Submission on:

WestConnex M4 East Environmental Impact Statement (EIS)

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I welcome the opportunity to comment on the EIS for the proposed M4 East.

I strongly object to the M4 East project, and to the broader WestConnex scheme, on the following grounds:

1. **The EIS does not comply with the SEARs.**
2. **The EIS does not include an assessment of the impacts of the proposed project (M4 East). The project modelled/assessed in the EIS (M4 East plus a reduction of general traffic lanes on Parramatta Road) is fundamentally different from the proposed project.**
3. **There are major issues with the Traffic and Transport Assessment. There is insufficient information about the modelling inputs, assumptions and methodology for the forecasts to be independently verified. There is no sensitivity analysis of key assumptions.**
4. **The social and environmental impacts described in the EIS are unacceptable. Because of flaws in the modelling, the actual impacts are likely to be even greater than those forecast.**
5. **The project does not meet the project objectives.**
6. **Many of the project objectives, such as congestion relief, could be met through better management of demand on the existing road network, e.g., through reform of road pricing. The area already has an extensive and high capacity road network, there is just too much demand at present for it to operate effectively.**
7. **The project makes little sense from a transport planning and policy perspective. The role of motorways is to allow traffic to circumvent densely populated areas. For radial transport into and out of urban centres, mass transit is more efficient and economical, and has less impact on the human population.**
8. **The project is not in the public interest. It will be used by less than 1% of the NSW population each day. The rest of the population will pay dearly in terms of higher traffic impacts, poorer**

air quality, and state and federal taxes being diverted from public transport and other more worthy causes.

9. **The estimated $3.4 billion of productivity benefits does not justify the $15.4 billion cost.**
10. **The project has a high financial risk. The traffic forecasts for the M4 East tunnel assume a reduction in the number of general traffic lanes on Parramatta Road (which will force traffic into the tunnel). However, the state government has not proposed or committed to reducing the number of traffic lanes on Parramatta Road. Furthermore, AECOM has a history of providing over-optimistic traffic forecasts for toll roads, resulting in previous financial failures (e.g., Clem7).**

The following sections describe general issues with the EIS, the project and the broader WestConnex scheme (Section 1), non-compliances with the SEARs (Section 2), non-compliances with the project objectives (Section 3), and major issues with the Traffic and Transport Assessment (Section 4).

1 General issues with EIS, M4 East and WestConnex

1) The proposed M4 East and broader WestConnex scheme are not in the public interest.
   a) According to the 2013 WestConnex Business Case Summary, there will be only a $3.4 billion productivity benefit, while the project will cost more than $15.4 billion.
   b) Any personal travel time savings generated by the project will not benefit the economy, and will be cancelled out in time by induced demand and induced sprawl.
   c) It will be used by less than 1% of the NSW population each day. The costs will be borne by the whole population.
   d) It will cause immense social harm. It will destroy long-established communities. It will cause an increase in air pollution-related deaths and illnesses.
   e) There are numerous ways of spending $15.4 billion that would deliver a much greater social and economic benefit, and would not cause so much destruction.
2) The EIS authors (AECOM) have failed to model the impacts of implementing the proposed project (M4 East) relative to not implementing the proposed project (the 'future do minimum' scenario). The 'future do something' scenarios in the Traffic and Transport Assessment, on which the traffic, air quality, health and greenhouse modelling are based, include the M4 East project *plus another uncommitted project* to convert kerbside general traffic lanes on Parramatta Road to bus priority lanes. With these additional bus lanes, the capacity of Parramatta Road would be significantly reduced and traffic volumes would fall accordingly, with drivers opting to use the M4 East tunnel instead. As such, the traffic volumes for the M4 East tunnel have been dramatically overestimated, and the traffic volumes for Parramatta Road have been dramatically

underestimated in the 'future do something' scenarios.

The impacts of the project as proposed by the proponent (and as defined in Section 5 of the EIS), that is, the M4 East Tunnel with *no* new priority bus lanes on Parramatta Road, have not been presented in the EIS, as required by the SEARs.

