should also be part of the project's commitment to sustainability.

Greenhouse gas and energy

The assessment of greenhouse gases identifies the massive impact of construction materials. This further underlines the need to commit to exploring and applying viable alternatives to conventional high-carbon construction materials.

Environmental and sustainability management

The environmental and sustainability management system described will provide a sound governance mechanism, assuming it is implemented as described. The key will be to ensure that the commitments are delivered by the contractors that deliver the project. The experience of building sustainability in to the contract deeds gained in the preparation of the 2008-9 Sydney Metro will be invaluable in locking in sustainability to the project delivery. The City can provide contact with the relevant person involved in those contracts, and who is still employed in the Transport cluster.

Mitigation measures

The City would like to note that our own climate adaptation **project identified extreme heat as biggest direct climate risk** to be addressed. Page 890 ref SUS4 addresses increased temperatures, which we support, though this likely climate risk will impact more than the HVAC system of Metro. **The track buckling incidents of Melbourne's Metro rail should serve as a reminder to the possible outcomes of not considering extreme heat and their increasing frequency, intensity and length** due to climate change over the lifetime of the project.

26. Cumulative impacts

The Cumulative Impacts in the EIS are noted, and it is positive to see that major developments are included as well as major Government infrastructure projects.

At Martin Place, any additional pedestrian access closures that occur will have to be carefully managed if they coincide with the Martin Place closure. **It is recommended that these be avoided wherever possible, particularly when major events are on.**

Waterloo station cumulative impacts **should consider in more detail the impact of WestConnex Stage 2 and additional impacts of developments in Green Square and Mascot** that will have demands on the road network. It is our understanding that spoil removal routes for Metro and WestConnex are likely to converge around the Princes Highway in St Peters and this may have impacts on areas that have not been assessed in this EIS.

Although we appreciate that keeping a conversation open can be a positive way to mitigate some of the impacts, **there should be an assessment of the upper threshold of tolerance for the road network** and make an assessment on how the demand for space can be managed without additional capacity being the outcome.

27. Consolidated environmental mitigation measures and environmental performance outcomes

No specific comments.

28. Environmental risk analysis

No specific comments.

29. Justification and conclusions

The City supports the Metro project and its delivery.

Design Guidelines

The City notes the Design Guidelines and their intended purpose to set the principles for design throughout the project. However, for a project of this scale and in siting with some of the most sensitive land uses in the state; these Guidelines are not sufficient in lieu of an Urban Design chapter within the EIS. The City has raised this point multiple times in our pre-EIS engagement with Metro. **The City is of the view that without a dedicated Urban Design chapter, Metro has not adequately responded to the SEARs.**

Urban Design and the SEARs

Urban Design is a separate distinct subject matter to Landscape Character and Visual Amenity, with a different purpose and approach to urban issues.

The Metro has stations in the centre of the densest and most extensive concentration of financial and allied institutions in Australia**. It is most important that special care is taken to continue to support and not disrupt the public spaces that support its productivity.** This needs to be clearly demonstrated by Urban Design analysis and a synthetic approach that **integrates the transport function of the metro and the public spaces that it interconnects**.

The SEARs identifies Urban Design as a 'Key Issue and Desired Performance Outcome', separate and in addition to Visual Amenity. This alone indicates the need for a separate chapter on Urban Design.

The specific assessment requirements outlined by the SEARs for Urban Design comprise an essential part of the EIS. The requirements are listed below as a benchmark for assessing the gaps in the EIS.

1. **Identify the urban design and landscaping aspects of the project and its components**

Urban design aspects of the project include:

- A response to how the streets and public spaces will spatially and physically accommodate additional pedestrian movement (as assessed in the transport chapter) that gives emphasis to the pedestrian comfort of Metro customers' experience and the all other existing uses of these places;
- Appreciation and design of the environment around the station to become a unified part of the City's urban fabric;
- Interventions in the public domain associated with the new stations, such as introduction or removal of some structures in streets and spaces; and
- An approach to customer experience across the whole of journey, including areas outside the stations that form part of the total trip for these customers.

