RESPONSE TO

ENVIRONMENTAL IMPACT STATEMENT

NORTHCONNEX M1-M2 TUNNEL

to

Director – Infrastructure Projects
Department of Planning and Environment
Application Number – SSI 13_6136
Major Projects Assessment
GPO Box 39 SYDNEY NSW 2001

prepared by

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12 September 2014

EXECUTIVE SUMMARY

Location of portals and emission stack:

The location of the proposed emission stack in the residential heritage precinct of Wahroonga close to pre-schools, primary schools and high schools will result in adverse long-term health impacts. Currently approximately 9000 children go to school in the Wahroonga area.

The proposed northern portal does not take advantage of the existing topography. The design forces all vehicles to go up hill in the tunnel, only to exit and immediately go back down the hill along the M1. Forcing all vehicles to do this is a waste of energy, directly resulting from the poor design of the tunnel.

Air Quality:

The proposed tunnel has a gradient over its entire length. Tunnels with gradients have higher emissions than tunnels that are built horizontal[1].

The proposed tunnel gradient will cause impaired air quality in the northbound tunnel and outside the tunnel adjacent to the stack.

The tunnel is designed to better facilitate the passage of heavy freight haulage and the stack would emit 9km of concentrated exhaust in the middle of the residential area of Wahroonga. This would have detrimental effects on the suburb.

The view of the Australian Government National Pollutant Inventory on particulate matter (PM10 and PM2.5) is "there is no threshold at which health effects do not occur"[2]. Expert medical opinion[3] recognises that there is no minimum acceptable threshold for PM2.5 particulates. Therefore the construction of infrastructure that would cause an increase in PM2.5 particulates in a residential area is not acceptable.

The reduction in the quality of air in Wahroonga would, over time have cumulative adverse impacts on the health of all people, animals and plants.

[1] NSW Government & Advisory Committee on Tunnel Air Quality, 2014 p30
[2] Australian Government, Department of the Environment - National Pollution Inventory, 2013
[3] Open letter from Dr Raymond Nassar and Prof Simon Finfer September 2014

Biodiversity:

The Cockle Creek/Spring Gully Creek riparian zone will be destroyed. Cockle Creek/Spring Gully Creek is a tributary waterway to Cowan Creek at Bobbin Head, Ku-ring-gai National Park.

Urban Design, Landscape Character and Visual Amenity

The widening of the M1 in the middle of Wahroonga to an effective width of 10 lanes, to allow the construction of entry and exit tunnels, will force the compulsory acquisition of houses, causing fragmentation of the society.

The entry and exit tunnels and their associated portals + emission stack will be in close proximity to adjacent houses. The bulk and scale of such a structure is industrial and not in harmony with the heritage area of Wahroonga. It will be visually intrusive and detract from the character of the area.

Social and Economic

The location of the portals and emission stack would have a negative impact that:

- would adversely affect the health and well being of the residents of Wahroonga.
- would have a detrimental impact on the value of surrounding houses.
- would have a detrimental impact on the enrolment to the various pre-schools, primary schools and high schools.
- would have a substantial negative impact on the society and economy of Wahroonga.

Solution - THE EQUILIBRIA PROPOSAL TO ENHANCE NORTHCONNEX:

Transurban is proposing to build the longest tunnel in Australia. It is vital that the health outcomes are optimized. The horizontal tunnel proposed by Equilibria would facilitate the reduction in vehicle emissions, ensuring improved health outcomes.

A HORIZONTAL TUNNEL MEANS MINIMUM EMISSIONS FROM ALL VEHICLES.[4]

The Equilibria Proposal would enhance the NorthConnex M1-M2 Tunnel by extending the tunnel by approximately 1km. As the M1 falls down hill north of Pacific Highway, a horizontal tunnel can join the M1 on grade, with minimum vehicle emissions. The smoke stack would be close to the Hornsby industrial area, not immediate to the residential area in Wahroonga.

The redundant M1 land would be rezoned for a sustainable urban development.

It is recommended that the stack from the extended horizontal tunnel be fitted with a world best practice filtration system.

[4] NSW Government, Initial Report on Tunnel Air Quality, 2014 p30

The Equilibria Proposal provides the following benefits:

- Less pollution in tunnel because all vehicles will be coasting along the horizontal road (no gradient). This means faster traffic flows – a less stressed tunnel – therefore less risk for Transurban. Substantial fuel savings for heavy freight haulage per year.
- More vehicles are likely to remain in the tunnel once they enter north of Pacific Highway - less risk for Transurban.
- Greater community acceptance of the NorthConnex tunnel due to less pollution and noise in the tunnel and local residential area.
- The extension to the tunnel would be cost effective due to economies of scale from existing construction setup.
- A likely improved EIS / more efficient planning approval.
- NSW Government receives capital return on sale of redundant M1 land.
- The pollution stack would be located adjacent to Hornsby industrial area, not immediate to Wahroonga residential area.
- Cockle Creek/Spring Gully Creek riparian zone, currently adjacent to the M1 would be protected, not destroyed.
- No Wahroonga resident would be forced out of their home.
- Provision of additional 2000 dwellings for Sydney within walking distance of Wahroonga train station. The development of redundant M1 land would provide a subsidy to extend the tunnel.
- Economic Stimulus - Substantial financial benefits for the Federal Government, the NSW Government, Transurban and Lend Lease Bouygues.

Apart from providing the impetus for a cleaner, free flowing more efficient tunnel, the Equilibria Proposal would set a precedent for future urban renewal – that is the removal of a surface motorway from the residential area of Wahroonga and the provision of an additional 2000 dwellings within walking distance of a train station without the demolition of existing housing.

This report is in response to the NorthConnex Environmental Impact Statement and specifically addresses the Director General's Requirements of Part 3 of Schedule 2 of the Environment Planning and Assessment Regulation 2000 including:

- Statement of project objectives
- Analysis of feasible alternatives
- Analysis of strategic planning
- Principles of ecologically sustainable development
- Analysis of risk
- Traffic and transport
- Noise and vibration
- Air quality
- Soil and water
- Community liaison
- Urban design and visual amenity
- Biodiversity
- Land use, property and socio-economic
- Aboriginal Cultural Heritage
- Historic Heritage
- Consultation

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1.0 TERMINOLOGY

The following terminology is used throughout the report.

Acceptable

Transurban proposal is considered to be of an acceptable standard and does not require amendment.

Fair

Transurban proposal is considered to be of an acceptable standard, but requires some minor amendment.

Poor

Transurban proposal is considered to be of an unacceptable standard. It requires amendment.

Unsafe

Transurban proposal is considered to be not safe. It requires amendment.

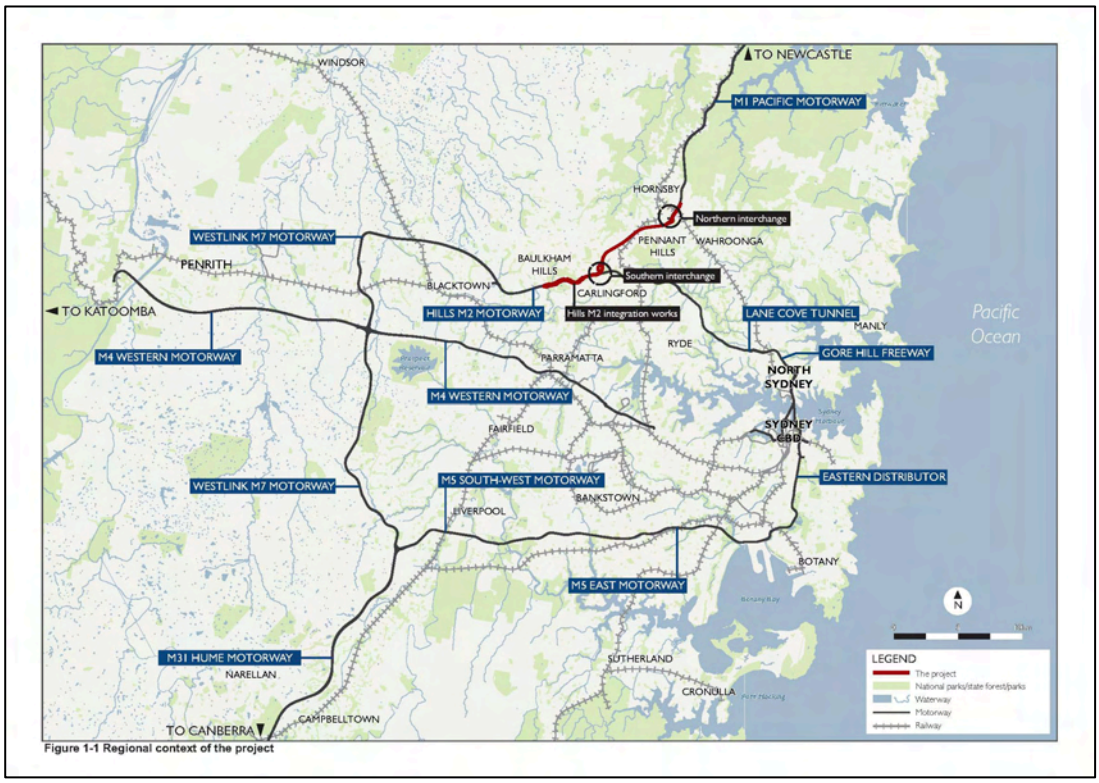
2.0 QUALIFICATIONS

This report has been prepared by Equilibria:
Peter Georgiades, Principal
Bachelor of Architecture UTS 1993, 1st Class Honours
NSW Architects Registration Board No. 6789

3.0 SCOPE

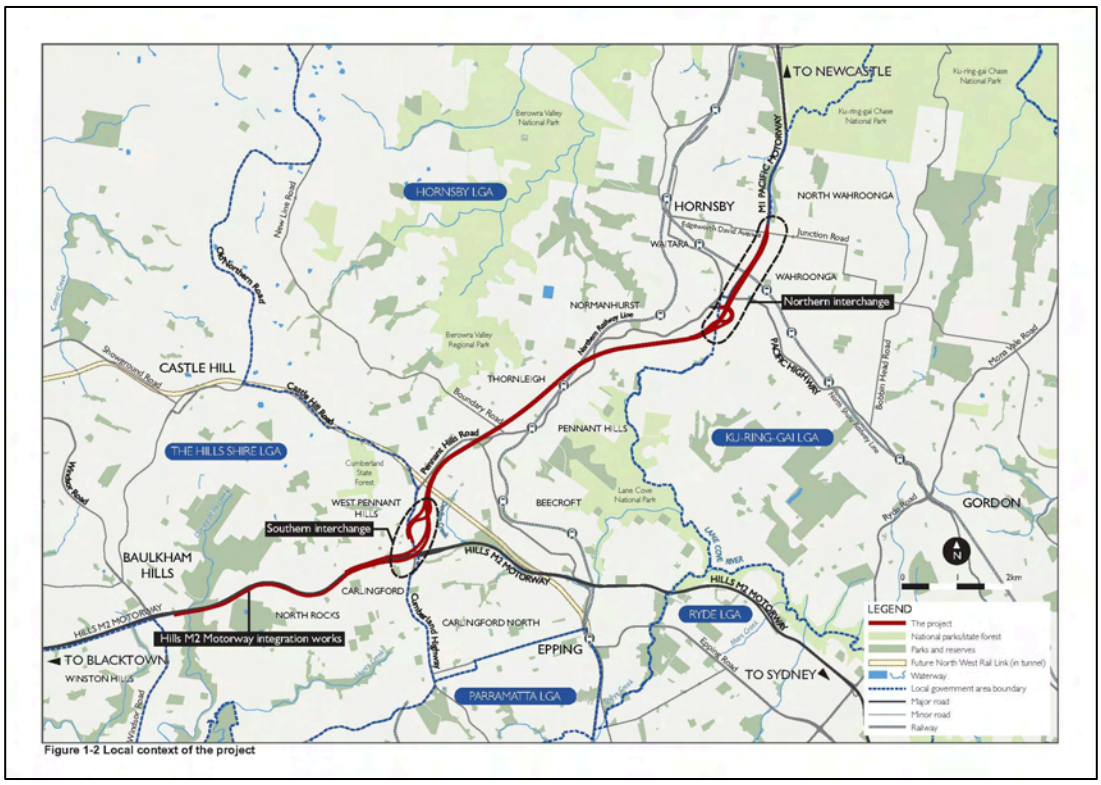
The scope of this report, in response to the NorthConnex Environmental Impact Statement, is to comment on issues that relate to the tunnel gradient, northern interchange, northern portal and emission stack. The issues are graded according to the above terminology and a recommended solution is provided.

4.0 SITE PLAN ANALYSIS



Photograph source: NorthConnex EIS

Figure 1: Regional Context – 'the missing link'

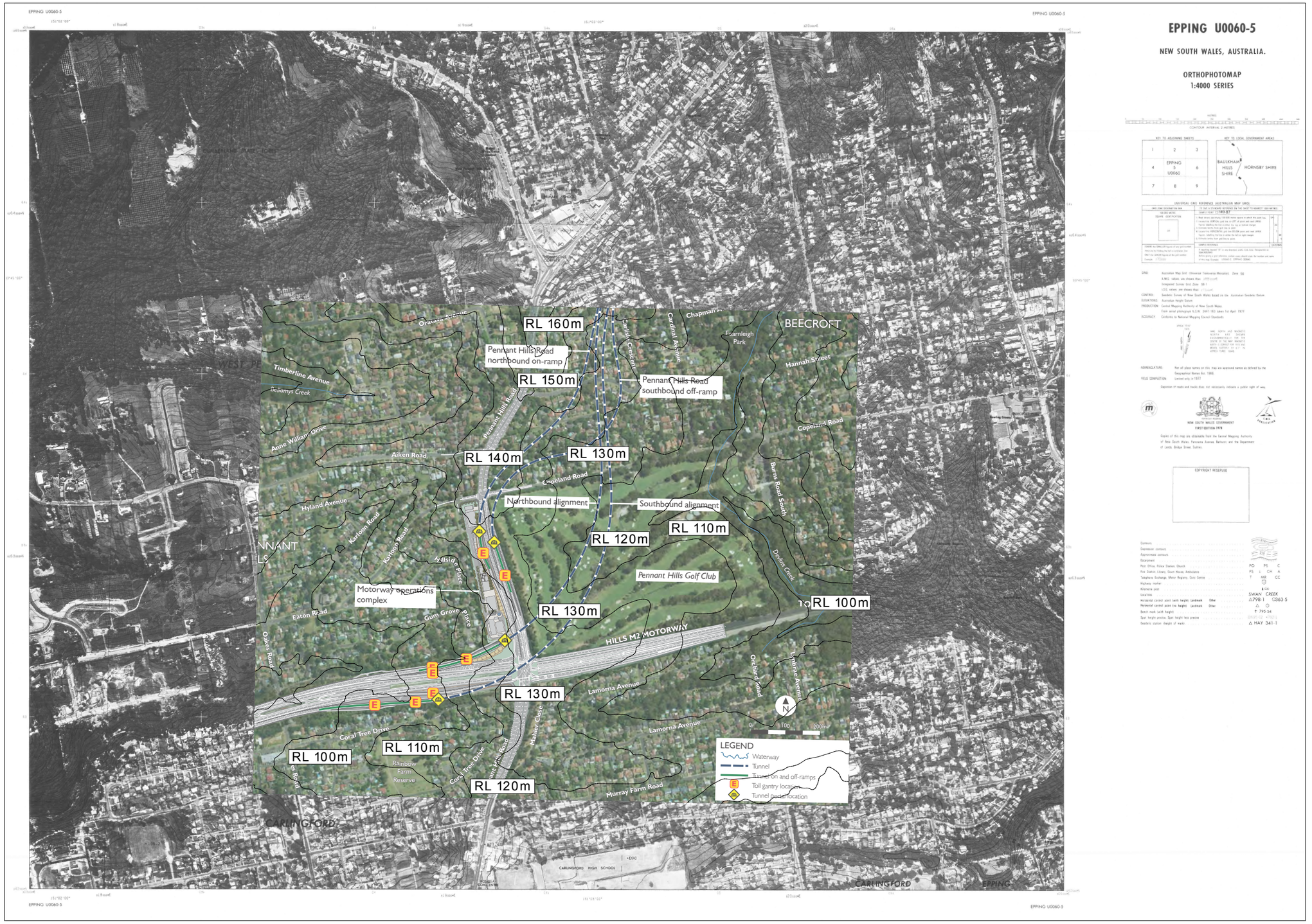


Photograph source: NorthConnex EIS

Figure 2: Local Context showing route and northern + southern interchange

Aerial Photograph inset source: NorthConnex EIS | Orthophotograph source: NSW Department of Lands

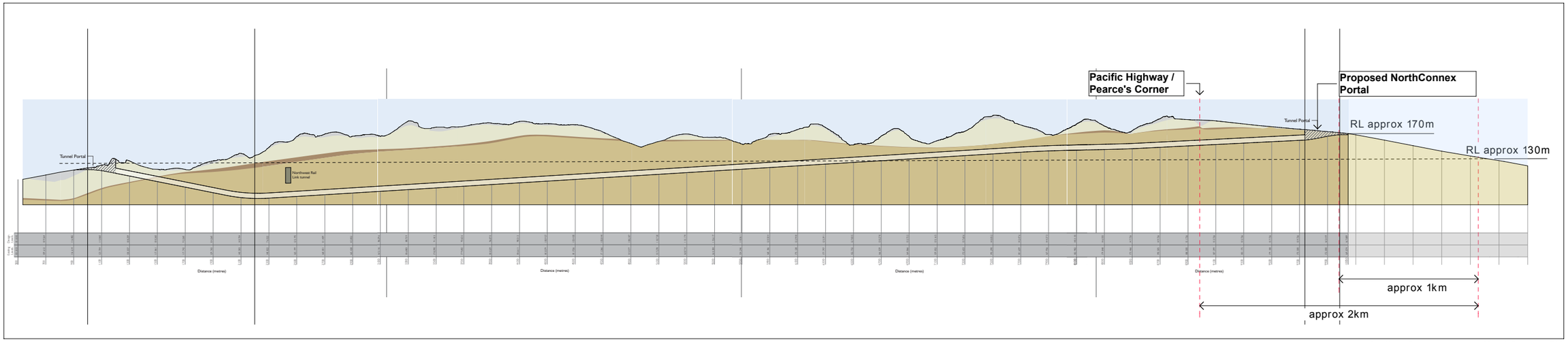
Figure 3: **Wahroonga Precinct Contour Analysis - 10m contours**



Aerial Photograph inset source: NorthConnex EIS | Orthophotograph source: NSW Department of Lands

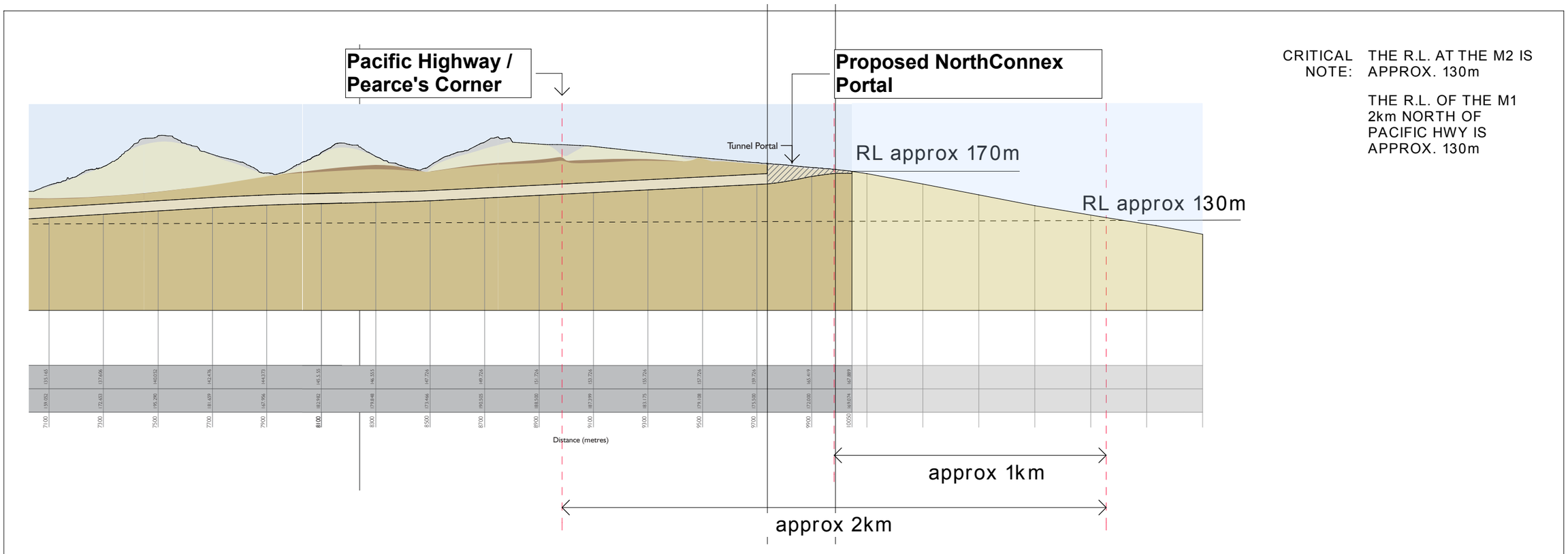
Figure 4: **Beecroft Precinct Contour Analysis - 10m contours**

5.0 SITE LONG SECTION ANALYSIS



Longitudinal Section source: NorthConnex EIS

Figure 5: NorthConnex Longitudinal Section including Wahroonga Precinct



Longitudinal Section source: NorthConnex EIS

Figure 6: Wahroonga Precinct Longitudinal Section

6.0 DIRECTOR GENERAL'S REQUIREMENTS

6.1 Statement of Project Objectives

Grade: Poor

A statement of the objectives of the project, including a description of the strategic need, justification, objectives and outcomes for the project, taking into account existing and proposed transport infrastructure and services within the adjoining subregions, and as relevant the outcomes and objectives of relevant strategic planning and transport policies, including, but not limited to, NSW 2021, NSW

Government State Infrastructure Strategy, NSW Long Term Transport Master Plan (December 2012), draft Metropolitan Plan for Sydney (March 2013) and any other relevant plans;

The objectives of the project are stated but some elements are unjustified.

It is true that this piece of infrastructure would reduce traffic congestion and heavy vehicles along Pennant Hills Rd. It is true that travel times will be reduced and state and national freight movement would be more efficient. It is likely that pedestrian and road safety would be improved along Pennant Hills Rd. It is likely that local air quality along Pennant Hills Road would improve however at the northern end of the project corridor reduction in air quality will make the local environment unsafe to live in.

One objective is to achieve design excellence and environmental sustainability. It is highlighted that the quality of air in the tunnel will be unfit to breath. Also 9km of this polluted air will be emitted via one stack in the middle of the Wahroonga residential area. This is not design excellence and not environmentally sustainable.

It is claimed that the current project is economically justified but it does not take into account the negative environmental impact, the long term cost to the community of the degradation of health particularly in the vicinity of the northern portal and the impact on the fragmentation of the local community.

The current proposal does not meet the statement of project objectives because it does not minimise the adverse social and environmental impacts.

6.2 Analysis of feasible alternatives

Grade: Poor

An analysis of feasible alternatives to the carrying out of the project and project justification, including:

- an analysis of alternatives/options considered having regard to the project objectives (including an assessment of the environmental costs and benefits of the project relative to alternatives and the consequences of not carrying out the project), and the provision of a clear discussion of the route development and selection process, the suitability of the chosen alignment and whether or not the project is in the public interest, and

- justification for the preferred project taking into consideration the objects of the Environmental Planning and Assessment Act 1979.

There is a total omission of site contour analysis across the entire route of the tunnel. This is most pertinent at the northern interchange as the M1 motorway falls down hill north of Pacific Highway. Approximately 2km north of Pacific Highway, the reduced level is 130m which is approximately same level as the M2 at Beecroft (see long section drawing above).

The environmental impact statement does not assess feasible alternatives for the chosen route. The submissions by Thiess John Holland Joint Venture and GlobalLink Joint Venture consisting of Ghella Pty Ltd and Acciona Infrastructure Australia Pty Ltd are not public documents. The announcement of the winning tender by Lend Lease Bouygues Joint Venture described a tunnel approx. 1km longer, however there is no information regarding any other tunnel design. As the winning scheme positioned the northern portal in the middle of the residential area of Wahroonga, why was there no consideration for a longer scheme with the portal beyond the residential area?

6.3 Analysis of strategic planning

Grade: Poor

A statement of the objectives of the project, including a description of the strategic need, justification, objectives and outcomes for the project, taking into account existing and proposed transport infrastructure and services within the adjoining subregions, and as relevant the outcomes and objectives of relevant strategic planning and transport policies, including, but not limited to, NSW 2021, NSW Government State Infrastructure Strategy, NSW Long Term Transport Master Plan (December 2012), draft Metropolitan Plan for Sydney (March 2013) and any other relevant plans;

An analysis of the project including an assessment, with a particular focus on the requirements of the listed key issues, in accordance with clause 7(1)(d) of Schedule 2 of the Regulation (where relevant), including an identification of how relevant planning, land use and development matters (including relevant strategic and statutory matters) have been considered in the impact assessment (direct, indirect and cumulative impacts) and/or in developing management/mitigation measures.

State Infrastructure Strategy

The NSW State Infrastructure Strategy demands 'quality of investment' to ensure adequate productivity and ultimate return on investment. The NorthConnex project is a massive undertaking which must take advantage of potential land use synergies. The Equilibria Proposal is an urban renewal idea that makes the most of an existing asset. It recognises that the M1 is a noisy, polluting piece of infrastructure that has dislocated the suburb of Wahroonga. The construction of NorthConnex, if built only 1km further north, could mend this adverse impact, while mitigating the overall adverse impacts of the project.

The creation of approx. 100,000 sqm of land for development within walking distance of an existing railway station is a rare opportunity and not to be dismissed.

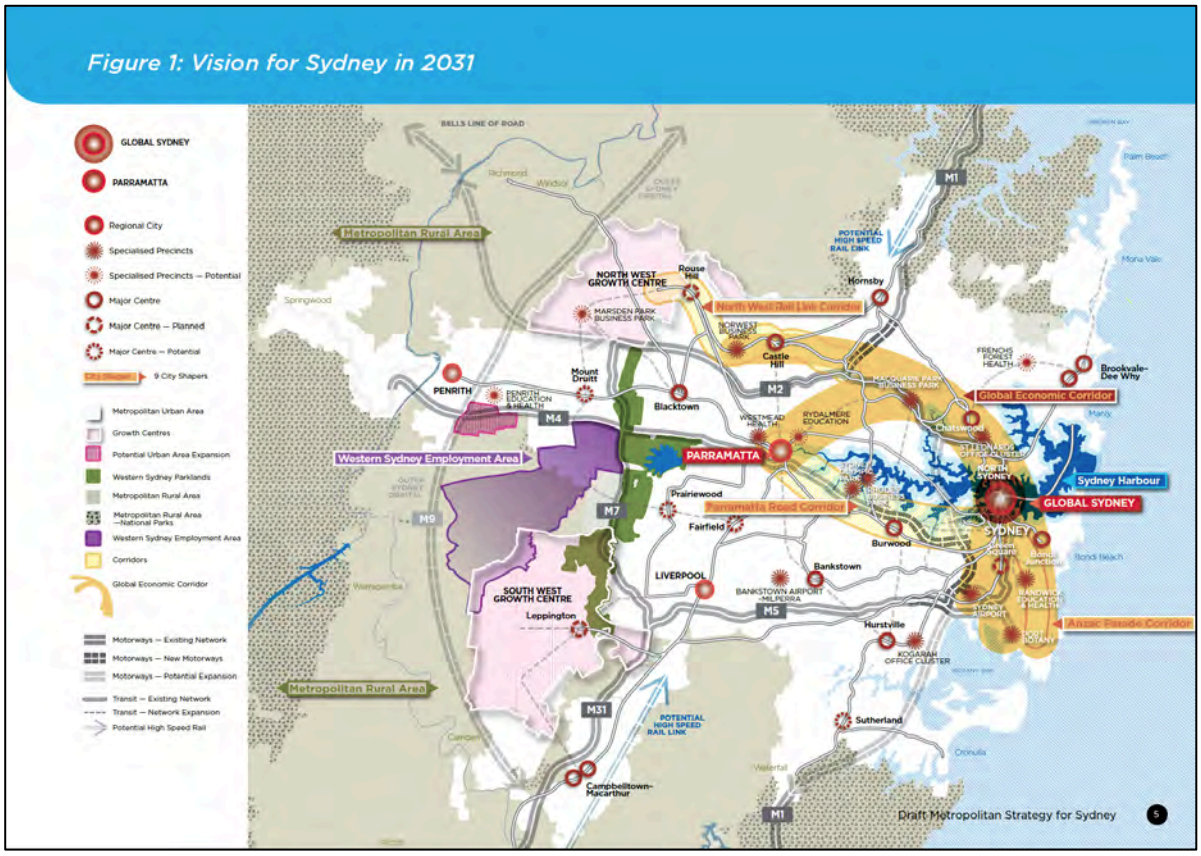
Draft Metropolitan Strategy for Sydney to 2031, March 2013

A more efficient use of existing infrastructure

The urban renewal of the M1 would provide much needed housing in a sustainable location immediate to existing infrastructure such as shops, parks, schools and transport.

Accessibility and Connectivity

Wahroonga is a dynamic Village, situated along Sydney's north shore railway line, in close proximity to Chatswood, Hornsby and Macquarie Park. Its location provides easy access to the proposed 'Global Economic Corridor'[5], along with fast commute to the centre of Sydney. Wahroonga is well placed, allowing easy access to the Global Economic Corridor, particularly via the proposed NorthConnex tunnel. It is in tune with 'Accessibility and Connectivity' objectives of the Draft Metropolitan Strategy, The housing development would facilitate easy access to rail transport and the new NorthConnex tunnel.



Map source: NSW Government: Draft Metropolitan Strategy for Sydney to 2031

Figure 7: Map of future vision for Sydney in 2031

Balanced Growth

The development also supports the concept of 'Balanced Growth' by designing 'urban renewal in areas that are close to transport hubs and corridors'. The conversion of a surface motorway to provide 2000 apartments in Wahroonga will not only repair the scar of the M1 that currently cuts Wahroonga in half, but is a real example of balanced growth, efficiently accommodating people within an established urban fabric. As a result, it will not only enhance the local economy, but also bolster the general economy in the local area.

[5] NSW Government, Department of Planning Draft Metropolitan Strategy for Sydney to 2031

Healthy and Resilient Environment

The proposed development would contribute to better biodiversity outcomes protecting the Cockle Creek/Spring Gully Creek riparian zone, while the horizontal tunnel provides the best effort to reducing emissions for improved air quality.

Whilst the strategic need for the project is well justified, the project does not sit in isolation from other crucial strategic master planning issues. When assessing this Critical State Significant Infrastructure, it is vital that the impacts on the whole of planning are taken into consideration. Urban landscape, air quality, land use and employment opportunity must all be considered, demanding that the proposal minimizes any negative impacts. In this regard, the current Transurban Proposal is satisfactory when considering the 'net' benefits of the tunnel project, while there will be substantial negative environmental impacts surrounding the northern portal and adjacent emission stack.

6.4 Ecologically sustainable development

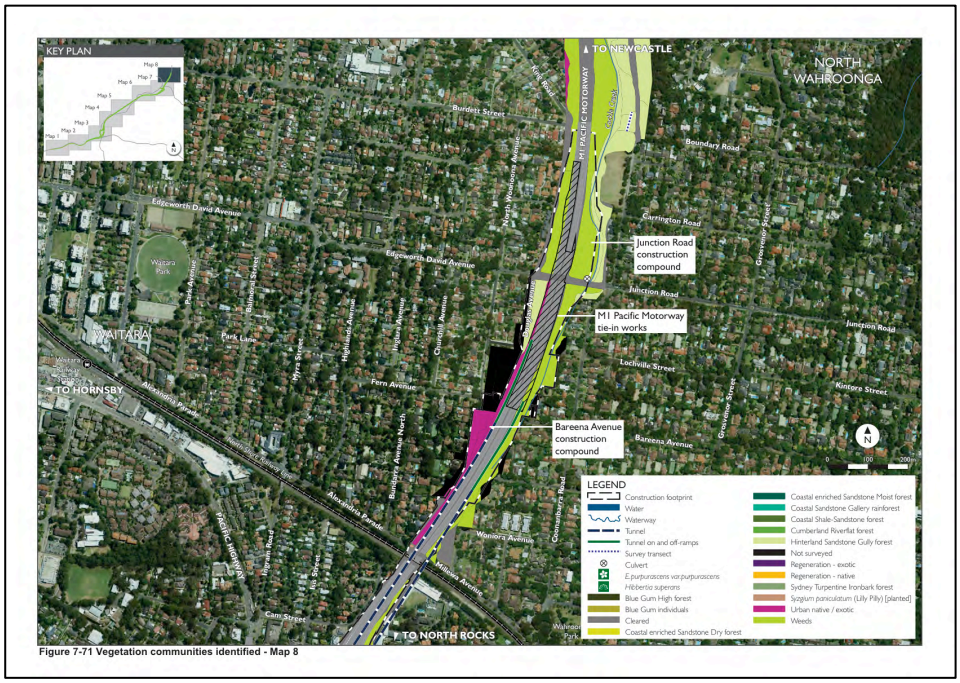
Grade: Poor

A detailed description of the project and its relationship and/or interaction with the existing public transport service (rail and bus), bus stops, passenger facilities, location of routes, operator amenities, cyclist facilities, the proposed removal of trees and the location and operational requirements of construction compounds; and detail how the principles of ecologically sustainable development will be incorporated in the design, construction and ongoing operation phases of the project.

The proposed location of the northern portal, requiring the widening of the M1 to an effective width of 10 lanes will cause the destruction of the adjacent Cockle Creek/Spring Gully Creek.

Photograph source: Equilibria

Figure 8: Image of Cockle Creek adjacent to M1 motorway



Plan source: NorthConnex EIS

Figure 9: Image showing extent of vegetation along M1 corridor in Wahroonga

The EIS describes the existing Cockle Creek riparian zone as ‘weeds’.

The location of the Junction Road compound will also have a major impact on the local ecology. It is understood however that relevant mitigation measures will be put in place and the bush will be regenerated after the construction is complete.

Image source: NorthConnex EIS

Figure 10: Junction Rd Compound directly over Cockle Creek

6.5 Analysis of risk

Grade: Unsafe

Notwithstanding the key issues identified for consideration, the EIS must include an environmental risk analysis to identify the potential environmental impacts associated with the infrastructure. Where relevant, the assessment of key issues identified for consideration, and any additional significant issues identified in the risk assessment, must include:

- *adequate baseline data;*
- *consideration of the potential cumulative impacts due to other development in the vicinity; and*
- *measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment.*

The area of risk of most serious concern is that of air quality. It is noted that the construction of NorthConnex will affect a net benefit in the quality of air the along the Pennant Hills Road corridor. However there will be an adverse impact on air quality in the area surrounding the northern portal. The EIS claims that this will be negligible, even though there will be an increase in diesel particulates. As there is no safe minimum level of PM2.5 particles, any increase is not acceptable[6]. The design of the tunnel must minimise the level of diesel particulates, especially PM2.5 particles, as these particles are known to cause an array of serious medical diseases. The cumulative impact of diesel particulate emissions from the proposed tunnel has been refuted or ignored.

The Transurban proposal has not adopted the main design element that would minimise the amount of diesel particulates emitted from the stack. This design element is the construction of a horizontal tunnel. As the local topography allows the construction of a horizontal tunnel, not doing so is a design failure that could lead to serious health impacts on the community.

Another design element that has been excluded is tunnel emission filtration. It is considered to be not economic rather than not effective.

It seems that Transurban is prepared to risk the health of the people using the tunnel, residents of Wahroonga and the growing generations of children breathing the polluted air in Wahroonga while they go to school.

The design of this Critical State Significant Infrastructure must place public health above financial gain. What is the purpose of The Environmental Planning and Assessment Act if is not to guide the building of an urban environment that is safe for the users and general community.

[6]Fairfax Media Network Online article: No Safe Level of Air Pollution, says Study July 2013

6.6 Traffic and transport

Grade: Fair

An assessment (including modelling) of the operational traffic impacts of the project, impacts (volumes, speeds, intersection performance, freight volumes, tolling etc) on the M1 (F3 Freeway), M2 and M7 Motorways, Pennant Hills Road, Windsor Road and the surrounding local, regional and state road network.

An assessment of wider transport interactions (local and regional roads and public and freight transport).

An assessment of the induced traffic and operational implications for public transport (particularly with respect to strategic bus corridors and bus routes) and consideration of opportunities to improve public transport. The assessment must address impacts on cyclists and pedestrian access and safety (for those ancillary works around the Motorway corridor, as relevant) and consider opportunities to integrate cycleway and pedestrian elements with surrounding networks.

An assessment of construction traffic impacts, including a considered approach to route identification and scheduling of transport movements, the number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements), construction worker parking, the nature of existing traffic on construction access routes (including consideration of peak traffic times and sensitive road users, including emergency vehicles and buses), and the need to close, divert or otherwise reconfigure elements of the road network associated with construction of the project.

A strategy for managing construction traffic impacts, with a particular focus placed on those activities identified as having the greatest potential for adverse traffic flow, capacity or safety implications, and a broader, more generic approach developed for day-to-day traffic management.

Consideration of the cumulative construction impacts on residents/businesses taking into account other infrastructure projects that have either commenced construction, are preparing for construction or have recently been completed.

The EIS contains an array of tabular details regarding traffic volumes, based on software output. It is assumed that the information provided is correct and the need for the project is justified.

It is noted that the NorthConnex tunnel will cause approx. 15% fewer vehicles to use the Pacific Highway north of Pearce's Corner. It also will increase traffic volumes on the M1 close to the Wahroonga exit. It is important to note that currently the M1, during peak periods, is very heavy with traffic and when NorthConnex is open, the M1 will be virtually at capacity.
See NorthConnex EIS diagram below:

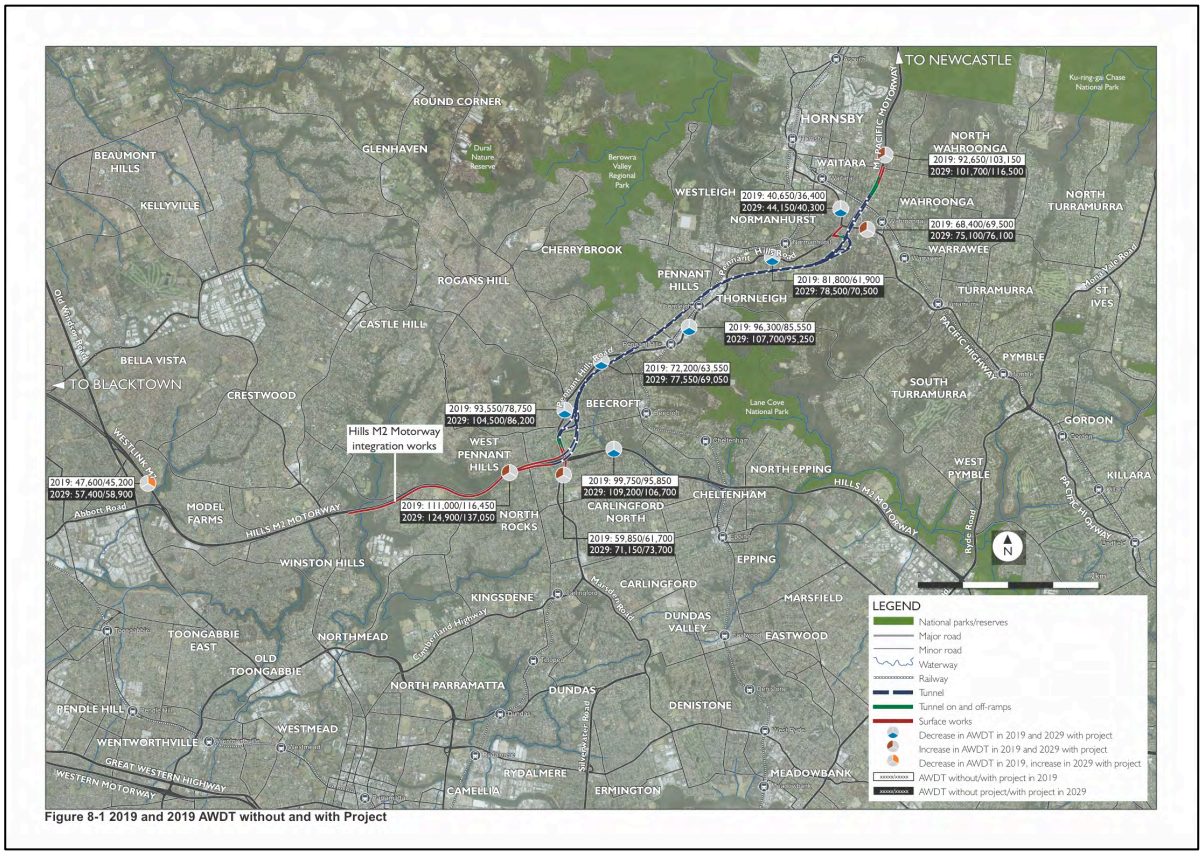


Figure 8-1 2019 and 2019 AWDT without and with Project

Diagram source: NorthConnex EIS

Figure 11: 2019 and 2029 AWDT along M1-M2 corridor without and with NorthConnex tunnel

6.7 Noise and vibration

Grade: Fair

An assessment of the noise impacts of the project during operation, consistent with the Road Noise Policy (EPA, 2011) and NSW Industrial Noise Policy (EPA, 2000). The assessment must include specific consideration of impacts to receivers (dwellings, child care centres, educational establishments, hospitals, motels, nursing homes, or places of worship), including specific consideration of sleep disturbance and, as relevant, the characteristics of noise (eg. Low frequency noise), and identify reasonable and feasible mitigation measures.

An assessment of construction noise and vibration impacts, consistent with the Interim Construction Noise Guideline (DECCW, 2009) and Assessing Vibration: a technical guideline (DEC, 2006). The assessment must have regard to the nature of construction activities (including transport, tonal or impulsive noise-generating works and the removal of operational noise barriers, as relevant), the intensity and duration of noise and vibration impacts, the nature, sensitivity and impact to potentially affected receivers, the need to balance timely conclusion of noise and vibration-generating works with periods of receiver respite, and other factors that may influence the timing and duration of construction activities (such as traffic management), and mitigation and management measures. The assessment should present, as relevant, an indication of potential for works outside standard working hours, including predicted levels and exceedences, justification for the activity and discussion of available mitigation and management measures.