3) The EIS does not include modelling/forecasts for the scenario of Stages 1 and 2 (M4 East and new M5) without Stage 3 (M4-M5 link). Given that that Stage 3 is scheduled to be built a number of years after completion of Stages 1 and 2, and may never be built at all due to financial risks around the preceding stages, it is important to let the community and stakeholders know what the impacts of operating Stages 1 and 2 without Stage 3 will be.
4) The EIS authors (AECOM) have not modelled or objectively assessed alternative policy scenarios that could meet the transport/accessibility needs of NSW's growing population, e.g.,
    a) Greater investment in mass/public transport;
    b) Demand management/road pricing reform;
    c) Land use planning that places more homes closer to employment and services.
5) It is no secret that the primary purpose of the WestConnex scheme is to increase the road freight accessibility of Port Botany and Sydney Airport, and that private passenger vehicles have been included in the scheme as a means of paying for it (through tolls). However, there are various policy alternatives for dealing with the growing freight task that have not been objectively appraised, e.g.:
    a) Improve the capacity and reliability of rail freight.
    b) Increase rail/intermodal freight subsidies to match those of road freight.
    c) Divert container operations to other ports outside the city centre. Very few cities concentrate container operations in the city centre where road access is costly and has significant impacts on the surrounding residential areas. The Port Botany steelworks is facing closure with the loss of 20,000 jobs. An expansion of the Port Botany container terminal could help to offset the economic impact of these job losses in the Illawarra region.
    d) Freight demand management, e.g., incentivise shorter supply chains and local supply.
6) The Traffic and Transport Assessment does not stand up to scrutiny. There is not enough information about the methodology, input data or assumptions for the forecasts to be independently verified.
    a) In particular, the assumed toll price, on which the traffic forecasts heavily depend, has not been stated.
7) There is no sensitivity analysis in the Traffic and Transport Assessment. The effects of varying key assumptions (e.g., willingness to pay the M4 East toll) have not been described. AECOM has a

history of overestimating the willingness of motorists to pay for toll roads, resulting in overly-optimistic traffic forecasts and financial failures (e.g., Clem7).

8) There is no modelling/assessment of the travel time and accessibility impacts for non-motorised modes (walk and bicycle) in the Traffic and Transport Assessment
9) The issue of induced demand has not been adequately addressed in the Traffic and Transport Assessment.
10) Given the major flaws with the Traffic and Transport Assessment, there can be no confidence in the accuracy of the other impact analyses in the EIS that are dependent on the traffic forecasts, in particular:
    a) Air quality,
    b) Noise and vibration,
    c) Human health,
    d) Greenhouse gases.
11) The role of motorways in a multimodal urban transport network is to allow traffic to circumvent populated urban areas, and to connect less densely populated areas (where mass transit is not justified). For radial transport into and out of employment/activity centres, mass transit (e.g., rail) is faster, more efficient, requires less space, and has fewer impacts on highly populated urban areas.
12) The EIS does not consider the cumulative costs and impacts of adding more urban motorways to those previously built through the heart of Sydney since the 1950s. Although the economic, social and environmental costs of each individual motorway (as reported in an EIS) may be considered by some stakeholders to be acceptable, the cumulative costs are considerable:
    a) Following decades of road expansion and consequential sprawl, Sydney now spends about 13% of its GDP on transport, while the average European or Asian city spends only between 5% and 8%.[1]
    b) Serious human health impacts due to petrochemical vehicle emissions/smog, including:
        i) Lung cancer,
        ii) Asthma,
        iii) Heart disease,
        iv) Impaired lung development in children living near motorways/exhaust stacks.
    c) Waterways contaminated with road runoff (heavy metals and carcinogens in brake and clutch dust, exhaust particulates etc.).
    d) High traffic crash costs (deaths/traumatic injuries and material damage).
    e) Urban sprawl and increasing commuting distances.

f) Social isolation for non-drivers living in car-dependent suburbs.