2. **Include consideration of urban design principles adopted by each council or within each station precinct**

- Demonstrated appreciation of the relevant principles set out in the following key documents, which describe the City's approach to pedestrian movement, legality, function and spatial arrangement of our streets and spaces:
- *City North Public Domain Plan*, including the Martin Place Masterplan, which includes pedestrian movement analysis;

- City Centre Access Strategy (NSW Government);
- Special Character Areas as described in the *Sydney Development Control Plan*;
- City of Sydney *Streets Code*;
- Any other considered applicable to the proposed project.

Documents are available on the City's website.

3. **Assess the impact of the project on the urban, rural and natural fabric**

- Assessment of proposed works (at 'a') against existing condition, with consideration of the City's principles (at 'b').
- Identify impact, outline mitigating measure and present design alternative.
- In particular demonstrate an understanding of the likely impact on, or proposed changes to, infrastructure in streets and public spaces.

4. **Explore the use of CPTED principles**
5. **Identify urban design strategies and opportunities to enhance healthy, cohesive and including communities**

- Demonstrating that pedestrian movement is equitable to other road users' movements, and existing pedestrian amenity is improved not compromised, and the urban qualities of wider context are enhanced.

At the most basic level, **the EIS lacks an analysis and description of how projected pedestrian numbers and level of service compare with footpath widths, spatial constraints such as furniture, surface infrastructure and trees**. The EIS does not adequately illustrate how the City's streets and spaces will be altered to fully understand the environmental impact of the project. **It is therefore unclear what the extent of additional works to City assets will be, and how our workers, residents and visitors will be affected.**

Those physical changes need to be clarified in order for an accurate visual impact or landscape impact to be understood and communicated.

The Metro provides many benefits to Sydney, not least the increased and improved access to employment in the Sydney CBD. **It is important that these benefits are not undermined by not fully understanding how this is integrated seamlessly into the public spaces of the city**, spaces that form part of the Metro customer's trips and are an important supporting elements for the continued productivity of Australia.

Future and further work to resolve the urban design aspects of this project, and ensure the successful integration of the Metro into the City of Sydney is required.

This submission sets out the considerations and work required on a city-wide, precinct-wide and station scale.

Urban Design Guidelines

The City generally supports the Design Guidelines to guide the future development of station and precinct design.

Generally, in regards to Urban Design, **the Guidelines are too brief to adequately address the City's Urban Design requirements or design considerations, or the SEARs requirements for Urban Design.**

Recommendation: Any project approval should be conditioned to ensure that the City is consulted in the development of Station and Precinct plans, the application of the Urban Design Guidelines and is represented on an Urban Domain Reference Group or Review Panel to guide the detailed designs.

Design Development and Implementation

Development of **Sub-plans** is required for each station and precinct. This is consistent with similar determinations made by the Minister for State Significant Infrastructure. The **extent of each precinct should be defined considering** the catchment for customers living or working at each station, the distance to interchange with other transport modes, and the destinations serviced by the stations.

The Sub-plans would include a greater level of detail than is shown in the EIS including plans and sections of streets and open spaces, indicating existing and proposed kerb alignments, trees, extent of station entries, bike parking, bus stops, street trees, furniture and other surface infrastructure.

Design issues to be resolved in future stages, and agreed with the City, is set out below. These are generic and apply to all Sub-Plans.

Urban Design considerations through Construction

- Pedestrian level of service through construction, and how will this be managed;
- The temporary plaza space at Martin Place and the nature of that space;
- Access to Martin Place during events in the CBD;
- Hoardings during construction and application of the City's Public Art Policy;
- Treatment of temporary structures on development sites and in the public domain including colour, texture, and material finishes; and
- Footpath edges must be kept tidy, and continuous. A continuous, straight line at the edge of enclosures and hoardings is necessary to ensure that the street edge is detectable by people with vision impairment or low vision.

Pedestrian Integration

Further work needs to be undertaken by Metro to resolve interventions to the public domain required to accommodate additional or altered pedestrian numbers and movements in the CBD and Waterloo.

Recommendation: An expanded area beyond the immediate vicinity of stations should be considered, to ensure that interchange from the stations to other transport destinations is adequately captured.

This is particularly applies at Pitt Street, where a high degree of east-west pedestrian movement is anticipated in interchanging between the metro and:

- eastern service buses on Elizabeth Street;
- western service buses from Castlereagh or Clarence Street;
- metro buses on Park Street;
- Town Hall Station;
- Light Rail on George Street; and

- Cycle routes

Removal of furniture and trees does not constitute an increase in footpath space. Relocation of furniture along streets outside stations may be considered.