Consideration of the nature and duration of construction noise and vibration impacts of the project, in terms of a continuance of these impacts from the recently completed M2 Upgrade project, on residents located adjacent to the Hills M2 Motorway between Windsor Road and Pennant Hills Road.

It is expected that there will be some degree of noise disturbance during the construction of such infrastructure. The EIS does describe appropriate noise and vibration mitigation measures that will be implemented. It is recognised that such measures would be appropriate, considering that any construction disturbance is only temporary.

The M1 motorway was built in the late 1980's and cuts Wahroonga in two along the valley of Cockle Creek/Spring Gully Creek. All vehicles join the M1 at Pacific Highway at approx. RL 185m and go down hill to cross Cockle Creek at approx. 90m. The NorthConnex EIS does little to recognise the current excessive noise levels caused by heavy vehicles' exhaust braking day and night down the hill of the M1 through Wahroonga.

Post construction, the anticipated increase in number of vehicles using the M1 will exacerbate the current noise levels along the Cockle Creek valley and adjacent residential area of Wahroonga. Existing and proposed noise barriers are an attempt to address the noise issues but with limited success.

The design of the NorthConnex project does not take advantage of the existing topography to mitigate the future excessive noise levels along the Cockle Creek valley and reverberation across the residential area of Wahroonga.

Figure 7-12 Noise barriers - north

Diagram source: NorthConnex EIS

Figure 12: M1 along Cockle Creek valley showing existing and assessed noise barriers

6.8 Air quality

Grade: Unsafe

An assessment of construction and operation activities that have the potential to impact on local and regional air quality. The assessment should provide an assessment of the risk associated with potential discharges of fugitive and point source emissions, and include:

- details of the proposed methods to minimise adverse impacts on air quality during construction, particularly in relation to mobile plant,

- air quality impact assessment and air dispersion modeling conducted in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2005) where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty as to the potential level of risk, including a particle assessment addressing PM10 and PM2.5 values, consideration of impacts from dispersal of TSP, CO, NO_2 and other nitrogen oxides, volatile organic compounds (eg BTEX), details of the proposed mitigation measures to address air quality in tunnels and in the vicinity of portals and any mechanical ventilation systems (ie ventilation stacks), including details of proposed monitoring,

- consideration of the requirements of Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards (enHealth, 2012), and

- take into account any applicable advice provided by the Independent Advisory Committee on Tunnel Air Quality.

The proponents of this project have a duty of care to ensure the health and safety of both the users of the tunnel as well as all the people that are impacted by the project. In-tunnel air quality is extremely important to ensure the success of this critical infrastructure. Due to the toxicity of vehicle emissions, particularly diesel engines, the design must minimise gradients in the tunnel. The current design has various gradients across its entire length, resulting in very poor air quality in the tunnel. There will also be an increase in the dangerous PM2.5 particulates in Wahroonga. This is considered dangerous and must not go ahead.

Air quality has a direct impact on health. Any increase in PM2.5 particulates has an adverse impact on health. Note that the normal 24hr level of exposure to PM2.5 is up to 25 micrograms per cubic meter. In peak periods, the NorthConnex project will create up to 500 micrograms per cubic meter of particulate matter in the tunnel. This is considered dangerous.

This high level of particulate matter will be emitted via the northern ventilation facility at a height of 15m above natural ground. It is highly likely that this will be below the inversion layer, trapping the toxins and sending them straight back down to the ground. The residential area of Wahroonga, including more than 9000 school children will be adversely affected.

Table 7-101 Calculated in-tunnel air quality – main alignment tunnels during peak hours

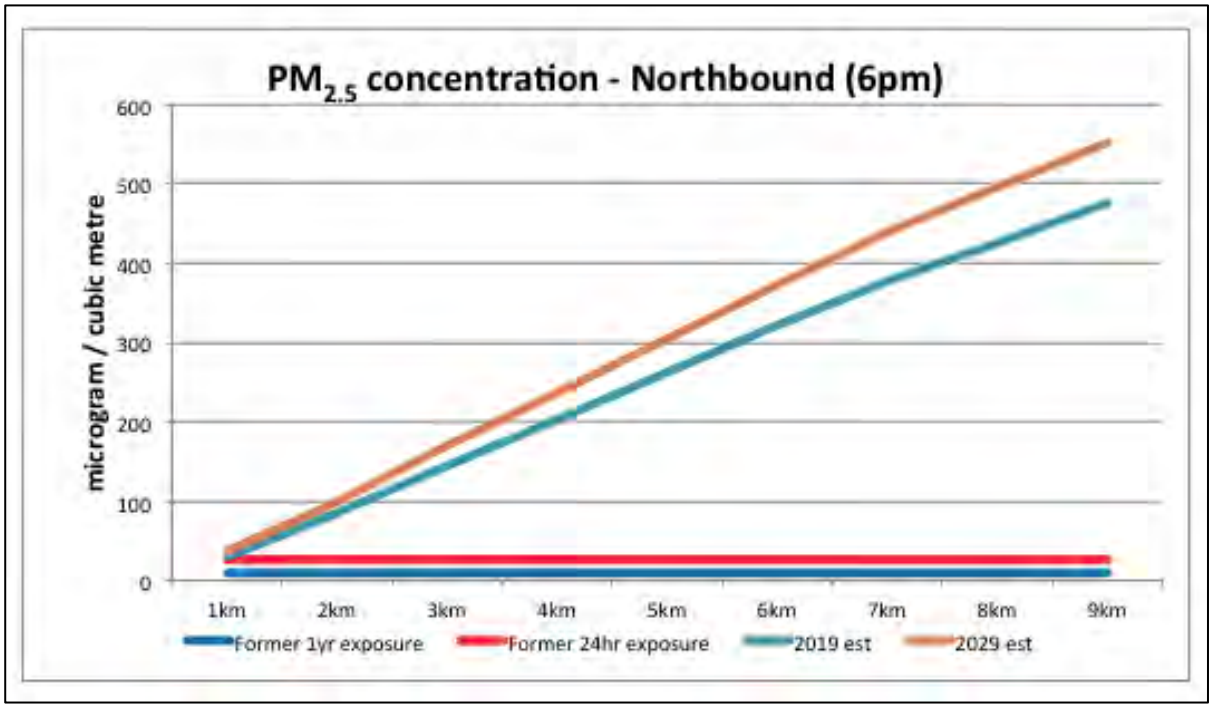
Pollutant	Pollutant concentrations (mg/m^3) (peak hour) Approximate distance along main alignment tunnels 1 km	2 km	3 km	4 km	5 km	6 km	7 km	8 km	9 km
Southbound main alignment tunnel at 9 am (2019)									
CO	0.331	0.772	1.06	1.34	1.62	1.90	2.17	2.58	3.45
NO_2^*	0.039	0.098	0.124	0.144	0.165	0.186	0.206	0.250	0.374
PM_{10}	0.039	0.084	0.122	0.158	0.193	0.229	0.265	0.307	0.377
$PM_{2.5}$	0.037	0.080	0.115	0.149	0.183	0.217	0.251	0.290	0.347
PAH	0.000006	0.00002	0.00002	0.00003	0.00003	0.00004	0.00004	0.00005	0.00006
VOC	0.033	0.079	0.109	0.136	0.164	0.192	0.219	0.260	0.346
Southbound main alignment tunnel at 9 am (2029)									
CO	0.411	0.956	1.32	1.67	2.01	2.35	2.70	3.20	4.29
NO_2^*	0.043	0.108	0.136	0.159	0.182	0.204	0.277	0.276	0.411
PM_{10}	0.047	0.101	0.145	0.189	0.232	0.275	0.319	0.369	0.439
$PM_{2.5}$	0.046	0.095	0.137	0.178	0.219	0.260	0.301	0.348	0.414
PAH	0.000007	0.00002	0.00003	0.00003	0.00003	0.00004	0.00005	0.00005	0.00007
VOC	0.040	0.094	0.129	0.162	0.195	0.228	0.262	0.310	0.413
Northbound main alignment tunnel at 6 pm (2019)									
CO	0.156	0.911	1.76	2.62	3.47	4.32	5.12	5.59	6.26
NO_2^*	0.005	0.110	0.231	0.352	0.473	0.594	0.707	0.771	0.860
PM_{10}	0.032	0.090	0.153	0.215	0.278	0.340	0.401	0.450	0.504
$PM_{2.5}$	0.030	0.085	0.144	0.203	0.263	0.322	0.379	0.425	0.477
PAH	0.000002	0.00002	0.00003	0.00005	0.00006	0.00008	0.00009	0.00010	0.0010
VOC	0.014	0.089	0.173	0.258	0.342	0.427	0.506	0.554	0.620
Northbound main alignment tunnel at 6 pm (2029)									
CO	0.195	1.13	2.19	3.25	4.31	5.37	6.35	6.94	7.76
NO_2^*	0.005	0.119	0.250	0.381	0.512	0.643	0.765	0.834	0.932
PM_{10}	0.039	0.106	0.178	0.250	0.323	0.395	0.464	0.521	0.585
$PM_{2.5}$	0.037	0.100	0.169	0.237	0.305	0.373	0.439	0.497	0.553
PAH	0.000002	0.00002	0.00003	0.00005	0.00007	0.00008	0.00010	0.00011	0.00012
VOC	0.017	0.106	0.207	0.308	0.408	0.509	0.603	0.661	0.739

*Note: NO_2 has been assumed to be 10% of total nitrogen oxides, consistent with PIARC (2012)

NorthConnex 516
Environmental impact statement

Table source: NorthConnex EIS

Figure 13: In-tunnel air quality during peak hours



Graph source: Graeme Foley

Figure 14: In-tunnel air quality PM2.5 particulates northbound at 6pm

The concentration of PM2.5 increases as vehicles go further through the tunnel to levels that are very dangerous to health. These high levels are emitted in the Wahroonga area.

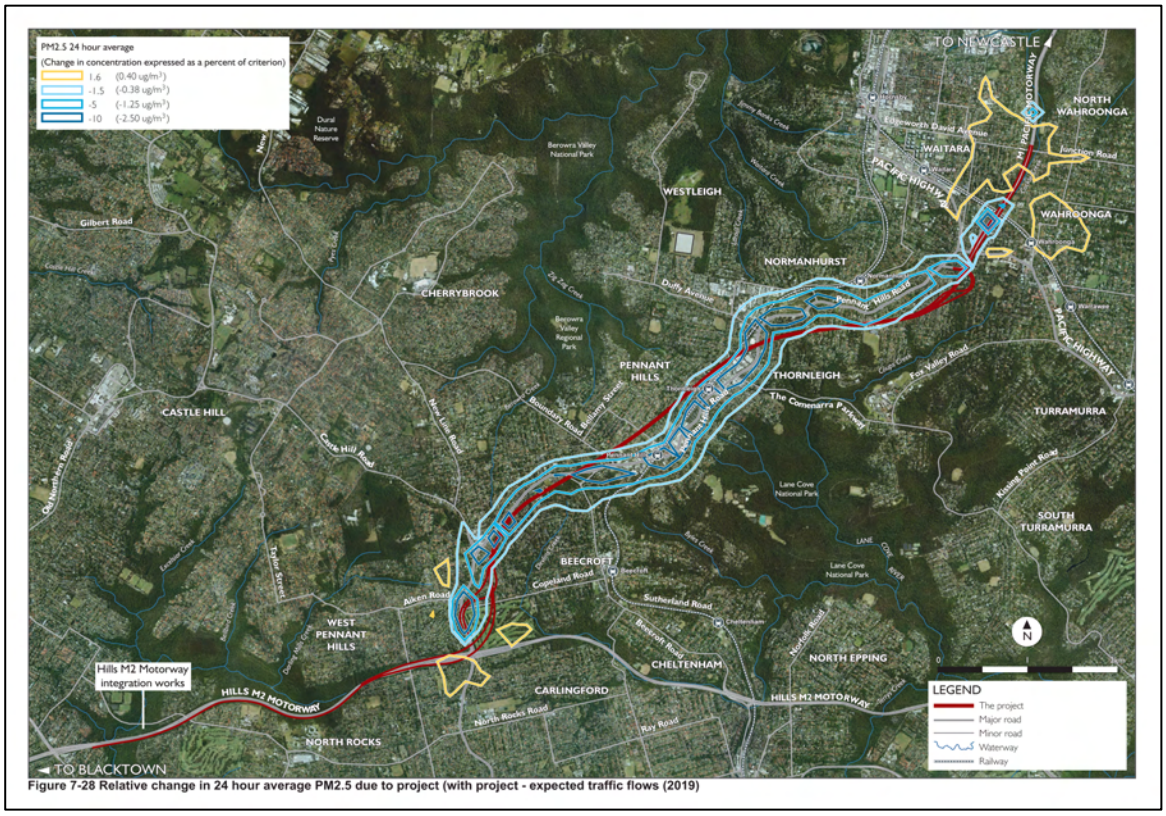


Figure 7-28 Relative change in 24 hour average PM2.5 due to project (with project - expected traffic flows (2019)

Diagram source: NorthConnex EIS

Figure 15: M1 corridor showing increase in PM2.5 mainly in Wahroonga.

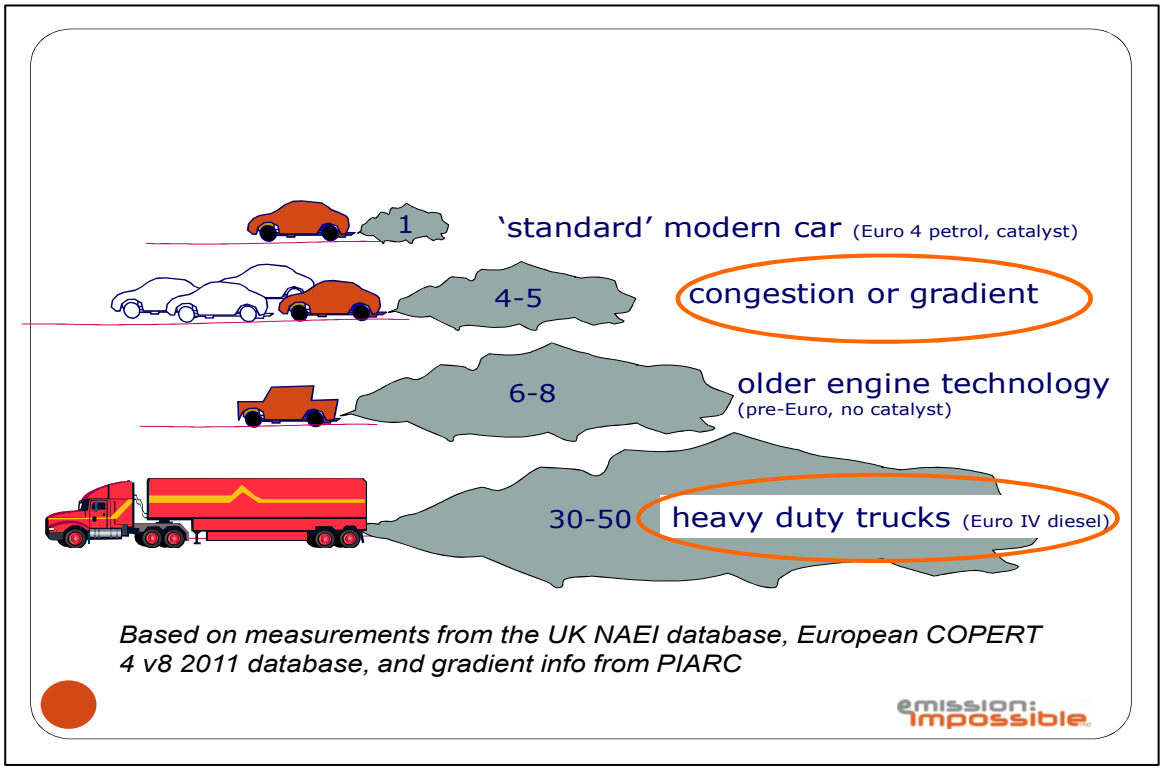


Diagram source: Presentation by Dr Gerda kuschel, NorthConnex Air Quality Forum 29 July 2014

Figure 16: Diagram highlighting that vehicles going up an incline or gradient emit 4 to 5 times more emission than going along a horizontal road.

The tunnel must be amended so that the portal is not in the residential area and in-tunnel air quality must be ensured by minimising tunnel gradients and maximising fresh air intake.

Pollution mitigation measures to ensure highest air quality in residential area may be achieved by:

a) Building the tunnel with minimum gradient and thereby minimising emissions from all vehicles. Note that at the NorthConnex Air Quality Forum on 29 July 2014, Dr Gerda Kuschel highlighted that vehicles going up an incline or gradient emit up to 4 to 5 times more emissions. Refer to slide from the presentation:

b) Designing the tunnel portal and associated stack out of a residential area.

c) Providing tunnel emission filtration.
Note that a horizontal tunnel would deliver a reduced level of emission. Filtration of a horizontal tunnel would be more cost effective because it would take longer for the filter to get 'clogged'. This is simply due to the fact that there would be fewer pollutants per hour being emitted into a horizontal tunnel by all vehicles.

6.9 Soil and water

Grade: Unsafe

An assessment of construction and operational erosion and sediment and water quality impacts, taking into account impacts from both accidents and runoff (i.e. acute and chronic impacts), having consideration to impacts to surface water runoff, soil erosion and sediment transport, mass movement, and urban and regional salinity. The assessment of water quality impacts is to have reference to relevant public health and environmental water quality criteria, including those specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000), and any applicable regional, local or site-specific guidelines.

Groundwater impacts as a result of the project (including ancillary facilities such as the tunnel control centre and any deluge systems), considering local impacts along the length of the tunnels and impacts on local and regional hydrology. The assessment must consider: extent of drawdown; impacts to groundwater quality; discharge requirements; location and details of groundwater management and implications for groundwater-dependent surface flows, groundwaterdependent ecological communities, and groundwater users. The assessment should be prepared having consideration to the requirements of the NSW Aquifer Interference Policy.

A Spoil Management Strategy detailing how spoil will be managed during construction, including likely volumes, likely nature and classification of excavated material, opportunities for recycling, potential disposal sites, stockpile management, and method of transportation.

Currently, Cockle Creek runs adjacent to the M1 Pacific Motorway. It is a natural waterway that flows into Cowan Creek at Bobbin Head, Ku-ring-gai Chase National Park. The proposed tunnel splices into the M1 Motorway with entry and exit tunnels adjacent to the existing M1 Motorway in the vicinity of Bareena Ave and Woonona Ave, Wahroonga. The construction of the entry and exit tunnels and portals will require the destruction of Cockle Creek/Spring Gully Creek and the associated riparian zone. There is also added risk of pollutant runoff from the construction process directly into Cockle Creek.

The position of the Junction Road compound is directly above Cockle Creek. In the event of a chemical spill such as diesel, it will flow directly into Cockle Creek.

It is recognized that Cockle Creek and the riparian zone form a local landmark waterway and should be preserved and protected.

One option for the spoil disposal is to fill the old Hornsby Quarry via a special ‘Quarry Tunnel’. If this idea goes ahead, spoil removal would be facilitated more easily if the northern portal were closer to the start of the Quarry Tunnel. The relocation of the northern portal approx. 1km further north would assist with this.

6.10 Community liaison

Grade: Fair

A Community Communication Framework for construction, identifying relevant stakeholders, procedures for distributing information and receiving/responding to feedback and procedures for resolving community complaints during construction. Key issues that should be addressed in the draft framework should include (but not necessarily be limited to):

- *air quality monitoring and management,*
- *traffic management (including property access, pedestrian access),*
- *landscaping/urban design matters,*
- *construction activities including out of hours work, and*
- *noise and vibration mitigation and management.*

It is understood that Transurban will set up a Community Communication Framework for construction to address issues such as air quality, traffic management, landscaping, construction activities and noise and vibration during construction. Any of the above issues should be addressed and responded to in a timely and comprehensive manner.

6.11 Urban design and visual amenity

Grade: Poor

A consideration of the urban design and visual amenity implications of the project, including supporting infrastructure, during construction and operation. The assessment must identify urban design and landscaping objectives and must demonstrate how the proposed urban design elements of the project would be consistent with the existing and desired future character of the area.

Identification and evaluation of the visual impacts and urban design aspects of the project (and its components) on surrounding areas.
A consideration of impacts on views and vistas, streetscapes, key sites and buildings.
Measures to manage lighting impacts both during construction and operation.
Artist's impressions and perspective drawings of the proposal from a variety of locations along the route.

The visual aspects of the proposed supporting infrastructure have been resolved well, considering the industrial scale of the buildings. It is understood that with the provision of this scale of infrastructure, there would inevitably be buildings that have an adverse impact on the visual amenity of the immediate local environment.

The only serious negative impact is associated with the location of the Bareena Ave/Woonona Ave Compound with the associated stack located in the Wahroonga heritage precinct. In this case, the proposed urban design elements of the project are not consistent with the existing and desired future character of the area.

Photograph and image source: NorthConnex EIS

Figure 17: Images highlighting impact on visual amenity

6.12 Biodiversity

Grade: Unsafe

An assessment of the potential ecological impacts of the project, with specific reference to vegetation and habitat clearing, connectivity, edge effects, weed dispersal, bushfire risk, riparian and aquatic habitat impacts and soil and water quality impacts. The assessment must:

- *Make specific reference to impacts on threatened species and endangered ecological communities.*

- *Have reference to the Draft Guidelines for Threatened Species Assessment (DEC/DPI, 2005), Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (DEC), the Guidelines for Aquatic Habitat Management and Fish Conservation (DPI, 1999) and any relevant draft or final recovery plans.*

- *Include details of any off-set measures that may be required, including demonstration that the measures are consistent with the NSW offset principles for major projects (state significant development and state significant infrastructure) (OEH, 2013).*

The design of the entry and exit tunnels connecting the NorthConnex tunnel with the M1 Pacific Motorway in the middle of the residential area is poor. There is very little peripheral space adjacent to the M1 and as a result of widening the road corridor to fit an additional 6 lanes, the riparian zone and Cockle Creek/Spring Gully Creek will be adversely affected. The widening of the M1 to provide adequate 'tie-in' along the M1 north of the portals will further impact on the creek and riparian zone.

The riparian zone is described in the EIS as "weeds". This statement is incorrect as there are many mature eucalypts, western red cedar trees and ferns as well as local micro-environment fauna such as a colony of water dragons, green tree frogs, wallaby, blue tongue lizard and ducks.

During construction, the construction of the Junction Road compound and associated carpark will have a detrimental effect on this riparian zone.

If the tunnel was extended by 1km and an interchange designed in tune with the Equilibria Proposal, the riparian zone adjacent to the current M1 would be protected, not destroyed. All the trees would remain. The microhabitat would not need to be destroyed.

6.13 Land use, property and socio-economic

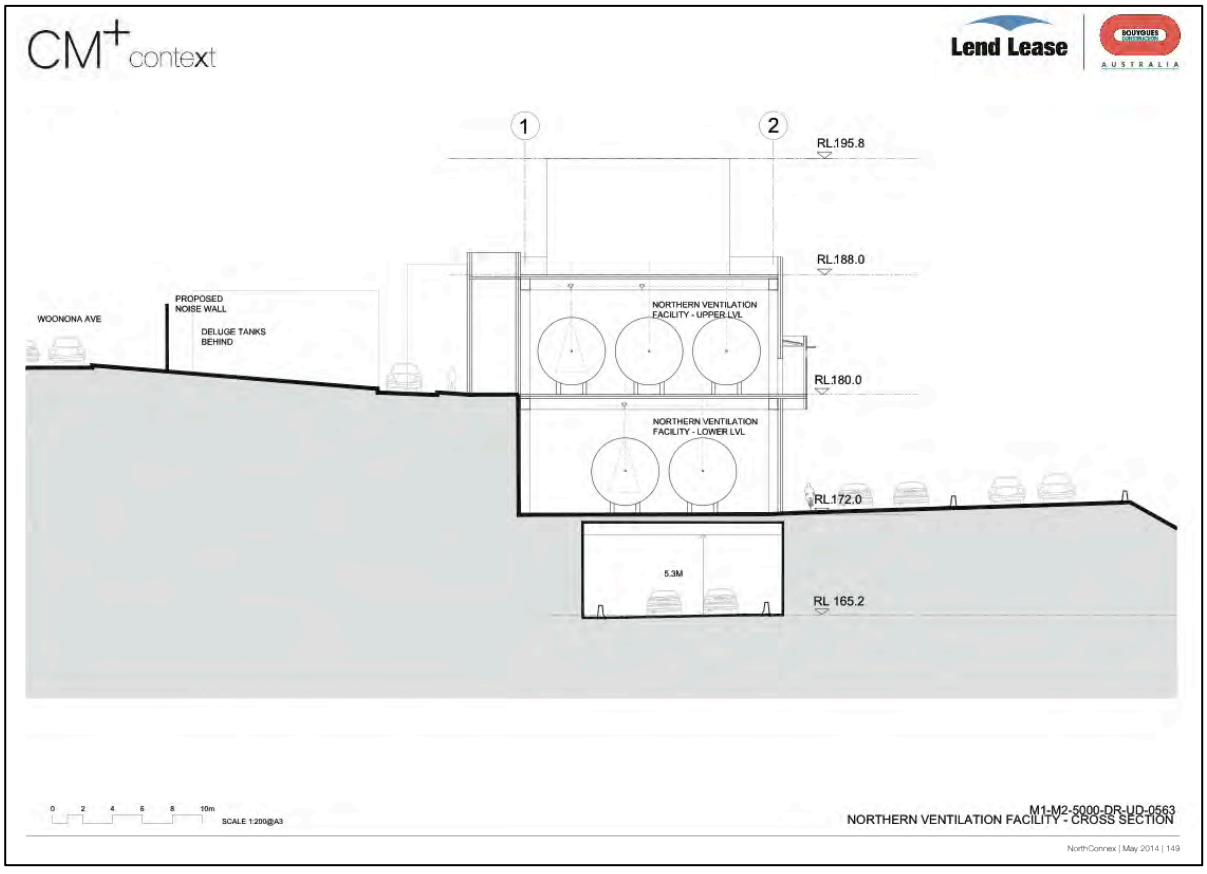
Grade: Poor

Impacts on directly affected properties and land uses, including impacts related to access, land use, property acquisition and amenity related changes.

Social and economic impacts to businesses along Pennant Hills Road and the Pacific Highway, and the community associated with traffic, access, property, public domain and amenity related changes.

The proposed NorthConnex project requires the compulsory acquisition of houses along the M1 corridor in Wahroonga to allow the widening of the M1 Pacific Motorway corridor, construction of the entry and exit tunnels to the proposed NorthConnex tunnel and northern ventilation facility on Woonona Avenue Wahroonga.

The location of the portals and the ventilation facility in the middle of the Wahroonga residential area is not acceptable. Even though the height of the structure above the M1 Pacific Motorway is approx. 24m, it is only approx. 15m above the street level of Woonona Avenue. Refer to cross section of the northern ventilation facility below:



Cross Section source: NorthConnex EIS

Figure 18: Northern ventilation facility cross section only 15m above Woonona Avenue.

The proposal to build the northern portals and ventilation facility in Wahroonga has brought enormous anxiety and fear into the community. This is evident across all age groups from school children to the elderly. The local residents are extremely concerned about the real long-term health implications of exposure to the toxic emissions. Up to 500micrograms per cubic meter of PM2.5 particulates along with all other pollutants such as carbon monoxide and nitrogen oxides will be emitted via the stack in Woonona Ave only 15m above the level of the street. It must be noted that the normal safe level of daily exposure to PM2.5 is 25 micrograms per cubic meter[7].

The social cohesion of the Wahroonga community will be affected as people make the decision to move out of the suburb to avoid the negative impact of the emissions stack. Compulsory acquisition of homes has caused and will continue to cause extreme levels of disruption and anxiety in the community. The NorthConnex project has already and will cause social dislocation and fragmentation of the community. The level of anxiety related to the positioning of the emissions stack is highlighted by the elevated number of recent sales within a 1km radius of the proposed stack[8].

Over time, the suburb will become known as a black spot for serious health issues such as asthma, cancer, respiratory and cardiovascular disease.

It is likely that the current design of the NorthConnex tunnel with the unfiltered ventilation facility in the residential area will have an adverse effect on enrolments at local schools in Wahroonga.

The NorthConnex proposal intensifies and widens the M1 in an area of Wahroonga where a sensitive corridor exits. The entry and exit tie in works will impact on to the point of destruction of the riparian zone. This riparian zone feeds directly into Cockle Creek/Spring Gully Creek which in turn flows into the waterways of the Ku-ring-gai National Park. It is important to note that local destruction of the environment will seriously impact on precious habitats that must be preserved for the long term survival of myriad of species of plants, wildlife and aquatic life.

The impact and degradation of the local amenity and society in Wahroonga is vexatious and unwarranted compared with the opportunity of providing apartments within walking distance of a train station not to mention the benefits to Wahroonga of reuniting the suburb and the resulting significant economic stimulus. In this regard, see the Equilibria Proposal which forms part of this submission.

[7] Australian Government, Department of the Environment - National Pollution Inventory 2013
[8] RPData, 2014 – 1km radius from proposed ventilation facility sales data since Jan 2014

6.14 Aboriginal Cultural Heritage

Grade: Fair

An assessment of the potential Aboriginal cultural heritage impacts of the project, including an assessment of objects, places of significance, natural and landscape values of the corridor and surrounding area, taking into account the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005).

Demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures).

Provision of Critical State Significant Infrastructure may in some instances impact on Australian Aboriginal Cultural Heritage. All Aboriginal Heritage must be protected and if impacted, relevant mitigation measures should be put in place.

6.15 Historic Heritage

Grade: Poor

An assessment of direct and/or indirect impacts to state and local heritage. Where impacts to State or locally significant historic heritage is identified, the assessment shall:

- Outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the guidelines in the NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning 1996).

- A statement of heritage impact for all heritage items/areas to be impacted (including significance assessment).

- Consider the impacts from vibration, demolition, altered historical arrangements and access, and architectural noise treatment.

The proposed construction of an industrial scale building in the heritage precinct of Woonona Avenue, Wahroonga is unacceptable. The bulk and scale is out of context and despite efforts to 'soften' impacts by timber screening, the noise of the turbine fans and image of the stack detract substantially from the visual amenity of the area.

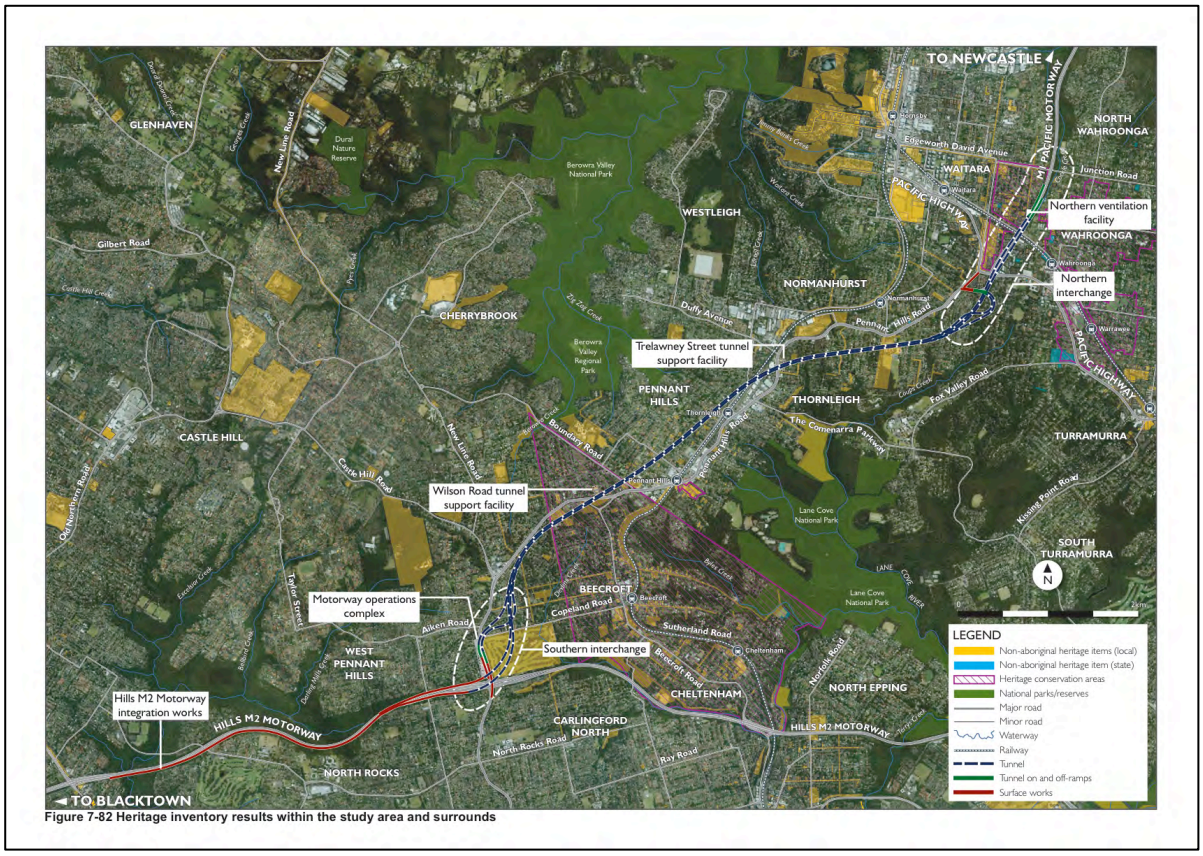


Figure 7-82 Heritage inventory results within the study area and surrounds

Diagram source: NorthConnex EIS

Figure 19: Diagram highlighting heritage precincts

Perspective source: NorthConnex EIS

Figure 20: Perspective of northern ventilation facility located in Wahroonga heritage precinct.

Note that the above industrial scale building is proposed to be built directly opposite the heritage building shown below. The location of the ventilation facility compromises the curtilage required for these heritage buildings. It is not a suitable location for the ventilation facility.

Plate 89	42 Woonona Avenue c.1993 (Hornsby Shire Council, 2014)	Plate 90	42 Woonona Avenue c.2013

Photograph source: NorthConnex EIS

Figure 21: Heritage item in Woonona Ave opposite stack

Figure 5-43 Indicative Bareena Avenue construction compound

Photograph source: NorthConnex EIS

Figure 22: Proximity of northern ventilation facility to heritage houses in Woonona Ave, Wahroonga.

6.16 Consultation

Grade: Poor

During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with:

Local, State and Commonwealth government authorities, including the:

- *Environment Protection Authority;*
- *NSW Health;*
- *Office of Environment and Heritage (including Heritage Division);*
- *NSW Office of Water;*
- *Department of Primary Industries;*
- *The Hills Shire Council;*
- *Hornsby Shire Council; and*
- *Ku-ring-gai Municipal Council.*

Specialist interest groups, including Local Aboriginal Land Councils, Aboriginal stakeholders;

Emergency services;

Utilities and service providers; and

The public, including community groups and adjoining and affected landowners.

The EIS must describe the consultation process and the issues raised, and identify where the design of the infrastructure has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.

Equilibria attended a community liaison event on Tuesday 22 October 2013 at the Turramurra Masonic Hall and Function Centre. At his meeting, the project to provide the missing link for Sydney's motorway network was described – ie to link the M1(F3) to the M2 via a tunnel.

At the meeting Transurban stated that they:

"would like to hear the views of community members and businesses about the F3-M2 proposal, in particular:

• What do you see as the community benefits in the proposal?

• What aspects of the proposal are important to you?

• Are there any issues relating to your local community you think we should be aware of?

• Should the proposal proceed, what are the most important considerations during design and environmental assessment?

• How do you want receive information, discuss issues, share values and engage with the project team in future project stages?

We look forward to meeting you and encourage you to provide your feedback by email."

After this meeting Equilibria became concerned about potentially harmful air quality in the tunnel and subsequently resolved an amendment to improve the in-tunnel environment and social impact. This proposal known as the Equilibria Proposal was first presented to Richard Merrett, Design Project Manager Development and Operations Enhancements, Transurban at a meeting on Monday 18 November 2013. Equilibria also met with Transurban's Group General Manager NSW, Andrew Head and Raymond Golzar, General Manager Development and Tollaust on 7 January 2014. On the 28 January 2014 we also met with Tim Parker Project Director – F3 – M2 Link RMS, together with senior members of the NSW Department of Premier and Cabinet.

On 27 March 2014 at the Hornsby RSL there was another community information session and at this meeting it described the preferred Lend Lease Bouygues scheme for NorthConnex.

The NorthConnex Air Quality Forum was held on Tuesday 29 July 2014.

The first time Equilibria received a response from Transurban was on 16 April 2014. A further response was received on 2 July 2014. Clarification of all issues raised by Transurban was contained in an email from Equilibria to Transurban on 2 July 2014. On 16 July a further refusal was sent by Andrew Head recommending we submit our suggestions via the EIS process. Andrew Head states in this correspondence that "I remain satisfied our proposal provides the best design option for the M1-M2 link".

It is noted that the benefits of the Equilibria Proposal were brought to the attention of Transurban early in the community liaison process in 2013. There was no attempt by Transurban to make any amendment to improve their project as proposed by Equilibria.

7.0 RECOMMENDATION – EQUILIBRIA PROPOSAL

The Lend Lease Bouygues Proposal provides a longer tunnel (9km instead of 8km) which has a northern portal approximately 1km north of Pacific Highway, near Bareena Avenue, Wahroonga. The northern portal design however does require amendment to reduce its environmental impact. At this point, the total motorway width would be 10 lanes as it also proposes to keep the existing M1 through to Pacific Highway. This duplication of road results in a massive expanse of bitumen through a section of Wahroonga which does not have a lot of peripheral space. Subsequently, the proposed northern portal requires the compulsory acquisition of adjacent houses and the construction of an exhaust stack in the immediate vicinity. This is not acceptable and must not go ahead.

The local community welcomes the concept of the tunnel development and is keen to ensure that the delivery achieves the best outcomes, overall. The solution for the northern portal should, after detailed community consultation and site analysis, recognise that the tunnel must not end in the middle of the Wahroonga residential area, and should provide a smart solution that does not have any negative impact. To that extent, major suggested improvements to the NorthConnex Proposal which warrant further and most serious consideration have been suggested by Equilibria.

Refer to section 9.1 Equilibria Proposal.

7.1 Mission – Minimum emission with a horizontal tunnel

To enhance the NorthConnex M1-M2 Tunnel Proposal by extending the tunnel by approximately 1km. A horizontal tunnel would then join the M1 on grade with minimum vehicle emissions. The redundant M1 land would be rezoned for a sustainable urban development. Wahroonga is reunited and quiet AND the smoke stack is located further north in Hornsby industrial area.

7.2 Benefits of a horizontal tunnel with minimum gradients

The following longitudinal sections compare the current NorthConnex tunnel with the proposed amended tunnel by Equilibria.

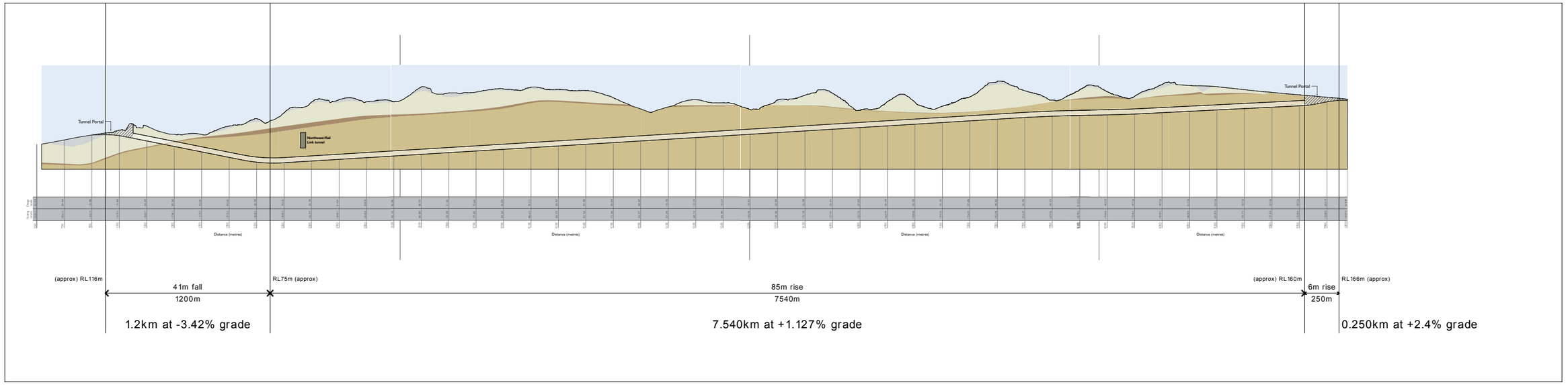
An analysis of the effect of gradient on pollution emission for each of the above cross sections was undertaken by Pacific Environment Limited using NSW EPA 'Air Quality Appraisal Tool' (AQAT). The results illustrate the comparative emissions between the NorthConnex Tunnel and the Equilibria Proposal extended and predominantly horizontal tunnel. Refer to the results below:

Emissions from tunnel	CO	NOx	$PM_{2.5}$	HC	$CO_{2\text{-}e}$
Transurban tunnel	395.17	154.83	3.93	17.50	55,223.35
Alternative (Equilibria Proposal)	173.45	117.76	3.57	8.44	32,409.70
Change (tonnes/year)	-221.73	-37.07	-0.36	-9.06	-22,813.65
Change (%)	-56.1%	-23.9%	-9.1%	-51.8%	-41.3%

Table information source: Pacific Environment Limited AQAT calculation

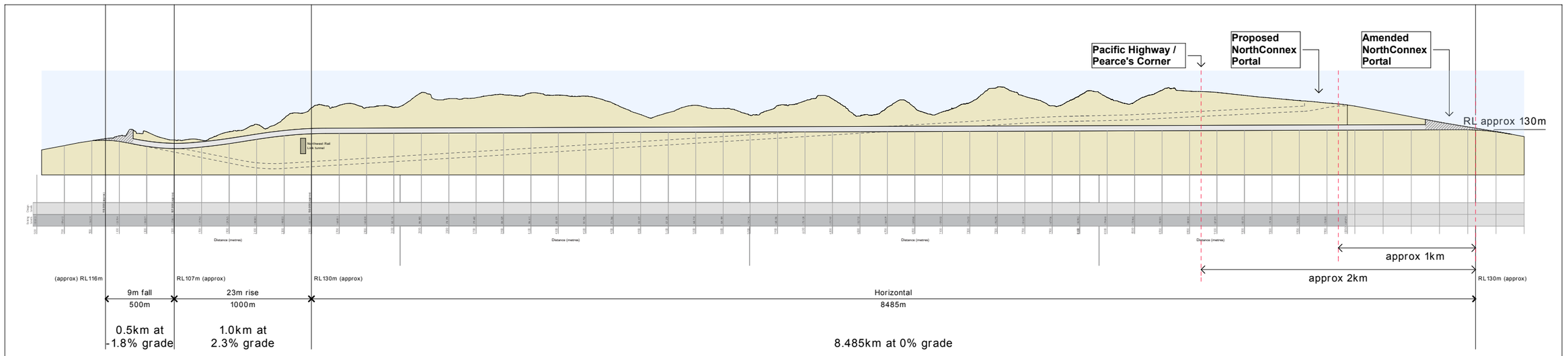
Figure 23: Results from AQAT calculation comparing Transurban tunnel with Equilibria amendment

The results clearly show that improved tunnel alignment by reducing gradients to a minimum can reduce emissions by up to 50%.