g) Increasing numbers of people losing sleep due to traffic noise pollution.

h) Impacts on visual amenity (pollution stacks, concrete interchanges, concrete flyovers).

i) Extreme summer temperatures (urban heat island effect).

j) Community destruction and severance.

k) Destruction of heritage areas/buildings.

l) Irreversible biodiversity loss.

m) Less incidental physical activity from walking and bicycling (including to/from public transport), resulting in higher rates of obesity, diabetes, cancer and heart disease.

n) Increased chauffeuring burdens for parents and carers.

o) Less independence for children.

p) High per-capita greenhouse gas emissions.

2 Non-compliances with SEARs

13) The EIS does not meet a number of the SEARs, as detailed below.

SEAR	**Requirement met?**	**Reasons SEAR not met**
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 taking into account environmental impacts, consideration of tunnel construction methods 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.	No	The EIS does not include cost-benefit analysis, modelling, or any other objective analysis of feasible alternatives.
Consideration of potential	No	The assessment of cumulative impacts does

SEAR	Requirement met?	Reasons SEAR not met
cumulative impacts due to other development in the vicinity; and		not include past/existing developments, in particular existing arterial roads and motorways. Although the economic, social and environmental costs of the proposed M4 East motorway (as reported in an EIS) on its own may be considered by some stakeholders to be acceptable, the cumulative costs of this and previous/existing motorway developments are considerable: 1. Following decades of road expansion and consequential sprawl, Sydney now spends about 13% of its GDP on transport, while the average European or Asian city spends only between 5% and 8%.[1] 2. Serious human health impacts due to petrochemical vehicle emissions/smog, including: a. Lung cancer, b. Asthma, c. Heart disease, d. Impaired lung development in children living near motorways/exhaust stacks. 3. Waterways contaminated with road runoff (heavy metals and carcinogens in brake and clutch dust, exhaust particulates etc.). 4. High traffic crash costs (deaths/traumatic injuries and material damage). 5. Urban sprawl and increasing commuting distances. 6. Social isolation for non-drivers living in car-dependent suburbs. 7. Noise pollution from traffic and its impacts on sleep. 8. Impacts on visual amenity (pollution stacks, concrete interchanges, concrete flyovers). 9. Extreme summer temperatures (urban heat island effect). 10. Community destruction and severance. 11. Destruction of heritage. 12. Irreversible Biodiversity loss. 13. Less incidental physical activity from walking and cycling (including to/from public transport), resulting in higher rates of obesity, diabetes, cancer and heart disease. 14. Increased chauffeuring burdens for

SEAR	Requirement met?	Reasons SEAR not met
		parents and carers. 15. Less independence for children. 16. High per-capita greenhouse gas emissions.
An assessment and modelling of operational traffic and transport impacts on the local and regional road network (including Parramatta Road, Queens Road, Gipps Street, and other arterials), and the Sydney motorway network	No	The EIS authors (AECOM) have failed to model the traffic and transport impacts of implementing the proposed project (M4 East) relative to not implementing the proposed project (the 'future do minimum' scenario). The 'future do something' scenarios, on which the traffic, air quality, health and greenhouse modelling is based, include the M4 East project *plus another uncommitted project* to convert kerbside general traffic lanes on Parramatta Road to bus priority lanes. With these additional bus lanes, the capacity of Parramatta Road would be significantly reduced and traffic volumes would fall accordingly, with drivers opting to use the M4 East tunnel instead. As such, the traffic volumes for the M4 East tunnel have been dramatically overestimated, and the traffic volumes for Parramatta Road have been dramatically underestimated in the 'future do something' scenarios. The impacts of the project as proposed by the proponent (and as defined in Section 5 of the EIS), that is, the M4 East Tunnel with *no* new priority bus lanes on Parramatta Road, has not been presented in the EIS.
		The EIS does not include any objective assessment or modelling of impacts on pedestrians and bicycles using the local and regional road network. Pedestrian and bicycle movements have not been included in the strategic model (WRTM) nor the intersection models (LinSig). There is no forecast of the impacts on walking and bicycling travel times and accessibility. As such the EIS does not provide a complete "assessment and modelling of operational traffic and transport impacts", it provides only an objective assessment of motor vehicle and public transport impacts.