It is unclear if pedestrian modelling allows space for minimum requirement street furniture to be retained or provided.

Pedestrian LoS vs Pedestrian Level of Comfort

Pedestrian Level of Comfort should be considered as a tool for assessing pedestrian flow and designing a response. Fruin's Pedestrian Level of Service is too generic to properly conceptualise people's experience of space within different contexts and land uses. The Pedestrian Level of Comfort provides a more useful tool to apply.

The City of Melbourne has undertaken some useful research on existing pedestrian service/comfort tools, and should be considered in any assessment.

Furniture and trees are a necessary part of the City's streetscape and should be considered as part of any modelling undertaken to resolve pedestrian integration.

Streets and Open Space Design

The City seeks to prioritise pedestrian space and safety wherever possible, as they are the most intensive, numerous and vulnerable user of the public domain in the Sydney CBD.

Averaging the level of service on footpaths around stations is difficult to interpret and respond to. **Further analysis is required to identify where space is inadequate and how kerb alignments and the various physical and spatial components of the street will be reorganised to meet the demands of pedestrians in a safe and comfortable way.**

The City supports the prioritisation of street spaces as outlined in the *City Centre Access Strategy.* Particularly, the CBD core is prioritised for pedestrian access along George Street and the cross-streets, and the relevant streets for cycling. The City has a well-developed and steadily executed *Cycle Strategy and Action Plan* that lays out the key routes for cycling. **It will be important to ensure that the Castlereagh Street cycleway that connects Belmore Park and Liverpool Street is extended further north to create a safe cycle access to Pitt Street and Martin Place stations without an unnecessary circuitous detour to the Kent Street cycleway.**

The City expects that engagement with Metro will continue as this information is acquired and designs are developed.

It is also expected that streets and public spaces will be designed, detailed and constructed in accordance with the City's Design Codes and Specifications to ensure the efficient long term maintenance of these assets.

Urban Design development at each station must consider relevant Public Domain Plans for the wider context:

- Harbour Village North Public Domain Plan;
- City North Public Domain Plan;
- Chinatown and City South Public Domain Plan; and
- Future Public Domain Plan prepared by Urban Growth in consultation with the City.

Station and Built Form Design

The ground and first floor building design is critical to the successful integration of the stations and associated development into the City. The City has a set of urban design principles which form the foundation of the SLEP and SDCP controls.

All Over Station Development must comply with the City's SLEP, SDCP and Design Excellence standards and controls.

The articulation of the built form will vary according to context, but it is **expected that the new development on all Metro sites, including stations, will contribute to a legible and consistent city form**, with:

- Active frontages at ground floor, no long blank walls and minimal or no service boxes fronting the street. Service and lift cores for OSD should be centralised; and
- Clear definition of the public domain, with building edges meeting the street at the property boundary; and
- Provision of adequate pedestrian circulation space within the station entry, not on the street (this may vary outside the City Centre); and
- Scale, articulation and materiality to match the heritage context, special character area or conservation area as appropriate.

Any security bollards deemed to be necessary at stations should be accommodated within the building line as footpaths are highly constrained by services, fixtures and pedestrian movement.

The **increased natural light to stations below is not an appropriate offset for the loss of public space**. Skylights in the public domain in the City of Sydney are an inefficient use of space. Pedestrian circulation space must be prioritised in every station in the City's LGA to accommodate the very large numbers of pedestrians.

The Metro stations proposed within the City of Sydney are all located in existing or proposed high density locations where public space is at a premium, and forecast pedestrian numbers in and around the station are expected to be very high. There is absolutely no space available in the public domain or in the stations themselves to accommodate ramps or level changes between the street level and the station entry.

All stations within the City of Sydney must accommodate infrastructure within the station box (or associated development) to manage flood levels safely and efficiently.

Cycle Parking

In Sydney CBD, it is expected that cycle parking will be integrated into the station entries and exits, and not occupy space on streets or any other public space.