Longitudinal section source: NorthConnex EIS Longitudinal Section Vol1C - Appendix C

LONGITUDINAL SECTION: NORTHCONNEX M1-M2 TUNNEL



Longitudinal section source: NorthConnex EIS Longitudinal Section Vol1C - Appendix C

Alternative Scenario: LONGITUDINAL SECTION: M1-M2 HORIZONTAL TUNNEL + EXTENSION

Figure 24: Longitudinal Section - Grade Analysis

7.3 Placement of emission stack out of a residential area

The following diagram shows the proposed northern portal and location for the emission stack in the Hornsby Industrial area. This location is not adjacent to houses and is high at the end of Leighton Place at approximate RL170m. The emission pipe runs underground adjacent to Cockle Creek, through the hill under Leighton Place and terminates behind the industrial buildings. There is enough space to build the ventilation facility buildings next to the stack. The stack can be as high as it needs to be for safe dispersion of pollutants, without offending anyone. Emission filtration is recommended.

7.4 The outcome

Equilibria's Proposal would deliver benefits to the Federal Government, NSW State Government, Transurban, Lend Lease Bouygues and the municipalities of Ku-ring-gai and Hornsby. Equilibria's Proposal is to build the tunnel approximately 1km longer than the current Transurban/Lend Lease Bouygues Proposal (approx. 2km north of Pacific Highway). The 2km length of M1 then becomes redundant and is rezoned to provide 2000 dwellings.

The Transurban M1-M2 Tunnel project would be instrumental in creating much sought after economic stimulus for the State of NSW. Perhaps the winning tenderer, Lend Lease Bouygues (a tier 1 construction company) would consider building the longer tunnel as well as taking control of the entire 100,000sqm of available housing land above.

The Equilibria Proposal is a minor amendment which will unleash a synergy of benefits, including a less congested and safer M1 close to Pacific Highway AND most importantly, a smoother, cleaner free flowing NorthConnex with no negative impacts on the community. This improvement opportunity will exist just once. If it is not accepted now, the present plans for NorthConnex will forever eliminate these possible benefits.

Finally, the community welcomes this enhancement and the benefits that will flow, if it is implemented. I vehemently urge the Government to approve Transurban's Unsolicited Proposal with the condition that the tunnel gradients and the northern portal are amended to allow the Equilibria Proposal.

Figure 25: **Proposed location of northern ventilation facility in Hornsby Industrial Area**

8.0 RESPONSE TO EIS COMMENTS ON EQUILIBRIA PROPOSAL

The alternative Equilibria Proposal to government would need to be considered under the NSW Government's unsolicited proposals process. The Equilibria Proposal does not align with the unsolicited proposal currently being considered by the NSW Government in accordance with The Guide of Submissions and Assessment of Unsolicited Proposals (2012).

This issue was discussed at the meeting with the Department of Premier and Cabinet on 28 January 2014. It was indicated at this meeting by the government that the Equilibria Proposal would have to be considered as an amendment to Transurban's Unsolicited Proposal. The Department of Premier and Cabinet was open minded and appreciative of the idea and stipulated that Transurban would have to come back to the government with this amendment.

It is important to note that the Equilibria Proposal is an urban design scheme that enhances the current NorthConnex proposal and unleashes many environmental, social and financial benefits. The Equilibria Proposal would only be possible if the Transurban Unsolicited Proposal was amended. Therefore on this basis a separate unsolicited proposal by Equilibria is not required.

A response has been provided to the Equilibria proponents citing safety, traffic management, financial and equity limitations including:

On Friday 22 August 2014, Equilibria met with senior management of RMS. The following issues were discussed and understood. Equilibria is pleased to provide its commentary on those matters from section 8.1 to 8.5 which follow immediately.

8.1 Path for Dangerous Goods

No suitable alternative for dangerous goods vehicles travelling along the M1 Pacific Motorway. Vehicles carrying dangerous goods would be forced off the motorway around Berowra and would need to travel through additional residential areas of Berowra, Asquith and Hornsby. Alternatively, safety standards would need to be relaxed to allow dangerous goods vehicles in the tunnel which would have potential implications for in-tunnel road safety.

The SKM main report 'F3 to Sydney Orbital Link Study' April 2004 states on page 3 – 14 the number of dangerous goods vehicles to be about 5%[9].

Currently, dangerous goods vehicles travel along the Pacific Highway all the way up the north shore, through St Leonards and Chatswood to Pearces Corner, along Pacific Highway north of Pearces Corner and also along Pennant Hills Rd. They also travel along the M1 Pacific Motorway north of Pacific Highway.

In peak periods, the southern section of the M1 Pacific Motorway is very heavy with traffic, increasing the risk of a traffic incident with a dangerous goods vehicle in the middle of the residential area of Wahroonga.

The Pacific Highway north of Pearces Corner, prior to the opening of the F3 (now the M1) in 1988, was the main highway out of Sydney. It is currently under-capacity and must be available to carry all the M1 traffic in the event of a serious incident forcing the closure of the M1. The Pacific Highway currently provides the passage of dangerous goods vehicles to Hornsby and Mt Ku-ring-gai industrial areas and has ample capacity to provide the path for dangerous goods vehicles.

The NorthConnex EIS (See Figure 8) highlights that once NorthConnex is opened there will be an increase in the number of vehicles using the M1 Pacific Motorway south of Berowra and also a decrease by approx. 15% in the number of vehicles using the existing Pacific Highway north of Pearces Corner. This change will exacerbate the existing traffic stresses on the M1 Pacific Motorway close to Wahroonga and increase the possibility of a serious incident with a dangerous goods vehicle.

It is proposed that the dangerous goods vehicles would not use the proposed NorthConnex tunnel north of Pacific Highway but would fill the 'void' along the existing Pacific Highway north of Pearces Corner. This would facilitate easing traffic volumes on the M1 Pacific Motorway close to Sydney and eliminate the possibility of an incident with a dangerous goods vehicle just north of the entry to the NorthConnex tunnel.

[9] SKM F3 to Sydney Orbital Link Study: Main Report April 2004 p3-14

8.2 Access to Pennant Hills Road Corridor

Forcing vehicles who need to access the Pennant Hills road corridor from the M1 Pacific Motorway through a tolled tunnel.

It would not be necessary for a toll in the extended tunnel north Pacific Highway because this section of tunnel will receive a $350M subsidy via the redevelopment of the redundant M1, as per the Equilibria Proposal. All vehicles would go past the toll road scanner after the exit tunnel to the Pacific Highway interchange.

8.3 Traffic Management

Lack of consideration of traffic management issues if the tunnel extension were closed due to an incident (unlike NorthConnex with Pennant Hills Road remaining as an alternative).

In the event of an incident in the main section of the NorthConnex tunnel, south of Pacific Highway, it would be still possible to exit via the Pacific Highway interchange to access both Pennant Hills Road and Pacific Highway.

In the event of an incident in the tunnel, north of Pacific Highway, then there would be no access to the tunnel directly from the M1 and the M1 would be closed. Note that if the incident is in the tunnel north of Pacific Highway, it will still be possible to access the main tunnel south of Pacific Highway from the Pacific Highway Interchange.

Likewise, with the current Transurban proposal, if there was an incident on the M1 just north of the entry portal to the NorthConnex tunnel, there would be no access to the tunnel or Pacific Highway and the M1 would be closed.

It is important to note that currently there is the occasional serious incident on the M1 north of Wahroonga, forcing the closure of the M1. In this instance, all traffic from the M1 is diverted to the Pacific Highway.

The above explanation highlights that extending the tunnel north of Pacific Highway would not reduce the quality of service of the M1 Pacific Motorway or the NorthConnex Tunnel.

8.4 Financial Model

Lack of robust financial and cost estimate information that allows for proposal appraisal.

Equilibria has prepared a 12-page discounted cash flow feasibility outlining the financial modelling of the development of the 10 separate land precincts.

8.5 Transurban Consideration

The additional length of tunnelling would also require another intermediate tunnel support facility (similar to the Wilson Road and Trelawney Street tunnel support facilities) in order to provide a safe in-tunnel environment in the event of an emergency. This would result in additional land acquisition, and associated social and environmental impacts.

The benefits that would be unleashed from instigation of the Equilibria Proposal would make it feasible to resolve all details required for the longer tunnel.

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Ambient Air Quality Standards Setting
An Approach to Health-Based Hazard Assessment

Dorothy L Robinson, Armidale Air Quality Group, Australia
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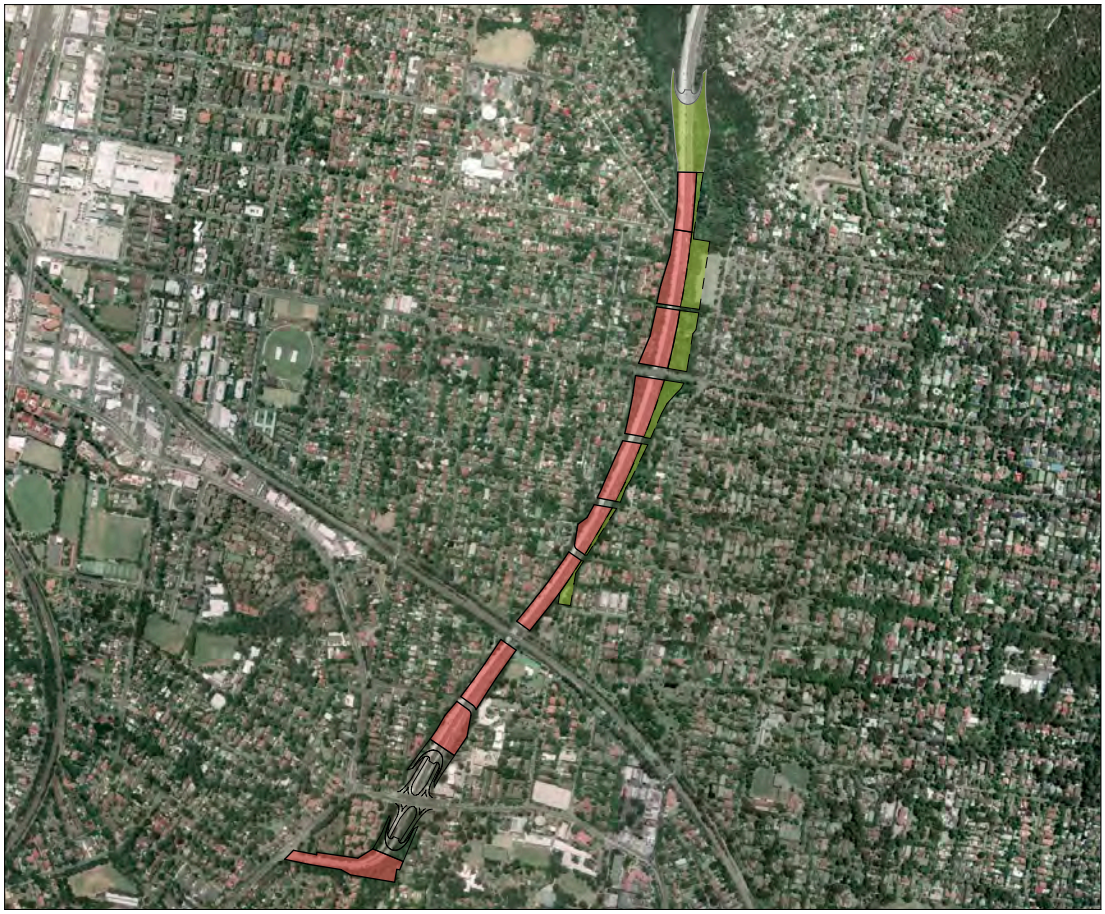
US EPA: *AQI (Air Quality Index)*
US EPA *AQI Brochure: February 2014*
US EPA *Standards for PM2.5*

10.0 APPENDICES

10.1 EQUILIBRIA PROPOSAL



Aerial Photograph Source: Google

INFRASTRUCTURE OPPORTUNITY

PROPOSED M1-M2 TUNNEL EXTENSION

WAHROONGA NSW

A proposal by

EQUILIBRIA

in association with

DALY INTERNATIONAL

12 SEPTEMBER 2014

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SUMMARY

Transurban has made an Unsolicited Proposal to design, build, operate, maintain and finance a tolled motorway linking the M1 at Wahroonga to the Hills M2 at West Pennant Hills.

Equilibria's Proposal is to extend the tunnel for an additional 2km at the start of the M1, or approximately 1km longer than the current Transurban / Lend Lease Bouygues Joint Venture Proposal.

The benefits would not only overcome the issue of a gradient in the tunnel, but would also substantially reduce noise and air pollution in the tunnel and Wahroonga.

A Unique Opportunity

The land, presently occupied by the M1, would become available, providing a unique opportunity to create a sustainable urban development. The suburb of Wahroonga would be reunited (currently cut in two by the M1) and approximately 2000 dwellings would be built.

Ultimately, Equilibria's Proposal would enhance Transurban's Proposal, benefit project partners, and provide economic stimulus to the State of NSW and the local community.

ASSUMPTIONS

The premier of NSW sees the value in extending the tunnel and building apartments in place of the 2km length of M1 Motorway.

Transurban sees the value in extending the tunnel and seeks to amend their Unsolicited Proposal.

The NSW Government and Transurban work together to facilitate the amendment.

SYNOPSIS

- Proposed M1-M2 Tunnel is extended by approx. 1km;
- Spoil from tunnel is used to rebuild sites and local streets;
- Wahroonga is reunited and benefits from reduction of M1 noise;
- 10 Precincts are created for development with total area approx. 100,000m^2;
- Outstanding opportunity to create 21st century sustainable housing;
- Economic stimulus.

POSSIBLE DEVELOPMENT OUTCOME

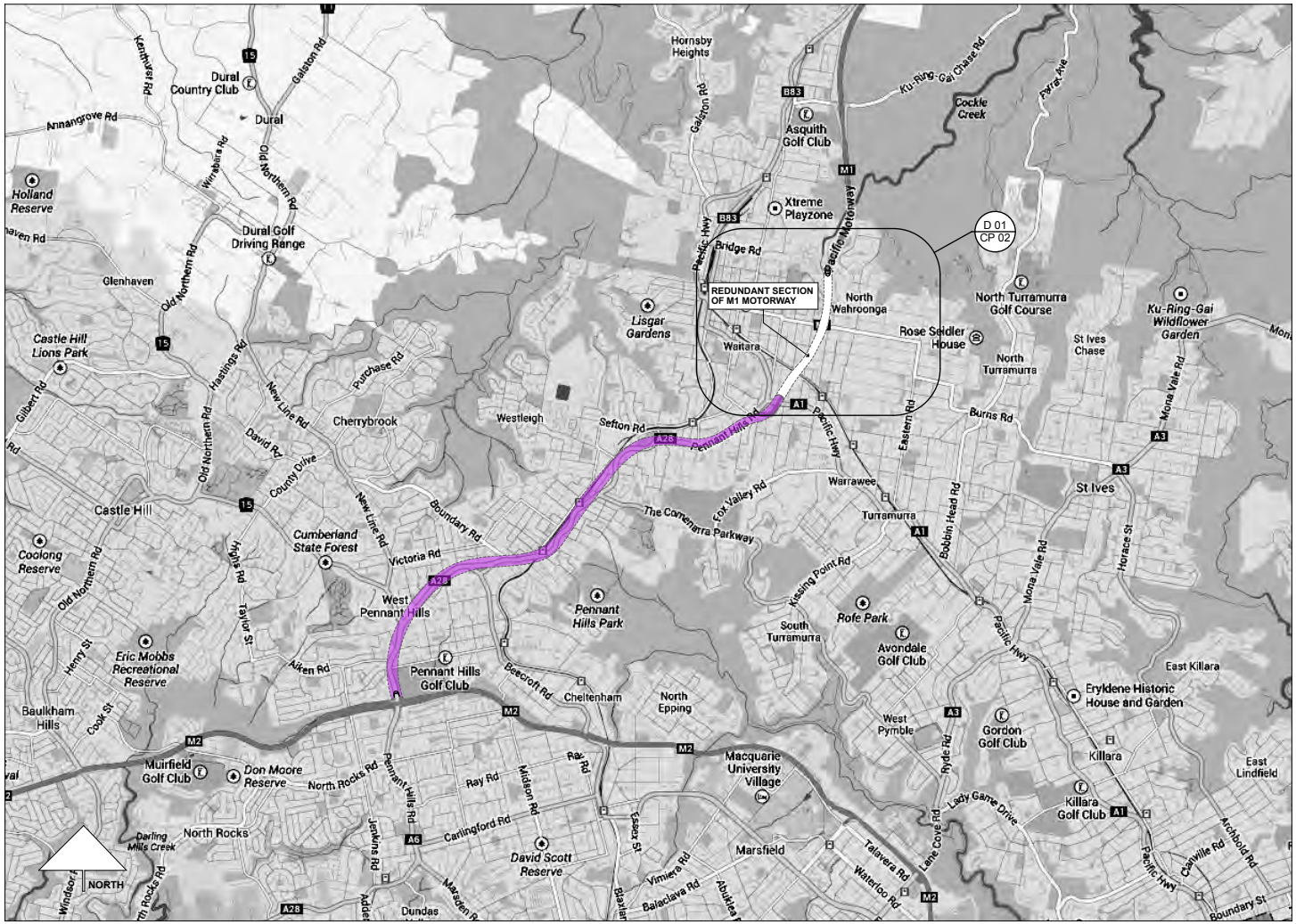
- Total Site Area (not including roads) = approx. 112,430m^2
- Area dedicated as bush reserve = approx. 14,320m^2
- Total Buildable Area = approx. 98,110m^2
- Residential development subsidy for 1km tunnel extension = $350M
- Payment to NSW Government for land purchase = approx. $100M
- Total No. of apartments = 2000
- Total sales = approx. $1.833B
- Total stamp duty from development sales = $74M
- Development Profit = approx. $400M

BENEFITS TO THE STATE OF NSW

- Lower environmental impact;
- Re-unification of the suburb of Wahroonga;
- Less traffic congestion where the original tunnel was proposed to end;
- Less pollution and cleaner air in the tunnel;
- Protection of Spring Gully Creek riparian zone;
- Swifter through traffic in tunnel;
- Capital return on sale of land;
- Provision of much needed residential accommodation close to a railway station;
- Much reduced noise impacts on Wahroonga;
- Likely greater community acceptance of NorthConnex;
- Economic stimulus.

BENEFITS TO TRANSURBAN / LEND LEASE BOUYGUES

- More vehicles likely to remain in tunnel rather than use Pennant Hills Road;
- Faster flow of all vehicles due to predominantly 0% gradient in tunnel;
- Fuel savings due to predominantly 0% gradient;
- Better tunnel experience due to minimum pollution in tunnel;
- Cost effective extension to the tunnel because the establishment costs would not need to be duplicated;
- Likely greater community acceptance of NorthConnex and improved public perception of Transurban;
- Likely improved EIS and more efficient planning approval;
- The section of M1 between Pacific Highway and Edgeworth David Road would not require upgrading;
- Overall a better tunnel and greater capital return from apartment sales.



Cadastral Map Source: Google

M1-M2 TUNNEL CORRIDOR scale 1 : 100,000

EQUILIBRIA
Architecture
Ph 02 9487 3800 Fax 02 9487 3850 PO Box 265 Wahroonga NSW 2076

CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
A	

AMENDMENTS	ISSUED

DATE	JOB No.	DWG No.
11/09/14		CP 01
ISSUE: A	DRAWN: TPG	

Cadastral Map Source: Google

D 01: M1-M2 TUNNEL EXTENSION CORRIDOR

scale 1 : 20,000

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CONCEPT PROPOSAL
M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

DATE	11/09/14
ISSUE	A
JOB No.	
DRAWN	TPG
DWG No.	CP 02

Cadastral Map Source: Google

D 02: M1 CORRIDOR PRECINCTS MASTERPLAN- WAHROONGA

scale 1:10,000

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

DATE	JOB No.	DWG No.
11/09/14		CP 03
ISSUE A	DRAWN TPG	

Cadastral Map Source: Google

D 03: M1 CORRIDOR PRECINCTS MASTERPLAN- WAHROONGA NORTH

scale 1:10,000

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

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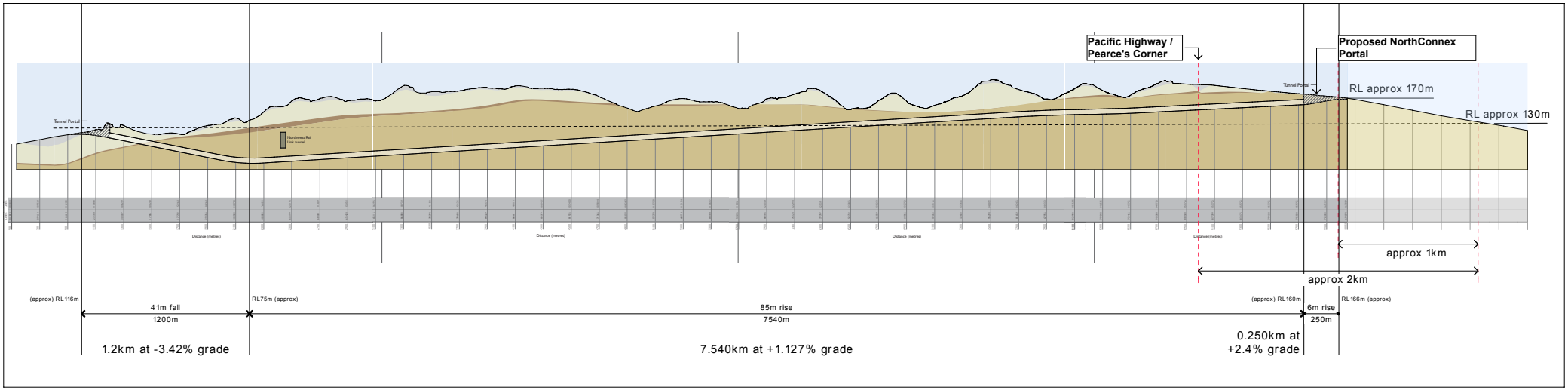
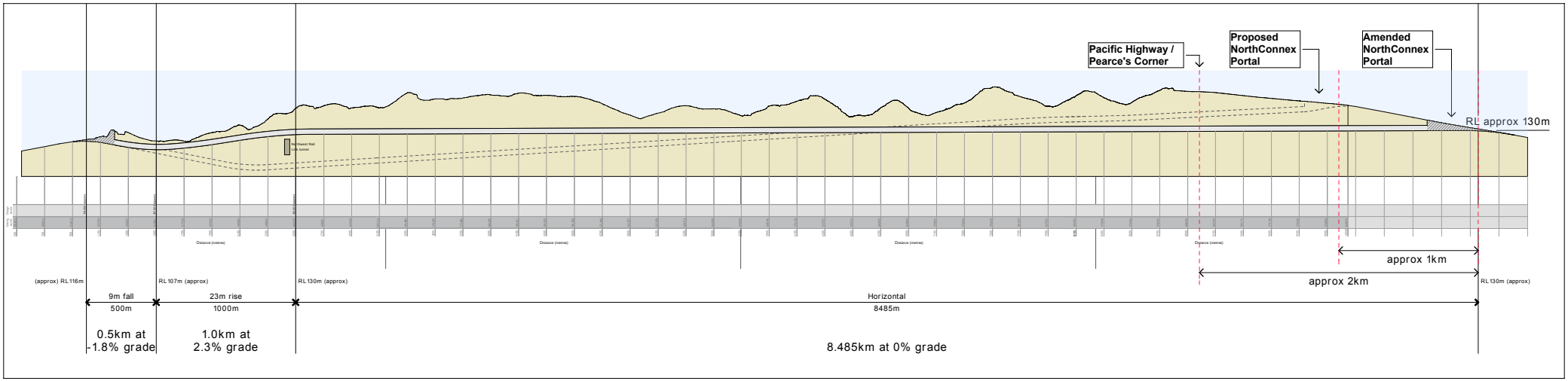


Longitudinal section source: NorthConnex EIS Longitudinal Section Vol1C - Appendix C

Current Transurban Proposal: LONGITUDINAL SECTION - NORTHCONNEX M1-M2 TUNNEL



Longitudinal section source: NorthConnex EIS Longitudinal Section Vol1C - Appendix C

Proposed Equilibria Amendment: LONGITUDINAL SECTION - M1-M2 HORIZONTAL TUNNEL + EXTENSION

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
A	

AMENDMENTS	ISSUED

DATE	JOB No.	DWG No.
11/09/14		CP 05
ISSUE A	DRAWN TPG	

Aerial Photograph Source: Google

M1-M2 TUNNEL EXTENSION - Proposed emission pipe to ventilation stack in Hornsby Industrial Area approx. RL 170m

scale 1 : 10,000

EQUILIBRIA
Architecture
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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

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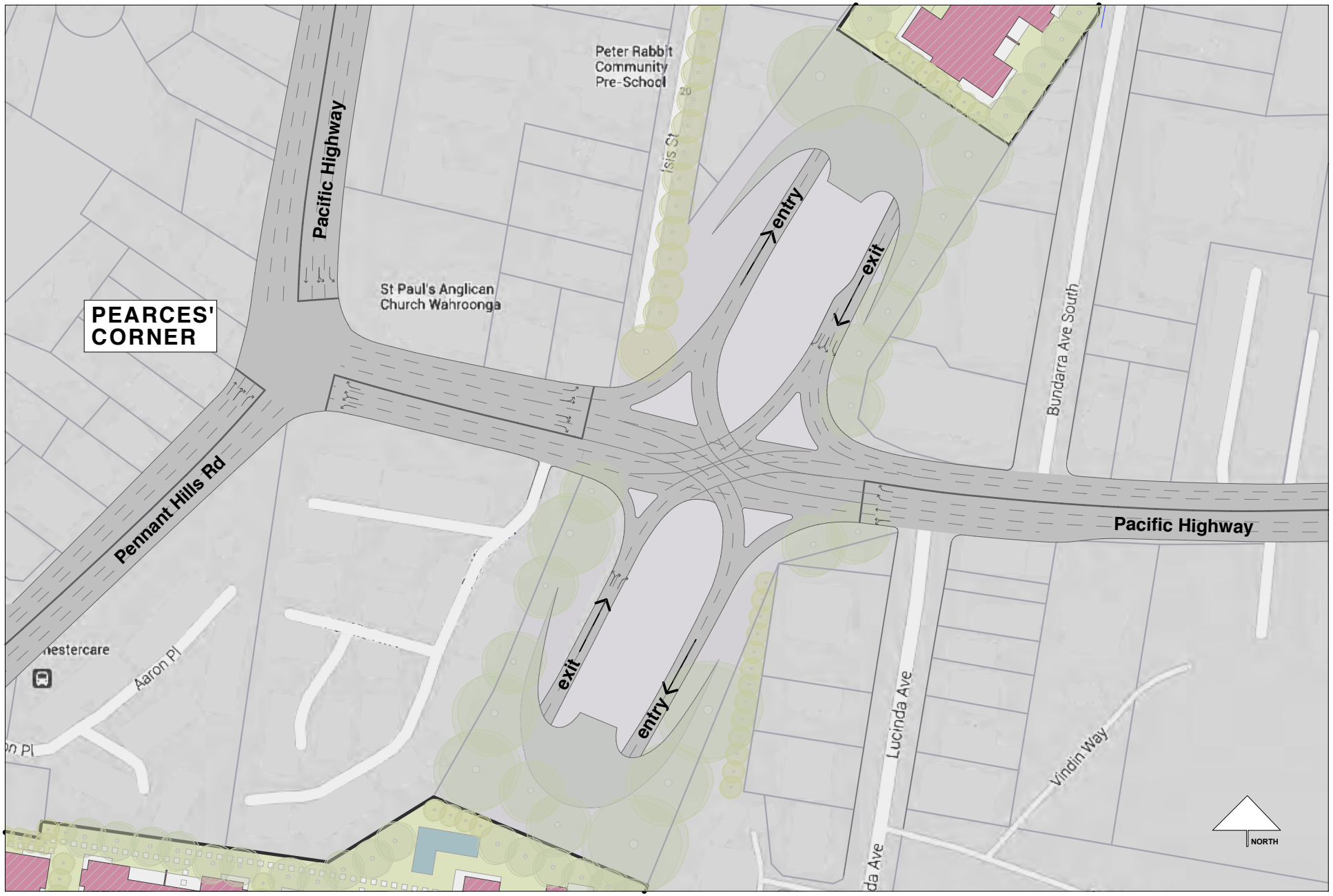

Cadastral Map Source: Google

D 04: M1-M2 TUNNEL / PACIFIC HIGHWAY INTERCHANGE - Option A: Full Traffic Light Controlled

scale 1 : 2,000

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

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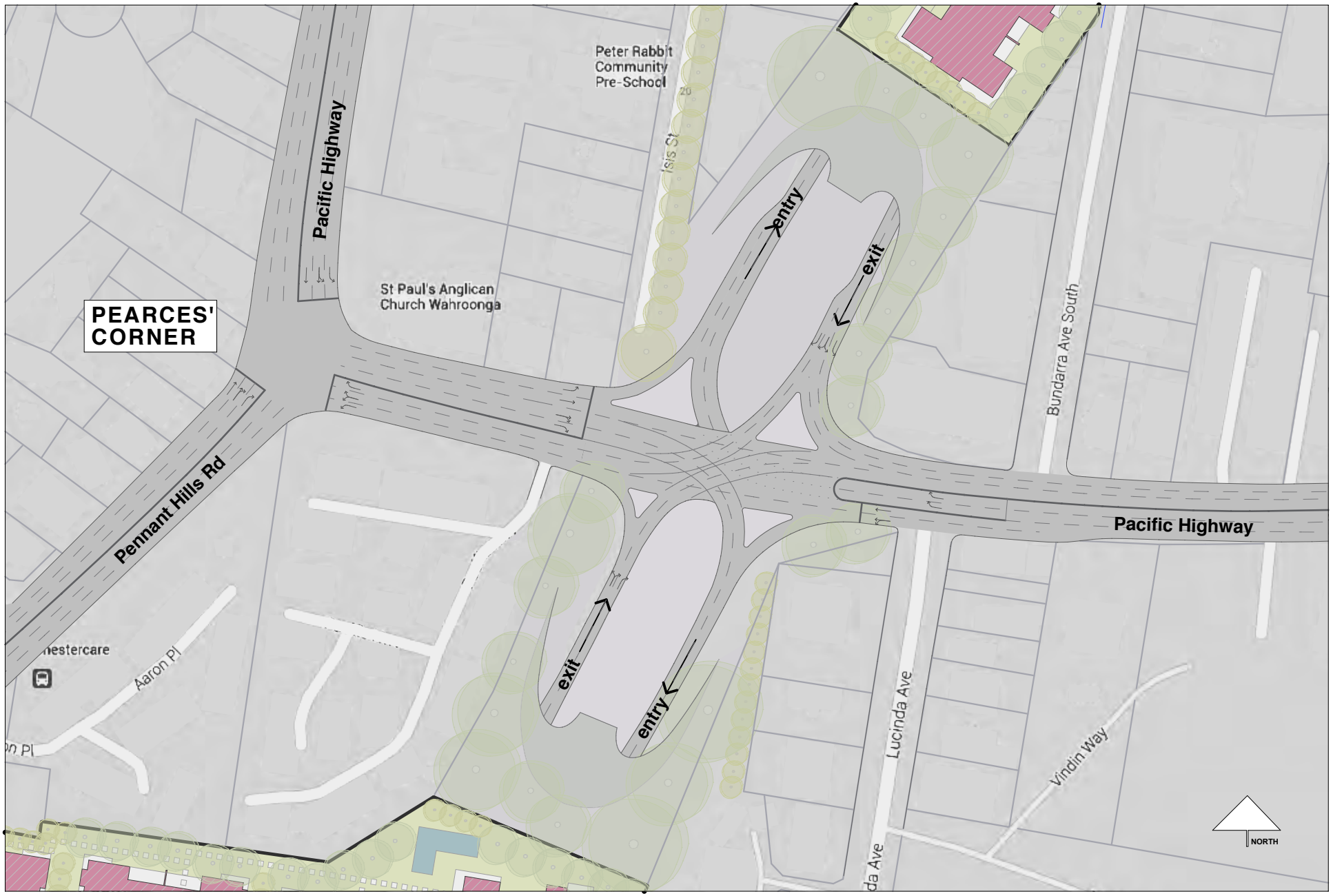

Cadastral Map Source: Google

D 05: M1-M2 TUNNEL / PACIFIC HIGHWAY INTERCHANGE - Option B: Northern Flow Priority

scale 1 : 2,000

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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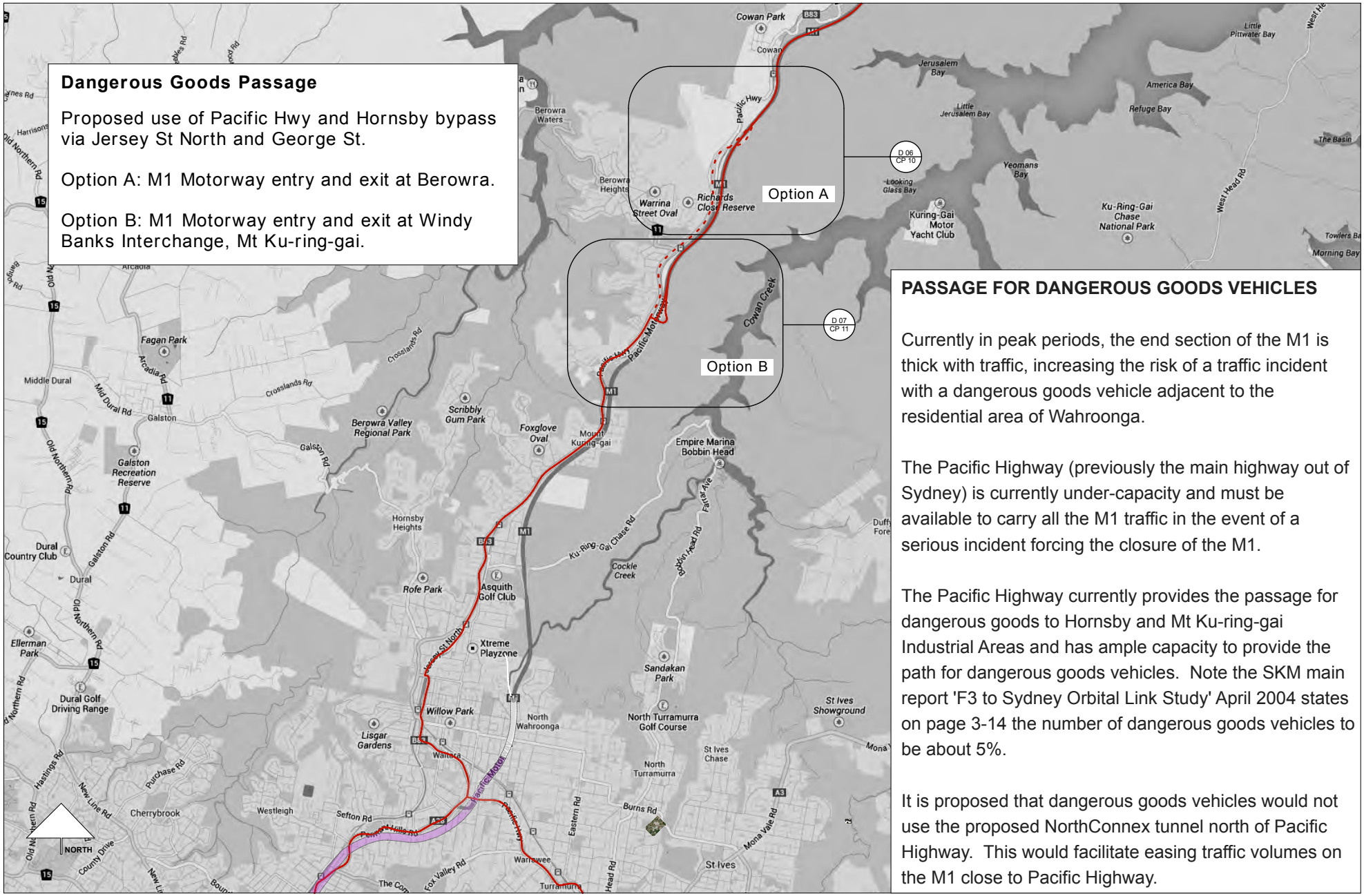

PASSAGE FOR DANGEROUS GOODS VEHICLES

Currently in peak periods, the end section of the M1 is thick with traffic, increasing the risk of a traffic incident with a dangerous goods vehicle adjacent to the residential area of Wahroonga.

The Pacific Highway (previously the main highway out of Sydney) is currently under-capacity and must be available to carry all the M1 traffic in the event of a serious incident forcing the closure of the M1.

The Pacific Highway currently provides the passage for dangerous goods to Hornsby and Mt Ku-ring-gai Industrial Areas and has ample capacity to provide the path for dangerous goods vehicles. Note the SKM main report 'F3 to Sydney Orbital Link Study' April 2004 states on page 3-14 the number of dangerous goods vehicles to be about 5%.

It is proposed that dangerous goods vehicles would not use the proposed NorthConnex tunnel north of Pacific Highway. This would facilitate easing traffic volumes on the M1 close to Pacific Highway.

Cadastral Map Source: Google

DANGEROUS GOODS PASSAGE

scale 1 : 100,000

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

DATE	11/09/14
ISSUE	A
JOB No.	
DRAWN	TPG
DWG No.	CP 09

1. View North along Pacific Highway

2. View South along Pacific Highway

Dangerous Goods Passage - Berowra exit

Exit for southbound traffic. Exit for detour routes to Berowra and Hornsby. Entry for northbound traffic.

Cadastral Map Source: Google

D 06: DANGEROUS GOODS PASSAGE Option A - Berowra Exit

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CONCEPT PROPOSAL

M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

DATE 11/09/14

ISSUE A

JOB No.

DRAWN TPG

DWG No. CP 10

Cadastral Map Source: Google

Photograph Source: Google

3. View North along Pacific Highway

Photograph Source: Google

4. View of Windy Banks bridge over M1

Dangerous Goods Passage - Windy Banks Interchange

Proposed new entry ramp going north and a new exit slip lane to connect to 'dormant' lane on existing M1 bridge. Connects directly to Pacific Highway.

D 07: DANGEROUS GOODS PASSAGE Option B - Mt Ku-ring-gai Windy Banks Interchange

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CONCEPT PROPOSAL
M1-M2 TUNNEL EXTENSION

AMENDMENTS	ISSUED
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AMENDMENTS	ISSUED

DATE 11/09/14
ISSUE A
JOB No.
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DWG No. CP 11

Aerial Photograph Source: Google

AERIAL VIEW OF LAND OCCUPIED BY M1 CORRIDOR

Arrow indicates direction of view - refer to following pages

Photograph Source: Equilibria

1. View North from Pacific Highway

Photograph Source: Equilibria

2. View South from Pedestrian Bridge

Views of land to be reclaimed for residential development and for the reunification of the suburb of Wahroonga.

Photograph Source: Equilibria

3. View North from Millewa Avenue

Photograph Source: Equilibria

4. View North from Junction Road

Views of land to be reclaimed for residential development and for the reunification of the suburb of Wahroonga.

EQUILIBRIA: Project Vision, Concept Design and Development

Equilibria was established in 1994 to deliver excellence in architecture and urban design.

The practice develops conceptually powerful ideas to form a balanced, environmentally responsible design solution. Modern design principles underpin the resolution of site context, function and client brief to create elegant, refined architecture.

A strong understanding of the process of building and the detailing of design results in cost effective solutions that provide efficient and accurate transition from drawings to built form. Durable materials and efficient technologies are selected based on site conditions to ensure low maintenance costs and long life.

Urban design projects evolve from a creative vision. Detailed discussions with local authorities and the client form unique, sustainable, low energy environments. Building form is balanced against site constraints and local authority regulations to result in buildings that are fit for purpose and commercially astute.

Completed projects include commercial and retail, industrial, education as well as large and small scale residential. Specifically, urban infrastructure projects include the resolution of a new urban centre in Penrith, Sydney and Honeysuckle, Newcastle.

Concept, master planning, over-riding design management

Our team has the capability to provide the following services to the M1-M2 tunnel extension and development of the land above the tunnel (currently M1 Motorway) for use as residential development:

- Negotiations with Council or NSW Government re zoning;
- Preparation of a preliminary draft LEP as a guide for Council or NSW Government;
- Preparation of design guidelines as embodiments of the LEP;
- Master planning in association with town planning and engineering consultants;
- Site Massing;
- Guiding and coordinating integration of services, access, vehicular routes, pedestrian ways and landscaping;
- Guiding the synthesis of client expectations and engineering requirements within a consistent aesthetic; which is to apply to the tunnel, the tunnel access ways, context; and the residential development;
- Quality assurance with respect to interpretation of the LEP, design guidelines, graphics, materials, textures and environmental considerations;
- Guidance on short-listing of residential development companies to develop the several portions of residential land; and or
- Guidance on short-listing of architects to design residential accommodation in the several precincts;
- Possibly accept the role of architect in designing residential accommodation for one or more of the residential precincts;
- Act as adviser to the client on all matters relating to aesthetics.