SEAR	Requirement met?	Reasons SEAR not met
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 patronage;	No	Induced demand has not been adequately accounted for because: 1) The model ignores the induced demand caused by long-term transport decisions of individuals and firms, including: a) Residential location choice – the project will encourage more people to move further from work (sprawl), thereby increasing average travel distances/demand. b) Work location choice – the project will encourage more people to work further from home, thereby increasing average travel distances/demand. c) Car ownership choice – the project will encourage more car ownership and use. d) Firm location choice – the project will encourage firms to locate in locations further away from their labour supply/customers/suppliers than they otherwise would, thereby increasing travel distances/demand. 2) To my knowledge, there has been no long-term evaluation/verification of the methodology used to forecast induced demand (New Zealand Transport Agency Economic Evaluation Manual (EEM)). Induced demand by its nature materialises over several years, as people gradually move home/work location etc. Without a long-term evaluation/verification of the methodology, there can be no confidence in the induced demand forecast produced.
Impacts on cyclists and pedestrian access and safety and consideration of opportunities to integrate cycleway and pedestrian elements with surrounding networks.	No	The EIS does not include any objective assessment or modelling of impacts on pedestrians and bicycles using the local and regional road network. Pedestrian and bicycle movements have not been included in the strategic transport model (WRTM) nor the intersection models (LinSig). There is no forecast of the impacts on walking and bicycling travel times and accessibility.

SEAR	Requirement met?	Reasons SEAR not met
An assessment of construction and operational activities that have the potential to impact on in-tunnel, local and regional air quality. The air quality impact assessment must provide an assessment of the risk associated with potential discharges of fugitive and point source emissions on sensitive receivers	No	An accurate assessment of air quality impacts is dependent on an accurate assessment of traffic and transport impacts. Because the traffic and transport impacts have not been correctly modelled, the air quality impact assessment is worthless.
An assessment of human health impacts	No	An accurate assessment of human health is dependent on an accurate assessment of traffic and transport impacts. Because the traffic and transport impacts have not been correctly modelled, the human health impact assessment is worthless.
An assessment of the noise impacts of the project during operation	No	An accurate assessment of noise impacts is dependent on an accurate assessment of traffic and transport impacts. Because the traffic and transport impacts have not been correctly modelled, the noise impact assessment is worthless.

3 Objectives not met

14) The stated objectives for the project were contrived to fit the project after it had already been announced. In a democratic strategic planning process, objectives are set first based on the needs and desires of the community, and then alternative projects/policies are appraised against their ability to meet those objectives.

15) The objectives have no associated targets by which their achievement can be ever be determined. E.g., how can it ever be determined if the objective to "maintain regional air quality" has been met? Objectives/targets need to be:

    a) Specific
    b) Measurable
    c) Achievable
    d) Relevant
    e) Time-bound

16) Even though the objectives have been contrived to fit the project, the project still does not meet them, as detailed below.

Objective	Objective met by proposed project?	Reasons objective not met
Support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways (Sydney Airport and Port Botany), Western Sydney and places of business across the city	No	17) According to the 2013 WestConnex Business Case Summary, there will be only a $3.4 billion productivity benefit, while the scheme will cost more than $15.4 billion. 18) There is already an extensive and high–capacity road and motorway network linking Sydney's international gateways (Sydney Airport and Port Botany), Western Sydney and places of business across the city. The operation of this network could be improved significantly with demand management such as road pricing reform. There is no need for costly and destructive new motorways. 19) The most efficient and economic way to link large trip generators is with mass transit. A single motorway lane can transport only 2000 passengers per hour, under ideal conditions. A single railway line can transport 20,000 passengers per hour.