Despite our awareness of Transport for NSW's policy on cycle parking at stations, it would be useful for the EIS to advise the proposed quantum. Similarly, the EIS does not adequately account for access routes to and from all stations. For example, there is no direct route to Martin Place station from any direction that does not require either a proportion of riding on CBD streets, or a section where a dismount and walk is required, or a circuitous route is necessary to maximise use of cycleways. These types of barriers are significant and can have a major impact on the level of riding and multi-modal trips, particularly for new or less confident bike riders.

Integration and interface of proposed and existing cycle movements with the station entries and exits needs to be investigated and resolved, ensuring that access is direct and does not conflict with pedestrian circulation in the vicinity of the station.

Sub-plans: Specific Urban Design Considerations

Further Urban Design work required at each station is outlined below. This includes design work to link safe and effective pedestrian integration with landscape and visual impact mitigation.

Barangaroo

- **Integration of station exits and servicing** into the BDA development envelope or the Hickson Road wall;
- **Resolution of the park edges** and their interface with the station exit;
- Pedestrian movements beyond each exit, ensuring adequate space is provided for pedestrians and cyclists;
- Design of Hickson Road across the full cross-section and full length to **enable safe crossing from the station exit** to the eastern side of Hickson Road and then beyond to the wider catchment including Millers Point and Walsh Bay; and
- **Street tree design** for Hickson Road.

Martin Place

- Kerb extension of Castlereagh Street at the southern entry is required to accommodate pedestrians exiting the station. The footpath width here is relatively narrow and unable to safely accommodate additional pedestrians exiting from the station in the peak hours. **Queuing at the intersection would likely result in blockages to pedestrian movement**, that creates an unsafe level of congestion at the kerbside and encourage pedestrians to jaywalk;
- It is understood that an exit to Martin Place directly may be required for pedestrian safety affected by the station exit itself. **Any exit here should be minimised in width** to maintain the function, arrangement and landscape setting of Martin Place;
- The **'transit hall' nature of the station design should be scaled back**;
- The City supports an additional exit to Bligh Street at the northern exit; and
- The development of the station box at Hunter Street, and associated Over Station Development forms an important corner in the **Chifley Square Special Character Area** and contributes to defining that public space. This should be respected in the architectural definition of the building and its entries.

Pitt Street

- The City supports the Pitt Street station's two access points at Park and Bathurst Streets;
- Bicycle parking should be integrated within the station design and not rely on space in the public domain;
- The corner of Park and Pitt Streets should be activated with outward facing retail;
- The Pitt Street façade of the southern entry should also be activated with retail; and

- **Service risers must be pushed inwards** to vent at a higher level. Only services that require direct street access (e.g. fire stairs) should appear on the Pitt Street façade.

Central

The EIS contains only very minimal information about the long term operational impacts at Central Station. The City understands that this is part of a wider masterplan. Development of that masterplan should document and address the following key landscape impacts arising from Metro:

- **Integration of the public space at the Western Forecourt** and at the corner of Eddy Avenue into the wider urban context and future pedestrian connections, resulting in removal of the existing bus and vehicle ramps;
- Identification of **future pedestrian numbers to the western exit** and its effect on footpath demand, plus ways to manage this demand;
- Possible relocation of the light rail circuit around Belmore Park to George Street, as a result of a new public space to the Western Forecourt;
- Significant opportunity to **better link Railway Square and a new Western Forecourt public space with Belmore Park**, wrapping around Central Station. This would provide significant benefit for pedestrian connectivity and legibility of public space network in the southern part of the Sydney CBD;
- Resolution of public domain **connections to Haymarket and Darling Harbour**, including potential to **complete the Goods Line** active transport corridor to the east; and
- Consideration of the **Chinatown and City South Public Domain Plans**. Many of the projects in these plans, including kerb realignment, are already underway as capital works by the City.

There are two really significant urban design elements of the Central Station works that require further design resolution.

The permanent access bridge structure from Regent Street will be highly visible from the public domain and from surrounding tall developments, including Central Park and UTS. The bridge sits amongst some significant heritage items and will affect their setting.

A design excellence process must be undertaken for the bridge, which includes the following key principles in the brief:

- Architecturally beautiful;
- Visually recessive and lightweight;
- Respectful of heritage context and preserves important views and curtilage;
- Contributes positively to views from major public places including Prince Alfred Park; and
- Is spatially very efficient, with a minimum width. The delivery of a single lane should be considered to reduce the bulk, scale and cost of the bridge. This could be managed with a shared zone arrangement at the entry on Regent Street, allowing space for more than one truck to wait and pass.