DALY INTERNATIONAL: Infrastructure delivery services

Daly International specialises in the delivery of infrastructure projects by providing engineering, town planning, property consultancy and project management services.

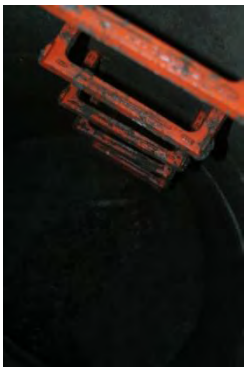
Daly International is engaging with Equilibria to develop the concept of a further 2km extension to the proposed F3-M2 tunnel. We fully support this concept that will deliver massive, economic and environmental benefit not only to Wahroonga and surrounding suburbs, but also to Sydney.

Our team of 220 professionals specialise in shaping infrastructure projects for maximum operational, economic and community benefit. Our clients include: governments; infrastructure owners and operators; financiers; and construction contractors.

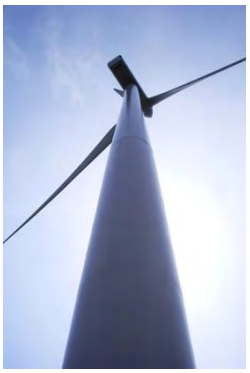
Our team has the capability to provide the following services to the F3-M2 tunnel extension.

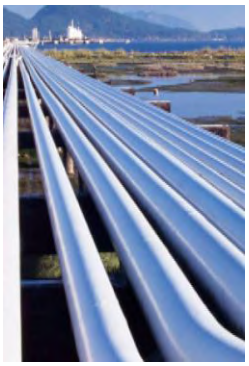
- Master planning
- Civil and structural design
- Stormwater modelling
- Detailed documentation
- Performance specification
- Engineering peer review for financiers
- Technical engineering advisory
- Building material and methodology review
- Quality assurance and compliance inspections during construction
- Construction contractor review
- Highest and best use analysis
- Property acquisition
- Compensation assessments
- Stakeholder identification and analysis
- Community consultation
- Town planning approvals
- Environmental assessment

Daly International is a privately owned company headquartered in Sydney. For more information about us see www.dalyinternational.com







Proposed M1-M2 tunnel extension
Surface infrastructure budget costing

13 January 2014

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2.2 Budget costs summary 6

Appendix A Precinct drawings 8

Document control

A	13/1/14	Approved draft for discussion	SETB	BP	SJC

Introduction

Transurban propose to design, build, operate, maintain and finance a tolled motorway linking the M1 at Wahroonga to the Hills M2 at West Pennant Hills.

Equilibria propose to extend the tunnel for an additional 2 km at the start of the M1 and reclaim the land currently occupied by freeway to create a sustainable urban development accommodating hundreds of new dwellings and reuniting the suburb of Wahroonga.

Daly International have contributed to the Equilibria proposal and now through Woolacotts Consulting Engineers (their wholly owned engineering subsidiary) and JHA Consulting Engineers (as sub consultants to Woolacotts) have undertaken an assessment of budget costs associated with providing infrastructure to support the intended surface development.

This report details our assumptions and provides budget costing for:

- Water supply to precinct boundaries
- Sewer mains with connection point at precinct boundaries
- Gas mains to precinct boundaries
- Civil works consisting of minor earthworks and stormwater drainage to each precinct
- Electrical supply to precinct boundaries
- Communications infrastructure to precinct boundaries
- Reconnection across the old freeway of Bundarra Avenue South, Burns Road, Bareena Avenue, Lochville Street and Carrington Street.

2.0 Budget costing

The overall concept of the proposed surface development is to make available areas of land which can be developed by other parties into residential precincts and reconnect residential areas to the east and west of the existing freeway. It is intended to provide services to the boundaries of each precinct to ensure that future developers can undertake their works without the need for major infrastructure upgrading in the surrounding residential areas.

Our budget cost estimates are exclusive of any contingencies, fees or managing contractors mark up. At this stage we recommend an overall allowance of 50% be made for these items in project budget estimates.

2.1 Base data and assumptions

Our budget costing is based on the Precinct drawings presented in Appendix A and the information obtained from DBYD investigations and preliminary review of authority infrastructure data presented in Appendix B. No discussions have been held with service authorities at this stage. We recommend that such negotiations be commenced and the costs confirmed as soon as practical.

The following specific assumptions have been made:

2.1.1 Water

A 150mm diameter water main will be provided to all precincts

2.1.2 Sewer

The diameter of sewer mains has been sized to suit the estimated population within each building

2.1.3 Gas

The sizes of gas mains is based on the need to supply 120 MJ/hr to each dwelling

2.1.4 Civil works

Minimum earthworks and stormwater drainage will be undertaken to maintain stability and erosion control until development commences. It is intended that the existing freeway surface and stormwater drainage be maintained where possible. Where the existing freeway drainage is interrupted by reconnection of roads, additional pipes or culverts will be installed to maintain stormwater drainage.

2.1.5 Electricity

Budget costs are based on infrastructure external to the individual development sites installed underground. Infrastructure internal to the sites (such as individual substations) will be a part of a separate costing exercise and funded by the Developers.

Given the compressed time no negotiations have taken place with Ausgrid. To receive definitive advice from Ausgrid on the capacity of existing nearby high voltage feeders and a supply methodology will necessitate formal applications, precise staging strategies and an

extended negotiating period (typically several months for a development of this nature). On this basis the analysis has been undertaken on a conservative basis.

JHA has undertaken a preliminary maximum demand assessment for the entire development (based on 1,450 dwellings) and has ascertained a maximum demand in the order of 6-7MVA.

While it may be possible to source power from a number of nearby HV feeders and extend such infrastructure the extent of their spare capacity is unknown. On this basis the budgets prepared are on the basis of a new high voltage feeder from the nearby Hornsby Zone Substation.

The reticulation route for this HV cable is in the order of 2km. A further 1.5km reticulation route is needed to run the HV infrastructure to the boundary of each development site. The total reticulation length of 3.5km of HV cabling represents a total investment in the order of $3.5 million which has been amortised across all the development sites.

2.1.6 Communications

The reticulation of telecommunications infrastructure to each development site is a normal part of Telstra / NBN's charter and as such there is no cost to the Developer. Such infrastructure supplied by Telstra / NBN includes all conduits and pits to the development boundary plus the reticulation of copper / fibre to the main distribution frame within each development site. As a result of this there are no infrastructure costs to the development sites.

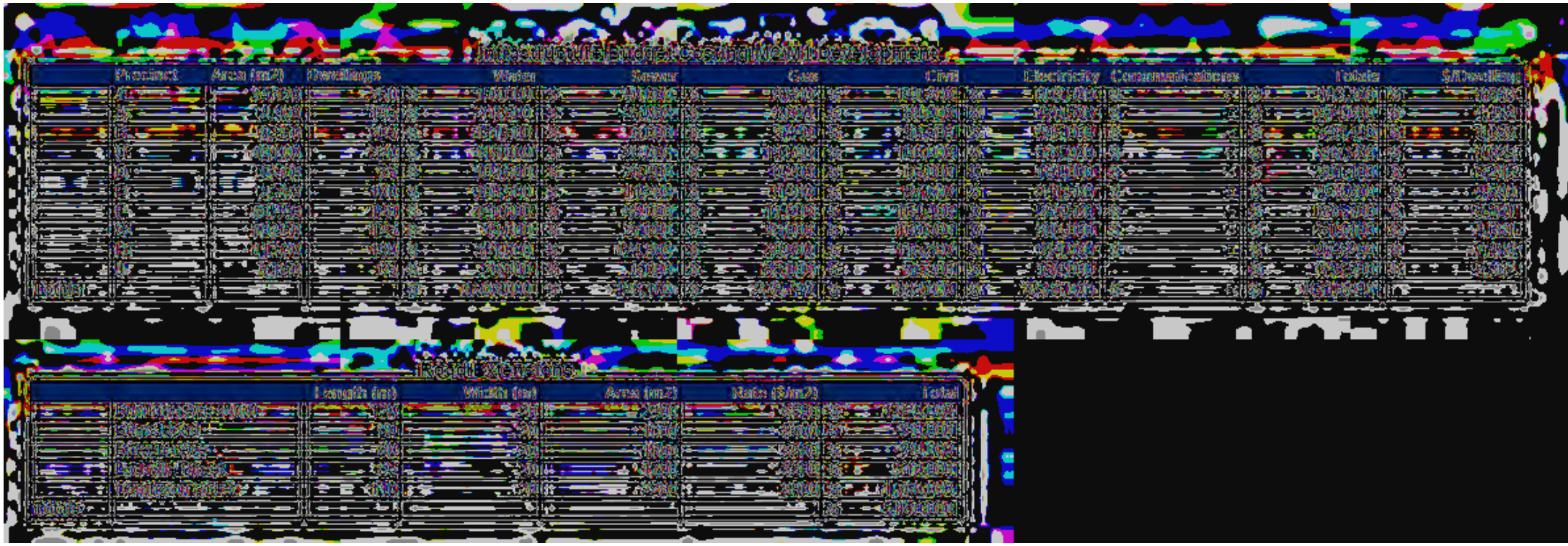
It is assumed the current Telstra / NBN policy of delivering infrastructure to each development site at no cost remains

2.1.7 Reconnection of roads

Provide a 20m wide road reserve with 14m wide asphaltic concrete pavement, concrete kerb and gutter, stormwater drainage, concrete footpath, street lighting and signage. Reinforced earth retaining walls with an average height of 3m will be provided to form the road reserve across the old freeway for Bundarra Avenue South and Carrington Road. All other roadworks are assumed to require less than 600mm fill.

2.2 Budget costs summary

The spreadsheets presented on the following page summarise our budget costing for the infrastructure associated with the proposed surface development.



Appendix A
Precinct drawings

A3

Possible w/main Conn. (200/150 Ø)

Precinct 1
250 DWELLINGS

Sewer Conn (150Ø)

Sewer Conn (150Ø)

PRECINCT 1

DBYD Address: 4 Aaron Pl Wahroonga NSW 2076	DBYD Job No: 6959215 DBYD Sequence No: 31860449		Scale: 1:1500 Date of Production: 11/12/2013	Plan 1 of 1 N 0m 9m 18m 27m 36m

A3

Precinct B.
120 DWELLINGS.

Precinct A.
230 DWELLINGS

Precinct 1

RAILWAY.

PHWY

BRENTFORD RD

ROBERTS AVE

JOHN HUGHES

ISIS ST

CAM ST

BENSON

WARWILLA

WOONONA AVE

SOUTH AVE

BUNDARRA

PACIFIC HWY

PACIFIC HWY BRIDGE

EVERETT W

WP0213 WAHROONG

WAHROONGA RESERVOIR

WAHROONGA RESERVOIR No.6

150 SAC SEWER CONN.

SEWER CONN.

SEWER CONN.

150 water Connection

Sewer conn.

This is sewer offroad

Connects to 150 w/main in WOONONA AVE (S)

(NEW) 150 PW/MAIN.

(NEW) 150 PW/MAIN.

Whole of Site being reviewed for Di
Please call Group Property on 8849

PRECINCTS A & B
SEWER & WATER

DBYD Address:
n/a 20 Bundarra Ave South
Wahroonga NSW 2076

DBYD Job No: 6959264

DBYD Sequence No: 31860690

No warranty is given that the information shown is complete or accurate.

SYDNEY WATER CORPORATION

Scale: 1:1500

Date of Production: 11/12/2013

Plan 1 of 1

N

0m 7m 14m 21m 28m

A3

150Ø. Sewer conn.

Precinct

Sewer conn. 150Ø.

W/M CONN.

150 DIA.

W/M CONN.

Sewer Conn.

225Ø. Sewer conn.

Sewer conn.

Sewer conn.

Sewer conn.

Sewer conn.

WP0213 WAHROONGA-HORNSBY

FERN AVE

LOCHVILLE ST

FWY

INGALARA AVE

CHURCHILL AVE

WOONONA AVE

HIGHLANDS AVE

BUNDARRA AVE

BAREENA AVE

SYDNEY-NEWCASTLE

COONANBARRA RD

BURNS RD

PDE

North Shore

BENSON

NORTH RD

WONIORA AVE

PHWY

BRENTFORD RD

PL

WARWILLA

MILLEWA

SOUTH AVE

Railway

NERINGAH AVE

MILLEWA LANE

STUART

DBYD Address: n/a Benson Cl Wahroonga NSW 2076	DBYD Job No: 6959619 DBYD Sequence No: 31862314	Copyright Reserved Sydney Water 2013 No warranty is given that the information shown is complete or accurate. SYDNEY WATER CORPORATION	Scale: 1:2000 Date of Production: 11/12/2013	Plan 1 of 1 N 0m 9m 18m 27m 36m

A3

PRECINCT H.
AREA = 10,850m²
F.S.R. 1:3:1.
DWELLINGS = 12.5

PRECINCT G.
SITE AREA = 10,600m²
DWELLINGS = 120
F.S.R. 1:3:1.

PRECINCT F.
SITE AREA = 10,420
F.S.R. 1:3:1.
YIELD = 120 DWELLINGS

NEW WATER CONN. 150 ϕ.

W 150 DIA.

POSS. 3rd CONN.

CONN. POINT 150 DIA.

SAC (NEW) S1. 150 SAC

NEW WATER CONN. 150 ϕ.

WATER CONN. POINT.

SAC (NEW) S.

UPGRADE MAIN TO 150 DIA.

CONN TO EXIST. SAC.

WATER CONN. POINT.

CONN TO EXIST. SAC

SAC TOWN CONN.

NEW SEWER (150. ϕ) DRAIN TO EXIST. SAC.

SPRING GULLY

KING RD

BURDETT ST

WOONONA AVE

CARRINGTON ST

EDGEWORTH DAVID AVE

LOCHVILLE ST

COONANBARRA RD

KILLAWARRA PL

BOUNDARY RD

JUNCTION

DARRI

DBYD Address:
20 Carrington Rd
Wahroonga NSW 2076

DBYD Job No: 6959755

DBYD Sequence No: 31863010

No warranty is given that the information shown is complete or accurate.

SYDNEY WATER CORPORATION

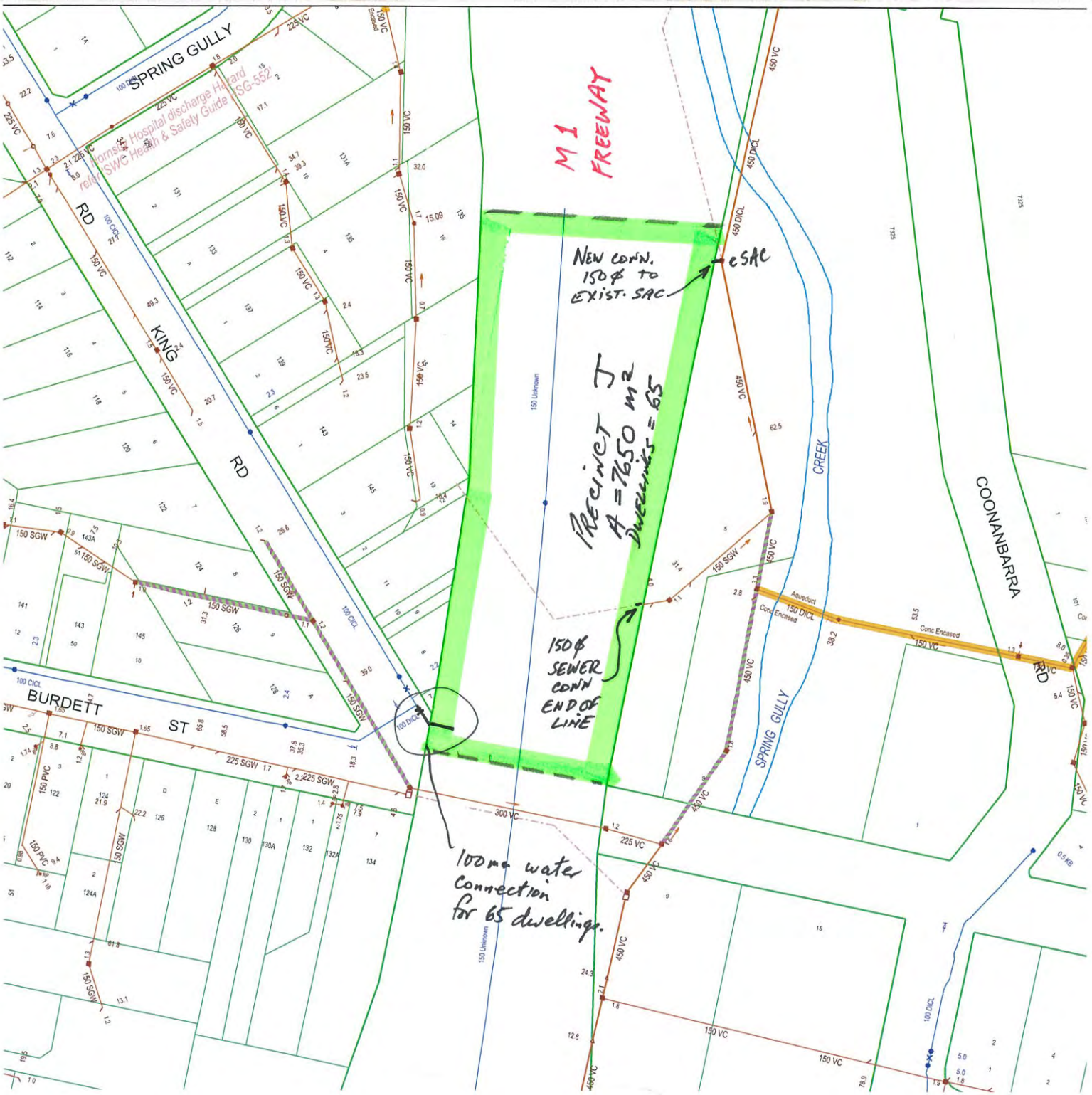
Scale: 1:2000

Date of Production: 11/12/2013

Plan 1 of 1

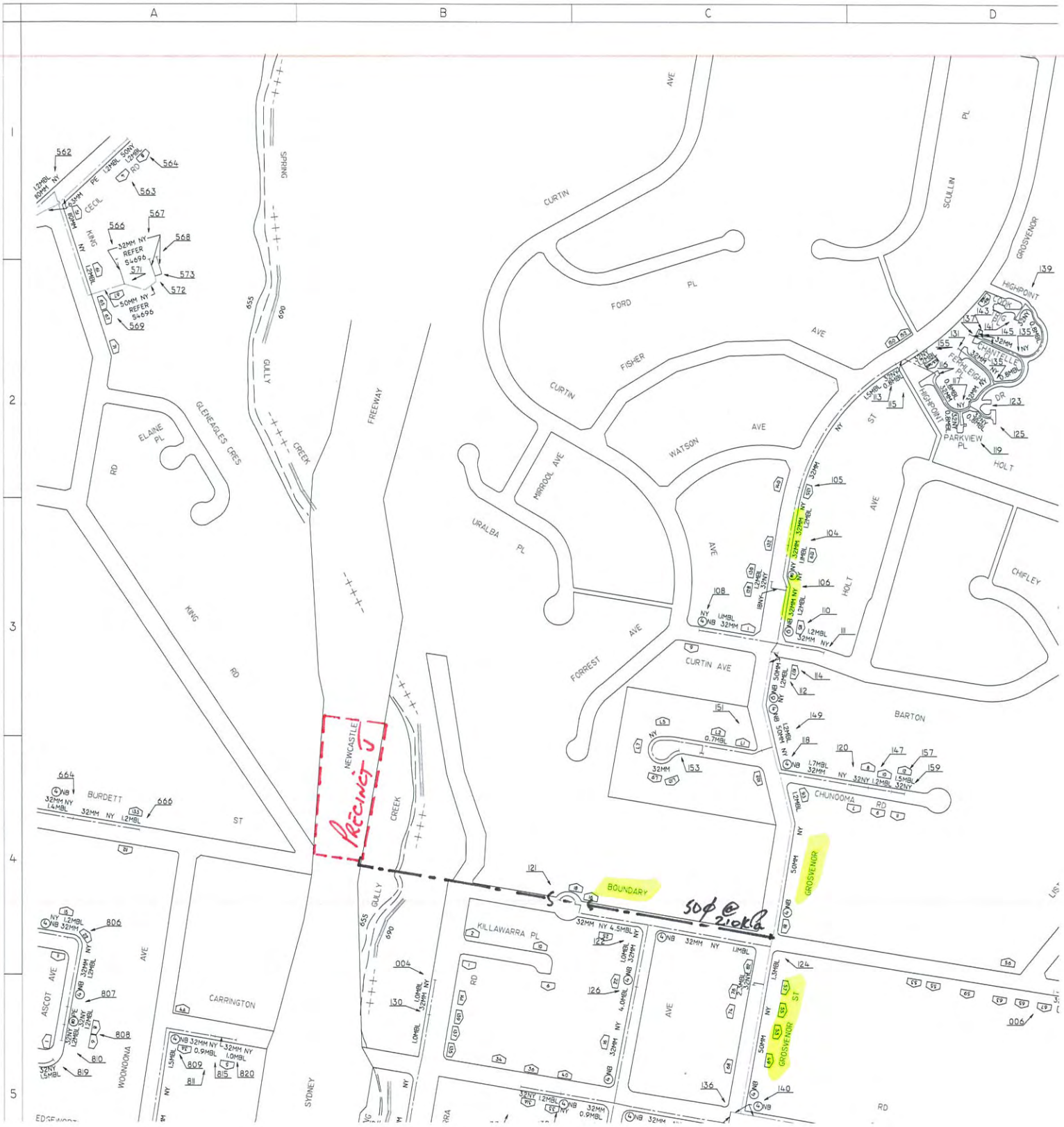
N

0m 9m 18m 27m 36m

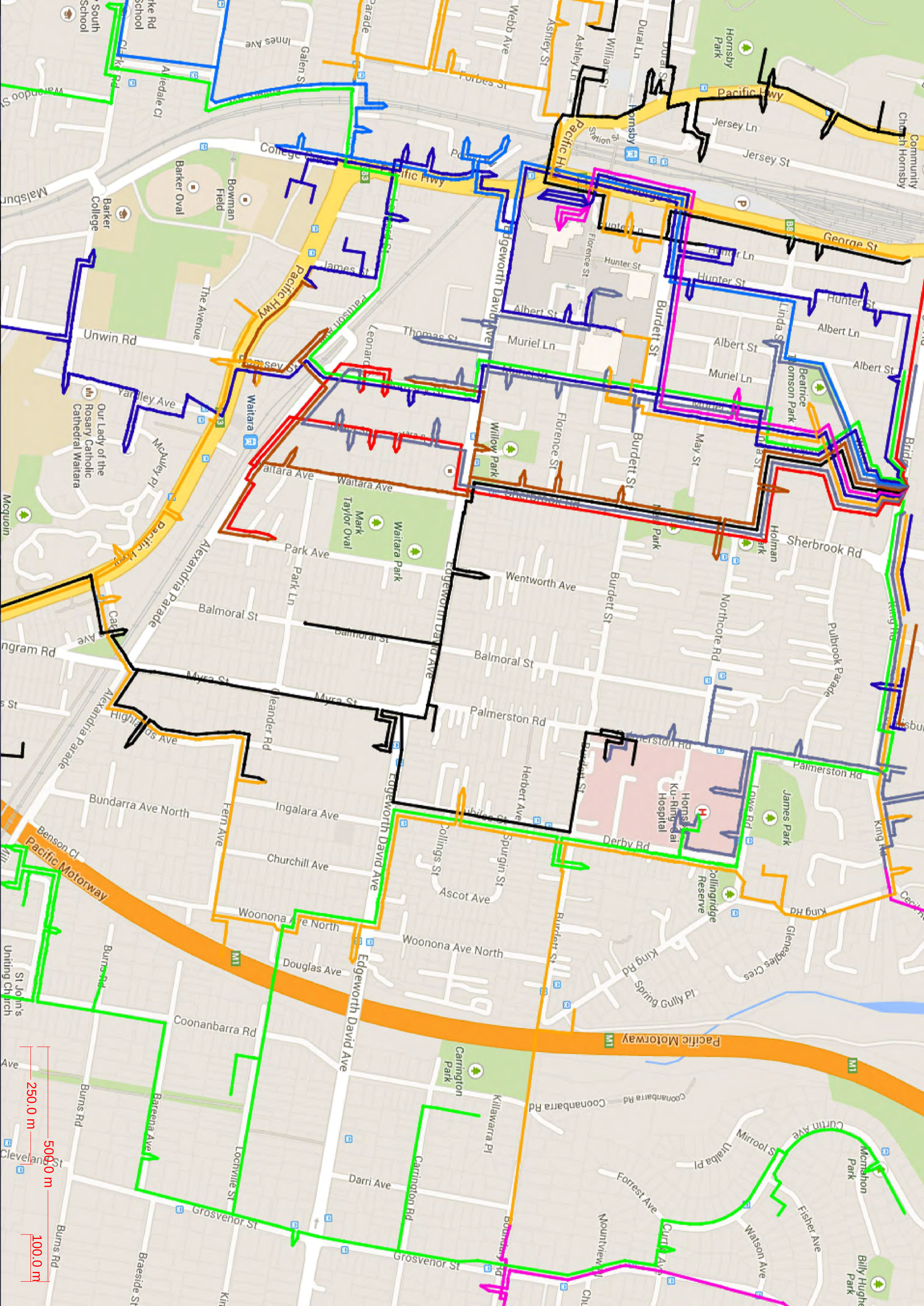


Note: No 150mm water mains in immediate proximity.

PRECINCT J.
Scale 1:1500 APPROX.
JAN 2014.



PRECINCT J
AREA = 7,650m²
DWELLINGS = 65
JAN 2014.


Pacific Hwy
Jersey Ln
Jersey St
George St
Hunter St
Albert St
Muriel Ln
Albert Ln
Unwin Rd
Barker College
Barker Oval
Bowman Field
The Avenue
James St
Edgeworth David Ave
Burdett St
Florence St
Linda St
Beatrice
Thomson Park
Hornsby Park
Community Church Hornsby
Station St
Ashley St
Ashley Ln
Williams St
Dural Ln
Dural St
Webb Ave
Forbes St
Parade
Galen St
Allendale Cl
Clarke Rd
Malsbury
Waitara Ave
Mark Taylor Oval
Waitara Park
Willow Park
Park Ave
Park Ln
Wentworth Ave
Holman Park
Sherbrook Rd
Northcote Rd
Pulbrook Parade
Balmoral St
Myra St
Palmerston Rd
Herbert Ave
Alexandria Parade
Cleander Rd
Highlands Ave
Bundarra Ave North
Ingalara Ave
Fern Ave
Churchill Ave
Ascot Ave
Woonona Ave North
Douglas Ave
Derby Rd
Hornsby Ku-Ring-Gai Hospital
Collingridge Reserve
James Park
Spurgin St
Collings St
Pacific Motorway
Coonanbarra Rd
Carrington Park
Killawarra Pl
Carrington Rd
Darri Ave
Grosvenor St
Locnville St
Barena Ave
Burns Rd
Braeside St
Cleveland St
Uniting Church
St John's
Benson Cl
Mcquoin
Yanalley Ave
Our Lady of the Rosary Catholic Cathedral Waitara
McAuley Pl
Pacific Hwy
Galston Rd
Edgeworth David Ave
Florence St
Hunter St
Albert St
Muriel Ln
Burdett St
Linda St
Beatrice
Thomson Park
Hornsby Park
Community Church Hornsby
Pacific Hwy
Jersey Ln
Jersey St
George St
Hunter St
Albert Ln
Albert St
Muriel Ln
Palmerston Rd
James Park
Derby Rd
Collingridge Reserve
Holman Park
Sherbrook Rd
Northcote Rd
Pulbrook Parade
Waitara Ave
Mark Taylor Oval
Waitara Park
Willow Park
Park Ave
Park Ln
Wentworth Ave
Balmoral St
Myra St
Palmerston Rd
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Alexandria Parade
Cleander Rd
Highlands Ave
Bundarra Ave North
Ingalara Ave
Fern Ave
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Burns Rd
Braeside St
Cleveland St
Uniting Church
St John's
Benson Cl
Mcquoin
Yanalley Ave
Our Lady of the Rosary Catholic Cathedral Waitara
McAuley Pl
Pacific Hwy
Galston Rd
Spring Gully Pl
King Rd
Gleneagles Cres
Mirrool St
Curtin Ave
Urlaba Pl
Forrest Ave
Curtin Ave
Watson Ave
Fisher Ave
Mcmahon Park
Billy Hughes Park
Mountview Rd
Boundary Rd
Chu
250.0 m
500.0 m
100.0 m

10.2 FINANCIAL MODEL: DISCOUNTED CASHFLOW FEASIBILITY

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	**FEASIBILITY SUMMARY**												
3													
4	TOTAL AREA OF ALL PRECINCTS				98,110	sqm		Total Land Tax		$10,412,288			
5													
6	INTEREST RATE				6.0%			Total Stamp Duty for Land		$7,594,540			
7													
8	RESIDENTIAL DEVELOPMENT SUBSIDY FOR TUNNEL EXTENSION				$350,000,000			Equilibria Concept Fee - included in feasibility					
9													
10	TOTAL SURFACE INFRASTRUCTURE COST				$15,907,260								
11								Equilibria Development Fee - included in feasibility					
12	PAYMENT TO NSW GOVERNMENT FOR REDUNDANT M1 LAND				$100,000,000								
13													
14	TOTAL NUMBER OF DWELLINGS				2,000								
15								Taxes to Government - 40% of sales		Stamp Duty			
16	TOTAL DEVELOPMENT SALES				$1,833,570,000			$733,428,000		$74,528,822			
17													
18	**TOTAL DEVELOPMENT PROFIT**				$405,951,565	22.14%							
19													
20													
21													
22	***DISCLAIMER**												
23	This development analysis is NOT advice and has been prepared for the client as information only. It relies on the client to check all information.												
24	It has been prepared as an aid only in the decision to develop the site. Please note:												
25	• Site areas are approximate only.												
26	• Construction amounts are subject to variation and are approximate.												
27	• Construction costs will vary considerably depending on the type of builder & timing of construction.												
28	• Areas provided are approximate. Actual areas can only be known when the Development Application has been undertaken and approval												
29	granted from Council.												
30	• The feasibility describes a proposed dwelling mix which would be subject to council approval.												
31	• Note that the figures are provided as a preliminary guide only. A quantity surveyor should be consulted for an accurate construction cost												
32	estimate once all the approvals have been obtained.												
33													
34													
35													
36													
37													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
49	Interest - Credit	6.0%										$1,205,305		$2,104,063		$2,447,747		$2,681,397													
50	**BALANCE**			($44,175,880)		($56,884,322)		($85,394,609)		($120,430,541)		$21,293,721		$37,171,786		$43,243,535		$47,371,350													
51																															
52																															
53	**Precinct D**																														
54																															
55	Balance from Previous Year					($28,972,278)		($35,045,737)		($46,308,449)		($65,560,774)		($89,234,036)		($1,748,092)		$10,920,895		$15,764,021											
56	Income			$0		$0		$0		$0		$0		$98,725,000		$13,970,000		$5,060,000		$715,000											
57	GST Annual Reconciliation			$2,673,319		$398,405		$687,310		$1,438,105		$1,629,855		($8,916,969)		($1,258,394)		($448,394)		($53,394)											
58	Expenses			($30,005,657)		($4,488,142)		($9,328,789)		($16,979,443)		($20,252,135)		($2,223,138)		($660,783)		($660,783)		($483,078)											
59	NET			($27,332,338)		($33,062,016)		($43,687,216)		($61,849,786)		($84,183,053)		($1,649,144)		$10,302,731		$14,871,718		$15,942,549											
60	Interest - Debit	6.0%		($1,639,940)		($1,983,721)		($2,621,233)		($3,710,987)		($5,050,983)		($98,949)																	
61	Interest - Credit	6.0%														$618,164		$892,303		$956,553											
62	**BALANCE**			($28,972,278)		($35,045,737)		($46,308,449)		($65,560,774)		($89,234,036)		($1,748,092)		$10,920,895		$15,764,021		$16,899,102											
63																															
64																															
65	**Precinct E**																														
66																															
67	Balance from Previous Year					($39,032,393)		($42,510,446)		($45,210,418)		($55,035,037)		($80,050,847)		($110,763,296)		$9,711,605		$25,452,505		$31,643,858									
68	Income			$0		$0		$0		$0		$0		$0		$134,860,000		$16,665,000		$5,775,000		$990,000									
69	GST Annual Reconciliation			$3,603,467		$93,091		$0		$443,717		$1,903,882		$2,155,339		($12,191,248)		($1,501,250)		($511,250)		($76,250)									
70	Expenses			($40,426,479)		($1,164,892)		($140,892)		($7,153,145)		($22,388,512)		($26,598,167)		($2,743,564)		($863,559)		($863,559)		($626,124)									
71	NET			($36,823,012)		($40,104,194)		($42,651,338)		($51,919,846)		($75,519,667)		($104,493,675)		$9,161,892		$24,011,797		$29,852,697		$31,931,485									
72	Interest - Debit	6.0%		($2,209,381)		($2,406,252)		($2,559,080)		($3,115,191)		($4,531,180)		($6,269,621)																	
73	Interest - Credit	6.0%														$549,714		$1,440,708		$1,791,162		$1,915,889									
74	**BALANCE**			($39,032,393)		($42,510,446)		($45,210,418)		($55,035,037)		($80,050,847)		($110,763,296)		$9,711,605		$25,452,505		$31,643,858		$33,847,374									
75																															
76																															
77	**Precinct F**																														
78																															
79	Balance from Previous Year					($45,552,220)		($49,593,607)		($52,742,313)		($56,079,941)		($67,331,018)		($97,000,801)		($133,762,654)		$10,994,884		$30,292,866		$36,332,727							
80	Income			$0		$0		$0		$0		$0		$0		$0		$162,030,000		$20,460,000		$5,500,000		$2,090,000							
81	GST Annual Reconciliation			$4,206,505		$107,091		$0		$0		$478,690		$2,247,157		$2,577,591		($14,649,326)		($1,843,865)		($483,865)		($173,865)							
82	Expenses			($47,180,297)		($1,341,292)		($163,292)		($163,292)		($7,918,577)		($26,426,328)		($31,767,973)		($3,245,488)		($1,032,843)		($1,032,843)		($747,723)							
83	NET			($42,973,793)		($46,786,421)		($49,756,899)		($52,905,605)		($63,519,828)		($91,510,189)		($126,191,183)		$10,372,533		$28,578,176		$34,276,158		$37,501,139							
84	Interest - Debit	6.0%		($2,578,428)		($2,807,185)		($2,985,414)		($3,174,336)		($3,811,190)		($5,490,611)		($7,571,471)															
85	Interest - Credit	6.0%																$622,352		$1,714,691		$2,056,569		$2,250,068							
86	**BALANCE**			($45,552,220)		($49,593,607)		($52,742,313)		($56,079,941)		($67,331,018)		($97,000,801)		($133,762,654)		$10,994,884		$30,292,866		$36,332,727		$39,751,207							
87																															
88																															
89	**Precinct G**																														
90																															
91	Balance from Previous Year					($48,318,383)		($52,599,515)		($55,938,752)		($59,478,342)		($63,230,309)		($75,201,658)		($106,659,441)		($145,612,492)		($366,153)		$25,189,764		$31,768,036					
92	Income			$0		$0		$0		$0		$0		$0		$0		$0		$163,460,000		$27,720,000		$6,435,000		$2,365,000					
93	GST Annual Reconciliation			$4,462,303		$113,091		$0		$0		$0		$491,392		$2,362,122		$2,711,526		($14,774,996)		($2,502,999)		($567,999)		($197,999)					
94	Expenses			($50,045,684)		($1,416,892)		($172,892)		($172,892)		($172,892)		($8,206,043)		($27,782,578)		($33,422,361)		($3,417,939)		($1,086,920)		($1,086,920)		($786,950)					
95	NET			($45,583,380)		($49,622,184)		($52,772,407)		($56,111,644)		($59,651,234)		($70,944,960)		($100,622,114)		($137,370,276)		($345,427)		$23,763,928		$29,969,845		$33,148,087					
96	Interest - Debit	6.0%		($2,735,003)		($2,977,331)		($3,166,344)		($3,366,699)		($3,579,074)		($4,256,698)		($6,037,327)		($8,242,217)		($20,726)											
97	Interest - Credit	6.0%																				$1,425,836		$1,798,191		$1,988,885					
98	**BALANCE**			($48,318,383)		($52,599,515)		($55,938,752)		($59,478,342)		($63,230,309)		($75,201,658)		($106,659,441)		($145,612,492)		($366,153)		$25,189,764		$31,768,036		$35,136,972					
99																															
100																															
101	**Precinct H**																														
102																															
103	Balance from Previous Year					($51,087,163)		($55,608,198)		($59,138,132)		($62,879,861)		($66,846,094)		($71,050,301)		($83,707,799)		($116,978,491)		($158,185,285)		($567,765)		$23,117,249		$27,924,364			
104	Income			$0		$0		$0		$0		$0		$0		$0		$0		$0		$177,265,000		$25,850,000		$4,785,000		$2,090,000			
105	GST Annual Reconciliation			$4,718,349		$119,091		$0		$0		$0		$497,107		$2,475,870		$2,847,678		($16,025,723)		($2,332,145)		($417,145)		($172,145)			
106	Expenses			($52,913,786)		($1,492,492)		($182,492)		($182,492)		($182,492)		($182,492)		($8,416,427)		($29,125,139)		($35,100,588)		($3,589,619)		($1,141,365)		($1,141,365)		($826,380)			
107	NET			($48,195,437)		($52,460,564)		($55,790,690)		($59,320,624)		($63,062,353)		($67,028,586)		($78,969,621)		($110,357,067)		($149,231,401)		($535,627)		$21,808,725		$26,343,739		$29,015,839			
108	Interest - Debit	6.0%		($2,891,726)		($3,147,634)		($3,347,441)		($3,559,237)		($3,783,741)		($4,021,715)		($4,738,177)		($6,621,424)		($8,953,884)		($32,138)									
109	Interest - Credit	6.0%																						$1,308,524		$1,580,624		$1,740,950			
110	**BALANCE**			($51,087,163)		($55,608,198)		($59,138,132)		($62,879,861)		($66,846,094)		($71,050,301)		($83,707,799)		($116,978,491)		($158,185,285)		($567,765)		$23,117,249		$27,924,364		$30,756,790			
111																															
112																															
113	**Precinct J**																														
114																															
115	Balance from Previous Year					($24,348,144)		($26,551,670)		($28,239,844)		($30,029,308)		($31,926,140)		($33,936,782)		($36,068,063)		($43,662,108)		($60,478,314)		($80,691,324)		($8,706,477)		$2,969,626		$6,495,296	
116	Income			$0		$0		$0		$0		$0		$0		$0		$0		$0		$0		$81,620,000		$13,255,000		$4,070,000		$1,705,000	
117	GST Annual Reconciliation			$2,245,680		$61,091		$0		$0		$0		$0		$0		$365,854		$1,246,277		$1,377,951		($7,375,468)		($1,196,094)		($361,094)		($146,094)	
118	Expenses			($25,215,628)		($761,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($5,488,459)		($14,639,182)		($17,023,528)		($1,766,865)		($550,895)		($550,895)		($399,920)	
119	NET			($22,969,948)		($25,048,746)		($26,641,362)		($28,329,536)		($30,119,000)		($32,015,832)		($34,026,474)		($41,190,668)		($57,055,013)		($76,123,890)		($8,213,657)		$2,801,534		$6,127,638		$7,654,282	
120	Interest - Debit	6.0%		($1,378,197)		($1,502,925)		($1,598,482)		($1,699,772)		($1,807,140)		($1,920,950)		($2,041,588)		($2,471,440)		($3,423,301)		($4,567,433)		($492,819)							
121	Interest - Credit	6.0%																								$168,092		$367,658		$459,257	
122	**BALANCE**			($24,348,144)		($26,551,670)		($28,239,844)		($30,029,308)		($31,926,140)		($33,936,782)		($36,068,063)		($43,662,108)		($60,478,314)		($80,691,324)		($8,706,477)		$2,969,626		$6,495,296		$8,113,539	
123																															
124																															
125																															
126	**TOTAL PER YEAR**																														
127																															
128	Balance from Previous Year					($464,074,554)		($534,072,623)		($641,834,770)		($808,520,862)		($693,255,546)		($514,525,147)		($228,879,612)		($109,639,160)		$18,073,194		$200,791,469		$319,689,766		$355,952,577		$381,814,188	
129	Income			$0		$0		$0		$0		$307,060,000		$344,250,000		$409,490,000		$216,420,000		$198,460,000		$213,625,000		$115,995,000		$20,405,000		$6,160,000		$1,705,000	
130	GST Annual Reconciliation			$42,854,672		$3,279,043		$6,121,209		$10,376,243		($17,321,629)		($22,680,470)		($31,534,662)		($13,932,701)		($13,770,717)		($17,883,349)		($10,449,477)		($1,811,237)		($533,238)		($146,094)	
131	Expenses			($480,660,856)		($43,046,586)		($77,553,086)		($131,297,002)		($135,232,175)		($113,715,066)		($79,354,354)		($77,040,857)		($57,999,939)		($24,388,930)		($4,742,874)		($2,479,210)		($1,377,275)		($399,920)	
132	NET			($437,806,183)		($503,842,098)		($605,504,500)		($762,755,530)		($654,014,666)		($485,401,082)		($215,924,162)		($103,433,170)		$17,050,183		$189,425,914		$301,594,119		$335,804,318		$360,202,064		$382,973,174	
133	Interest - Debit	6.0%		($26,268,371)		($30,230,526)		($36,330,270)		($45,765,332)		($39,240,880)		($29,124,065)		($12,955,450)		($6,205,990)													
134	Interest - Credit	6.0%																		$1,023,011		$11,365,555		$18,095,647		$20,148,259		$21,612,124		$22,978,390	
135	**BALANCE**			($464,074,554)		($534,072,623)		($641,834,770)		($808,520,862)		($693,255,546)		($514,525,147)		($228,879,612)		($109,639,160)		$18,073,194		$200,791,469		$319,689,766		$355,952,577		$381,814,188		$405,951,565
136																															
137																															
138																															
139	**IRR Calculation**																														
140	Income			$0		$0		$0		$0		$307,060,000		$344,250,000		$409,490,000		$216,420,000		$198,460,000		$213,625,000		$115,995,000		$20,405,000		$6,160,000		$1,705,000	
141	GST Reconciliation			$42,854,672		$3,279,043		$6,121,209		$10,376,243		($17,321,629)		($22,680,470)		($31,534,662)		($13,932,701)		($13,770,717)		($17,883,349)		($10,449,477)		($1,811,237)		($533,238)		($146,094)	
142	Expenses			($480,660,856)		($43,046,586)		($77,553,086)		($131,297,002)		($135,232,175)		($113,715,066)		($79,354,354)		($77,040,857)		($57,999,939)		($24,388,930)		($4,742,874)		($2,479,210)		($1,377,275)		($399,920)	
143	Sub-Total			($437,806,183)		($39,767,543)		($71,431,877)		($120,920,759)		$154,506,196		$207,854,464		$298,600,985		$125,446,441		$126,689,343		$171,352,720		$100,802,649		$16,114,553		$4,249,487		$1,158,986	
144																															
145	**Balance**			($437,806,183)		($39,767,543)		($71,431,877)		($120,920,759)		$154,506,196		$207,854,464		$298,600,985		$125,446,441		$126,689,343		$171,352,720		$100,802,649		$16,114,553		$4,249,487		$1,158,986	
146																															
147	**IRR**	**10.66%**																													

EQUILIBRIA COMMERCIAL-IN-CONFIDENCE

STAGE 2: ESTIMATES OF INFRASTRUCTURE COSTS (excluding residential sites)

NOTE: These estimates are presented as Stage 2A and Stage 2B

Stage 2A includes infrasture for Precincts A, B, C and I

Stage 2B incudes infrastructure for Precincts D, E, F, G, H, & J

STAGE 2A ESTIMATES

PRECINCT	A	B	C	I
Area	8,900	9,350	10,000	14,120
Dwellings	195	205	220	250
Total Dwellings in Stage 2A				870
Services:				
Water	$286,500	$151,500	$119,000	$150,000
Sewer	$25,000	$6,000	$28,000	$80,000
Gas	$3,000	$3,440	$19,500	$8,600
Civil	$89,000	$93,500	$100,000	$141,200
Power	$470,500	$495,000	$531,000	$603,500
Comms	$0	$0	$0	$0
Stage 2A Total Individual Precinct Services Cost	$874,000	$749,440	$797,500	$983,300
Stage 2A Total Services Cost of all Precincts				$3,404,240
Cost per Dwelling based on totals for Precincts A, B, C & I				$3,913
Cost per Dwelling precinct by precinct	$4,482	$6,245	$3,625	$3,933

Stage 2A Total Services Cost **$3,404,240**

Roads for Precincts A, B, C & I	Weeks	Length (m)	Width (m)	Area (sqm)	Type	Rate ($/sqm)	Total $
Bundarra Ave South through to John Hughes	20	120	20	2400	Raised	$800	$1,920,000
Burns Road through to Woonona Ave	4	80	20	1600	On grade	$300	$480,000

Stage 2A Total Road Cost **$2,400,000**

TOTAL INFRASTRUCTURE COSTS FOR STAGE 2A **$5,804,240**

[Excludes contingencies, fees or managing contractor's mark up.]