Objective	Objective met by proposed project?	Reasons objective not met
Relieve road congestion so as to improve the speed, reliability and safety of travel in the M4 corridor, including parallel arterial roads	No	20) There is no evidence that increasing road capacity and building urban motorways can relieve road congestion in the long term, because the added capacity simply induces more demand. 21) As travel speeds increase, so do travel distances, i.e., increasing the speed of the road network encourages urban sprawl. Perversely, this sprawl has the effect of reducing the population's accessibility to employment, education and services, and increasing transport costs (because people have to travel longer distances). 22) Road congestion is inevitable in any large city, in the absence of adequate demand management. There can never be enough road capacity to satisfy the latent demand for driving, where everyone can live as far from work as they like, and drive whenever they like, to wherever they like in free flowing traffic. It is geometrically impossible. 23) Congestion on Sydney's roads is the main thing keeping private vehicle travel demand in check. If this congestion is relieved temporarily by increasing the road supply, then demand will increase until a new equilibrium between supply and demand is reached (i.e., congestion will return to its previous level). 24) A better objective would be to give as many people as possible a reasonable alternative to sitting in traffic. How many people would really prefer to spend hours each week crawling along a dark tunnel inhaling truck fumes, than sitting in a modern train that takes them swiftly to their destination, where they can use the time to relax, read, work etc.?
Cater for the diverse travel demands along these corridors that are best met by road infrastructure	No	25) There is already more than sufficient capacity along these corridors to cater for all the essential vehicle travel.

Objective	Objective met by proposed project?	Reasons objective not met
Create opportunities for urban revitalisation, improved liveability, and public and active transport improvements along and around Parramatta Road	No	26) Traffic volumes on Parramatta Road will be higher with the proposed project than without it. (The only reason the Traffic and Transport Assessment in the EIS is able to forecast lower traffic volumes is because it assumes new kerbside bus lanes will be implemented on Parramatta Road, in which case the number of general traffic lanes would be reduced. However, these bus lanes are neither part of the proposed project, nor the broader WestConnex scheme.) 27) A six-lane highway with high traffic volumes (and associated noise, air pollution and traffic danger) is not a basis for urban revitalisation, improved liveability, and public and active transport improvements.
Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure	No	28) This objective could be more easily and more economically achieved by improving the operation of the existing road network with demand management, e.g., road pricing reform. 29) It has to be questioned whether a highly populated inner city area is the optimal location for some commercial and freight generating land uses. Could some of them be relocated to less populated areas, where the transport costs and externalities are lower?
Enhance movements across the Parramatta Road corridor which are currently restricted	No	30) The project will result in increased traffic volumes on Parramatta Road and nearby roads, which will further hinder movement across Parramatta Road.

Objective	Objective met by proposed project?	Reasons objective not met
Fit within the financial capacity of the State and Federal Governments, in partnership with the private sector	No	31) The project has a high financial risk. The traffic forecasts for the M4 East tunnel assume a reduction in the number of general traffic lanes on Parramatta Road (which will force traffic into the tunnel). However, the state government has not proposed or committed to reducing the number of traffic lanes. Furthermore, AECOM has a history of providing over-optimistic traffic forecasts for toll roads, resulting in past financial failures (e.g., Clem7).
Optimise user pays contributions to support funding in a way that is affordable and equitable	No	32) More than 99% of the NSW population will not use the project each day, but they will still have to pay for it through general taxation. 33) Many of the potential users will be from low-income households who cannot afford to live near employment centres or railway stations. They will have to pay high tolls while higher-income households have access to cheaper roads and public transport. This is hardly equitable.
Integrate with the preceding and proposed future stages of WestConnex, without creating significant impacts on the surrounding environment or duplicating any potential issues across the construction periods	No	34) There will be significant impacts on the surrounding environment. 35) There is a high risk that future stages of the WestConnex scheme will never go ahead, due to the likely financial failure of the preceding stages.
Manage tunnel ventilation emissions to ensure local air quality meets EPA standards	No	36) The emissions from the exhaust stacks and tunnel portals will not be filtered. 37) Local air quality near the project is already poor, with air toxin levels regularly exceeding standards. Even when they do not exceed standards, they still cause health problems. There is no safe level of air pollution. 38) The project will result in poorer local air quality. The air quality modelling in the EIS is unreliable because it is based on flawed traffic modelling.