The Regent Street entry/exit to the bridge should be designed to minimise impact on pedestrians. A footpath continuation should be provided, and shared zone treatment considered at the entry beyond the footpath, providing planting and Water Sustainable Urban Design (WSUD) opportunities.

Waterloo

- **A second, and potentially third entry to the station should be considered** for better and more convenient integration with future, high density development to the east to be delivered by Urban Growth;
- Second and third exits required to meet demands of density and adequately interchange with other transport modes. The second entry should be to the south on Wellington Street, and a potential third entry to the west on Botany Road to enable bus interchange;
- **Supermarket and community facilities to be integrated into the design at ground level**, to co-locate with the station and create a community service hub that does not currently exist;
- Relocate ground level servicing in the current design to above or below ground to enable facilities at the ground level;
- **The cycleway proposed for Raglan Street should be a condition of consent**, as should another cycleway connection on Cope Street that connects Raglan Street with our planned cycleway to south;
- Undertake traffic modelling to determine whether the intersection of Raglan and Cope Streets should be signalised, or if not signalised, that the existing roundabout be removed and **a facility be implemented that provides pedestrian and cycle crossings on all legs**. This is intimated in the visualisation but not in the maps;
- The east-west pedestrian crossings across **Botany Road should have longer green times for pedestrians** to enable good levels of service for the increased numbers of pedestrians (they are currently very short);
- Consider, should the future delivery of full WestConnex occur and heavy vehicle demand is potentially shifted to the motorway, to **review all heavy vehicles routes to transition Botany Road and other heavy vehicle routes from primary 'movement' corridor to a higher 'place' function**; and
- On Botany Road, the **alignment of development on the eastern side of Botany Road should be setback** and aligned with the existing heritage item. This would facilitate future desired widening of Botany Road, without demolition of heritage items on the western alignment of Botany Road in that block (can be seen on either corner).

City Approval of works to Public Space

All works to the public domain, including footpaths, trees, furniture, signage, kerb extensions, will require approval by the City of Sydney.

The City has well established processes to respond to applications for approvals. The City would work with Metro during the detailed design to provide assurance to Metro and the Department of Planning and Environment that the City would act quickly to resolve any application. It should give Metro comfort that should the City policies, plans, codes and standards that have been outlined in this submission be applied, then the outcome of any application is often straightforward.

Public Art

Public art is captured in the Sydney Metro City and Southwest – Chatswood to Sydenham Design Guidelines Appendix B section of the EIS under 3.2.2 Place-making, 3.2.3 Heritage and Archaeology, 3.2.5 Art, 3.2.6 Lighting and 4.1.2 Station Entries.

The integration of public art into an infrastructure project of this scale is encouraged, and the Guidelines outlined in the document are sound. **It is critical to the success of any public artwork incorporated in the project that the artists be brought on early in the process** to allow the artwork to be developed in tandem with the design of the public spaces and infrastructure.

A **Public Art Strategy should be developed by an experienced Curator** that outlines the conceptual approach to public art, identifies specific opportunities, a process for procurement of artists and dedicated budgets. The City can assist with advice on the development of the Strategy and effective processes for procuring appropriately experienced curators and artists to ensure the effective integration of public art into the project.

There are international precedents for the **incorporation of artwork into stations and transport infrastructure resulting in a high quality public art/design outcomes creating a sense of identity** and bringing a profile to the project that ultimately contributes to the positive image of the City. See the incorporation of artist Daniel Buren's artwork into the design of the station and tram infrastructure for the light rail in Tours, France.

With regard to public art that will be affected by the construction of Metro, (including those contained within private developments subject to proposed demolition) the City would expect to see these works addressed as part of the Public Art Strategy. The Strategy should outline how the works will be impacted and identify a process for their proposed reinstatement, relocation or decommissioning. **The strategy should outline the process for consultation with the artists and any relevant stakeholders** to ensure that this process is managed in accordance with moral rights legislation.

Recommendations:

- Engage with artists early, in the design development stage, to ensure a successful art strategy for Metro.
- Engage an experienced Curator to develop a Public Art Strategy.
- The Public Art Strategy should outlines a process for engagement with artists, the City and other relevant stakeholders including Arts NSW.