Therefore QS is advised to add 50%

Recommended estimate of Infrastructure costs for Stage 2A **$8,706,360**

Total infrastructure cost per Dwelling in Stage **$10,007**

STAGE 2B ESTIMATES

PRECINCT	D	E	F	G	H	J
Area	6,500	8,670	10,440	10,950	11,530	7650
Dwellings	75	100	120	125	130	65
Total Dwellings in Stage 2B						615
Services:						
Water	$109,500	$109,500	$140,000	$33,000	$381,000	$20,000
Sewer	$26,400	$11,200	$88,000	$27,600	$124,900	$6,000
Gas	$9,200	$9,200	$11,800	$38,000	$38,000	$88,000
Civil	$65,000	$87,600	$104,400	$109,500	$115,300	$76,500
Power	$181,000	$241,500	$289,500	$302,000	$314,000	$158,000
Comms	$0	$0	$0	$0	$0	$0
Stage 2B Total Individual Precinct Services cost	$391,100	$459,000	$633,700	$510,100	$973,200	$348,500
Stage 2B Total Services Cost of all Precincts						$3,315,600
Cost per Dwelling based on totals for Precincts D, E, F, G, H & J						$5,391
Cost per Dwelling precinct by precinct	$5,215	$4,590	$5,281	$4,081	$7,486	

Stage 2B Total Services Cost **$3,315,600**

Roads for Precincts D, E, F, G, H & J	Weeks	Length (m)	Width (m)	Area (sqm)	Type	Rate ($/sqm)	Total $
Bareena Ave through to Bareena Ave	4	80	20	1600	On grade	$300	$480,000
Lochville St through to Lochville Street	4	85	20	1700	On grade	$300	$510,000
Carrington through to Carrington. Walk / Bicycle	4	110	10	1100	On grade	$300	$330,000
Burdett St through to Boundary Road Walk / Bicycle	4	55	10	550	On grade	$300	$165,000

Stage 2B Total Road Costs **$1,485,000**

TOTAL INFRASTRUCTURE COSTS FOR STAGE 2B **$4,800,600**

[Excludes contingencies, fees or managing contractor's mark up.]

Therefore QS is advised to add 50%

Recommended estimate of Infrastructure costs for Stage 2B **$7,200,900**

Total infrastructure cost per Dwelling in Stage **$11,709**

TOTAL RECOMMENDED ESTIMATE OF COST OF INFRASTRUCTURE FOR STAGES 2A AND 2B **$15,907,260**

Total infrastrucure cost per Dwelling for Stages 2A and 2B **$10,712**

NOTE: The above cost estimates are to be used as a guide only. This document is a draft only and all figures must be checked by a quantity surveyor.

Equilibria accepts no responsibility for any loss incurred as a result of reliance on these figures.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1																														
2	**Precinct I**																													
3																														
4	**The Site**																													
5	Precinct Site Area (approx)			14120	sqm																									
6					LEP Site Value																									
7	Land Cost				($9,900,000)			($9,900,000)																($9,900,000)	OK					
8	GST on land				**$900,000**			**$900,000**																						
9	Stamp Duty				($752,454)			($752,454)																						
10	Land Tax			($164,892)	($659,568)			($164,892)		($164,892)		($164,892)		($164,892)										($659,568)						
11																														
12	**LEP Control**		FSR 1.3 : 1	18356	sqm																						**LEP Control**			
13	**No. of Dwellings**	198																									**No. of Dwellings**			
14																														
15	**Dwelling Mix example***			sqm	sqm																						**Dwelling Mix example***			
16		60	1 BED	65	3900																									
17		122	2 BED	90	10980																									
18		16	3 BED	125	2000																									
19	Lobby + internal public circulation			1377	1377																						Lobby + internal public circulation			
20				Total	18257																									
21	Balconies	99		20	1980																						Balconies			
22																														
23	Balconies are provided																										Balconies are provided			
24	Balconies are not included in GFA																										Balconies are not included in GFA			
25								**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**Check Totals**						
26																														
27	**Residential Development Subsidy for Tunnel Extension**			Total	($34,650,000)			**($34,650,000)**																						
28																														
29	**GST**				**$3,150,000**			**$3,150,000**																						
30																														
31	**Construction - Nominal Allowances***																										**Construction - Nominal Allowances***			
32	Dwelling type	Amount	sqm	rate/sqm																							Dwelling type			
33	1 BED	60	65	($1,800)	($7,020,000)							($2,340,000)		($4,680,000)										($7,020,000)	OK		1 BED			
34	2 BED	122	90	($1,800)	($19,764,000)							($6,588,000)		($13,176,000)										($19,764,000)	OK		2 BED			
35	3 BED	16	125	($1,800)	($3,600,000)							($1,200,000)		($2,400,000)										($3,600,000)	OK		3 BED			
36	Balconies	99	20	($800)	($1,584,000)							($528,000)		($1,056,000)										($1,584,000)	OK		Balconies			
37	Lobby + circul.		1377	($1,800)	($2,478,060)							($826,020)		($1,652,040)										($2,478,060)	OK		Lobby + circul.			
38	Carpark	271	9485	($900)	($8,536,500)							($8,536,500)												($8,536,500)	OK		Carpark			
39				Total	($42,982,560)	25%						**($20,018,520)**		**($22,964,040)**										**($42,982,560)**						
40																														
41	**GST**				**$3,907,505**							**$1,819,865**		**$2,087,640**										$3,907,505						
42																														
43	The construction cost will vary considerably depending																										The construction cost will vary considerably depending			
44	on the type of builder &																										on the type of builder &			
45								YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8								
46	**Site Works - Nominal Allowances***																										**Site Works - Nominal Allowances***			
47	Demolition				($200,000)					($150,000)		($50,000)												($200,000)			Demolition			
48	Excavation/Earthworks (includ. compaction)				($1,500,000)					($1,125,000)		($375,000)												($1,500,000)			Excavation/Earthworks (includ. compaction)			
49	Stormwater Detention				($1,500,000)					($1,125,000)		($375,000)												($1,500,000)			Stormwater Detention			
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($1,500,000)					($1,125,000)		($375,000)												($1,500,000)			Civil/Hydraulic Engineering Works (Road & Drainage)			
51	Electrical (Power & Telephone)				($1,000,000)					($500,000)		($500,000)												($1,000,000)			Electrical (Power & Telephone)			
52	Surveying & Linen Plan				($100,000)					($100,000)														($100,000)			Surveying & Linen Plan			
53	Construction Survey				($100,000)					($50,000)		($50,000)												($100,000)			Construction Survey			
54	External Works and Landscaping				($2,000,000)					($1,000,000)		($500,000)		($500,000)										($2,000,000)			External Works and Landscaping			
55				Total	($7,900,000)																			($7,900,000)						
56																														
57	**GST**				**$718,182**			**$0**		**$470,455**		**$202,273**		**$45,455**		**$0**		**$0**		**$0**		**$0**		$718,182						
58																														
59		Total Construction + Site Works + Tunnel			**($85,532,560)**																									
60																														
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($776,600)			($776,600)																						
62																														
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($1,089,000)					($1,089,000)																				
64																											**Professional Fees - Nominal**			
65	**Consultant Fees - Nominal**		say 7.5%		($7,056,436)			($1,411,287)		($2,116,931)		($1,411,287)		($1,411,287)		($705,644)								($7,056,436)	OK		Overall Budget			
66																														
67	**Project Management Fees - Nominal**		say 1.5%		($1,411,287)			($176,411)		($176,411)		($176,411)		($176,411)		($176,411)		($176,411)		($176,411)		($176,411)		($1,411,287)						
68																														
69	**Authority Fees & Charges - Approximate**																										**Authority Fees & Charges - Approximate**			
70	Overall Budget		say 1.25%		($1,176,073)					($294,018)		($294,018)		($588,036)										($1,176,073)	OK		Overall Budget			
71				Total	($11,509,396)			($2,364,298)		($3,676,360)		($1,881,716)		($2,175,734)		($882,055)		($176,411)		($176,411)		($176,411)		($11,509,396)						
72																														
73	**GST**				**$1,046,309**			**$214,936**		**$334,215**		**$171,065**		**$197,794**		**$80,187**		**$16,037**		**$16,037**		**$16,037**		$1,046,309						
74																														
75		Total Construction + Professional & Authority Fees			**($97,041,956)**	57%																								
76																														
77																														
78	**Total Precinct Cost including Land**				**($108,353,978)**																									
79																														
80																														
81	**Sale Price - Nominal**																										**Sale Price - Nominal**			
82	Strata Title, apartments	rate/sqm	$10,000									Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD						Strata Title, apartments			
83	Sale Price	1 BED	$650,000	60	$39,000,000					1 BED		($24,796)		60	54	$35,100,000	4	$2,600,000	2	$1,300,000	0	$0	60	$39,000,000	OK		Sale Price			
84	Sale Price	2 BED	$900,000	122	$109,800,000					2 BED		($36,046)		122	110	$99,000,000	8	$7,200,000	3	$2,700,000	1	$900,000	122	$109,800,000	OK		Sale Price			
85	Sale Price	3 BED	$1,250,000	16	$20,000,000					3 BED		($54,296)		16	12	$15,000,000	2	$2,500,000	1	$1,250,000	1	$1,250,000	16	$20,000,000	OK		Sale Price			
86				Subtotal	$168,800,000											$149,100,000		$12,300,000		$5,250,000		$2,150,000		$168,800,000						
87																														
88		**Total Revenue***			**$168,800,000**																									
89																														
90	Stamp Duty Total				($6,754,100)									Stamp Duty		($1,338,982)		($99,184)		($49,592)		$0								
91																($3,965,055)		($288,368)		($108,138)		($36,046)								
92																($651,552)		($108,592)		($54,296)		($54,296)								
93																														
94	**GST**				**($15,345,455)**											($13,554,545)		($1,118,182)		($477,273)		($195,455)		$15,345,455						
95																														
96	**Profit**																										**Profit**			
97	Total Revenue		Total Precinct Cost																								Total Revenue			
98	$168,800,000	minus	($108,353,978)	=	$60,446,022																						$0			
99																														
100	**Total Precinct Yield (refer to exclusions below)***				**$60,446,022**																									
101																														
102								2018		2019		2020		2021		2022		2023		2024		2025								
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances																						**EXPENDITURE**			
104																														
105	Finance Costs	*See Progressive Bank Balance below*			($18,046,223)																						Finance Costs			
106	Contingency/Escalation				($4,852,098)					($727,815)		($970,420)		($1,940,839)		($1,213,024)								($4,852,098)	OK		Contingency/Escalation			
107	Marketing & Selling Costs			3%	($5,064,000)					($379,800)		($506,400)		($1,139,400)		($1,012,800)		($759,600)		($759,600)		($506,400)		($5,064,000)	OK		Marketing & Selling Costs			
108	Legal Costs/Strata Fees				($500,000)					($400,000)				($100,000)										($500,000)	OK		Legal Costs/Strata Fees *Registration of Strata Plans*			
109	Sect 94 Contributions - approx $6385/unit				($1,264,230)					($1,264,230)														($1,264,230)	OK		Sect 94 Contributions - approx $6385/unit			
110	Sect 96 amendments				excluded																						Sect 96 amendments			
111	Land + Environ Court				excluded																						Land + Environ Court			
112																														
113	GST Reconciliation				($5,623,459)			**$4,264,936**		**$804,669**		**$2,193,203**		**$2,330,889**		**($13,474,359)**		**($1,102,144)**		**($461,235)**		**($179,417)**		($5,623,459)			GST Reconciliation			
114				Total	**($35,350,010)**																									
115																														
116	Credit Interest	*See Progressive Bank Balance below*			$5,058,001																									
117																														
118				**GROSS PROFIT**	**$30,154,013**	17.86%																								
119																														
120				Profit per Unit	$152,293																									
121																														
122					Balance from Previous Year					($46,180,710)		($60,593,986)		($89,217,795)		($122,824,120)		$10,275,260		$21,769,331		$27,159,410								
123	($120,034,306)			CR	Income			$0		$0		$0		$0		$149,100,000		$12,300,000		$5,250,000		$2,150,000		$168,800,000	CR Income	OK				
124					GST Annual Reconciliation			$4,264,936		$804,669		$2,193,203		$2,330,889		($13,474,359)		($1,102,144)		($461,235)		($179,417)		($5,623,459)						
125					Expenses			($47,831,644)		($11,788,097)		($25,766,948)		($28,984,906)		($3,107,879)		($936,011)		($936,011)		($682,811)		($120,034,306)	TOTAL Expenses	OK				
126					NET			($43,566,708)		($57,164,138)		($84,167,731)		($115,871,812)		$9,693,642		$20,537,105		$25,622,085		$28,447,182		$43,142,236	CR Sub Balance	OK				
127	**Finance Cost (Interest)**		($18,046,223)		Interest - Debit	6.0%		($2,614,002)		($3,429,848)		($5,050,064)		($6,952,309)										($18,046,223)	DR Interest	OK	**Finance Cost (Interest)**			
128					Interest - Credit	6.0%										$581,619		$1,232,226		$1,537,325		$1,706,831		$5,058,001	CR Interest					
129					**BALANCE**			($46,180,710)		($60,593,986)		($89,217,795)		($122,824,120)		$10,275,260		$21,769,331		$27,159,410		$30,154,013		**$30,154,013**	**GROSS PROFIT**	OK	**Highest Exposure**			
130																														
131	**Maximum Exposure**		($122,824,120)																					17.86%						
132																														
133																														
134																														
135					**IRR Calculation**																									
136					Income			$0		$0		$0		$0		$149,100,000		$12,300,000		$5,250,000		$2,150,000								
137					GST Reconciliation			$4,264,936		$804,669		$2,193,203		$2,330,889		($13,474,359)		($1,102,144)		($461,235)		($179,417)								
138					Expenses			($47,831,644)		($11,788,097)		($25,766,948)		($28,984,906)		($3,107,879)		($936,011)		($936,011)		($682,811)		($120,034,306)						
139					Sub-Total			($43,566,708)		($10,983,428)		($23,573,745)		($26,654,017)		$132,517,762		$10,261,845		$3,852,754		$1,287,772								
140																														
141					**Balance**			($43,566,708)		($10,983,428)		($23,573,745)		($26,654,017)		$132,517,762		$10,261,845		$3,852,754		$1,287,772								
142																														
143					**IRR**	**12.59%**																								
144																														
145																														

PROPERTY DEVELOPMENT FEASIBILITY
M1-M2 Freeway Extension Site

Precinct A | % Cost

The Site
Precinct Site Area (approx) | 8900 sqm

	LEP Site Value	2018	2019	2020	2021	2022	2023	2024	2025	2026	Check Totals
Land Cost	($14,600,000)	($14,600,000)									($14,600,000) OK
GST on land	$1,327,273	$1,327,273									
Stamp Duty	($1,081,454)	($1,081,454)									
Land Tax	($1,200,460)	($240,092)	($240,092)	($240,092)	($240,092)	($240,092)					($1,200,460)

LEP Control | FSR 3.0 : 1 | 26700 sqm
No. of Dwellings | 292

Dwelling Mix example*

			sqm	sqm
	112	1 BED	65	7280
	146	2 BED	90	13140
	34	3 BED	125	4250
Lobby + internal public circulation			2003	2003
		Total		26673
Balconies	146		20	2920

Balconies are provided
Balconies are not included in GFA

Residential Development Subsidy for Tunnel Extension	Total	($51,100,000)	($51,100,000)									
GST		$4,645,455	$4,645,455									
Infrastructure - Precincts A,B,C,I	Total	($8,706,360)		($4,353,180)	($4,353,180)							
GST		$791,487		$395,744	$395,744							

Construction - Nominal Allowances (incl. GST)

Dwelling type	Amount	sqm	rate/sqm									
1 BED	112	65	$1,800	($13,104,000)			($4,368,000)	($8,736,000)				($13,104,000) OK
2 BED	146	90	$1,800	($23,652,000)			($7,884,000)	($15,768,000)				($23,652,000) OK
3 BED	34	125	$1,800	($7,650,000)			($2,550,000)	($5,100,000)				($7,650,000) OK
Balconies	146	20	$800	($2,336,000)			($778,667)	($1,557,333)				($2,336,000) OK
Lobby + circul.		2003	$1,800	($3,604,500)			($1,201,500)	($2,403,000)				($3,804,500) OK
Carpark	397.6	13916	$900	($12,524,400)			($12,524,400)					($12,524,400) OK
			Total	**($62,870,900)**			**($29,306,567)**	**($33,564,333)**				**($62,870,900)**
GST				**$5,715,536**			**$2,664,233**	**$3,051,303**				$5,715,536

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances (incl. GST)		YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	
Demolition	($200,000)		($150,000)	($50,000)					($200,000)
Excavation/Earthworks (includ. compaction)	($2,000,000)		($1,500,000)	($500,000)					($2,000,000)
Stormwater Detention	($1,000,000)		($750,000)	($250,000)					($1,000,000)
Civil/Hydraulic Engineering Works (Road & Drainage)	($1,000,000)		($750,000)	($250,000)					($1,000,000)
Electrical (Power & Telephone)	($1,000,000)		($500,000)	($500,000)					($1,000,000)
Surveying & Linen Plan	($100,000)	($100,000)							($100,000)
Construction Survey	($100,000)		($50,000)	($50,000)					($100,000)
External Works and Landscaping	($1,000,000)		($500,000)	($250,000)	($250,000)				($1,000,000)
Total	($6,400,000)								($6,400,000)
GST	**$581,818**	**$0**	**$9,091**	**$381,818**	**$168,182**	**$22,727**	**$0**	**$0**	**$0**	**$0**	$581,818

Total Construction + Site Works + Tunnel + Infrastructure | **($129,077,260)** | 52%

Equilibria Concept Fee - Upfront | $50.00 / m2 of Land | ($489,500) | ($489,500)
Equilibria Development Fee - On Gazettal | $5,000.00 / Dwelling | ($1,606,000) | ($1,606,000)

Consultant Fees - Nominal	say 7.5%	($10,648,874)	($2,129,775)	($2,129,775)	($2,129,775)	($2,129,775)	($1,064,887)	($1,064,887)				($10,648,874) OK
Project Management Fees - Nominal	say 1.5%	($2,129,775)			($304,254)	($304,254)	($304,254)	($304,254)	($304,254)	($304,254)	($304,254)	($2,129,775)

Authority Fees & Charges - Approximate

Overall Budget	say 1.25%	($1,774,812)			($443,703)	($443,703)	($887,406)					($1,774,812) OK
	Total	($16,648,961)	($2,619,275)	($3,735,775)	($2,877,731)	($2,877,731)	($2,256,547)	($1,369,141)	($304,254)	($304,254)	($304,254)	($16,648,961)
GST		**$1,513,542**	**$238,116**	**$339,616**	**$261,612**	**$261,612**	**$205,141**	**$124,467**	**$27,659**	**$27,659**	**$27,659**	$1,513,542

Total Construction + Professional & Authority Fees | **($145,726,221)** | 59%

Total Precinct Cost including Land | **($162,606,135)**

Sale Price - Nominal

Strata Title, apartments	rate/sqm	$10,000			Stamp Duty/Apart.	No. of Aparts.	SOLD		SOLD		SOLD		SOLD		
Sale Price	1 BED	$650,000	112	$72,800,000	($24,796)	112	100	$65,000,000	8	$5,200,000	3	$1,950,000	1	$650,000	112	$72,800,000 OK
Sale Price	2 BED	$900,000	146	$131,400,000	($36,046)	146	130	$117,000,000	12	$10,800,000	3	$2,700,000	1	$900,000	146	$131,400,000 OK
Sale Price	3 BED	$1,250,000	34	$42,500,000	($54,296)	34	28	$35,000,000	3	$3,750,000	2	$2,500,000	1	$1,250,000	34	$42,500,000 OK
			Subtotal	$246,700,000				$217,000,000		$19,750,000		$7,150,000		$2,800,000		$246,700,000

Total Revenue*

Stamp Duty Total	($9,885,920)				Stamp Duty	($2,479,596)		($198,368)		($74,388)		($24,796)		
						($4,685,974)		($432,551)		($108,138)		($36,046)		
						($1,520,288)		($162,888)		($108,592)		($54,296)		
GST	**($22,427,273)**					($19,727,273)		($1,795,455)		($650,000)		($254,545)		$22,427,273

Profit

Total Revenue		Total Precinct Cost		
$246,700,000	minus	($162,606,135)	=	$84,091,865

Total Precinct Yield (refer to exclusions below)* | **$84,091,565**

ADDITIONAL EXPENDITURE		Nominal Allowances	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Finance Costs	*See Progressive Bank Balance below*	($32,637,039)										
Contingency/Escalation		($7,286,311)			($1,092,947)	($1,457,262)	($2,914,524)	($1,821,578)				($7,286,311) OK
Marketing & Selling Costs	3%	($7,401,000)			($555,075)	($740,100)	($1,665,225)	($1,480,200)	($1,110,150)	($1,110,150)	($740,100)	($7,401,000) OK
Legal Costs/Strata Fees	*Registration of Strata Plans*	($500,000)			($400,000)		($100,000)					($500,000) OK
Sect 94 Contributions - approx $6385/unit		($1,864,420)			($1,864,420)							($1,864,420) OK
Sect 96 amendments		excluded										
Land + Environ Court		excluded										
GST Reconciliation		($7,852,162)	**$6,210,843**	**$744,450**	**$1,039,174**	**$3,094,027**	**$3,279,171**	**($19,602,805)**	**($1,767,795)**	**($622,341)**	**($226,886)**	($7,852,162)
	Total	**($57,540,932)**										
Credit Interest	*See Progressive Bank Balance below*	$4,765,405										
	GROSS PROFIT	**$31,316,339**	12.69%									
	Profit per Unit	$107,248										

Balance from Previous Year			($67,235,776)	($79,415,595)	($99,597,458)	($140,953,694)	($189,385,160)	$3,541,583	$21,315,947	$28,014,955		
Income	CR	$0	$0	$0	$0	$0	$217,000,000	$19,750,000	$7,150,000	$2,800,000	$246,700,000	CR Income OK
GST Annual Reconciliation		$6,210,843	$744,450	$1,039,174	$3,094,027	$3,279,171	($19,602,805)	($1,767,795)	($622,341)	($226,886)	($7,852,162)	
Expenses		($69,640,821)	($8,429,047)	($15,583,445)	($36,471,752)	($40,990,722)	($4,670,919)	($1,414,404)	($1,414,404)	($1,044,354)	($179,659,866)	TOTAL Expenses OK
NET		($63,429,978)	($74,920,373)	($93,959,866)	($132,975,183)	($178,665,245)	$3,341,116	$20,109,384	$26,429,203	$29,543,716	$59,187,972	CR Sub Balance OK
Interest - Debit	6.0%	($3,805,799)	($4,495,222)	($5,637,592)	($7,978,511)	($10,719,915)					($32,637,039)	DR Interest OK
Interest - Credit	6.0%						$200,467	$1,206,563	$1,585,752	$1,772,623	$4,765,405	CR Interest
BALANCE		($67,235,776)	($79,415,595)	($99,597,458)	($140,953,694)	($189,385,160)	$3,541,583	$21,315,947	$28,014,955	$31,316,339	**$31,316,339**	**GROSS PROFIT** OK

Maximum Exposure | ($189,385,160) | 12.69%

IRR Calculation

Income	$0	$0	$0	$0	$0	$217,000,000	$19,750,000	$7,150,000	$2,800,000
GST Reconciliation	$6,210,843	$744,450	$1,039,174	$3,094,027	$3,279,171	($19,602,805)	($1,767,795)	($622,341)	($226,886)
Expenses	($69,640,821)	($8,429,047)	($15,583,445)	($36,471,752)	($40,990,722)	($4,670,919)	($1,414,404)	($1,044,354)	($179,659,866)
Sub-Total	($63,429,978)	($7,684,596)	($14,544,271)	($33,377,725)	($37,711,551)	$192,726,276	$16,567,801	$5,113,256	$1,528,760
Balance	($63,429,978)	($7,684,596)	($14,544,271)	($33,377,725)	($37,711,551)	$192,726,276	$16,567,801	$5,113,256	$1,528,760

IRR | **9.79%**

Sale Price - Nominal
Strata Title, apartments
Sale Price
Sale Price
Sale Price

Lobby + internal public circulation
Balconies
Balconies are provided
Balconies are not included in GFA

Dwelling Mix example*

Profit
Total Revenue
$0

Construction - Nominal Allowances*
Dwelling type
1 BED
2 BED
3 BED
Balconies
Lobby + circul.
Carpark

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*
Demolition
Excavation/Earthworks (includ. compaction)
Stormwater Detention
Civil/Hydraulic Engineering Works (Road & Drainage)
Electrical (Power & Telephone)
Surveying & Linen Plan
Construction Survey
External Works and Landscaping

Professional Fees - Nominal
Overall Budget

Authority Fees & Charges - Approximate
Overall Budget

EXPENDITURE
Finance Costs
Contingency/Escalation
Marketing & Selling Costs
Legal Costs/Strata Fees *Registration of Strata Plans*
Sect 94 Contributions - approx $6385/unit
Sect 96 amendments
Land + Environ Court
GST Reconciliation

Finance Cost (Interest)
Highest Exposure

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1																																		
2	**Precinct B**																																	
3																																		
4	**The Site**																																	
5	Precinct Site Area (approx)			9350	sqm																													
6					LEP Site Value																													
7	Land Cost				($15,000,000)			($15,000,000)																				($15,000,000)	OK					
8	GST on land				**$1,363,636**			**$1,363,636**																										
9	Stamp Duty				($1,109,454)			($1,109,454)																										
10	Land Tax			($246,492)	($1,478,952)			($246,492)		($246,492)		($246,492)		($246,492)		($246,492)		($246,492)										($1,478,952)						
11																																		
12	**LEP Control**		FSR 3.0 : 1	28050	sqm																										**LEP Control**			
13	**No. of Dwellings**	300																													**No. of Dwellings**			
14																																		
15	**Dwelling Mix example***			sqm	sqm																										**Dwelling Mix example***			
16		100	1 BED	65	6500																													
17		160	2 BED	90	14400																													
18		40	3 BED	125	5000																													
19	Lobby + internal public circulation			2104	2104																										Lobby + internal public circulation			
20				Total	28004																													
21	Balconies	150		20	3000																										Balconies			
22																																		
23	Balconies are provided																														Balconies are provided			
24	Balconies are not included in GFA																														Balconies are not included in GFA			
25								**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**2026**		**2027**		**Check Totals**						
26																																		
27	**Residential Development Subsidy for Tunnel Extension**			Total	($52,500,000)			**($52,500,000)**																										
28																																		
29	**GST**				**$4,772,727**			**$4,772,727**																										
30																																		
31	**Construction - Nominal Allowances***																														**Construction - Nominal Allowances***			
32	Dwelling type	Amount	sqm	rate/sqm																											Dwelling type			
33	1 BED	100	65	($1,800)	($11,700,000)											($3,900,000)		($7,800,000)										($11,700,000)	OK		1 BED			
34	2 BED	160	90	($1,800)	($25,920,000)											($8,640,000)		($17,280,000)										($25,920,000)	OK		2 BED			
35	3 BED	40	125	($1,800)	($9,000,000)											($3,000,000)		($6,000,000)										($9,000,000)	OK		3 BED			
36	Balconies	150	20	($800)	($2,400,000)											($800,000)		($1,600,000)										($2,400,000)	OK		Balconies			
37	Lobby + circul.		2104	($1,800)	($3,786,750)											($1,262,250)		($2,524,500)										($3,786,750)	OK		Lobby + circul.			
38	Carpark	413	14455	($900)	($13,009,500)											($13,009,500)												($13,009,500)	OK		Carpark			
39				Total	($65,816,250)	25%										**($30,611,750)**		**($35,204,500)**										**($65,816,250)**						
40																																		
41	**GST**				**$5,983,295**											**$2,782,886**		**$3,200,409**										$5,983,295						
42																																		
43	The construction cost will vary considerably depending																														The construction cost will vary considerably depending			
44	on the type of builder &																														on the type of builder &			
45								YEAR 1						YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8								
46	**Site Works - Nominal Allowances***																														**Site Works - Nominal Allowances***			
47	Demolition				($200,000)									($150,000)		($50,000)												($200,000)			Demolition			
48	Excavation/Earthworks (includ. compaction)				($750,000)									($562,500)		($187,500)												($750,000)			Excavation/Earthworks (includ. compaction)			
49	Stormwater Detention				($750,000)									($562,500)		($187,500)												($750,000)			Stormwater Detention			
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($700,000)									($525,000)		($175,000)												($700,000)			Civil/Hydraulic Engineering Works (Road & Drainage)			
51	Electrical (Power & Telephone)				($700,000)									($350,000)		($350,000)												($700,000)			Electrical (Power & Telephone)			
52	Surveying & Linen Plan				($100,000)					($100,000)																		($100,000)			Surveying & Linen Plan			
53	Construction Survey				($100,000)									($50,000)		($50,000)												($100,000)			Construction Survey			
54	External Works and Landscaping				($1,000,000)									($500,000)		($250,000)		($250,000)										($1,000,000)			External Works and Landscaping			
55				Total	($4,300,000)																							($4,300,000)						
56																																		
57	**GST**				**$390,909**			**$0**		**$9,091**		**$0**		**$245,455**		**$113,636**		**$22,727**		**$0**		**$0**		**$0**		**$0**		$390,909						
58																																		
59		Total Construction + Site Works + Tunnel			**($122,616,250)**																													
60																																		
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($514,250)			($514,250)																										
62																																		
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($1,650,000)					($1,650,000)																								
64																															**Professional Fees - Nominal**			
65	**Consultant Fees - Nominal**		say 7.5%		($10,115,841)			($2,023,168)						($3,034,752)		($2,023,168)		($2,023,168)		($1,011,584)								($10,115,841)	OK		Overall Budget			
66																																		
67	**Project Management Fees - Nominal**		say 1.5%		($2,023,168)			($252,896)						($252,896)		($252,896)		($252,896)		($252,896)		($252,896)		($252,896)		($252,896)		($2,023,168)						
68																																		
69	**Authority Fees & Charges - Approximate**																														**Authority Fees & Charges - Approximate**			
70	Overall Budget		say 1.25%		($1,685,973)									($421,493)		($421,493)		($842,987)										($1,685,973)	OK		Overall Budget			
71				Total	($15,989,232)			($2,790,314)		($1,650,000)		$0		($3,709,142)		($2,697,558)		($3,119,051)		($1,264,480)		($252,896)		($252,896)		($252,896)		($15,989,232)						
72																																		
73	**GST**				**$1,453,567**			**$253,665**		**$150,000**		**$0**		**$337,195**		**$245,233**		**$283,550**		**$114,953**		**$22,991**		**$22,991**		**$22,991**		$1,453,567						
74																																		
75		Total Construction + Professional & Authority Fees			**($138,605,482)**	54%																												
76																																		
77																																		
78	**Total Precinct Cost including Land**				**($156,193,888)**																													
79																																		
80																																		
81	**Sale Price - Nominal**																														**Sale Price - Nominal**			
82	Strata Title, apartments	rate/sqm	$10,000													Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD						Strata Title, apartments			
83	Sale Price	1 BED	$650,000	100	$65,000,000									1 BED		($24,796)		100	90	$58,500,000	8	$5,200,000	2	$1,300,000	0	$0	100	$65,000,000	OK		Sale Price			
84	Sale Price	2 BED	$900,000	160	$144,000,000									2 BED		($36,046)		160	144	$129,600,000	12	$10,800,000	3	$2,700,000	1	$900,000	160	$144,000,000	OK		Sale Price			
85	Sale Price	3 BED	$1,250,000	40	$50,000,000									3 BED		($54,296)		40	34	$42,500,000	4	$5,000,000	1	$1,250,000	1	$1,250,000	40	$50,000,000	OK		Sale Price			
86				Subtotal	$259,000,000															$230,600,000		$21,000,000		$5,250,000		$2,150,000		$259,000,000						
87																																		
88		**Total Revenue***			$259,000,000																													
89																																		
90	Stamp Duty Total				($10,418,788)													Stamp Duty		($2,231,636)		($198,368)		($49,592)		$0								
91																				($5,190,618)		($432,551)		($108,138)		($36,046)								
92																				($1,846,064)		($217,184)		($54,296)		($54,296)								
93																																		
94	**GST**				**($23,545,455)**															($20,963,636)		($1,909,091)		($477,273)		($195,455)		$23,545,455						
95																																		
96	**Profit**																														**Profit**			
97	Total Revenue		Total Precinct Cost																												Total Revenue			
98	$259,000,000	minus	($156,193,888)	=	$102,806,112																										$0			
99																																		
100	**Total Precinct Yield (refer to exclusions below)***				**$102,806,112**																													
101																																		
102								2018		2019		2020		2021		2022		2023		2024		2025		2026		2027								
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances																										**EXPENDITURE**			
104																																		
105	Finance Costs	*See Progressive Bank Balance below*			($36,445,202)																										Finance Costs			
106	Contingency/Escalation				($6,930,274)									($1,039,541)		($1,386,055)		($2,772,110)		($1,732,569)								($6,930,274)	OK		Contingency/Escalation			
107	Marketing & Selling Costs			3%	($7,770,000)									($582,750)		($777,000)		($1,748,250)		($1,554,000)		($1,165,500)		($1,165,500)		($777,000)		($7,770,000)	OK		Marketing & Selling Costs			
108	Legal Costs/Strata Fees				($250,000)									($200,000)				($50,000)										($250,000)	OK		Legal Costs/Strata Fees *Registration of Strata Plans*			
109	Sect 94 Contributions - approx $6385/unit				($1,915,500)									($1,915,500)														($1,915,500)	OK		Sect 94 Contributions - approx $6385/unit			
110	Sect 96 amendments				excluded																										Sect 96 amendments			
111	Land + Environ Court				excluded																										Land + Environ Court			
112																																		
113	GST Reconciliation				($9,581,320)			**$6,390,029**		**$159,091**		**$0**		**$582,649**		**$3,141,755**		**$3,506,686**		**($20,848,684)**		**($1,886,100)**		**($454,282)**		**($172,464)**		($9,581,320)			GST Reconciliation			
114				Total	**($62,892,296)**																													
115																																		
116	Credit Interest	*See Progressive Bank Balance below*			$8,551,012																													
117																																		
118				**GROSS PROFIT**	**$48,464,828**	18.71%																												
119																																		
120				Profit per Unit	$161,549																													
121																																		
122					Balance from Previous Year					($69,171,605)		($75,269,547)		($80,047,001)		($95,249,243)		($136,820,923)		($187,306,917)		$18,966,951		$38,862,202		$44,773,896								
123				CR	Income			$0		$0		$0		$0		$0		$0		$230,600,000		$21,000,000		$5,250,000		$2,150,000		$259,000,000	CR Income	OK				
124					GST Annual Reconciliation			$6,390,029		$159,091		$0		$582,649		$3,141,755		$3,506,686		($20,848,684)		($1,886,100)		($454,282)		($172,464)		($9,581,320)						
125					Expenses			($71,646,260)		($1,996,492)		($246,492)		($10,393,425)		($36,968,854)		($43,390,403)		($4,551,049)		($1,418,396)		($1,418,396)		($1,029,896)		($173,059,662)	TOTAL Expenses	OK				
126					NET			($65,256,232)		($71,009,007)		($75,516,039)		($89,857,777)		($129,076,342)		($176,704,639)		$17,893,350		$36,662,455		$42,239,524		$45,721,536		$76,359,018	CR Sub Balance	OK				
127	**Finance Cost (Interest)**		($36,445,202)		Interest - Debit	6.0%		($3,915,374)		($4,260,540)		($4,530,962)		($5,391,467)		($7,744,581)		($10,602,278)										($36,445,202)	DR Interest	OK	**Finance Cost (Interest)**			
128					Interest - Credit	6.0%														$1,073,601		$2,199,747		$2,534,371		$2,743,292		$8,551,012	CR Interest					
129					**BALANCE**			($69,171,605)		($75,269,547)		($80,047,001)		($95,249,243)		($136,820,923)		($187,306,917)		$18,966,951		$38,862,202		$44,773,896		$48,464,828		**$48,464,828**	**GROSS PROFIT**	OK	**Highest Exposure**			
130																																		
131	**Maximum Exposure**		($187,306,917)																									18.71%						
132																																		
133																																		
134																																		
135					**IRR Calculation**																													
136					Income			$0		$0		$0		$0		$0		$0		$230,600,000		$21,000,000		$5,250,000		$2,150,000								
137					GST Reconciliation			$6,390,029		$159,091		$0		$582,649		$3,141,755		$3,506,686		($20,848,684)		($1,886,100)		($454,282)		($172,464)								
138					Expenses			($71,646,260)		($1,996,492)		($246,492)		($10,393,425)		($36,968,854)		($43,390,403)		($4,551,049)		($1,418,396)		($1,418,396)		($1,029,896)		($173,059,662)						
139					Sub-Total			($65,256,232)		($1,837,401)		($246,492)		($9,810,775)		($33,827,099)		($39,883,716)		$205,200,268		$17,695,504		$3,377,322		$947,640								
140																																		
141					**Balance**			($65,256,232)		($1,837,401)		($246,492)		($9,810,775)		($33,827,099)		($39,883,716)		$205,200,268		$17,695,504		$3,377,322		$947,640								
142																																		
143					**IRR**	**10.96%**																												
144																																		
145																																		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1																														
2	**Precinct C**																													
3																														
4	**The Site**																													
5	Precinct Site Area (approx)			10000	sqm																									
6					LEP Site Value																									
7	Land Cost				($9,500,000)			($9,500,000)																($9,500,000)	OK					
8	GST on land				**$863,636**			**$863,636**																						
9	Stamp Duty				($724,454)			($724,454)																						
10	Land Tax			($158,492)	($633,968)			($158,492)		($158,492)		($158,492)		($158,492)										($633,968)						
11																														
12	**LEP Control**		FSR 1.8 : 1	18000	sqm																						**LEP Control**			
13	**No. of Dwellings**	190																									**No. of Dwellings**			
14																														
15	**Dwelling Mix example***			sqm	sqm																						**Dwelling Mix example***			
16		60	1 BED	65	3900																									
17		104	2 BED	90	9360																									
18		26	3 BED	125	3250																									
19	Lobby + internal public circulation			1350	1350																						Lobby + internal public circulation			
20				Total	17860																									
21	Balconies	95		20	1900																						Balconies			
22																														
23	Balconies are provided																										Balconies are provided			
24	Balconies are not included in GFA																										Balconies are not included in GFA			
25								**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**Check Totals**						
26																														
27	**Residential Development Subsidy for Tunnel Extension**			Total	($33,250,000)			**($33,250,000)**																						
28																														
29	**GST**				**$3,022,727**			**$3,022,727**																						
30																														
31	**Construction - Nominal Allowances***																										**Construction - Nominal Allowances***			
32	Dwelling type	Amount	sqm	rate/sqm																							Dwelling type			
33	1 BED	60	65	($2,000)	($7,800,000)							($2,600,000)		($5,200,000)										($7,800,000)	OK		1 BED			
34	2 BED	104	90	($2,000)	($18,720,000)							($6,240,000)		($12,480,000)										($18,720,000)	OK		2 BED			
35	3 BED	26	125	($2,000)	($6,500,000)							($2,166,667)		($4,333,333)										($6,500,000)	OK		3 BED			
36	Balconies	95	20	($800)	($1,520,000)							($506,667)		($1,013,333)										($1,520,000)	OK		Balconies			
37	Lobby + circul.		1350	($2,000)	($2,700,000)							($900,000)		($1,800,000)										($2,700,000)	OK		Lobby + circul.			
38	Carpark	262.8	9198	($900)	($8,278,200)							($8,278,200)												($8,278,200)	OK		Carpark			
39				Total	($45,518,200)	25%						**($20,691,533)**		**($24,826,667)**										**($45,518,200)**						
40																														
41	**GST**				**$4,138,018**							**$1,881,048**		**$2,256,970**										$4,138,018						
42																														
43	The construction cost will vary considerably depending																										The construction cost will vary considerably depending			
44	on the type of builder &																										on the type of builder &			
45								YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8								
46	**Site Works - Nominal Allowances***																										**Site Works - Nominal Allowances***			
47	Demolition				($200,000)					($150,000)		($50,000)												($200,000)			Demolition			
48	Excavation/Earthworks (includ. compaction)				($1,500,000)					($1,125,000)		($375,000)												($1,500,000)			Excavation/Earthworks (includ. compaction)			
49	Stormwater Detention				($1,000,000)					($750,000)		($250,000)												($1,000,000)			Stormwater Detention			
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($750,000)					($562,500)		($187,500)												($750,000)			Civil/Hydraulic Engineering Works (Road & Drainage)			
51	Electrical (Power & Telephone)				($750,000)					($375,000)		($375,000)												($750,000)			Electrical (Power & Telephone)			
52	Surveying & Linen Plan				($100,000)					($100,000)														($100,000)			Surveying & Linen Plan			
53	Construction Survey				($100,000)					($50,000)		($50,000)												($100,000)			Construction Survey			
54	External Works and Landscaping				($1,500,000)					($750,000)		($375,000)		($375,000)										($1,500,000)			External Works and Landscaping			
55				Total	($5,900,000)																			($5,900,000)						
56																														
57	**GST**				**$536,364**			**$0**		**$351,136**		**$151,136**		**$34,091**		**$0**		**$0**		**$0**		**$0**		$536,364						
58																														
59		Total Construction + Site Works + Tunnel			**($84,668,200)**																									
60																														
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($550,000)			($550,000)																						
62																														
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($1,045,000)					($1,045,000)																				
64																											**Professional Fees - Nominal**			
65	**Consultant Fees - Nominal**		say 7.5%		($6,985,127)			($1,397,025)		($2,095,538)		($1,397,025)		($1,397,025)		($698,513)								($6,985,127)	OK		Overall Budget			
66																														
67	**Project Management Fees - Nominal**		say 1.5%		($1,397,025)			($174,628)		($174,628)		($174,628)		($174,628)		($174,628)		($174,628)		($174,628)		($174,628)		($1,397,025)						
68																														
69	**Authority Fees & Charges - Approximate**																										**Authority Fees & Charges - Approximate**			
70	Overall Budget		say 1.25%		($1,164,188)					($291,047)		($291,047)		($582,094)										($1,164,188)	OK		Overall Budget			
71				Total	($11,141,340)			($2,121,653)		($3,606,213)		($1,862,700)		($2,153,747)		($873,141)		($174,628)		($174,628)		($174,628)		($11,141,340)						
72																														
73	**GST**				**$1,012,849**			**$192,878**		**$327,838**		**$169,336**		**$195,795**		**$79,376**		**$15,875**		**$15,875**		**$15,875**		$1,012,849						
74																														
75		Total Construction + Professional & Authority Fees			($95,809,540)	53%																								
76																														
77																														
78	**Total Precinct Cost including Land**				**($106,667,962)**																									
79																														
80																														
81	**Sale Price - Nominal**																										**Sale Price - Nominal**			
82	Strata Title, apartments	rate/sqm	$11,000									Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD						Strata Title, apartments			
83	Sale Price	1 BED	$715,000	60	$42,900,000					1 BED		($27,721)		60	54	$38,610,000	5	$3,575,000	1	$715,000	0	$0	60	$42,900,000	OK		Sale Price			
84	Sale Price	2 BED	$990,000	104	$102,960,000					2 BED		($40,096)		104	90	$89,100,000	10	$9,900,000	3	$2,970,000	1	$990,000	104	$102,960,000	OK		Sale Price			
85	Sale Price	3 BED	$1,375,000	26	$35,750,000					3 BED		($61,171)		26	22	$30,250,000	2	$2,750,000	1	$1,375,000	1	$1,375,000	26	$35,750,000	OK		Sale Price			
86				Subtotal	$181,610,000											$157,960,000		$16,225,000		$5,060,000		$2,365,000		$181,610,000						
87																														
88		**Total Revenue***			$181,610,000																									
89																														
90	Stamp Duty Total				($7,423,683)									Stamp Duty		($1,496,932)		($138,605)		($27,721)		$0								
91																($3,608,636)		($400,960)		($120,288)		($40,096)								
92																($1,345,762)		($122,342)		($61,171)		($61,171)								
93																														
94	**GST**				**($16,510,000)**											($14,360,000)		($1,475,000)		($460,000)		($215,000)		$16,510,000						
95																														
96	**Profit**																										**Profit**			
97	Total Revenue		Total Precinct Cost																								Total Revenue			
98	$181,610,000	minus	($106,667,962)	=	$74,942,038																						$0			
99																														
100	**Total Precinct Yield (refer to exclusions below)***				**$74,942,038**																									
101																														
102								2018		2019		2020		2021		2022		2023		2024		2025								
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances																						**EXPENDITURE**			
104																														
105	Finance Costs	*See Progressive Bank Balance below*			($17,370,869)																						Finance Costs			
106	Contingency/Escalation				($4,790,477)					($718,572)		($958,095)		($1,916,191)		($1,197,619)								($4,790,477)	OK		Contingency/Escalation			
107	Marketing & Selling Costs			3%	($5,448,300)					($408,623)		($544,830)		($1,225,868)		($1,089,660)		($817,245)		($817,245)		($544,830)		($5,448,300)	OK		Marketing & Selling Costs			
108	Legal Costs/Strata Fees				($250,000)					($200,000)				($50,000)										($250,000)	OK		Legal Costs/Strata Fees *Registration of Strata Plans*			
109	Sect 94 Contributions - approx $6385/unit				($1,213,150)					($1,213,150)														($1,213,150)	OK		Sect 94 Contributions - approx $6385/unit			
110	Sect 96 amendments				excluded																						Sect 96 amendments			
111	Land + Environ Court				excluded																						Land + Environ Court			
112																														
113	GST Reconciliation				($6,936,405)			**$4,079,241**		**$678,974**		**$2,201,521**		**$2,486,856**		**($14,280,624)**		**($1,459,125)**		**($444,125)**		**($199,125)**		($6,936,405)			GST Reconciliation			
114				Total	**($36,009,201)**																									
115																														
116	Credit Interest	*See Progressive Bank Balance below*			$8,438,513																									
117																														
118				**GROSS PROFIT**	**$47,371,350**	26.08%																								
119																														
120				Profit per Unit	$249,323																									
121																														
122					Balance from Previous Year					($44,175,880)		($56,884,322)		($85,394,609)		($120,430,541)		$21,293,721		$37,171,786		$43,243,535								
123				CR	Income			$0		$0		$0		$0		$157,960,000		$16,225,000		$5,060,000		$2,365,000		$181,610,000	CR Income	OK				
124					GST Annual Reconciliation			$4,079,241		$678,974		$2,201,521		$2,486,856		($14,280,624)		($1,459,125)		($444,125)		($199,125)		($6,936,405)						
125					Expenses			($45,754,599)		($10,167,549)		($25,878,151)		($30,705,964)		($3,160,420)		($991,873)		($991,873)		($719,458)		($118,369,889)	TOTAL Expenses	OK				
126					NET			($41,675,358)		($53,664,455)		($80,560,952)		($113,613,718)		$20,088,416		$35,067,723		$40,795,788		$44,689,953		$56,303,706	CR Sub Balance	OK				
127	**Finance Cost (Interest)**		($17,370,869)		Interest - Debit	6.0%		($2,500,521)		($3,219,867)		($4,833,657)		($6,816,823)										($17,370,869)	DR Interest	OK	**Finance Cost (Interest)**			
128					Interest - Credit	6.0%										$1,205,305		$2,104,063		$2,447,747		$2,681,397		$8,438,513	CR Interest					
129					**BALANCE**			($44,175,880)		($56,884,322)		($85,394,609)		($120,430,541)		$21,293,721		$37,171,786		$43,243,535		$47,371,350		**$47,371,350**	**GROSS PROFIT**	OK	**Highest Exposure**			
130																														
131	**Maximum Exposure**		($120,430,541)																					26.08%						
132																														
133																														
134																														
135					**IRR Calculation**																									
136					Income			$0		$0		$0		$0		$157,960,000		$16,225,000		$5,060,000		$2,365,000								
137					GST Reconciliation			$4,079,241		$678,974		$2,201,521		$2,486,856		($14,280,624)		($1,459,125)		($444,125)		($199,125)								
138					Expenses			($45,754,599)		($10,167,549)		($25,878,151)		($30,705,964)		($3,160,420)		($991,873)		($991,873)		($719,458)		($118,369,889)						
139					Sub-Total			($41,675,358)		($9,488,575)		($23,676,630)		($28,219,108)		$140,518,956		$13,774,002		$3,624,002		$1,446,417								
140																														
141					**Balance**			($41,675,358)		($9,488,575)		($23,676,630)		($28,219,108)		$140,518,956		$13,774,002		$3,624,002		$1,446,417								
142																														
143					**IRR**	**16.29%**																								
144																														
145																														