Objective	Objective met by proposed project?	Reasons objective not met
Maintain regional air quality	No	39) Regional air quality in Sydney is already poor, with air toxin levels regularly exceeding standards. Even when they do not exceed standards, they still cause health problems. There is no safe level of air pollution. 40) The project will result in poorer regional air quality. The air quality modelling in the EIS is unreliable because it is based on flawed traffic modelling.
Minimise adverse impacts at a local level on air and noise quality	No	41) The overall increase in VKT and increased traffic volumes on surface streets will result in poorer air quality and more noise pollution.
Manage in-tunnel air quality to meet community visibility and health expectations	No	42) The in-tunnel air quality will be poorer than that for surface roads. People using the tunnels on a regular basis will have a higher risk of lung cancer, asthma, heart disease and other diseases. The health of children being driven through the tunnels is a particular concern.
Minimise energy use during construction and operation	No	43) Roads are one of most energy-intensive ways of moving people and freight. Road construction is also energy-intensive. 44) The project will encourage longer travel distances (sprawl), which will result in increased transport energy use. 45) The project will encourage travellers to switch from energy-efficient public transport to energy-inefficient private vehicles. 46) Transport energy use could be better minimised by: a) Providing for energy-efficient transport modes (public transport, walking, bicycling). b) Land use planning that places homes closer to employment and other destinations.
Manage noise impacts in accordance with the NSW Road Noise Policy and realise opportunities to reduce or mitigate noise	No	47) Traffic volumes on surface roads will increase, resulting in increased noise pollution.

Objective	Objective met by proposed project?	Reasons objective not met
Provide for improvement of social and visual amenity	No	48) The project will reduce social and visual amenity. a) The concrete interchanges and pollution stacks will be visually obtrusive. b) The increased traffic volumes on surface roads will result in lower amenity (more noise pollution, more fear and intimation, increased crash risk etc.). c) The increase in petrochemical exhaust emissions from the tunnel portals, pollution stacks and surface roads will result in increased smog and reduced visibility and air quality.
Minimise impacts on natural systems including biodiversity	No	49) The project will cause irreversible biodiversity loss. 50) The project will contribute to climate change through increased greenhouse gas emissions. This will result in further biodiversity loss and damage to natural systems.
Minimise impact on Aboriginal and non-Aboriginal cultural heritage	No	51) The project will destroy heritage areas of Sydney, e.g., Haberfield.
Minimal impact on surface and groundwater sources and water quality including management of contaminated areas	No	52) The project will result in increased VKT, and therefore more contaminants (brake and clutch dust, hydrocarbon particulates etc.) being deposited on roadways and washed into waterways.
Reduce susceptibility to, and minimise impacts of, flooding	No	53) The project will contribute to climate change through increased greenhouse gas emissions. This will increase the risk of flooding and other extreme weather events, not just in Sydney, but worldwide.

Objective	Objective met by proposed project?	Reasons objective not met
Integrate sustainability considerations throughout the design, construction and operation of the project, including consideration of the Infrastructure Sustainability Council of Australia (ISCA) Sustainability Rating tool scorecard.	No	54) The project is not a sustainable development. a) Not economically sustainable. The costs far outweigh the productivity benefits. b) Not socially sustainable. It will destroy and sever communities, and result in poorer public health, more car dependency, more transport inequity, and more social isolation. c) Not environmentally sustainable. It will result in higher greenhouse gas emissions and irreversible biodiversity loss.

4 Issues with the Traffic and Transport Assessment (Appendix G)

4.1 General comments

55) The Traffic and Transport Assessment does not stand up to scrutiny. There is not enough information about the methodology, input data or assumptions for the forecasts to be independently verified.