Technical Paper 1: Traffic and Transport

There is a very strong nexus and interdependency between transport and urban design. As a result, the commentary on the Traffic and Transport papers and the commentary on Urban Design, and the Landscape and Visual Impact sections should be read together.

The commentary on the Traffic and Transport papers is primarily more technical, as the concerns of the City are largely related to the movement of people within a constrained environment.

Traffic modelling

The City notes that the CBD is described as a congested environment, yet the traffic modelling shows almost all modelled CBD intersections operating at a Level of Service (LoS) of less than C. This would instead indicate a relatively uncongested environment and is counter-intuitive to known site conditions where high queue lengths and delays are observed during the AM and PM peaks.

It is assumed that the base models were calibrated to traffic flows (amount of traffic passing a particular point), hence the model outputs indicate good levels of service for the intersections. It is requested for the base models to be calibrated to traffic demands (amount of traffic wanting to pass through) and validated to existing queue lengths to reflect observed traffic conditions for better project outcomes. It will be beneficial for modelled queue lengths to be presented in the report for further comments.

Another explanation for this may be that vehicular traffic is given priority green phasing, and pedestrians and cyclists are given shorter green time to enable a better LoS for vehicles, however the EIS does not give a reasoning. Given pedestrian traffic accounts for over 80% of trips in the CBD, and cycling has grown by half; this does not make sense.

The City also questions the assumption that background traffic flows would be the same in 2056 as 2015. There is no reasoning given as to this assumption and the testing of its reasonableness.

Recommendation: An explanation of the reason for the good CBD Level of Service and use of 2015 traffic as the base for 2056 should be given in the Response to Submissions.

Catchments and Precincts

The EIS has done a good job of visually representing information which makes a lot of the information easier to understand, but the documentation is not necessarily clear on the scope of the study catchments or the definition of a precinct.

It would be useful to depict this information on a map to show the relationship a bit more clearly between sites of interchange that are not within the immediate vicinity of the station entries.

The EIS states that Metro Precinct Plans were used as part of the Traffic and Transport methodology. **It would be useful if these plans were provided to understand the scope and spatial reach of each station's precinct.**

City and South East light rail

It appears that the light rail has not been included in the forecast modal shares for station arrival. This is surprising given transfer to and from the light rail is expected, particularly at Pitt Street and at Central stations.

As the light rail project is well advanced, it is expected that there would be solid data on patronage forecasts along the route. Given the light rail will be in operation by the time Metro opens, this should be incorporated into the data and analysis.

Recommendation: Provide data and analysis on the expected mode share of light rail as an entry/exit point for the Metro network at relevant stations.

Pedestrian modelling

The City welcomes the inclusion of pedestrian modelling for the Metro EIS. As the most dominant transport mode in the Sydney CBD, it is often considered subordinate to vehicular traffic in other transport assessments.

We note there is no modelling results diagram for Barangaroo. We assume this is due to the relative linear nature of the corridor, however, it would be useful to understand the expectations of travel demand and how they might change particularly as pedestrian connections such as Wynyard Walk are complete, and what the outcome would look like if a lift was provided to connect Millers Point.

Recommendation: Provide pedestrian modelling results for Barangaroo station, including the results with all pedestrian connections completed (including the proposed lift).

While the outputs are generally consistent with our expectations of observed behaviour, the forecast split for pedestrians at Waterloo station is surprising. While the dominant foot traffic towards the Australian Technology Park in the AM peak is expected, the PM peak shows a majority demand from the south. It is not clear why this is the case. However, if this is correct, **this strengthens the transport need for an entry to the south**.

The operational modelling outputs for Central station show a strong pedestrian demand to and from the west, and would indicate that an underground pedestrian thoroughfare at Central station would be useful to service this demand. The Devonshire Street tunnel is located to the south and the EIS shows it has a low demand compared to other access points. If a more **mid-point link provides a more useful connection, then this should be considered as the primary east-west movement corridor** that does not require access to the station itself. It is assumed that this would connect with a Western Forecourt.

Parking

The removal of on-street parking in streets under the City's control must be consulted with the affected community, endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee (LPCTCC) and approved by the City. All costs associated with parking and traffic changes must be borne by the Applicant.