Precinct D

The Site

Precinct Site Area (approx)			6500	sqm
				LEP Site Value
Land Cost				($6,200,000)
GST on land				**$563,636**
Stamp Duty				($493,454)
Land Tax			($105,692)	($528,460)

LEP Control		FSR 1.8 : 1	11700	sqm
No. of Dwellings	124			

Dwelling Mix example*			sqm	sqm
	38	1 BED	65	2470
	70	2 BED	90	6300
	16	3 BED	125	2000
Lobby + internal public circulation			878	878
			Total	11648
Balconies	62		20	1240

Balconies are provided

Balconies are not included in GFA

Residential Development Subsidy for Tunnel Extension			Total	($21,700,000)	
GST				**$1,972,727**	
Infrastructure - Precincts D,E,F,G,H,J			Total	($7,200,900)	
GST				**$654,627**	

Construction - Nominal Allowances*					
Dwelling type	Amount	sqm	rate/sqm		
1 BED	38	65	($2,000)	($4,940,000)	
2 BED	70	90	($2,000)	($12,600,000)	
3 BED	16	125	($2,000)	($4,000,000)	
Balconies	62	20	($800)	($992,000)	
Lobby + circul.		878	($2,000)	($1,755,000)	
Carpark	172	6013	($900)	($5,411,700)	
			Total	($29,698,700)	25%
GST				**$2,699,882**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*					
Demolition				($200,000)	
Excavation/Earthworks (includ. compaction)				($750,000)	
Stormwater Detention				($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)				($500,000)	
Electrical (Power & Telephone)				($500,000)	
Surveying & Linen Plan				($100,000)	
Construction Survey				($100,000)	
External Works and Landscaping				($650,000)	
			Total	($3,300,000)	
GST				**$300,000**	
	Total Construction + Site Works + Tunnel + Infrastructure			**($61,899,600)**	
Equilibria Concept Fee - Upfront		$50.00	/ m2 of Land	($357,500)	
Equilibria Development Fee - On Gazettal		$5,000.00	/ Dwelling	($682,000)	
Consultant Fees - Nominal		say 7.5%		($5,106,717)	
Project Management Fees - Nominal		say 1.5%		($1,021,343)	
Authority Fees & Charges - Approximate					
Overall Budget		say 1.25%		($851,120)	
			Total	($8,018,680)	
GST				**$728,971**	
	Total Construction + Professional & Authority Fees			**($69,918,280)**	59%

Total Precinct Cost including Land **($77,140,194)**

Sale Price - Nominal					
Strata Title, apartments	rate/sqm	$11,000			
Sale Price	1 BED	$715,000	38	$27,170,000	
Sale Price	2 BED	$990,000	70	$69,300,000	
Sale Price	3 BED	$1,375,000	16	$22,000,000	
			Subtotal	$118,470,000	
	Total Revenue*			$118,470,000	

Stamp Duty Total				($4,838,849)
GST				**($10,770,000)**

Profit

Total Revenue		Total Precinct Cost		
$118,470,000	minus	($77,140,194)	=	$41,329,806

Total Precinct Yield (refer to exclusions below)* **$41,329,806**

ADDITIONAL EXPENDITURE				Nominal Allowances	
Finance Costs	*See Progressive Bank Balance below*			($15,105,813)	
Contingency/Escalation				($3,495,914)	
Marketing & Selling Costs			3%	($3,554,100)	
Legal Costs/Strata Fees				($100,000)	
Sect 94 Contributions - approx $6385/unit				($791,740)	
Sect 96 amendments				excluded	
Land + Environ Court				excluded	
GST Reconciliation				($3,850,156)	
			Total	**($26,897,724)**	
Credit Interest	*See Progressive Bank Balance below*			$2,467,020	
			GROSS PROFIT	**$16,899,102**	14.26%
			Profit per Unit	$136,283	

				Balance from Previous Year		
($85,081,948)			CR	Income		
				GST Annual Reconciliation		
				Expenses		
				NET		
Finance Cost (Interest)		($15,105,813)		Interest - Debit	6.0%	
				Interest - Credit	6.0%	
				BALANCE		
Maximum Exposure		($89,234,036)				

IRR Calculation		
Income		
GST Reconciliation		
Expenses		
Sub-Total		
Balance		
IRR		**10.35%**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	Check Totals	
Residential Development Subsidy for Tunnel Extension	**($21,700,000)**										
GST	**$1,972,727**										
Infrastructure - Precincts D,E,F,G,H,J		**($3,600,450)**	**($3,600,450)**								
GST		**$327,314**	**$327,314**								
Construction - Nominal Allowances*											
Dwelling type											
1 BED				($1,646,667)	($3,293,333)					($4,940,000)	OK
2 BED				($4,200,000)	($8,400,000)					($12,600,000)	OK
3 BED				($1,333,333)	($2,666,667)					($4,000,000)	OK
Balconies				($330,667)	($661,333)					($992,000)	OK
Lobby + circul.				($585,000)	($1,170,000)					($1,755,000)	OK
Carpark				($5,411,700)						($5,411,700)	OK
				($13,507,367)	**($16,191,333)**					**($29,698,700)**	
GST				**$1,227,942**	**$1,471,939**					$2,699,882	
Site Works - Nominal Allowances*	YEAR 1		YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8		
Demolition			($150,000)	($50,000)						($200,000)	
Excavation/Earthworks (includ. compaction)			($562,500)	($187,500)						($750,000)	
Stormwater Detention			($375,000)	($125,000)						($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)			($375,000)	($125,000)						($500,000)	
Electrical (Power & Telephone)			($250,000)	($250,000)						($500,000)	
Surveying & Linen Plan	($100,000)									($100,000)	
Construction Survey			($50,000)	($50,000)						($100,000)	
External Works and Landscaping			($325,000)	($162,500)	($162,500)					($650,000)	
										($3,300,000)	
GST	**$0**	**$9,091**	**$189,773**	**$86,364**	**$14,773**	**$0**	**$0**	**$0**	**$0**	$300,000	
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102		OK
Finance Cost (Interest)	($1,839,940)	($1,983,721)	($2,621,233)	($3,710,987)	($5,050,983)	($98,949)	$618,164	$892,303	$956,553	$2,467,020	OR Interest
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102	**$16,899,102**	**GROSS PROFIT**
										14.26%	

	$0	$0	$0	$0	$0	$98,725,000	$13,970,000	$5,060,000	$715,000	$118,470,000	CR Income
	$2,673,319	$398,405	$687,310	$1,438,105	$1,629,855	($8,916,969)	($1,258,394)	($448,394)	($53,394)	($3,850,156)	
	($30,005,657)	($4,488,142)	($9,328,789)	($16,979,443)	($20,252,135)	($2,223,138)	($660,783)	($660,783)	($483,078)	($85,081,948)	TOTAL Expenses
	($27,332,338)	($33,062,016)	($43,687,216)	($61,849,786)	($84,183,053)	($1,649,144)	$10,302,731	$14,871,718	$15,942,549	$29,537,896	CR Sub Balance

	$0	$0	$0	$0	$0	$98,725,000	$13,970,000	$5,060,000	$715,000		
	$2,673,319	$398,405	$687,310	$1,438,105	$1,629,855	($8,916,969)	($1,258,394)	($448,394)	($53,394)		
	($30,005,657)	($4,488,142)	($9,328,789)	($16,979,443)	($20,252,135)	($2,223,138)	($660,783)	($660,783)	($483,078)	($85,081,948)	
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		

Precinct D

The Site

Precinct Site Area (approx)			6500	sqm
				LEP Site Value
Land Cost				($6,200,000)
GST on land				**$563,636**
Stamp Duty				($493,454)
Land Tax			($105,692)	($528,460)

LEP Control		FSR 1.8 : 1	11700	sqm
No. of Dwellings	124			

Dwelling Mix example*			sqm	sqm
	38	1 BED	65	2470
	70	2 BED	90	6300
	16	3 BED	125	2000
Lobby + internal public circulation			878	878
			Total	11648
Balconies	62		20	1240

Balconies are provided

Balconies are not included in GFA

Residential Development Subsidy for Tunnel Extension			Total	($21,700,000)	
GST				**$1,972,727**	
Infrastructure - Precincts D,E,F,G,H,J			Total	($7,200,900)	
GST				**$654,627**	

Construction - Nominal Allowances*					
Dwelling type	Amount	sqm	rate/sqm		
1 BED	38	65	($2,000)	($4,940,000)	
2 BED	70	90	($2,000)	($12,600,000)	
3 BED	16	125	($2,000)	($4,000,000)	
Balconies	62	20	($800)	($992,000)	
Lobby + circul.		878	($2,000)	($1,755,000)	
Carpark	172	6013	($900)	($5,411,700)	
			Total	($29,698,700)	25%
GST				**$2,699,882**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*					
Demolition				($200,000)	
Excavation/Earthworks (includ. compaction)				($750,000)	
Stormwater Detention				($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)				($500,000)	
Electrical (Power & Telephone)				($500,000)	
Surveying & Linen Plan				($100,000)	
Construction Survey				($100,000)	
External Works and Landscaping				($650,000)	
			Total	($3,300,000)	
GST				**$300,000**	
	Total Construction + Site Works + Tunnel + Infrastructure			**($61,899,600)**	
Equilibria Concept Fee - Upfront		$50.00	/ m2 of Land	($357,500)	
Equilibria Development Fee - On Gazettal		$5,000.00	/ Dwelling	($682,000)	
Consultant Fees - Nominal		say 7.5%		($5,106,717)	
Project Management Fees - Nominal		say 1.5%		($1,021,343)	
Authority Fees & Charges - Approximate					
Overall Budget		say 1.25%		($851,120)	
			Total	($8,018,680)	
GST				**$728,971**	
	Total Construction + Professional & Authority Fees			**($69,918,280)**	59%

Total Precinct Cost including Land **($77,140,194)**

Sale Price - Nominal					
Strata Title, apartments	rate/sqm	$11,000			
Sale Price	1 BED	$715,000	38	$27,170,000	
Sale Price	2 BED	$990,000	70	$69,300,000	
Sale Price	3 BED	$1,375,000	16	$22,000,000	
			Subtotal	$118,470,000	
	Total Revenue*			$118,470,000	

Stamp Duty Total				($4,838,849)
GST				**($10,770,000)**

Profit

Total Revenue		Total Precinct Cost		
$118,470,000	minus	($77,140,194)	=	$41,329,806

Total Precinct Yield (refer to exclusions below)* **$41,329,806**

ADDITIONAL EXPENDITURE				Nominal Allowances	
Finance Costs	*See Progressive Bank Balance below*			($15,105,813)	
Contingency/Escalation				($3,495,914)	
Marketing & Selling Costs			3%	($3,554,100)	
Legal Costs/Strata Fees				($100,000)	
Sect 94 Contributions - approx $6385/unit				($791,740)	
Sect 96 amendments				excluded	
Land + Environ Court				excluded	
GST Reconciliation				($3,850,156)	
			Total	**($26,897,724)**	
Credit Interest	*See Progressive Bank Balance below*			$2,467,020	
			GROSS PROFIT	**$16,899,102**	14.26%
			Profit per Unit	$136,283	

				Balance from Previous Year		
($85,081,948)			CR	Income		
				GST Annual Reconciliation		
				Expenses		
				NET		
Finance Cost (Interest)		($15,105,813)		Interest - Debit	6.0%	
				Interest - Credit	6.0%	
				BALANCE		
Maximum Exposure		($89,234,036)				

IRR Calculation		
Income		
GST Reconciliation		
Expenses		
Sub-Total		
Balance		
IRR		**10.35%**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	Check Totals	
Residential Development Subsidy for Tunnel Extension	**($21,700,000)**										
GST	**$1,972,727**										
Infrastructure - Precincts D,E,F,G,H,J		**($3,600,450)**	**($3,600,450)**								
GST		**$327,314**	**$327,314**								
Construction - Nominal Allowances*											
Dwelling type											
1 BED				($1,646,667)	($3,293,333)					($4,940,000)	OK
2 BED				($4,200,000)	($8,400,000)					($12,600,000)	OK
3 BED				($1,333,333)	($2,666,667)					($4,000,000)	OK
Balconies				($330,667)	($661,333)					($992,000)	OK
Lobby + circul.				($585,000)	($1,170,000)					($1,755,000)	OK
Carpark				($5,411,700)						($5,411,700)	OK
				($13,507,367)	**($16,191,333)**					**($29,698,700)**	
GST				**$1,227,942**	**$1,471,939**					$2,699,882	
Site Works - Nominal Allowances*	YEAR 1		YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8		
Demolition			($150,000)	($50,000)						($200,000)	
Excavation/Earthworks (includ. compaction)			($562,500)	($187,500)						($750,000)	
Stormwater Detention			($375,000)	($125,000)						($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)			($375,000)	($125,000)						($500,000)	
Electrical (Power & Telephone)			($250,000)	($250,000)						($500,000)	
Surveying & Linen Plan	($100,000)									($100,000)	
Construction Survey			($50,000)	($50,000)						($100,000)	
External Works and Landscaping			($325,000)	($162,500)	($162,500)					($650,000)	
										($3,300,000)	
GST	**$0**	**$9,091**	**$189,773**	**$86,364**	**$14,773**	**$0**	**$0**	**$0**	**$0**	$300,000	
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102		OK
Finance Cost (Interest)	($1,839,940)	($1,983,721)	($2,621,233)	($3,710,987)	($5,050,983)	($98,949)	$618,164	$892,303	$956,553	$2,467,020	OR Interest
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102	**$16,899,102**	**GROSS PROFIT**
										14.26%	

	$0	$0	$0	$0	$0	$98,725,000	$13,970,000	$5,060,000	$715,000		
	$2,673,319	$398,405	$687,310	$1,438,105	$1,629,855	($8,916,969)	($1,258,394)	($448,394)	($53,394)		
	($30,005,657)	($4,488,142)	($9,328,789)	($16,979,443)	($20,252,135)	($2,223,138)	($660,783)	($660,783)	($483,078)	($85,081,948)	
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		

Precinct D

The Site

Precinct Site Area (approx)			6500	sqm
				LEP Site Value
Land Cost				($6,200,000)
GST on land				**$563,636**
Stamp Duty				($493,454)
Land Tax			($105,692)	($528,460)

LEP Control		FSR 1.8 : 1	11700	sqm
No. of Dwellings	124			

Dwelling Mix example*			sqm	sqm
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Lobby + internal public circulation			878	878
			Total	11648
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Infrastructure - Precincts D,E,F,G,H,J			Total	($7,200,900)	
GST				**$654,627**	

Construction - Nominal Allowances*					
Dwelling type	Amount	sqm	rate/sqm		
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Lobby + circul.		878	($2,000)	($1,755,000)	
Carpark	172	6013	($900)	($5,411,700)	
			Total	($29,698,700)	25%
GST				**$2,699,882**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*					
Demolition				($200,000)	
Excavation/Earthworks (includ. compaction)				($750,000)	
Stormwater Detention				($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)				($500,000)	
Electrical (Power & Telephone)				($500,000)	
Surveying & Linen Plan				($100,000)	
Construction Survey				($100,000)	
External Works and Landscaping				($650,000)	
			Total	($3,300,000)	
GST				**$300,000**	
	Total Construction + Site Works + Tunnel + Infrastructure			**($61,899,600)**	
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			Total	($8,018,680)	
GST				**$728,971**	
	Total Construction + Professional & Authority Fees			**($69,918,280)**	59%

Total Precinct Cost including Land **($77,140,194)**

Sale Price - Nominal					
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			Subtotal	$118,470,000	
	Total Revenue*			$118,470,000	

Stamp Duty Total				($4,838,849)
GST				**($10,770,000)**

Profit

Total Revenue		Total Precinct Cost		
$118,470,000	minus	($77,140,194)	=	$41,329,806

Total Precinct Yield (refer to exclusions below)* **$41,329,806**

ADDITIONAL EXPENDITURE				Nominal Allowances	
Finance Costs	*See Progressive Bank Balance below*			($15,105,813)	
Contingency/Escalation				($3,495,914)	
Marketing & Selling Costs			3%	($3,554,100)	
Legal Costs/Strata Fees				($100,000)	
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Sect 96 amendments				excluded	
Land + Environ Court				excluded	
GST Reconciliation				($3,850,156)	
			Total	**($26,897,724)**	
Credit Interest	*See Progressive Bank Balance below*			$2,467,020	
			GROSS PROFIT	**$16,899,102**	14.26%
			Profit per Unit	$136,283	

				Balance from Previous Year		
($85,081,948)			CR	Income		
				GST Annual Reconciliation		
				Expenses		
				NET		
Finance Cost (Interest)		($15,105,813)		Interest - Debit	6.0%	
				Interest - Credit	6.0%	
				BALANCE		
Maximum Exposure		($89,234,036)				

IRR Calculation		
Income		
GST Reconciliation		
Expenses		
Sub-Total		
Balance		
IRR		**10.35%**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	Check Totals	
Residential Development Subsidy for Tunnel Extension	**($21,700,000)**										
GST	**$1,972,727**										
Infrastructure - Precincts D,E,F,G,H,J		**($3,600,450)**	**($3,600,450)**								
GST		**$327,314**	**$327,314**								
Construction - Nominal Allowances*											
Dwelling type											
1 BED				($1,646,667)	($3,293,333)					($4,940,000)	OK
2 BED				($4,200,000)	($8,400,000)					($12,600,000)	OK
3 BED				($1,333,333)	($2,666,667)					($4,000,000)	OK
Balconies				($330,667)	($661,333)					($992,000)	OK
Lobby + circul.				($585,000)	($1,170,000)					($1,755,000)	OK
Carpark				($5,411,700)						($5,411,700)	OK
				($13,507,367)	**($16,191,333)**					**($29,698,700)**	
GST				**$1,227,942**	**$1,471,939**					$2,699,882	
Site Works - Nominal Allowances*	YEAR 1		YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8		
Demolition			($150,000)	($50,000)						($200,000)	
Excavation/Earthworks (includ. compaction)			($562,500)	($187,500)						($750,000)	
Stormwater Detention			($375,000)	($125,000)						($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)			($375,000)	($125,000)						($500,000)	
Electrical (Power & Telephone)			($250,000)	($250,000)						($500,000)	
Surveying & Linen Plan	($100,000)									($100,000)	
Construction Survey			($50,000)	($50,000)						($100,000)	
External Works and Landscaping			($325,000)	($162,500)	($162,500)					($650,000)	
										($3,300,000)	
GST	**$0**	**$9,091**	**$189,773**	**$86,364**	**$14,773**	**$0**	**$0**	**$0**	**$0**	$300,000	
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102		OK
Finance Cost (Interest)	($1,839,940)	($1,983,721)	($2,621,233)	($3,710,987)	($5,050,983)	($98,949)	$618,164	$892,303	$956,553	$2,467,020	OR Interest
	($28,972,278)	($35,045,737)	($46,308,449)	($65,560,774)	($89,234,036)	($1,748,092)	$10,920,895	$15,764,021	$16,899,102	**$16,899,102**	**GROSS PROFIT**
										14.26%	

	$0	$0	$0	$0	$0	$98,725,000	$13,970,000	$5,060,000	$715,000		
	$2,673,319	$398,405	$687,310	$1,438,105	$1,629,855	($8,916,969)	($1,258,394)	($448,394)	($53,394)		
	($30,005,657)	($4,488,142)	($9,328,789)	($16,979,443)	($20,252,135)	($2,223,138)	($660,783)	($660,783)	($483,078)	($85,081,948)	
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		
	($27,332,338)	($4,089,737)	($8,641,479)	($15,541,337)	($18,622,280)	$87,584,893	$12,050,823	$3,950,823	$178,528		

Precinct D

The Site

Precinct Site Area (approx)			6500	sqm
				LEP Site Value
Land Cost				($6,200,000)
GST on land				**$563,636**
Stamp Duty				($493,454)
Land Tax			($105,692)	($528,460)

LEP Control		FSR 1.8 : 1	11700	sqm
No. of Dwellings	124			

Dwelling Mix example*			sqm	sqm
	38	1 BED	65	2470
	70	2 BED	90	6300
	16	3 BED	125	2000
Lobby + internal public circulation			878	878
			Total	11648
Balconies	62		20	1240

Balconies are provided

Balconies are not included in GFA

Residential Development Subsidy for Tunnel Extension			Total	($21,700,000)	
GST				**$1,972,727**	
Infrastructure - Precincts D,E,F,G,H,J			Total	($7,200,900)	
GST				**$654,627**	

Construction - Nominal Allowances*					
Dwelling type	Amount	sqm	rate/sqm		
1 BED	38	65	($2,000)	($4,940,000)	
2 BED	70	90	($2,000)	($12,600,000)	
3 BED	16	125	($2,000)	($4,000,000)	
Balconies	62	20	($800)	($992,000)	
Lobby + circul.		878	($2,000)	($1,755,000)	
Carpark	172	6013	($900)	($5,411,700)	
			Total	($29,698,700)	25%
GST				**$2,699,882**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*					
Demolition				($200,000)	
Excavation/Earthworks (includ. compaction)				($750,000)	
Stormwater Detention				($500,000)	
Civil/Hydraulic Engineering Works (Road & Drainage)				($500,000)	
Electrical (Power & Telephone)				($500,000)	
Surveying & Linen Plan				($100,000)	
Construction Survey				($100,000)	
External Works and Landscaping				($650,000)	
			Total	($3,300,000)	
GST				**$300,000**	
	Total Construction + Site Works + Tunnel + Infrastructure			**($61,899,600)**	
Equilibria Concept Fee - Upfront		$50.00	/ m2 of Land	($357,500)	
Equilibria Development Fee - On Gazettal		$5,000.00	/ Dwelling	($682,000)	
Consultant Fees - Nominal		say 7.5%		($5,106,717)	
Project Management Fees - Nominal		say 1.5%		($1,021,343)	
Authority Fees & Charges - Approximate					
Overall Budget		say 1.25%		($851,120)	
			Total	($8,018,680)	
GST				**$728,971**	
	Total Construction + Professional & Authority Fees			**($69,918,280)**	59%

Total Precinct Cost including Land **($77,140,194)**

Sale Price - Nominal					
Strata Title, apartments	rate/sqm	$11,000			
Sale Price	1 BED	$715,000	38	$27,170,000	
Sale Price	2 BED	$990,000	70	$69,300,000	
Sale Price	3 BED	$1,375,000	16	$22,000,000	
			Subtotal	$118,470,000	
	Total Revenue*			$118,470,000	

Stamp Duty Total				($4,838,849)
GST				**($10,770,000)**

Profit

Total Revenue		Total Precinct Cost		
$118,470,000	minus	($77,140,194)	=	$41,329,806

Total Precinct Yield (refer to exclusions below)* **$41,329,806**

ADDITIONAL EXPENDITURE				Nominal Allowances	
Finance Costs	*See Progressive Bank Balance below*			($15,105,813)	
Contingency/Escalation				($3,495,914)	
Marketing & Selling Costs			3%	($3,554,100)	
Legal Costs/Strata Fees				($100,000)	
Sect 94 Contributions - approx $6385/unit				($791,740)	
Sect 96 amendments				excluded	
Land + Environ Court				excluded	
GST Reconciliation				($3,850,156)	
			Total	**($26,897,724)**	
Credit Interest	*See Progressive Bank Balance below*			$2,467,020	
			GROSS PROFIT	**$16,899,102**	14.26%
			Profit per Unit	$136,283	

				Balance from Previous Year		
($

Precinct E

The Site

Precinct Site Area (approx)			8670	sqm
				LEP Site Value
Land Cost				($8,400,000)
GST on land				**$763,636**
Stamp Duty				($647,454)
Land Tax			($140,892)	($845,352)

LEP Control		FSR 1.8 : 1	15606	sqm
No. of Dwellings	168			

Dwelling Mix example*			sqm	sqm
	60	1 BED	65	3900
	86	2 BED	90	7740
	22	3 BED	125	2750
Lobby + internal public circulation			1170	1170
			Total	15560
Balconies	84		20	1680

Balconies are provided

Balconies are not included in GFA

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Check Totals
Residential Development Subsidy for Tunnel Extension	**($29,400,000)**										($29,400,000)
GST	**$2,672,727**										**$2,672,727**

Construction - Nominal Allowances*

Dwelling type	Amount	sqm	rate/sqm										
1 BED	60	65	($2,000)	($7,800,000)				($2,600,000)	($5,200,000)				($7,800,000) OK
2 BED	86	90	($2,000)	($15,480,000)				($5,160,000)	($10,320,000)				($15,480,000) OK
3 BED	22	125	($2,000)	($5,500,000)				($1,833,333)	($3,666,667)				($5,500,000) OK
Balconies	84	20	($800)	($1,344,000)				($448,000)	($896,000)				($1,344,000) OK
Lobby + circul.		1170	($2,000)	($2,340,900)				($780,300)	($1,560,600)				($2,340,900) OK
Carpark	231	8078	($900)	($7,270,200)				($7,270,200)					($7,270,200) OK
			Total	($39,735,100)	25%			**($18,091,833)**	**($21,643,267)**				**($39,735,100)**
GST				**$3,612,282**				**$1,644,712**	**$1,967,570**				$3,612,282

The construction cost will vary considerably depending on the type of builder &

	YEAR 1			YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	
Site Works - Nominal Allowances*											
Demolition				($150,000)	($50,000)						($200,000)
Excavation/Earthworks (includ. compaction)				($562,500)	($187,500)						($750,000)
Stormwater Detention				($562,500)	($187,500)						($750,000)
Civil/Hydraulic Engineering Works (Road & Drainage)				($562,500)	($187,500)						($750,000)
Electrical (Power & Telephone)				($375,000)	($375,000)						($750,000)
Surveying & Linen Plan		($100,000)									($100,000)
Construction Survey				($50,000)	($50,000)						($100,000)
External Works and Landscaping				($400,000)	($200,000)	($200,000)					($800,000)
Total											($4,200,000)
GST	**$0**	**$9,091**	**$0**	**$242,045**	**$112,500**	**$18,182**	**$0**	**$0**	**$0**	**$0**	$381,818

Total Construction + Site Works + Tunnel		**($73,335,105)**
Equilibria Concept Fee - Upfront	$50.00 / m2 of Land	($476,850)
Equilibria Development Fee - On Gazettal	$5,000.00 / Dwelling	($924,000)
Consultant Fees - Nominal	say 7.5%	($6,050,146)
Project Management Fees - Nominal	say 1.5%	($1,210,029)
Authority Fees & Charges - Approximate		
Overall Budget	say 1.25%	($1,008,358)
Total		($9,669,383)
GST		**$879,035**
Total Construction + Professional & Authority Fees		**($83,004,483)** 52%

Equilibria Concept Fee - Upfront	($476,850)											
Equilibria Development Fee - On Gazettal		($924,000)										
Consultant Fees - Nominal	($1,210,029)			($1,815,044)	($1,210,029)	($1,210,029)	($605,015)				($6,050,146)	OK
Project Management Fees - Nominal	($151,254)			($151,254)	($151,254)	($151,254)	($151,254)	($151,254)	($151,254)	($151,254)	($1,210,029)	
Authority Fees & Charges - Approximate												
Overall Budget				($252,089)	($252,089)	($504,179)					($1,008,358)	OK
Total	($1,838,133)	($924,000)	$0	($2,218,387)	($1,613,372)	($1,865,462)	($756,268)	($151,254)	($151,254)	($151,254)	($9,669,383)	
GST	**$167,103**	**$84,000**	**$0**	**$201,672**	**$146,670**	**$169,587**	**$68,752**	**$13,750**	**$13,750**	**$13,750**	$879,035	

Total Precinct Cost including Land **($93,897,289)**

Sale Price - Nominal

Strata Title, apartments	rate/sqm	$11,000												
Sale Price	1 BED	$715,000	60	$42,900,000			1 BED	($27,721)	60	54	$38,610,000	4	$2,860,000	2
Sale Price	2 BED	$990,000	86	$85,140,000			2 BED	($40,096)	86	75	$74,250,000	7	$6,930,000	3
Sale Price	3 BED	$1,375,000	22	$30,250,000			3 BED	($61,171)	22	16	$22,000,000	5	$6,875,000	1
			Subtotal	$158,290,000							$134,860,000		$16,665,000	

Strata Title, apartments						Stamp Duty/Apart.	No. of Aparts.	SOLD		SOLD		SOLD		
Sale Price														
Sale Price														
Sale Price														

$1,430,000	0	$0	60	$42,900,000	OK									
$2,970,000	1	$990,000	86	$85,140,000	OK									
$1,375,000	0	$0	22	$30,250,000	OK									
$5,775,000		$990,000		$158,290,000										

Total Revenue* **$158,290,000**

Stamp Duty Total	($6,457,271)					Stamp Duty	($1,496,932)		($110,884)		($55,442)		$0	
							($3,007,197)		($280,672)		($120,288)		($40,096)	
							($978,736)		($305,855)		($61,171)		$0	
GST	**($14,390,000)**						($12,260,000)		($1,515,000)		($525,000)		($90,000)	$14,390,000

Profit

Total Revenue		Total Precinct Cost		
$158,290,000	minus	($92,897,289)	=	$65,392,711

Total Precinct Yield (refer to exclusions below)* **$65,392,711**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027		
ADDITIONAL EXPENDITURE											Nominal Allowances	
Finance Costs	*See Progressive Bank Balance below*										($21,090,704)	
Contingency/Escalation				($622,534)	($830,045)	($1,660,090)	($1,037,556)				($4,150,224)	OK
Marketing & Selling Costs				($356,153)	($474,870)	($1,068,456)	($949,740)	($712,305)	($712,305)	($474,870)	($4,748,700)	OK
Legal Costs/Strata Fees				($80,000)		($20,000)					($100,000)	OK
Sect 94 Contributions - approx $6385/unit				($1,072,680)							($1,072,680)	OK
Sect 96 amendments											excluded	
Land + Environ Court											excluded	
GST Reconciliation											($6,080,502)	
	$3,603,467	**$93,091**	**$0**	**$443,717**	**$1,903,882**	**$2,155,339**	**($12,191,248)**	**($1,501,250)**	**($511,250)**	**($76,250)**	($6,080,502)	
											Total	**($37,242,810)**
Credit Interest	*See Progressive Bank Balance below*										$5,697,472	
											GROSS PROFIT	**$33,847,374** 21.38%
											Profit per Unit	$201,472

											Balance from Previous Year		
											Income	CR	
											GST Annual Reconciliation		
											Expenses		
											NET		
Finance Cost (Interest)											Interest - Debit		6.0%
											Interest - Credit		6.0%
											BALANCE		

	($39,032,393)	($42,510,446)	($45,210,418)	($55,035,037)	($80,050,847)	($110,763,296)	$9,711,605	$25,452,505	$31,643,858				
$0	$0	$0	$0	$0	$0	$134,860,000	$16,665,000	$5,775,000	$990,000	$158,290,000	CR Income	OK	
$3,603,467	$93,091	$0	$443,717	$1,903,882	$2,155,339	($12,191,248)	($1,501,250)	($511,250)	($76,250)	($6,080,502)			
($40,426,479)	($1,164,892)	($140,892)	($7,153,145)	($22,388,512)	($26,598,167)	($2,743,564)	($863,559)	($863,559)	($626,124)	($102,968,893)	TOTAL Expenses	OK	
($36,823,012)	($40,104,194)	($42,651,338)	($51,919,846)	($75,519,667)	($104,493,675)	$9,161,892	$24,011,797	$29,852,697	$31,931,485	$49,240,606	CR Sub Balance	OK	
($2,209,381)	($2,406,252)	($2,559,080)	($3,115,191)	($4,531,180)	($6,269,621)					($21,090,704)	DR Interest	OK	**Finance Cost (Interest)**
						$549,714	$1,440,708	$1,791,162	$1,915,889	$5,697,472	CR Interest		
($39,032,393)	($42,510,446)	($45,210,418)	($55,035,037)	($80,050,847)	($110,763,296)	$9,711,605	$25,452,505	$31,643,858	$33,847,374	**$33,847,374**	**GROSS PROFIT**	OK	**Highest Exposure**

Maximum Exposure ($110,763,296) 21.38%

IRR Calculation

Income	$0	$0	$0	$0	$0	$0	$134,860,000	$16,665,000	$5,775,000	$990,000		
GST Reconciliation	$3,603,467	$93,091	$0	$443,717	$1,903,882	$2,155,339	($12,191,248)	($1,501,250)	($511,250)	($76,250)		
Expenses	($40,426,479)	($1,164,892)	($140,892)	($7,153,145)	($22,388,512)	($26,598,167)	($2,743,564)	($863,559)	($863,559)	($626,124)	($102,968,893)	
Sub-Total	($36,823,012)	($1,071,801)	($140,892)	($6,709,428)	($20,484,630)	($24,442,828)	$119,925,187	$14,300,192	$4,400,192	$287,627		
Balance	($36,823,012)	($1,071,801)	($140,892)	($6,709,428)	($20,484,630)	($24,442,828)	$119,925,187	$14,300,192	$4,400,192	$287,627		

IRR **11.83%**

Professional Fees - Nominal

Overall Budget

Authority Fees & Charges - Approximate

Overall Budget

Sale Price - Nominal

Strata Title, apartments

Sale Price

Sale Price

Sale Price

Profit

Total Revenue

$0

EXPENDITURE

Finance Costs

Contingency/Escalation

Marketing & Selling Costs

Legal Costs/Strata Fees *Registration of Strata Plans*

Sect 94 Contributions - approx $6385/unit

Sect 96 amendments

Land + Environ Court

GST Reconciliation

Construction - Nominal Allowances*

Dwelling type

1 BED

2 BED

3 BED

Balconies

Lobby + circul.