56) There is no sensitivity analysis in the Traffic and Transport Assessment. The effects of varying key assumptions (e.g., willingness to pay the M4 East toll) have not been described.

57) Travel time and accessibility impacts for non-motorised modes (walk and bicycle) have not been modelled or objectively assessed.

58) Impacts of disruptive technologies on future driving demand have not been not considered (e.g., automated vehicles).

59) Inter-generational changes in vehicle ownership, driver licensing and transport preferences have not been considered.

60) Changes in aggregate transport measures have not been provided for the various scenarios, e.g.,:

a) Overall increase in VKT.

b) Change in average trip distance.

4.2 Comments on specific sections

4.2.1 Section 1.4 Purpose of this report

61) One of the stated purposes of the report is to "Complete a holistic traffic and transport assessment including crash analysis, travel speeds and travel time analysis and opportunities to enhance public and active transport networks within the project area". However, the report does not include a crash analysis for active transport, nor an assessment of the impacts on active transport travel speeds and travel times.

62) Another purpose is to "Recommend a suite of measures to mitigate and manage traffic and transport impacts of the project for construction and operational scenarios". The general consensus among transport experts is that the most effective way to manage traffic demand is through demand management, e.g., road pricing reform. However, the report does not recommend any demand measurement measures.

4.2.2 Section 3 Strategic context

63) The stated justification for the project is based on the discredited 'predict and provide' approach to transport planning, whereby it is assumed that transport demand will continue to grow, and that capacity must be increased to accommodate it. In practice, transport demand in cities is limited by capacity: as capacity increases, so does demand (induced demand). It is geometrically impossible to provide enough roadway capacity to accommodate all the latent demand for driving (i.e., where everyone can live and work where they want, and make all the driving trips they want, when they want, to wherever they want in free-flow traffic) in a city of Sydney's population.

64) Furthermore, the most efficient way to accommodate the transport and accessibility needs of a growing population is through *mass transit* and better land use-transport integration. Urban motorways are a very inefficient way of moving people around. A single traffic lane can transport a maximum of only 2000 people per hour (in ideal conditions); a single railway line can transport 20,000 people per hour.

65) The statement "It is acknowledged that any investment in motorway infrastructure has to be aligned with supporting public and active transport initiatives to achieve an increase in capacity, while aiming to reduce the reliance and demand of private vehicles on the future road network" is contradictory: increasing motorway capacity will only serve to *increase* private vehicle demand.

4.2.3 Section 4 Assessment methodology

66) There is not enough information about the modelling methodology for it to be replicated and the outputs independently verified.
67) The transport model (WRTM) has not been made available for independent verification.
68) The model input data and assumptions have not been made available for independent verification.
    a) What toll prices have been assumed?
69) The model coverage area is too small to capture all the transport impacts of the project. The project will affect transport demand and behaviour across the whole metropolitan area.
70) Insufficient detail on the Value of Travel Time Saving (VTTS)/Willingness to Pay (WTP) model:
    a) What are the form and parameters of the model?
    b) If it was based on stated preference surveys, then how has the issue of hypothetical bias been addressed?
    c) Has the model been validated? Previous toll choice models in Australia have overestimated WTP for toll roads.
    d) Does the model include the negative utility of the tunnel environment (monotony, no natural light, poor air quality)?
    e) What value of WTP has been used in the WRTM?
    f) What is the confidence interval around the WTP value used?
71) Why has the weekend period not been modelled, when current weekend traffic volumes are higher than weekday traffic volumes on many corridors?
72) Insufficient information about the travel zone structure in the WRTM:
    a) What are the travel zones based on? How big are they?
    b) How are intra-zonal trips modelled?
    c) How are trips to/from external zones modelled?
73) It is stated that "An additional 'do something' scenario incorporating the project and the New M5 was strategically assessed to determine the potential impacts on traffic volumes and patterns within the study area (inclusive of the King Georges Road Interchange Upgrade and the M4 Widening projects). The results indicated no significant difference in volumes within the study area as a result of the New M5. No further analysis was therefore undertaken." I find it hard to believe that the building of a new motorway (the new M5) will not affect traffic volumes. I would like to see the inputs and outputs for this 'M4 East plus New M5' scenario.
74) Induced demand has not been adequately addressed:

a) The model ignores the impact of the project on the long-term transport decisions of individuals and firms, including:
    (1) Residential location choice – the project will encourage more people to move further from work (sprawl), thereby increasing average travel distances/demand.
    (2) Work location choice – the project will encourage more people to work further from home, thereby increasing average travel distances/demand.
    (3) Car ownership choice – the project will encourage more car ownership and use.
    (4) Firm location choice – the project will encourage firms to locate in locations further away from their labour supply/customers/suppliers than they otherwise would, thereby increasing travel distances/demand.
b) To my knowledge, there has been no long-term evaluation/verification of the methodology used to forecast induced demand (New Zealand Transport Agency Economic Evaluation Manual (EEM)). Induced demand by its nature materialises over several years, as people gradually move home/work location etc. Without a long-term evaluation/verification of the methodology, there can be no confidence in the induced demand forecast produced.

75) Insufficient detail on origin-destination demand matrix generation:
    a) What are the form and parameters of the generalised cost function?
    b) How were shortest paths calculated?
76) Insufficient detail on trip generation:
    a) What are the form and parameters of the trip production function, and how was it estimated?
    b) What are the form and parameters of the trip attraction function, and how was it estimated?
    c) How were trip productions and trip attractions balanced?
77) Insufficient detail on trip distribution/modal split:
    a) What are the form and parameters of the gravity model used?
    b) What are the form and parameters of the deterrence function used?
    c) How has modal split been estimated?
78) Insufficient detail on road traffic assignment:
    a) Is assignment stochastic or deterministic?
    b) What link loading/flow function was used? What parameters were chosen?
    c) Were intersection delays included?
79) Insufficient detail on public transport assignment:
    a) How were access and egress points determined?

b) How were route strategies determined?

80) Non-motorised trips were not included in the WRTM or LinSig modelling.

81) Impacts on accessibility have not been modelled/assessed.

a) Most transport is not an end in itself - it is a means to access work, education, services etc. How does the project affect accessibility?

82) Equity and equality impacts not described.

a) How many people have better accessibility with the project?

b) How many people have poorer accessibility with the project?

c) Do benefits/impacts accrue to any population groups more than others, e.g., people with a disability or on low incomes?

83) Downs-Thomson Paradox not considered:

a) The project will attract passengers away from public transport to driving. As such, public transport patronage will be lower than it would be without the project. This could result in public transport service levels being cut, which will encourage further mode shift from public transport to road.

84) No sensitivity analysis.

a) Given the numerous assumptions and approximations in the model, there needs to be some sensitivity analysis, e.g.,

i) How will traffic volumes be affected if (when) the WTP for the toll turns out to be higher than the point estimate used?

4.2.4 Section 7 Assessment of construction impacts

85) Impacts on walking/bicycle demand and travel times have not been modelled.

86) Does the LinSig intersection modelling take into account the impact that changes in intersection LOS will have on travel demand?

4.2.5 Section 8 Future year traffic volumes and patterns

87) An assessment of the impacts on walking and bicycle demand and travel times have not been provided.

88) Does the LinSig intersection modelling take into account the impact that changes in intersection LOS will have on travel demand?

4.2.6 Section 8 Future conditions without the project

89) An assessment of the impacts on walking and bicycle demand and travel times have not been provided.

90) Does the LinSig intersection modelling take into account the impact that changes in intersection LOS will have on travel demand?

4.2.7 Section 9 Assessment of operational impacts

91) An assessment of the impacts on walking and bicycle demand and travel times have not been provided.

5 References

1. Newman P, Kenworthy J. Costs of automobile dependence: global survey of cities. *Transp. Res. Rec. J. Transp. Res. Board* 1999;1670(1):17-26. doi:10.3141/1670-04.