Carpark

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*

Demolition

Excavation/Earthworks (includ. compaction)

Stormwater Detention

Civil/Hydraulic Engineering Works (Road & Drainage)

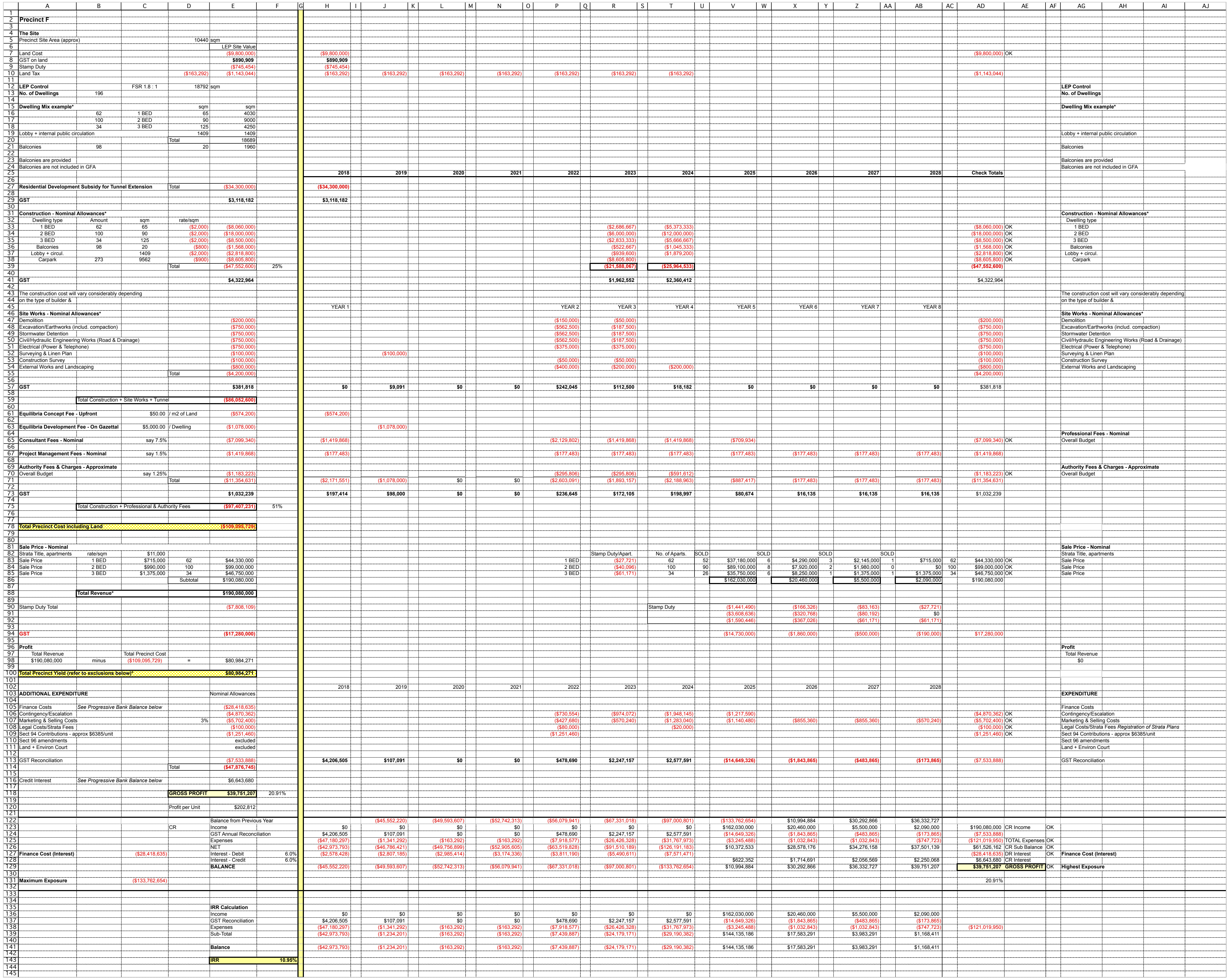
Electrical (Power & Telephone)

Surveying & Linen Plan

Construction Survey

External Works and Landscaping

Highest Exposure



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1																																				
2	**Precinct F**																																			
3																																				
4	**The Site**																																			
5	Precinct Site Area (approx)			10440	sqm																															
6					LEP Site Value																															
7	Land Cost				($9,800,000)			($9,800,000)																						($9,800,000)	OK					
8	GST on land				**$890,909**			**$890,909**																												
9	Stamp Duty				($745,454)			($745,454)																												
10	Land Tax			($163,292)	($1,143,044)			($163,292)		($163,292)		($163,292)		($163,292)		($163,292)		($163,292)		($163,292)										($1,143,044)						
11																																				
12	**LEP Control**		FSR 1.8 : 1	18792	sqm																												**LEP Control**			
13	**No. of Dwellings**	196																															**No. of Dwellings**			
14																																				
15	**Dwelling Mix example***			sqm	sqm																												**Dwelling Mix example***			
16		62	1 BED	65	4030																															
17		100	2 BED	90	9000																															
18		34	3 BED	125	4250																															
19	Lobby + internal public circulation			1409	1409																												Lobby + internal public circulation			
20				Total	18689																															
21	Balconies	98		20	1960																												Balconies			
22																																				
23	Balconies are provided																																Balconies are provided			
24	Balconies are not included in GFA																																Balconies are not included in GFA			
25								**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**2026**		**2027**		**2028**		**Check Totals**						
26																																				
27	**Residential Development Subsidy for Tunnel Extension**			Total	**($34,300,000)**			**($34,300,000)**																												
28																																				
29	**GST**				**$3,118,182**			**$3,118,182**																												
30																																				
31	**Construction - Nominal Allowances***																																**Construction - Nominal Allowances***			
32	Dwelling type	Amount	sqm	rate/sqm																													Dwelling type			
33	1 BED	62	65	($2,000)	($8,060,000)													($2,686,667)		($5,373,333)										($8,060,000)	OK		1 BED			
34	2 BED	100	90	($2,000)	($18,000,000)													($6,000,000)		($12,000,000)										($18,000,000)	OK		2 BED			
35	3 BED	34	125	($2,000)	($8,500,000)													($2,833,333)		($5,666,667)										($8,500,000)	OK		3 BED			
36	Balconies	98	20	($800)	($1,568,000)													($522,667)		($1,045,333)										($1,568,000)	OK		Balconies			
37	Lobby + circul.		1409	($2,000)	($2,818,800)													($939,600)		($1,879,200)										($2,818,800)	OK		Lobby + circul.			
38	Carpark	273	9562	($900)	($8,605,800)													($8,605,800)												($8,605,800)	OK		Carpark			
39				Total	($47,552,600)	25%												**($21,588,067)**		**($25,964,533)**										**($47,552,600)**						
40																																				
41	**GST**				**$4,322,964**													**$1,962,552**		**$2,360,412**										$4,322,964						
42																																				
43	The construction cost will vary considerably depending																																The construction cost will vary considerably depending			
44	on the type of builder &																																on the type of builder &			
45								YEAR 1								YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8								
46	**Site Works - Nominal Allowances***																																**Site Works - Nominal Allowances***			
47	Demolition				($200,000)											($150,000)		($50,000)												($200,000)			Demolition			
48	Excavation/Earthworks (includ. compaction)				($750,000)											($562,500)		($187,500)												($750,000)			Excavation/Earthworks (includ. compaction)			
49	Stormwater Detention				($750,000)											($562,500)		($187,500)												($750,000)			Stormwater Detention			
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($750,000)											($562,500)		($187,500)												($750,000)			Civil/Hydraulic Engineering Works (Road & Drainage)			
51	Electrical (Power & Telephone)				($750,000)											($375,000)		($375,000)												($750,000)			Electrical (Power & Telephone)			
52	Surveying & Linen Plan				($100,000)					($100,000)																				($100,000)			Surveying & Linen Plan			
53	Construction Survey				($100,000)											($50,000)		($50,000)												($100,000)			Construction Survey			
54	External Works and Landscaping				($800,000)											($400,000)		($200,000)		($200,000)										($800,000)			External Works and Landscaping			
55				Total	($4,200,000)																									($4,200,000)						
56																																				
57	**GST**				**$381,818**			**$0**		**$9,091**		**$0**		**$0**		**$242,045**		**$112,500**		**$18,182**		**$0**		**$0**		**$0**		**$0**		$381,818						
58																																				
59		Total Construction + Site Works + Tunnel			**($86,052,600)**																															
60																																				
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($574,200)			($574,200)																												
62																																				
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($1,078,000)					($1,078,000)																										
64																																	**Professional Fees - Nominal**			
65	**Consultant Fees - Nominal**		say 7.5%		($7,099,340)			($1,419,868)								($2,129,802)		($1,419,868)		($1,419,868)		($709,934)								($7,099,340)	OK		Overall Budget			
66																																				
67	**Project Management Fees - Nominal**		say 1.5%		($1,419,868)			($177,483)								($177,483)		($177,483)		($177,483)		($177,483)		($177,483)		($177,483)		($177,483)		($1,419,868)						
68																																				
69	**Authority Fees & Charges - Approximate**																																**Authority Fees & Charges - Approximate**			
70	Overall Budget		say 1.25%		($1,183,223)											($295,806)		($295,806)		($591,612)										($1,183,223)	OK		Overall Budget			
71				Total	($11,354,631)			($2,171,551)		($1,078,000)		$0		$0		($2,603,091)		($1,893,157)		($2,188,963)		($887,417)		($177,483)		($177,483)		($177,483)		($11,354,631)						
72																																				
73	**GST**				**$1,032,239**			**$197,414**		**$98,000**		**$0**		**$0**		**$236,645**		**$172,105**		**$198,997**		**$80,674**		**$16,135**		**$16,135**		**$16,135**		$1,032,239						
74																																				
75		Total Construction + Professional & Authority Fees			**($97,407,231)**	51%																														
76																																				
77																																				
78	**Total Precinct Cost including Land**				**($109,095,729)**																															
79																																				
80																																				
81	**Sale Price - Nominal**																																**Sale Price - Nominal**			
82	Strata Title, apartments	rate/sqm	$11,000															Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD						Strata Title, apartments			
83	Sale Price	1 BED	$715,000	62	$44,330,000											1 BED		($27,721)		62	52	$37,180,000	6	$4,290,000	3	$2,145,000	1	$715,000	62	$44,330,000	OK		Sale Price			
84	Sale Price	2 BED	$990,000	100	$99,000,000											2 BED		($40,096)		100	90	$89,100,000	8	$7,920,000	2	$1,980,000	0	$0	100	$99,000,000	OK		Sale Price			
85	Sale Price	3 BED	$1,375,000	34	$46,750,000											3 BED		($61,171)		34	26	$35,750,000	6	$8,250,000	1	$1,375,000	1	$1,375,000	34	$46,750,000	OK		Sale Price			
86				Subtotal	$190,080,000																	$162,030,000		$20,460,000		$5,500,000		$2,090,000		$190,080,000						
87																																				
88		**Total Revenue***			**$190,080,000**																															
89																																				
90	Stamp Duty Total				($7,808,109)															Stamp Duty		($1,441,490)		($166,326)		($83,163)		($27,721)								
91																						($3,608,636)		($320,768)		($80,192)		$0								
92																						($1,590,446)		($367,026)		($61,171)		($61,171)								
93																																				
94	**GST**				**($17,280,000)**																	($14,730,000)		($1,860,000)		($500,000)		($190,000)		$17,280,000						
95																																				
96	**Profit**																																**Profit**			
97	Total Revenue		Total Precinct Cost																														Total Revenue			
98	$190,080,000	minus	($109,095,729)	=	$80,984,271																												$0			
99																																				
100	**Total Precinct Yield (refer to exclusions below)***				**$80,984,271**																															
101																																				
102								2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028								
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances																												**EXPENDITURE**			
104																																				
105	Finance Costs	*See Progressive Bank Balance below*			($28,418,635)																												Finance Costs			
106	Contingency/Escalation				($4,870,362)											($730,554)		($974,072)		($1,948,145)		($1,217,590)								($4,870,362)	OK		Contingency/Escalation			
107	Marketing & Selling Costs			3%	($5,702,400)											($427,680)		($570,240)		($1,283,040)		($1,140,480)		($855,360)		($855,360)		($570,240)		($5,702,400)	OK		Marketing & Selling Costs			
108	Legal Costs/Strata Fees				($100,000)											($80,000)				($20,000)										($100,000)	OK		Legal Costs/Strata Fees *Registration of Strata Plans*			
109	Sect 94 Contributions - approx $6385/unit				($1,251,460)											($1,251,460)														($1,251,460)	OK		Sect 94 Contributions - approx $6385/unit			
110	Sect 96 amendments				excluded																												Sect 96 amendments			
111	Land + Environ Court				excluded																												Land + Environ Court			
112																																				
113	GST Reconciliation				($7,533,888)			**$4,206,505**		**$107,091**		**$0**		**$0**		**$478,690**		**$2,247,157**		**$2,577,591**		**($14,649,326)**		**($1,843,865)**		**($483,865)**		**($173,865)**		($7,533,888)			GST Reconciliation			
114				Total	**($47,876,745)**																															
115																																				
116	Credit Interest	*See Progressive Bank Balance below*			$6,643,680																															
117																																				
118				**GROSS PROFIT**	**$39,751,207**	20.91%																														
119																																				
120				Profit per Unit	$202,812																															
121																																				
122					Balance from Previous Year					($45,552,220)		($49,593,607)		($52,742,313)		($56,079,941)		($67,331,018)		($97,000,801)		($133,762,654)		$10,994,884		$30,292,866		$36,332,727								
123				CR	Income			$0		$0		$0		$0		$0		$0		$0		$162,030,000		$20,460,000		$5,500,000		$2,090,000		$190,080,000	CR Income	OK				
124					GST Annual Reconciliation			$4,206,505		$107,091		$0		$0		$478,690		$2,247,157		$2,577,591		($14,649,326)		($1,843,865)		($483,865)		($173,865)		($7,533,888)						
125					Expenses			($47,180,297)		($1,341,292)		($163,292)		($163,292)		($7,918,577)		($26,426,328)		($31,767,973)		($3,245,488)		($1,032,843)		($1,032,843)		($747,723)		($121,019,950)	TOTAL Expenses	OK				
126					NET			($42,973,793)		($46,786,421)		($49,756,899)		($52,905,605)		($63,519,828)		($91,510,189)		($126,191,183)		$10,372,533		$28,578,176		$34,276,158		$37,501,139		$61,526,162	CR Sub Balance	OK				
127	**Finance Cost (Interest)**		($28,418,635)		Interest - Debit	6.0%		($2,578,428)		($2,807,185)		($2,985,414)		($3,174,336)		($3,811,190)		($5,490,611)		($7,571,471)										($28,418,635)	DR Interest	OK	**Finance Cost (Interest)**			
128					Interest - Credit	6.0%																$622,352		$1,714,691		$2,056,569		$2,250,068		$6,643,680	CR Interest					
129					**BALANCE**			($45,552,220)		($49,593,607)		($52,742,313)		($56,079,941)		($67,331,018)		($97,000,801)		($133,762,654)		$10,994,884		$30,292,866		$36,332,727		$39,751,207		**$39,751,207**	**GROSS PROFIT**	OK	**Highest Exposure**			
130																																				
131	**Maximum Exposure**		($133,762,654)																											20.91%						
132																																				
133																																				
134																																				
135					**IRR Calculation**																															
136					Income			$0		$0		$0		$0		$0		$0		$0		$162,030,000		$20,460,000		$5,500,000		$2,090,000								
137					GST Reconciliation			$4,206,505		$107,091		$0		$0		$478,690		$2,247,157		$2,577,591		($14,649,326)		($1,843,865)		($483,865)		($173,865)								
138					Expenses			($47,180,297)		($1,341,292)		($163,292)		($163,292)		($7,918,577)		($26,426,328)		($31,767,973)		($3,245,488)		($1,032,843)		($1,032,843)		($747,723)		($121,019,950)						
139					Sub-Total			($42,973,793)		($1,234,201)		($163,292)		($163,292)		($7,439,887)		($24,179,171)		($29,190,382)		$144,135,186		$17,583,291		$3,983,291		$1,168,411								
140																																				
141					**Balance**			($42,973,793)		($1,234,201)		($163,292)		($163,292)		($7,439,887)		($24,179,171)		($29,190,382)		$144,135,186		$17,583,291		$3,983,291		$1,168,411								
142																																				
143					**IRR**	**10.95%**																														
144																																				
145																																				

Precinct G

The Site

Precinct Site Area (approx)			10950	sqm
				LEP Site Value
Land Cost				($10,400,000)
GST on land				**$945,455**
Stamp Duty				($787,454)
Land Tax			($172,892)	($1,383,136)

LEP Control		FSR 1.8 : 1	19710	sqm
No. of Dwellings	208			

Dwelling Mix example*				
			sqm	sqm
	72	1 BED	65	4680
	100	2 BED	90	9000
	36	3 BED	125	4500
Lobby + internal public circulation			1478	1478
			Total	19658
Balconies	104		20	2080
Balconies are provided				
Balconies are not included in GFA				

Residential Development Subsidy for Tunnel Extension			Total	($36,400,000)	
GST				**$3,309,091**	

Construction - Nominal Allowances*					
Dwelling type	Amount	sqm	rate/sqm		
1 BED	72	65	($2,000)	($9,360,000)	
2 BED	100	90	($2,000)	($18,000,000)	
3 BED	36	125	($2,000)	($9,000,000)	
Balconies	104	20	($800)	($1,664,000)	
Lobby + circul.		1478	($2,000)	($2,956,500)	
Carpark	289	10101	($900)	($9,090,900)	
			Total	($50,071,400)	25%
GST				**$4,551,945**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*				
Demolition				($200,000)
Excavation/Earthworks (includ. compaction)				($750,000)
Stormwater Detention				($750,000)
Civil/Hydraulic Engineering Works (Road & Drainage)				($750,000)
Electrical (Power & Telephone)				($750,000)
Surveying & Linen Plan				($100,000)
Construction Survey				($100,000)
External Works and Landscaping				($800,000)
			Total	($4,200,000)
GST				**$381,818**
	Total Construction + Site Works + Tunnel			**($90,671,400)**

Equilibria Concept Fee - Upfront		$50.00	/ m2 of Land	($602,250)
Equilibria Development Fee - On Gazettal		$5,000.00	/ Dwelling	($1,144,000)
Consultant Fees - Nominal		say 7.5%		($7,480,391)
Project Management Fees - Nominal		say 1.5%		($1,496,078)
Authority Fees & Charges - Approximate				
Overall Budget		say 1.25%		($1,246,732)
			Total	($11,969,450)
GST				**$1,088,132**
	Total Construction + Professional & Authority Fees			**($102,640,850)** 51%

Total Precinct Cost including Land **($115,211,440)**

Sale Price - Nominal

Strata Title, apartments	rate/sqm	$11,000								
Sale Price	1 BED	$715,000	72	$51,480,000						
Sale Price	2 BED	$990,000	100	$99,000,000						
Sale Price	3 BED	$1,375,000	36	$49,500,000						
			Subtotal	$199,980,000						
	Total Revenue*			**$199,980,000**						
Stamp Duty Total				($8,207,660)						
GST				**($18,180,000)**						

Profit

Total Revenue		Total Precinct Cost		
$199,980,000	minus	($115,211,440)	=	$84,768,560
Total Precinct Yield (refer to exclusions below)*				**$84,768,560**

ADDITIONAL EXPENDITURE			Nominal Allowances
Finance Costs	*See Progressive Bank Balance below*		($34,381,418)
Contingency/Escalation			($5,132,043)
Marketing & Selling Costs		3%	($5,999,400)
Legal Costs/Strata Fees			($100,000)
Sect 94 Contributions - approx $6385/unit			($1,328,080)
Sect 96 amendments			excluded
Land + Environ Court			excluded
GST Reconciliation			($7,903,559)
		Total	**($54,844,499)**
Credit Interest	*See Progressive Bank Balance below*		$5,212,912
		GROSS PROFIT	**$35,136,972** 17.57%
		Profit per Unit	$168,928

			Balance from Previous Year		
		CR	Income		
			GST Annual Reconciliation		
			Expenses		
			NET		
Finance Cost (Interest)	($34,381,418)		Interest - Debit	6.0%	
			Interest - Credit	6.0%	
			BALANCE		
Maximum Exposure	($145,612,492)				

			IRR Calculation	
			Income	
			GST Reconciliation	
			Expenses	
			Sub-Total	
			Balance	
			IRR	**9.57%**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	**Check Totals**
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Check Totals**
Residential Development Subsidy for Tunnel Extension	**($36,400,000)**												
GST	**$3,309,091**												
Construction - Nominal Allowances*													
1 BED							($3,120,000)	($6,240,000)					($9,360,000) OK
2 BED							($6,000,000)	($12,000,000)					($18,000,000) OK
3 BED							($3,000,000)	($6,000,000)					($9,000,000) OK
Balconies							($554,667)	($1,109,333)					($1,664,000) OK
Lobby + circul.							($985,500)	($1,971,000)					($2,956,500) OK
Carpark							($9,090,900)						($9,090,900) OK
							($22,751,067)	**($27,320,333)**					**($50,071,400)**
GST							**$2,068,279**	**$2,483,667**					$4,551,945
	YEAR 1					YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	
Site Works - Nominal Allowances*													
Demolition						($150,000)	($50,000)						($200,000)
Excavation/Earthworks (includ. compaction)						($562,500)	($187,500)						($750,000)
Stormwater Detention						($562,500)	($187,500)						($750,000)
Civil/Hydraulic Engineering Works (Road & Drainage)						($562,500)	($187,500)						($750,000)
Electrical (Power & Telephone)						($375,000)	($375,000)						($750,000)
Surveying & Linen Plan		($100,000)											($100,000)
Construction Survey						($50,000)	($50,000)						($100,000)
External Works and Landscaping						($400,000)	($200,000)	($200,000)					($800,000)
													($4,200,000)
GST	**$0**	**$9,091**	**$0**	**$0**	**$0**	**$242,045**	**$112,500**	**$18,182**	**$0**	**$0**	**$0**	**$0**	$381,818
Equilibria Concept Fee - Upfront	($602,250)												
Equilibria Development Fee - On Gazettal		($1,144,000)											
Consultant Fees - Nominal	($1,496,078)					($2,244,117)	($1,496,078)	($1,496,078)	($748,039)				($7,480,391) OK
Project Management Fees - Nominal	($187,010)					($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($1,496,078)
Authority Fees & Charges - Approximate													
Overall Budget						($311,683)	($311,683)	($623,366)					($1,246,732) OK
	($2,285,338)	($1,144,000)	$0	$0	$0	($2,742,810)	($1,994,771)	($2,306,454)	($935,049)	($187,010)	($187,010)	($187,010)	($11,969,450)
GST	**$207,758**	**$104,000**	**$0**	**$0**	**$0**	**$249,346**	**$181,343**	**$209,678**	**$85,004**	**$17,001**	**$17,001**	**$17,001**	$1,088,132
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
Sale Price - Nominal							Stamp Duty/Apart.	No. of Aparts.	SOLD		SOLD		SOLD
Sale Price						1 BED	($27,721)	72	64	$45,760,000	7	$5,005,000	1
Sale Price						2 BED	($40,096)	100	80	$79,200,000	16	$15,840,000	3
Sale Price						3 BED	($61,171)	36	28	$38,500,000	5	$6,875,000	2
										$163,460,000		$27,720,000	
Stamp Duty								Stamp Duty		($1,774,141)		($194,047)	
										($3,207,676)		($641,535)	
										($1,712,788)		($305,855)	
GST										($14,860,000)		($2,520,000)	
	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	**($14,774,996)**	**($2,502,999)**	**($567,999)**	**($197,999)**	($7,903,559)
Finance Costs													
Contingency/Escalation						($769,806)	($1,026,409)	($2,052,817)	($1,283,011)				($5,132,043) OK
Marketing & Selling Costs						($449,955)	($599,940)	($1,349,865)	($1,199,880)	($899,910)	($899,910)	($599,940)	($5,999,400) OK
Legal Costs/Strata Fees						($80,000)		($20,000)					($100,000) OK
Sect 94 Contributions - approx $6385/unit						($1,328,080)							($1,328,080) OK
Sect 96 amendments													
Land + Environ Court													
GST Reconciliation													
	$199,980,000	CR Income	OK										
	$0	$0	$0	$0	$0	$0	$0	$0	$163,460,000	$27,720,000	$6,435,000	$2,365,000	
	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	($14,774,996)	($2,502,999)	($567,999)	($197,999)	
	($50,045,684)	($1,416,892)	($172,892)	($172,892)	($172,892)	($8,206,043)	($27,782,578)	($33,422,361)	($3,417,939)	($1,086,920)	($1,086,920)	($786,950)	($127,770,963) TOTAL Expenses OK
	($45,583,380)	($49,622,184)	($52,772,407)	($56,111,644)	($59,651,234)	($70,944,960)	($100,622,114)	($137,370,276)	($345,427)	$23,763,928	$29,969,845	$33,148,087	$64,305,478 CR Sub Balance OK
	($2,735,003)	($2,977,331)	($3,166,344)	($3,366,699)	($3,579,074)	($4,256,098)	($6,037,327)	($8,242,217)	($20,726)				($34,381,418) DR Interest OK
										$1,425,836	$1,798,191	$1,988,885	$5,212,912 CR Interest
	($48,318,383)	($52,599,515)	($55,938,752)	($59,478,342)	($63,230,309)	($75,201,658)	($106,659,441)	($145,612,492)	($366,153)	$25,189,764	$31,768,036	$35,136,972	**$35,136,972 GROSS PROFIT** OK
													17.57%
IRR Calculation													
Income	$0	$0	$0	$0	$0	$0	$0	$0	$163,460,000	$27,720,000	$6,435,000	$2,365,000	
GST Reconciliation	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	($14,774,996)	($2,502,999)	($567,999)	($197,999)	
Expenses	($50,045,684)	($1,416,892)	($172,892)	($172,892)	($172,892)	($8,206,043)	($27,782,578)	($33,422,361)	($3,417,939)	($1,086,920)	($1,086,920)	($786,950)	($127,770,963)
Sub-Total	($45,583,380)	($1,303,801)	($172,892)	($172,892)	($172,892)	($7,714,651)	($25,420,456)	($30,710,835)	$145,267,065	$24,130,081	$4,780,081	$1,380,051	
Balance	($45,583,380)	($1,303,801)	($172,892)	($172,892)	($172,892)	($7,714,651)	($25,420,456)	($30,710,835)	$145,267,065	$24,130,081	$4,780,081	$1,380,051	

Precinct G

The Site

Precinct Site Area (approx) 10950 sqm

Land Cost ($10,400,000) ($10,400,000) OK

GST on land **$945,455**

Stamp Duty ($787,454)

Land Tax ($172,892) ($1,383,136) ($172,892) ($172,892) ($172,892) ($172,892) ($172,892) ($172,892) ($172,892) ($172,892) ($1,383,136)

LEP Control FSR 1.8 : 1 19710 sqm

No. of Dwellings 208

Dwelling Mix example*

			sqm	sqm
	72	1 BED	65	4680
	100	2 BED	90	9000
	36	3 BED	125	4500
Lobby + internal public circulation			1478	1478
			Total	19658
Balconies	104		20	2080

Balconies are provided

Balconies are not included in GFA

Residential Development Subsidy for Tunnel Extension			Total	($36,400,000)	
GST				**$3,309,091**	

Construction - Nominal Allowances*

Dwelling type	Amount	sqm	rate/sqm		
1 BED	72	65	($2,000)	($9,360,000)	
2 BED	100	90	($2,000)	($18,000,000)	
3 BED	36	125	($2,000)	($9,000,000)	
Balconies	104	20	($800)	($1,664,000)	
Lobby + circul.		1478	($2,000)	($2,956,500)	
Carpark	289	10101	($900)	($9,090,900)	
			Total	($50,071,400)	25%
GST				**$4,551,945**	

The construction cost will vary considerably depending on the type of builder &

Site Works - Nominal Allowances*				
Demolition				($200,000)
Excavation/Earthworks (includ. compaction)				($750,000)
Stormwater Detention				($750,000)
Civil/Hydraulic Engineering Works (Road & Drainage)				($750,000)
Electrical (Power & Telephone)				($750,000)
Surveying & Linen Plan				($100,000)
Construction Survey				($100,000)
External Works and Landscaping				($800,000)
			Total	($4,200,000)
GST				**$381,818**
	Total Construction + Site Works + Tunnel			**($90,671,400)**

Equilibria Concept Fee - Upfront		$50.00	/ m2 of Land	($602,250)
Equilibria Development Fee - On Gazettal		$5,000.00	/ Dwelling	($1,144,000)
Consultant Fees - Nominal		say 7.5%		($7,480,391)
Project Management Fees - Nominal		say 1.5%		($1,496,078)
Authority Fees & Charges - Approximate				
Overall Budget		say 1.25%		($1,246,732)
			Total	($11,969,450)
GST				**$1,088,132**
	Total Construction + Professional & Authority Fees			**($102,640,850)** 51%

Total Precinct Cost including Land **($115,211,440)**

Sale Price - Nominal

Strata Title, apartments	rate/sqm	$11,000		
Sale Price	1 BED	$715,000	72	$51,480,000
Sale Price	2 BED	$990,000	100	$99,000,000
Sale Price	3 BED	$1,375,000	36	$49,500,000
			Subtotal	$199,980,000
	Total Revenue*			**$199,980,000**
Stamp Duty Total				($8,207,660)
GST				**($18,180,000)**

Profit

Total Revenue		Total Precinct Cost		
$199,980,000	minus	($115,211,440)	=	$84,768,560
Total Precinct Yield (refer to exclusions below)*				**$84,768,560**

ADDITIONAL EXPENDITURE			Nominal Allowances
Finance Costs	*See Progressive Bank Balance below*		($34,381,418)
Contingency/Escalation			($5,132,043)
Marketing & Selling Costs		3%	($5,999,400)
Legal Costs/Strata Fees			($100,000)
Sect 94 Contributions - approx $6385/unit			($1,328,080)
Sect 96 amendments			excluded
Land + Environ Court			excluded
GST Reconciliation			($7,903,559)
		Total	**($54,844,499)**
Credit Interest	*See Progressive Bank Balance below*		$5,212,912
		GROSS PROFIT	**$35,136,972** 17.57%
		Profit per Unit	$168,928

			Balance from Previous Year		
		CR	Income		
			GST Annual Reconciliation		
			Expenses		
			NET		
Finance Cost (Interest)	($34,381,418)		Interest - Debit	6.0%	
			Interest - Credit	6.0%	
			BALANCE		
Maximum Exposure	($145,612,492)				

			IRR Calculation	
			Income	
			GST Reconciliation	
			Expenses	
			Sub-Total	
			Balance	
			IRR	**9.57%**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	**Check Totals**
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Check Totals**
Residential Development Subsidy for Tunnel Extension	**($36,400,000)**												
GST	**$3,309,091**												
Construction - Nominal Allowances*													
1 BED							($3,120,000)	($6,240,000)					($9,360,000) OK
2 BED							($6,000,000)	($12,000,000)					($18,000,000) OK
3 BED							($3,000,000)	($6,000,000)					($9,000,000) OK
Balconies							($554,667)	($1,109,333)					($1,664,000) OK
Lobby + circul.							($985,500)	($1,971,000)					($2,956,500) OK
Carpark							($9,090,900)						($9,090,900) OK
							($22,751,067)	**($27,320,333)**					**($50,071,400)**
GST							**$2,068,279**	**$2,483,667**					$4,551,945
	YEAR 1					YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	
Site Works - Nominal Allowances*													
Demolition						($150,000)	($50,000)						($200,000)
Excavation/Earthworks (includ. compaction)						($562,500)	($187,500)						($750,000)
Stormwater Detention						($562,500)	($187,500)						($750,000)
Civil/Hydraulic Engineering Works (Road & Drainage)						($562,500)	($187,500)						($750,000)
Electrical (Power & Telephone)						($375,000)	($375,000)						($750,000)
Surveying & Linen Plan		($100,000)											($100,000)
Construction Survey						($50,000)	($50,000)						($100,000)
External Works and Landscaping						($400,000)	($200,000)	($200,000)					($800,000)
													($4,200,000)
GST	**$0**	**$9,091**	**$0**	**$0**	**$0**	**$242,045**	**$112,500**	**$18,182**	**$0**	**$0**	**$0**	**$0**	$381,818
Equilibria Concept Fee - Upfront	($602,250)												
Equilibria Development Fee - On Gazettal		($1,144,000)											
Consultant Fees - Nominal	($1,496,078)					($2,244,117)	($1,496,078)	($1,496,078)	($748,039)				($7,480,391) OK
Project Management Fees - Nominal	($187,010)					($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($187,010)	($1,496,078)
Authority Fees & Charges - Approximate													
Overall Budget						($311,683)	($311,683)	($623,366)					($1,246,732) OK
	($2,285,338)	($1,144,000)	$0	$0	$0	($2,742,810)	($1,994,771)	($2,306,454)	($935,049)	($187,010)	($187,010)	($187,010)	($11,969,450)
GST	**$207,758**	**$104,000**	**$0**	**$0**	**$0**	**$249,346**	**$181,343**	**$209,678**	**$85,004**	**$17,001**	**$17,001**	**$17,001**	$1,088,132
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
Sale Price - Nominal							Stamp Duty/Apart.	No. of Aparts.	SOLD		SOLD		SOLD
Sale Price						1 BED	($27,721)	72	64	$45,760,000	7	$5,005,000	1
Sale Price						2 BED	($40,096)	100	80	$79,200,000	16	$15,840,000	3
Sale Price						3 BED	($61,171)	36	28	$38,500,000	5	$6,875,000	2
										$163,460,000		$27,720,000	
Stamp Duty								Stamp Duty		($1,774,141)		($194,047)	
										($3,207,676)		($641,535)	
										($1,712,788)		($305,855)	
GST										($14,860,000)		($2,520,000)	
	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	**($14,774,996)**	**($2,502,999)**	**($567,999)**	**($197,999)**	($7,903,559)
Finance Costs													
Contingency/Escalation						($769,806)	($1,026,409)	($2,052,817)	($1,283,011)				($5,132,043) OK
Marketing & Selling Costs						($449,955)	($599,940)	($1,349,865)	($1,199,880)	($899,910)	($899,910)	($599,940)	($5,999,400) OK
Legal Costs/Strata Fees						($80,000)		($20,000)					($100,000) OK
Sect 94 Contributions - approx $6385/unit						($1,328,080)							($1,328,080) OK
Sect 96 amendments													
Land + Environ Court													
GST Reconciliation													
	$199,980,000	CR Income	OK										
	$0	$0	$0	$0	$0	$0	$0	$0	$163,460,000	$27,720,000	$6,435,000	$2,365,000	
	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	($14,774,996)	($2,502,999)	($567,999)	($197,999)	
	($50,045,684)	($1,416,892)	($172,892)	($172,892)	($172,892)	($8,206,043)	($27,782,578)	($33,422,361)	($3,417,939)	($1,086,920)	($1,086,920)	($786,950)	($127,770,963) TOTAL Expenses OK
	($45,583,380)	($49,622,184)	($52,772,407)	($56,111,644)	($59,651,234)	($70,944,960)	($100,622,114)	($137,370,276)	($345,427)	$23,763,928	$29,969,845	$33,148,087	$64,305,478 CR Sub Balance OK
	($2,735,003)	($2,977,331)	($3,166,344)	($3,366,699)	($3,579,074)	($4,256,098)	($6,037,327)	($8,242,217)	($20,726)				($34,381,418) DR Interest OK
										$1,425,836	$1,798,191	$1,988,885	$5,212,912 CR Interest
	($48,318,383)	($52,599,515)	($55,938,752)	($59,478,342)	($63,230,309)	($75,201,658)	($106,659,441)	($145,612,492)	($366,153)	$25,189,764	$31,768,036	$35,136,972	**$35,136,972 GROSS PROFIT** OK
													17.57%
IRR Calculation													
Income	$0	$0	$0	$0	$0	$0	$0	$0	$163,460,000	$27,720,000	$6,435,000	$2,365,000	
GST Reconciliation	$4,462,303	$113,091	$0	$0	$0	$491,392	$2,362,122	$2,711,526	($14,774,996)	($2,502,999)	($567,999)	($197,999)	
Expenses	($50,045,684)	($1,416,892)	($172,892)	($172,892)	($172,892)	($8,206,043)	($27,782,578)	($33,422,361)	($3,417,939)	($1,086,920)	($1,086,920)	($786,950)	($127,770,963)
Sub-Total	($45,583,380)	($1,303,801)	($172,892)	($172,892)	($172,892)	($7,714,651)	($25,420,456)	($30,710,835)	$145,267,065	$24,130,081	$4,780,081	$1,380,051	
Balance	($45,583,380)	($1,303,801)	($172,892)	($172,892)	($172,892)	($7,714,651)	($25,420,456)	($30,710,835)	$145,267,065	$24,130,081	$4,780,081	$1,380,051	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1																																								
2	**Precinct H**																																							
3																																								
4	**The Site**																																							
5	Precinct Site Area (approx)			11530	sqm																																			
6					LEP Site Value																																			
7	Land Cost				($11,000,000)			($11,000,000)																										($11,000,000)	OK					
8	GST on land				**$1,000,000**			**$1,000,000**																																
9	Stamp Duty				($829,454)			($829,454)																																
10	Land Tax			($182,492)	($1,642,428)			($182,492)		($182,492)		($182,492)		($182,492)		($182,492)		($182,492)		($182,492)		($182,492)		($182,492)										($1,642,428)						
11																																								
12	**LEP Control**		FSR 1.8 : 1	20754	sqm																																**LEP Control**			
13	**No. of Dwellings**	220																																			**No. of Dwellings**			
14																																								
15	**Dwelling Mix example***			sqm	sqm																																**Dwelling Mix example***			
16		76	1 BED	65	4940																																			
17		110	2 BED	90	9900																																			
18		34	3 BED	125	4250																																			
19	Lobby + internal public circulation			1557	1557																																Lobby + internal public circulation			
20				Total	20647																																			
21	Balconies	110		20	2200																																Balconies			
22																																								
23	Balconies are provided																																				Balconies are provided			
24	Balconies are not included in GFA																																				Balconies are not included in GFA			
25								**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**2026**		**2027**		**2028**		**2029**		**2030**		**Check Totals**						
26																																								
27	**Residential Development Subsidy for Tunnel Extension**			Total	($38,500,000)			**($38,500,000)**																																
28																																								
29	**GST**				**$3,500,000**			**$3,500,000**																																
30																																								
31	**Construction - Nominal Allowances***																																				**Construction - Nominal Allowances***			
32	Dwelling type	Amount	sqm	rate/sqm																																	Dwelling type			
33	1 BED	76	65	($2,000)	($9,880,000)																	($3,293,333)		($6,586,667)										($9,880,000)	OK		1 BED			
34	2 BED	110	90	($2,000)	($19,800,000)																	($6,600,000)		($13,200,000)										($19,800,000)	OK		2 BED			
35	3 BED	34	125	($2,000)	($8,500,000)																	($2,833,333)		($5,666,667)										($8,500,000)	OK		3 BED			
36	Balconies	110	20	($800)	($1,760,000)																	($586,667)		($1,173,333)										($1,760,000)	OK		Balconies			
37	Lobby + circul.		1557	($2,000)	($3,113,100)																	($1,037,700)		($2,075,400)										($3,113,100)	OK		Lobby + circul.			
38	Carpark	304	10640	($900)	($9,576,000)																	($9,576,000)												($9,576,000)	OK		Carpark			
39				Total	($52,629,100)	25%																**($23,927,033)**		**($28,702,067)**										**($52,629,100)**						
40																																								
41	**GST**				**$4,784,464**																	**$2,175,185**		**$2,609,279**										$4,784,464						
42																																								
43	The construction cost will vary considerably depending																																				The construction cost will vary considerably depending			
44	on the type of builder &																																				on the type of builder &			
45								YEAR 1												YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8								
46	**Site Works - Nominal Allowances***																																				**Site Works - Nominal Allowances***			
47	Demolition				($200,000)															($150,000)		($50,000)												($200,000)			Demolition			
48	Excavation/Earthworks (includ. compaction)				($750,000)															($562,500)		($187,500)												($750,000)			Excavation/Earthworks (includ. compaction)			
49	Stormwater Detention				($750,000)															($562,500)		($187,500)												($750,000)			Stormwater Detention			
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($650,000)															($487,500)		($162,500)												($650,000)			Civil/Hydraulic Engineering Works (Road & Drainage)			
51	Electrical (Power & Telephone)				($750,000)															($375,000)		($375,000)												($750,000)			Electrical (Power & Telephone)			
52	Surveying & Linen Plan				($100,000)					($100,000)																								($100,000)			Surveying & Linen Plan			
53	Construction Survey				($100,000)															($50,000)		($50,000)												($100,000)			Construction Survey			
54	External Works and Landscaping				($800,000)															($400,000)		($200,000)		($200,000)										($800,000)			External Works and Landscaping			
55				Total	($4,100,000)																													($4,100,000)						
56																																								
57	**GST**				**$372,727**			**$0**		**$9,091**		**$0**		**$0**		**$0**		**$0**		**$235,227**		**$110,227**		**$18,182**		**$0**		**$0**		**$0**		**$0**		$372,727						
58																																								
59		Total Construction + Site Works + Tunnel			**($95,229,100)**																																			
60																																								
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($634,150)			($634,150)																																
62																																								
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($1,210,000)					($1,210,000)																														
64																																					**Professional Fees - Nominal**			
65	**Consultant Fees - Nominal**		say 7.5%		($7,856,401)			($1,571,280)												($2,356,920)		($1,571,280)		($1,571,280)		($785,640)								($7,856,401)	OK		Overall Budget			
66																																								
67	**Project Management Fees - Nominal**		say 1.5%		($1,571,280)			($196,410)												($196,410)		($196,410)		($196,410)		($196,410)		($196,410)		($196,410)		($196,410)		($1,571,280)						
68																																								
69	**Authority Fees & Charges - Approximate**																																				**Authority Fees & Charges - Approximate**			
70	Overall Budget		say 1.25%		($1,309,400)															($327,350)		($327,350)		($654,700)										($1,309,400)	OK		Overall Budget			
71				Total	($12,581,231)			($2,401,840)		($1,210,000)		$0		$0		$0		$0		($2,880,680)		($2,095,040)		($2,422,390)		($982,050)		($196,410)		($196,410)		($196,410)		($12,581,231)						
72																																								
73	**GST**				**$1,143,748**			**$218,349**		**$110,000**		**$0**		**$0**		**$0**		**$0**		**$261,880**		**$190,458**		**$220,217**		**$89,277**		**$17,855**		**$17,855**		**$17,855**		$1,143,748						
74																																								
75		Total Construction + Professional & Authority Fees			**($107,810,331)**	51%																																		
76																																								
77																																								
78	**Total Precinct Cost including Land**				**($121,282,213)**																																			
79																																								
80																																								
81	**Sale Price - Nominal**																																				**Sale Price - Nominal**			
82	Strata Title, apartments	rate/sqm	$11,000																			Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD						Strata Title, apartments			
83	Sale Price	1 BED	$715,000	76	$54,340,000															1 BED		($27,721)		76	65	$46,475,000	8	$5,720,000	2	$1,430,000	1	$715,000	76	$54,340,000	OK		Sale Price			
84	Sale Price	2 BED	$990,000	110	$108,900,000															2 BED		($40,096)		110	96	$95,040,000	12	$11,880,000	2	$1,980,000	0	$0	110	$108,900,000	OK		Sale Price			
85	Sale Price	3 BED	$1,375,000	34	$46,750,000															3 BED		($61,171)		34	26	$35,750,000	6	$8,250,000	1	$1,375,000	1	$1,375,000	34	$46,750,000	OK		Sale Price			
86				Subtotal	$209,990,000																					$177,265,000		$25,850,000		$4,785,000		$2,090,000		$209,990,000						
87																																								
88		**Total Revenue***			$209,990,000																																			
89																																								
90	Stamp Duty Total				($8,597,162)																			Stamp Duty		($1,801,862)		($221,768)		($55,442)		($27,721)								
91																										($3,849,212)		($481,151)		($80,192)		$0								
92																										($1,590,446)		($367,026)		($61,171)		($61,171)								
93																																								
94	**GST**				**($19,090,000)**																					($16,115,000)		($2,350,000)		($435,000)		($190,000)		$19,090,000						
95																																								
96	**Profit**																																				**Profit**			
97	Total Revenue		Total Precinct Cost																																		Total Revenue			
98	$209,990,000	minus	($121,282,213)	=	$88,707,787																																$0			
99																																								
100	**Total Precinct Yield (refer to exclusions below)***				**$88,707,787**																																			
101																																								
102								2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029		2030								
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances																																**EXPENDITURE**			
104																																								
105	Finance Costs	*See Progressive Bank Balance below*			($41,097,118)																																Finance Costs			
106	Contingency/Escalation				($5,390,517)															($808,577)		($1,078,103)		($2,156,207)		($1,347,629)								($5,390,517)	OK		Contingency/Escalation			
107	Marketing & Selling Costs			3%	($6,299,700)															($472,478)		($629,970)		($1,417,433)		($1,259,940)		($944,955)		($944,955)		($629,970)		($6,299,700)	OK		Marketing & Selling Costs			
108	Legal Costs/Strata Fees				($100,000)															($80,000)				($20,000)										($100,000)	OK		Legal Costs/Strata Fees *Registration of Strata Plans*			
109	Sect 94 Contributions - approx $6385/unit				($1,404,700)															($1,404,700)														($1,404,700)	OK		Sect 94 Contributions - approx $6385/unit			
110	Sect 96 amendments				excluded																																Sect 96 amendments			
111	Land + Environ Court				excluded																																Land + Environ Court			
112																																								
113	GST Reconciliation				($8,289,061)			**$4,718,349**		**$119,091**		**$0**		**$0**		**$0**		**$0**		**$497,107**		**$2,475,870**		**$2,847,678**		**($16,025,723)**		**($2,332,145)**		**($417,145)**		**($172,145)**		($8,289,061)			GST Reconciliation			
114				Total	**($62,581,096)**																																			
115																																								
116	Credit Interest	*See Progressive Bank Balance below*			$4,630,098																																			
117																																								
118				**GROSS PROFIT**	**$30,756,790**	14.65%																																		
119																																								
120				Profit per Unit	$139,804																																			
121																																								
122					Balance from Previous Year					($51,087,163)		($55,608,198)		($59,138,132)		($62,879,861)		($66,846,094)		($71,050,301)		($83,707,799)		($116,978,491)		($158,185,285)		($567,765)		$23,117,249		$27,924,364								
123				CR	Income			$0		$0		$0		$0		$0		$0		$0		$0		$0		$177,265,000		$25,850,000		$4,785,000		$2,090,000		$209,990,000	CR Income	OK				
124					GST Annual Reconciliation			$4,718,349		$119,091		$0		$0		$0		$0		$497,107		$2,475,870		$2,847,678		($16,025,723)		($2,332,145)		($417,145)		($172,145)		($8,289,061)						
125					Expenses			($52,913,786)		($1,492,492)		($182,492)		($182,492)		($182,492)		($182,492)		($8,416,427)		($29,125,139)		($35,100,588)		($3,589,619)		($1,141,365)		($1,141,365)		($826,380)		($134,477,130)	TOTAL Expenses	OK				
126					NET			($48,195,437)		($52,460,564)		($55,790,690)		($59,320,624)		($63,062,353)		($67,028,586)		($78,969,621)		($110,357,067)		($149,231,401)		($535,627)		$21,808,725		$26,343,739		$29,015,839		$67,223,810	CR Sub Balance	OK				
127	**Finance Cost (Interest)**		($41,097,118)		Interest - Debit	6.0%		($2,891,726)		($3,147,634)		($3,347,441)		($3,559,237)		($3,783,741)		($4,021,715)		($4,738,177)		($6,621,424)		($8,953,884)		($32,138)								($41,097,118)	DR Interest	OK	**Finance Cost (Interest)**			
128					Interest - Credit	6.0%																						$1,308,524		$1,580,624		$1,740,950		$4,630,098	CR Interest					
129					**BALANCE**			($51,087,163)		($55,608,198)		($59,138,132)		($62,879,861)		($66,846,094)		($71,050,301)		($83,707,799)		($116,978,491)		($158,185,285)		($567,765)		$23,117,249		$27,924,364		$30,756,790		**$30,756,790**	**GROSS PROFIT**	OK	**Highest Exposure**			
130																																								
131	**Maximum Exposure**		($158,185,285)																															14.65%						
132																																								
133																																								
134																																								
135					**IRR Calculation**																																			
136					Income			$0		$0		$0		$0		$0		$0		$0		$0		$0		$177,265,000		$25,850,000		$4,785,000		$2,090,000								
137					GST Reconciliation			$4,718,349		$119,091		$0		$0		$0		$0		$497,107		$2,475,870		$2,847,678		($16,025,723)		($2,332,145)		($417,145)		($172,145)								
138					Expenses			($52,913,786)		($1,492,492)		($182,492)		($182,492)		($182,492)		($182,492)		($8,416,427)		($29,125,139)		($35,100,588)		($3,589,619)		($1,141,365)		($1,141,365)		($826,380)		($134,477,130)						
139					Sub-Total			($48,195,437)		($1,373,401)		($182,492)		($182,492)		($182,492)		($182,492)		($7,919,320)		($26,649,269)		($32,252,910)		$157,649,658		$22,376,490		$3,226,490		$1,091,475								
140																																								
141					**Balance**			($48,195,437)		($1,373,401)		($182,492)		($182,492)		($182,492)		($182,492)		($7,919,320)		($26,649,269)		($32,252,910)		$157,649,658		$22,376,490		$3,226,490		$1,091,475								
142																																								
143					**IRR**	**8.62%**																																		
144																																								
145																																								

	A	B	C	D	E	F
2	**Precinct J**					
4	**The Site**					
5	Precinct Site Area (approx)			7650	sqm	
6					LEP Site Value	
7	Land Cost				($5,200,000)	
8	GST on land				**$472,727**	
9	Stamp Duty				($423,454)	
10	Land Tax			($89,692)	($896,920)	
12	**LEP Control**		FSR 1 : 3	9945	sqm	
13	**No. of Dwellings**	104				
15	**Dwelling Mix example***			sqm	sqm	
16		35	1 BED	65	2275	
17		50	2 BED	90	4500	
18		19	3 BED	125	2375	
19	Lobby + internal public circulation			746	746	
20				Total	9896	
21	Balconies	52		20	1040	
23	Balconies are provided					
24	Balconies are not included in GFA					
27	**Residential Development Subsidy for Tunnel Extension**			Total	($18,200,000)	
29	**GST**				**$1,654,545**	
31	**Construction - Nominal Allowances***					
32	Dwelling type	Amount	sqm	rate/sqm		
33	1 BED	35	65	($2,000)	($4,550,000)	
34	2 BED	50	90	($2,000)	($9,000,000)	
35	3 BED	19	125	($2,000)	($4,750,000)	
36	Balconies	52	20	($800)	($832,000)	
37	Lobby + circul.		746	($2,000)	($1,491,750)	
38	Carpark	145	5086	($900)	($4,576,950)	
39				Total	($25,200,700)	25%
41	**GST**				**$2,290,973**	
43	The construction cost will vary considerably depending					
44	on the type of builder &					
46	**Site Works - Nominal Allowances***					
47	Demolition				($200,000)	
48	Excavation/Earthworks (includ. compaction)				($750,000)	
49	Stormwater Detention				($750,000)	
50	Civil/Hydraulic Engineering Works (Road & Drainage)				($650,000)	
51	Electrical (Power & Telephone)				($750,000)	
52	Surveying & Linen Plan				($100,000)	
53	Construction Survey				($100,000)	
54	External Works and Landscaping				($800,000)	
55				Total	($4,100,000)	
57	**GST**				**$372,727**	
59		Total Construction + Site Works + Tunnel			**($47,500,705)**	
61	**Equilibria Concept Fee - Upfront**		$50.00	/ m2 of Land	($420,750)	
63	**Equilibria Development Fee - On Gazettal**		$5,000.00	/ Dwelling	($572,000)	
65	**Consultant Fees - Nominal**		say 7.5%		($3,918,808)	
67	**Project Management Fees - Nominal**		say 1.5%		($783,762)	
69	**Authority Fees & Charges - Approximate**					
70	Overall Budget		say 1.25%		($653,135)	
71				Total	($6,348,454)	
73	**GST**				**$577,132**	
75		Total Construction + Professional & Authority Fees			**($53,849,154)**	54%
78	**Total Precinct Cost including Land**				**($60,369,526)**	
81	**Sale Price - Nominal**					
82	Strata Title, apartments	rate/sqm	$11,000			
83	Sale Price	1 BED	$715,000	35	$25,025,000	
84	Sale Price	2 BED	$990,000	50	$49,500,000	
85	Sale Price	3 BED	$1,375,000	19	$26,125,000	
86				Subtotal	$100,650,000	
88		**Total Revenue***			**$100,650,000**	
90	Stamp Duty Total				($4,137,280)	
94	**GST**				**($9,150,000)**	
96	**Profit**					
97	Total Revenue		Total Precinct Cost			
98	$100,650,000	minus	($60,369,526)	=	$40,280,472	
100	**Total Precinct Yield (refer to exclusions below)***				**$40,280,472**	
103	**ADDITIONAL EXPENDITURE**				Nominal Allowances	
105	Finance Costs	*See Progressive Bank Balance below*			($22,904,048)	
106	Contingency/Escalation				($2,692,458)	
107	Marketing & Selling Costs			3%	($3,019,500)	
108	Legal Costs/Strata Fees				($100,000)	
109	Sect 94 Contributions - approx $6385/unit				($664,040)	
110	Sect 96 amendments				excluded	
111	Land + Environ Court				excluded	
113	GST Reconciliation				($3,781,895)	
114				Total	**($33,161,940)**	
116	Credit Interest	*See Progressive Bank Balance below*			$995,007	
118				**GROSS PROFIT**	**$8,113,539**	8.06%
120				Profit per Unit	$78,015	
122					Balance from Previous Year	
123				CR	Income	
124					GST Annual Reconciliation	
125					Expenses	
126					NET	
127	**Finance Cost (Interest)**		($22,904,048)		Interest - Debit	6.0%
128					Interest - Credit	6.0%
129					**BALANCE**	
131	**Maximum Exposure**		($80,691,324)			
135					**IRR Calculation**	
136					Income	
137					GST Reconciliation	
138					Expenses	
139					Sub-Total	
141					**Balance**	
143					**IRR**	**7.28%**

	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
7		($5,200,000)																												($5,200,000)	OK	
8		**$472,727**																														
9		($423,454)																														
10		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)										($896,920)			
18																																
19																																
21																																
23																																
24																																
25		**2018**		**2019**		**2020**		**2021**		**2022**		**2023**		**2024**		**2025**		**2026**		**2027**		**2028**		**2029**		**2030**		**2031**		**Check Totals**			
27		**($18,200,000)**																														
29		**$1,654,545**																														
31																																
32																																
33																		($1,516,667)		($3,033,333)										($4,550,000)	OK	
34																		($3,000,000)		($6,000,000)										($9,000,000)	OK	
35																		($1,583,333)		($3,166,667)										($4,750,000)	OK	
36																		($277,333)		($554,667)										($832,000)	OK	
37																		($497,250)		($994,500)										($1,491,750)	OK	
38																		($4,576,950)												($4,576,950)	OK	
39																		**($11,451,533)**		**($13,749,167)**										**($25,200,700)**		
41																		**$1,041,048**		**$1,249,924**										$2,290,973		
45		YEAR 1														YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8				
46																																
47																($150,000)		($50,000)												($200,000)		
48																($562,500)		($187,500)												($750,000)		
49																($562,500)		($187,500)												($750,000)		
50																($487,500)		($162,500)												($650,000)		
51																($375,000)		($375,000)												($750,000)		
52				($100,000)																										($100,000)		
53																($50,000)		($50,000)												($100,000)		
54																($400,000)		($200,000)		($200,000)										($800,000)		
55																														($4,100,000)		
57		**$0**		**$9,091**		**$0**		**$0**		**$0**		**$0**		**$0**		**$235,227**		**$110,227**		**$18,182**		**$0**		**$0**		**$0**		**$0**		$372,727		
61		($420,750)																														
63				($572,000)																												
65		($783,762)														($1,175,642)		($783,762)		($783,762)		($391,881)								($3,918,808)	OK	
67		($97,970)														($97,970)		($97,970)		($97,970)		($97,970)		($97,970)		($97,970)		($97,970)		($783,762)		
69																																
70																($163,284)		($163,284)		($326,567)										($653,135)	OK	
71		($1,302,482)		($572,000)		$0		$0		$0		$0		$0		($1,436,896)		($1,045,015)		($1,208,299)		($489,851)		($97,970)		($97,970)		($97,970)		($6,348,454)		
73		**$118,407**		**$52,000**		**$0**		**$0**		**$0**		**$0**		**$0**		**$130,627**		**$95,001**		**$109,845**		**$44,532**		**$8,906**		**$8,906**		**$8,906**		$577,132		
78																																
81																																
82																		Stamp Duty/Apart.		No. of Aparts.	SOLD		SOLD		SOLD		SOLD					
83																1 BED		($27,721)		35	28	$20,020,000	5	$3,575,000	1	$715,000	1	$715,000	35	$25,025,000	OK	
84																2 BED		($40,096)		50	40	$39,600,000	7	$6,930,000	2	$1,980,000	1	$990,000	50	$49,500,000	OK	
85																3 BED		($61,171)		19	16	$22,000,000	2	$2,750,000	1	$1,375,000	0	$0	19	$26,125,000	OK	
86																						$81,620,000		$13,255,000		$4,070,000		$1,705,000		$100,650,000		
90																				Stamp Duty		($776,187)		($138,605)		($27,721)		($27,721)				
91																						($1,603,838)		($280,672)		($80,192)		($40,096)				
92																						($978,736)		($122,342)		($61,171)		$0				
94																						($7,420,000)		($1,205,000)		($370,000)		($155,000)		$9,150,000		
96																																
98																																
100																																
102		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029		2030		2031				
103																																
105																																
106																($403,869)		($538,492)		($1,076,983)		($673,114)								($2,692,458)	OK	
107																($226,463)		($301,950)		($679,388)		($603,900)		($452,925)		($452,925)		($301,950)		($3,019,500)	OK	
108																($80,000)				($20,000)										($100,000)	OK	
109																($664,040)														($664,040)	OK	
110																																
111																																
113		**$2,245,680**		**$61,091**		**$0**		**$0**		**$0**		**$0**		**$0**		**$365,854**		**$1,246,277**		**$1,377,951**		**($7,375,468)**		**($1,196,094)**		**($361,094)**		**($146,094)**		($3,781,895)		
116																																
118																																
120																																
122				($24,348,144)		($26,551,670)		($28,239,844)		($30,029,308)		($31,926,140)		($33,936,782)		($36,068,063)		($43,662,108)		($60,478,314)		($80,691,324)		($8,706,477)		$2,969,626		$6,495,296					
123		$0		$0		$0		$0		$0		$0		$0		$0		$0		$0		$0		$81,620,000		$13,255,000		$4,070,000		$1,705,000		$100,650,000	CR Income	OK
124		$2,245,680		$61,091		$0		$0		$0		$0		$0		$365,854		$1,246,277		$1,377,951		($7,375,468)		($1,196,094)		($361,094)		($146,094)		($3,781,895)		
125		($25,215,628)		($761,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($5,488,459)		($14,639,182)		($17,023,528)		($1,766,865)		($550,895)		($399,920)		($66,845,526)	TOTAL Expenses	OK
126		($22,969,948)		($25,048,746)		($26,641,362)		($28,329,536)		($30,119,000)		($32,015,832)		($34,026,474)		($41,190,668)		($57,055,013)		($76,123,890)		($8,213,657)		$2,801,534		$6,127,638		$7,654,282		$30,022,579	CR Sub Balance	OK
127		($1,378,197)		($1,502,925)		($1,598,482)		($1,699,772)		($1,807,140)		($1,920,950)		($2,041,588)		($2,471,440)		($3,423,301)		($4,567,433)		($492,819)								($22,904,048)	DR Interest	OK
128																								$168,092		$367,658		$459,257		$995,007	CR Interest	
129		($24,348,144)		($26,551,670)		($28,239,844)		($30,029,308)		($31,926,140)		($33,936,782)		($36,068,063)		($43,662,108)		($60,478,314)		($80,691,324)		($8,706,477)		$2,969,626		$6,495,296		$8,113,539		**$8,113,539**	**GROSS PROFIT**	OK
131																												8.06%				
135																																
136		$0		$0		$0		$0		$0		$0		$0		$0		$0		$0		$81,620,000		$13,255,000		$4,070,000		$1,705,000				
137		$2,245,680		$61,091		$0		$0		$0		$0		$0		$365,854		$1,246,277		$1,377,951		($7,375,468)		($1,196,094)		($361,094)		($146,094)				
138		($25,215,628)		($761,692)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($5,488,459)		($14,639,182)		($17,023,528)		($1,766,865)		($550,895)		($399,920)		($66,845,526)				
139		($22,969,948)		($700,601)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($5,122,605)		($13,392,905)		($15,645,577)		$72,477,667		$11,508,011		$3,158,011		$1,158,986					
141		($22,969,948)		($700,601)		($89,692)		($89,692)		($89,692)		($89,692)		($89,692)		($5,122,605)		($13,392,905)		($15,645,577)		$72,477,667		$11,508,011		$3,158,011		$1,158,986					
143																																

10.3 EMISSIONS CALCULATION – AQAT

Pacific Environment Limited

Consulting • Technologies • Monitoring • Toxicology

NSW EPA

Air Quality Appraisal Tool (AQAT)

Version 1.2

18 April 2013

Author: Paul Boulter (Pacific Environment)

CONTENTS

This spreadsheet contains the following worksheets:

Versions: Provides information on version control.

Instructions: Provides instructions for using AQAT.

Data sources: Provides guidance on potential sources of input data. Default values are give for the traffic mix and speed by road type.

Planning Guidance: Provides guidance to planners on how AQAT might be integrated into the planning process.

References: Provides the references for the methods and default data used in AQAT.

Inputs (A): If estimates of the changes in emissions **are not already available**, this sheet is used to enter data.

Inputs (B): If estimates of the changes in emissions **are already available**, this sheet is used to enter data.

Results (A): Provides the model results, based on the information entered in the Inputs (A) sheet.

Results (B): Provides the model results, based on the information entered in the Inputs (B) sheet.

The default traffic mixes for the road types used in AQAT are given below (source: RMS, 2012).

Road type	Traffic mix (%)*								
	CP	CD	LDCP	LDCD	HDCP	RT	AT	BusD	MC
Residential	79.0	2.3	8.5	2.9	0.1	4.0	1.9	0.7	0.6
Arterial	75.6	2.2	9.6	3.2	0.2	5.3	2.7	0.6	0.6
Commercial arterial	72.8	2.1	10.2	3.5	0.2	6.5	3.6	0.5	0.6
Commercial highway	72.8	2.1	10.2	3.5	0.2	6.5	3.6	0.5	0.6
Highway / freeway	64.0	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5

* CP = petrol passenger vehicles; CD = diesel passenger vehicles; LDCP = light-duty commercial petrol vehicles (<=3500 kg); LDCD = light-duty commercial diesel vehicles (<=3500 kg); HDCP = heavy-duty commercial petrol vehicles (>3500kg); RT = rigid trucks (3.5-25 tonnes, diesel only); AT = articulated trucks (> 25 tonnes, diesel only); BusD = heavy public transport buses (diesel only); MC = motorcycles.

The default base traffic speeds for the road types used in AQAT are given below (source: RMS, 2012).

Road type	2008	2011	2016	2021	2026
Residential	24.1	24	23.7	23.7	23.7
Arterial	38	37.7	36.3	36	36
Commercial arterial	35.3	35.1	34.2	33.9	33.9
Commercial highway	56.9	56.5	55	54.6	54.6
Highway / freeway	66.3	66	65.7	65.3	65.1

Traffic growth

For assessments in future years, information on traffic growth projections in Australian cities can be found in a BITRE report:

http://www.bitre.gov.au/publications/2012/report_127.aspx

Step A1: Generic inputs

Assessment year	2016
Economic growth rate (%) (affects past and future prices)	2.5%

* CP = petrol passenger vehicles; CD = diesel passenger vehicles; LDCP = light-duty commercial petrol vehicles (<=3500 kg); LDCD = light-duty commercial diesel vehicles (<=3500 kg); HDCP = heavy-duty commercial petrol vehicles (>3500kg); RT = rigid trucks (3.5-25 tonnes, diesel only); AT = articulated trucks (> 25 tonnes, diesel only); BusD = heavy public transport buses (diesel only); MC = motorcycles.

Default traffic mixes are available on the 'Data sources' sheet.

Step A2: Road transport inputs

Before development

Name of road link or route	Road type	Grade (%)	Length (km)	Daily traffic (vpd)	Traffic mix (%) *									Speed (km/h)	Cold-start emissions
					CP	CD	LDCP	LDCD	HDCP	RT	AT	BusD	MC		
Section 1 - Transurban	*Highway / freeway*	*-4%*	1.2	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO
Section 2 - Transurban	*Highway / freeway*	*2%*	7.5	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO
Section 3 - Transurban	*Highway / freeway*	*2%*	0.3	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO

After development

Name of road link or route	Road type	Grade (%)	Length (km)	Daily traffic (vpd)	Traffic mix (%) *									Speed (km/h)	Cold-start emissions
					CP	CD	LDCP	LDCD	HDCP	RT	AT	BusD	MC		
Section 1 - Alternative	*Highway / freeway*	*-2%*	0.5	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO
Section 2 - Alternative	*Highway / freeway*	*2%*	1.0	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO
Section 3 - Alternative	*Highway / freeway*	*0%*	8.5	24,000	64	1.8	9.5	3.2	0.4	10.8	9.6	0.2	0.5	80	NO

Detailed results — Assessment year: 2016

Road transport

Before development

Name of road link or route	Emissions by road link (tonnes per year)					Damage costs due to primary $PM_{2.5}$ emissions from transport (A$)
	CO	NOx	$PM_{2.5}$	HC	CO_2-e	
Section 1 - Transurban	10.27	6.69	0.36	0.55	2,517.73	-
Section 2 - Transurban	372.55	143.39	3.46	16.40	51,014.16	-
Section 3 - Transurban	12.35	4.75	0.11	0.54	1,691.45	-
	-	-	-	-	-	-
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	-	-	-	-	-	-
	-	-	-	-	-	-
TOTAL	**395.17**	**154.83**	**3.93**	**17.50**	**55,223.35**	**-**

After development

Name of road link or route	Emissions by road link (tonnes per year)					Damage costs due to primary $PM_{2.5}$ emissions from transport (A$)
	CO	NOx	$PM_{2.5}$	HC	CO_2-e	
Section 1 - Alternative	5.54	3.66	0.16	0.29	1,237.19	-
Section 2 - Alternative	49.41	19.02	0.46	2.18	6,765.80	-
Section 3 - Alternative	118.49	95.08	2.95	5.97	24,406.71	-
	-	-	-	-	-	-
	-	-	-	-	-	-
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	-	-	-	-	-	-
TOTAL	**173.45**	**117.76**	**3.57**	**8.44**	**32,409.70**	**-**

Summary of results — Assessment year: 2016

Road transport emissions

Emissions from road network	CO	NOx	$PM_{2.5}$	HC	CO_2-e
Before development (tonnes/year)	395.17	154.83	3.93	17.50	55,223.35
After development (tonnes/year)	173.45	117.76	3.57	8.44	32,409.70
Change (tonnes/year)	**-221.73**	**-37.07**	**-0.36**	**-9.06**	**-22,813.65**
Change (%)	**-56.1%**	**-23.9%**	**-9.1%**	**-51.8%**	**-41.3%**

Rail transport emissions

Emissions from rail network	CO	NOx	$PM_{2.5}$	HC	CO_2-e
Before development (tonnes/year)	0.00	0.00	0.00	0.00	0.00
After development (tonnes/year)	0.00	0.00	0.00	0.00	0.00
Change (t/y)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Change (%)	**-**	**-**	**-**	**-**	**-**

Total emissions from road and rail

Emissions from road and rail neworks	CO	NOx	$PM_{2.5}$	HC	CO_2-e
Before development (tonnes/year)	395.17	154.83	3.93	17.50	55,223.35
After development (tonnes/year)	173.45	117.76	3.57	8.44	32,409.70
Change (tonnes/year)	**-221.73**	**-37.07**	**-0.36**	**-9.06**	**-22,813.65**
Change (%)	**-56.1%**	**-23.9%**	**-9.1%**	**-51.8%**	**-41.3%**

10.4 LETTER FROM DOCTORS

Letter of Medical Evidence opposing NorthConnex tunnel portal and stack placement in residential suburb

We are writing to you regarding the planned NorthConnex tunnel and associated northern ventilation stack, proposed for the densely populated *residential suburb* of Wahroonga, NSW. This project will emit *unfiltered* exhaust fumes from approximately 5000 trucks and 9000 cars per day into an area which has a high density of schools, hospitals and aged care facilities, and will be less than 50 metres to the nearest house.

As health professionals, we feel that this project will have a *major negative impact on the health of the surrounding community*.

The NHMRC (National Health and Medical Research Council) states that the great advantage of tunnels is that their portals and stacks can be *deliberately sited away from residential areas*. These recommendations are also found internationally.

International air pollution experts state that there is no safety threshold to the amount of air pollution causing health impacts, hence *there is no "safe level"*. The smallest amount of air pollution will have a corresponding amount of health impact. Even low dose exposures to particulate matter have been demonstrated to have significant health risks.

There are numerous, well documented health risks associated with air pollution exposure, as found around tunnel portals, tunnel stacks and associated on-ramps. As such we would like to raise our concerns regarding this proposal.

The following facts regarding air pollution are researched and documented in the scientific literature:

- There is an increased *risk of death in people* exposed to particulate matter*, even when exposure is within concentration ranges well below the present European standards.*
- Air pollution causes *Lung Cancer and is associated with Bladder cancer.*
- In 2010, 223,000 deaths from lung cancer worldwide resulted from air pollution according to the World Health Organisation (WHO)
- WHO classifies diesel exhaust fumes as a *carcinogen (cancer causing)*, belonging in the "same deadly category as asbestos, arsenic and mustard gas"
- *Ultrafine particles* (median diameter <0·1 micrometers) are more toxic when inhaled than other measurable particles. They are greatly absorbed into tissues and the circulation and are important factors in determining *cardiopulmonary toxicity*.
- Both short- and long-term exposures to particulate matter are associated with a host of *cardiovascular diseases, including heart attacks, arrhythmias, strokes and increased risk of death* from the above cardiovascular causes
- Children show *reduced lung function* growth which persist later into life, even when exposure stops, i.e. the damage for growing lungs is permanent.
- Children have been found to suffer from symptoms of *bronchitis* following exposure
- Residents living around tunnel ventilation stacks report more *upper and lower respiratory symptoms and have lower lung volumes.*

- *Low birth weights* are more common in pregnant women exposed to traffic pollution.
- Exposure to traffic-related air pollution during pregnancy and during the first year of life is associated with *autism*.
- Higher levels of long-term pollution are associated with significantly faster cognitive decline i.e development of *dementia*
- Outdoor pollutant levels correlate with those measured indoors in houses exposed to air traffic pollution.

Traffic emissions contain substances that are not accounted for in standard pollution modelling. These include ultrafine particles and other *unmeasured substances*. Dozens of compounds can be detected in vehicle exhaust. While the adverse effects of these exhausts have been extensively studied surrounding open roadways, the hazards to local residents and commuters resulting from the presence of ultrafine particles are less well known. *It is these ultrafine particles and unknown substances that potentially pose a great health risk.*

We are very concerned that any modelling of air quality and drawing conclusions on their resultant health impacts drawn from this modelling prior to construction will be inaccurate, *as little scientific evidence exists for long term health impacts of unmeasured particles.*

As health professionals, we strongly oppose the construction of a major source of air pollution at the proposed site. This is a residential neighbourhood. We are of the opinion that there will inevitably be negative long and short term health impacts in the surrounding area.

We strongly feel that an alternative solution needs to be found.

Please find attached a detailed review of the literature, outlining the medical evidence for serious potential health impacts of such a project. Also attached are signatures from health care professionals from a multitude of specialties.

Yours faithfully,

Dr Raymond Nassar
BSc(MED) MB BS FANZCA

Prof Simon Finfer
MB BS FRCP FRCA FCICM MD

All Correspomdence to :

Dr Raymond Nassar
Email: raymondnassar@yahoo.com.au
Mail: PO BOX 4353 Thornleigh 2120 NSW

Medical Evidence regarding adverse health effects of air pollution from tunnel portal and stack placement in residential suburb

There exists an overwhelming amount of medical evidence on the adverse health effects of air pollution, and as such, we have selected some of the most relevant and significant articles to present our concerns.

A recent study released in The Lancet, one of the most prestigious international medical journals, reported the adverse health effects in 367,251 people with long term exposure to air pollution. These people were followed for an average length of 13 years, during which 29,076 died.
The study found that there was a significantly increased risk of death in the participants exposed to particle matter. This risk was even found in individuals whose exposure was within concentration ranges well below the current European standard (1).

Another major study conducted by the American Cancer Society enrolled approximately 1.2 million adults in 1982 for an ongoing prospective mortality study.
Fine particulate and sulfur oxide--related pollution were associated with an increased risk of lung cancer and death from heart and lung diseases. Each 10-microg/m increase in fine particulate air pollution was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively (2).

A WHO press release in October 2012 stated that after thoroughly reviewing the latest available scientific literature, the world's leading experts concluded that there is sufficient evidence that exposure to outdoor air pollution causes lung cancer. They also noted a positive association with an increased risk of bladder cancer (3).
The most recent WHO data indicates that in 2010, 223,000 deaths from lung cancer resulted from air pollution (4).

Medical evidence is overwhelmingly clear that long term exposure to air pollution increases death rates.

A local study by Cowie et al looking at health effects of the Lane Cove tunnel in Sydney, NSW studied participants before and after the opening of the tunnel. The study found that residents living within 650m of the tunnel ventilation stack reported more upper and lower respiratory symptoms and had lower lung volumes in the first 2 years after the tunnel opened (5). There was also, unfortunately, no consistent evidence of improvement in respiratory health in residents living along the bypassed main road, despite a reduction in traffic from 90,000 to 45,000 vehicles per day.

A recent study using data from numerous international studies looked at dose response relationships for PM 2.5 (6). The results suggested a relatively steep exposure–response function at very low levels of exposure to PM 2.5 and a flattening out of cardiovascular risk at high exposure levels.
At very low levels of exposure excess mortality risks are similar for lung cancer and CVD mortality. A relative risk of 1.3 was found for cardiopulmonary disease secondary to PM2.5 levels of 24.5 micrograms/m3.
Current air quality modelling guidelines consider a level of less than 50 micrograms/m3 to be safe. This is equivalent to the risks associated with exposures to moderate to high levels of second hand cigarette smoke.
A potential explanation regarding the steep exposure–response for CVD mortality at low levels of exposure and the levelling off at high exposures is a saturation phenomenon whereby relatively low levels of exposure are capable of activating relevant biological pathways.

There is substantial and growing evidence that long-term exposures to PM2.5 from cigarette smoke, ambient air pollution, or both affect multiple physiologic pathways. Even low levels of exposure to PM 2.5 from second hand smoke and ambient air pollution have been associated with pulmonary and systemic oxidative stress, inflammatory vascular dysfunction, increased platelet activation and blood viscosity, atherosclerosis, IHD, and altered cardiac autonomic function

In eight different communities in Switzerland, lung function in adults was negatively associated with PM10, nitrogen dioxide, and sulphur dioxide all of which are pollutants arising from vehicle exhausts (7). The pollutants also increased symptoms of bronchitis (8). In children from ten Swiss communities, the same pollutants were found to be associated with symptoms of bronchitis (9).

In children living in 24 communities in Canada and the USA, significant associations were reported between exposure to fine particles and lung function and symptoms of bronchitis (10-12).

Exposure to particulate pollution is associated with reduced lung function growth in children (13), and even children relocating from high to low pollution areas (or vice versa) were shown to experience changes in lung function growth that mirrored changes in exposure to particulate matter (14).

Gauderman et al followed school children from the age of 10 for 8 years to observe the effects of air pollution on lung development. He showed that lung development is significantly affected through reductions in FVC, FEV1 and MMEF, as would be expected of the children had been exposed to maternal smoking(15).

Studies from across the world have consistently shown that both short- and long-term exposures to particulate matter are associated with a host of cardiovascular diseases, including heart attack, heart failure, abnormalities of heart rhythm, strokes and increased death from cardiovascular causes (16).

Evidence from cellular/toxicological experiments, controlled animal and human exposures and human panel studies have demonstrated several mechanisms by which particle exposure may both trigger acute events as well as prompt the chronic development of cardiovascular diseases. Particulate matter inhaled into the pulmonary tree may instigate remote cardiovascular health effects via three general pathways: instigation of systemic inflammation and/or oxidative stress, alterations in autonomic balance, and potentially by direct actions upon the vasculature of particle constituents capable of reaching the systemic circulation. In turn, these responses have been shown to trigger acute arterial vasoconstriction, endothelial dysfunction, arrhythmias and pro-coagulant/thrombotic actions (17).

In both short-term and long-term studies, air pollution has an effect on cardiac deaths and hospital admissions in addition to respiratory effects. Plasma viscosity, as well as heart rate and concentrations of C-reactive protein, were increased (18-20), all of which can contribute to an increased risk of cardiovascular events.
Studies in Boston, MA, USA, showed that nitrogen dioxide and PM2·5 were associated with life-threatening arrhythmia leading to therapeutic interventions by an implanted cardioverter defibrillator (21), and that PM2·5 concentrations were higher
in the hours and days before onset of myocardial infarction in a large group of patients (22).

Hoffman et al found that long-term residential exposure to high traffic is associated with the degree of coronary atherosclerosis. Participants living within 50m of a busy road had an odds ratio of 1.63 for developing coronary artery calcification compared with a control group (23). Older subjects (greater than or equal to 60 years of age) and women were found by Künzli et al, to have a 15.7% stronger association between particle matter exposure and carotid intimal thickening, ie the risk of stroke. (24)

In a study of 1,705 Boston-area patients admitted to hospital with strokes, the risk of stroke was increased by 34 percent on days when traffic pollutants were classified by federal regulators as "moderate," which is defined as a minimal danger to health. These results suggest that exposure to $PM_{2.5}$ concentration generally considered safe by the US EPA increase the risk of stroke onset within hours of exposure (25).

One of the most commonly measured chemicals arising from car emissions is nitrogen dioxide. Associations between natural-cause and respiratory mortality have been found to be statistically significant for NO_2 and black smoke (26).

Giulia et al studied the effects of long-term exposure to both fine particulate matter (≤ 2.5 μm; $PM_{2.5}$) and nitrogen dioxide (NO_2) on risk of death (27). This large study of over 1.2 million subjects strongly supports that long-term exposure to NO_2 and $PM_{2.5}$ increases risk of death, especially from cardiovascular causes.

Traffic emissions contain substances that can be measured and that cannot be measured or are accounted for in standard pollution modelling.

Dozens of volatile and semivolatile organic compounds can be detected in vehicle exhaust, along with numerous metals and oxides of sulfur, nitrogen, and carbon. While the adverse effects of these chemicals have been extensively studied surrounding open roadways, the hazards to local residents and commuters resulting from the presence of tunnel emission chemicals are less well known (28).

It is the unknown substances that potentially pose a great health risk in themselves.

The recognition that ultrafine particles (mass median diameter <0·1 _m) are more toxic when inhaled than PM10 suggests that their ability to be absorbed into tissues and the circulation, and their greatly increased surface area, might be important factors in determining cardiopulmonary toxicity (29).

In the local study by Cowie et al, which looked at the health impacts on locals living near the Lane Cove Tunnel Stack, the study found that there was an increase in the number of adverse health effects among residents living around the stack. It also went on to suggest that these effects may have occurred due to unmeasured pollutants. (5)

Diesel particulates and ozone have been shown to increase the synthesis of the allergic antibody IgE in animals (30), and human beings (31), which would increase sensitisation to common allergens (32). By interacting together and with other environmental factors, particulates and gaseous air pollutants can have long-term effects on allergic individuals.

Short term and long term health impacts have been well studied internationally.
The findings of increased airway inflammation and symptoms in subjects after only 2 hours exposure at a heavily trafficked location indicate that even short-term exposures to traffic-related air pollution has adverse health effects (33).

Fischer et al found that outdoor pollutant levels correlated with those measured indoors in 36 houses exposed to air traffic pollution. A substantially larger contrast (about a factor two) was found for outdoor concentration of the particulate components BaP, total polycyclic aromatic hydrocarbons, absorption coefficient (`soot') and the gas-phase components benzene and total volatile organic compounds. The contrasts for these pollutants were substantially larger than the estimated contrast in average NO_2 (22%). (34)

Pregnant women exposed to sulphur dioxide from traffic pollution are more likely to give birth to low birth-weight babies. (35)
Exposure to traffic-related air pollution, nitrogen dioxide, $PM_{2.5}$, and PM_{10} during pregnancy and during the first year of life is associated with autism (36).
Effects on the elderly
Higher levels of long-term exposure to both $PM_{2.5\text{-}10}$ and $PM_{2.5}$ are associated with significantly faster cognitive decline, i.e. can accelerate the development of dementia. (37).

A study of 137 Brisbane school children at 25 schools by Mazaheri (38) analyzing alveolar concentrations of ultrafine particles concluded that children's exposure during school hours was more strongly influenced by urban background particles than traffic near the school. The study also found that the highest dose intensity occurred during outdoor times at school and when children were more active.
There are large numbers of children in the immediate area surrounding the stack, attending schools.
These background levels of ultrafine particles could be significantly affected by an unfiltered exhaust stack within close proximity of multiple schools.

Buonanno et al (39) studied particle concentrations at schools in several different urban locations. In general, children attend school during day time hours on weekdays when traffic intensity is high.
It has been proven, that outdoor pollutants are able to penetrate inside the buildings, influencing indoor concentration levels on the basis of traffic, meteo-climatic and urban characteristics with regard to airborne particles. Indeed, indoor pollutants were found to explain a number of health effects even at concentrations significantly lower than outdoors.

In a separate study, Buoanno et al (40) looks at the health effects of dose related particle exposure on children. Significant differences were found for asthmatics, children with allergic rhinitis and sensitive to allergens compared to healthy subjects.
At present, it is not known which particle size, morphology or chemical components are most strongly related to the negative effects on human health and further research in this field is required.
These effects have received more attention in relation to children, because they inhale a higher dose of airborne particles relative to lung size when compared with adults.
Nevertheless, the major difficulty facing epidemiological studies of ultra fine particles is mostly related to the estimation of individual exposure levels. The most common current approach assumes that each person in a given region has the same exposure level, which is often obtained from a few air quality monitors and reflects the mean concentrations in the entire urban area or community.
This approach could lead to significant errors in the estimation of individual exposure to air pollutants because the actual exposure is strongly related to the time activity of the individuals. Furthermore, the use of mean air pollution levels smoothes peak air pollution concentrations and thus, may result in unreliable estimates of exposure (Manigrasso et al., 2013).

Furthermore, several authors have suggested that short term fluctuations in aerosol concentrations of particles increase morbidity and mortality (Brugge et al., 2007; Strak et al.,)

A recent study by the OECD has found that Australia is amongst only 14 out of 34 developed countries in the world where deaths from air pollution have increased in the past 5 years. In between 2005 and 2010, the number of deaths from air pollution in Australia increased by 68 per cent. Evidence suggested that road transport was probably responsible for about half of all deaths from air pollution. The economic cost for Australia was about $5.8 billion in 2010, up from $2.9 billion just five years earlier (41).

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