Submission No 10

INQUIRY INTO IMPACT OF THE ROZELLE INTERCHANGE

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Inquiry into the impact of the Rozelle Interchange

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Dr Christopher Standen a research fellow in urban development at UNSW Sydney. His research and expertise span travel behaviour, transport modelling and transport economics, as well as the health and environmental impacts of transport. Previously, he had various roles in government and industry. More information is available at the webpage below. This personal submission addresses some of the terms of reference.

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One-page summary

- The **traffic model** developed for WestConnex and the Rozelle Interchange **was not sufficiently sophisticated** to forecast with any accuracy or comprehensiveness the traffic impacts of such a major change to Sydney's transport system.
- The traffic modellers mistakenly classified Parramatta Rd as having four general traffic lanes when it actually has six. This means **the model underestimated the volume of traffic approaching the Rozelle Interchange** from the Parramatta Rd and City West Link corridor during the AM peak.
- Because the traffic modelling forecasts were wrong, the **forecast environmental and health impacts**, and the **economic benefits** and **benefit-cost ratio** presented in the business case (which were all based on the traffic modelling forecasts), were also **wrong**.
- The Rozelle Interchange has **increased bus journey times** along the Victoria Rd corridor. This impact was predicted in the environmental impact statement (EIS).
- The Rozelle Interchange has significantly **restricted Rozelle area residents' ability to access work, education, services and other destinations** by car or bus. Most affected are residents with limited capacity to change their travel choices. For example, teachers and nurses who cannot work from home or start work later.
- The NSW Government and Inner West Council have known since the EIS was published (2017) that the Interchange would limit car and bus access for Rozelle area residents. However, they **did little during this time to provide residents with other access/mobility options**. A high-capacity, frequent, rapid bus transit line along the Vicotria Rd corridor and Anzac Bridge to the CBD would have been relatively inexpensive.
- The Rozelle Interchange has caused **increased rat running** on local, residential streets. While this impact was not forecast by the traffic model (because the model did not include local streets), it was foreseeable. Inner West Council could have implemented measures such as modal filters to limit rat running before the Interchange opened.
- The increased congestion and traffic queues observed after the opening of the Interchange would be expected, based on experience and evidence, to return to tolerable levels over time. This is because people and business change their travel and location choices to avoid congestion. In other words, **the congestion will "fix" itself**. If further reductions in congestion are desired, proven measures include congestion pricing and (counterintuitively) reducing road capacity.
- However, there is much that Transport for NSW could so to improve bus journey times and reliability along the Vicotria Rd corridor. **Additional bus priority measures** would provide benefits far outweighing the costs. Traffic signals in NSW are already equipped with technology that can predict when a bus will arrive and ensure it has a green light when it does so – but it is rarely enabled.
- The cost to taxpayers of WestConnex (including the Rozelle Interchange) exceeds **$27 billion** (not adjusting for inflation). The NSW Government sold WestConnex to the Sydney Transport Partners consortium for **$20 billion** (not adjusting for inflation). The Sydney Transport Partners consortium is expected to earn an estimated **$65 billion** (in today's dollars) from WestConnex tolls over the next 37 years.

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The planning, design and development of the Rozelle Interchange project and its impact on traffic flow, including the prioritisation of traffic from toll roads including WestConnex over local traffic

1) The environmental impact statement (EIS) for WestConnex Stage 3 did show that the Rozelle Interchange would restrict the flow of motorised traffic and buses from Victoria Road and City West Link to Anzac Bridge (through multiple lane merges and traffic signal metering), and that it would give priority to WestConnex traffic.
2) However, the EIS did not fully describe the consequences of this design decision. For example, it described existing (pre-project) traffic volumes (AM peak hour, PM peak hour and average weekday) on Victoria Rd and City West Link (Appendix H, p.63), but it did not describe forecast changes in traffic volumes on these roads in the 'with project' scenarios.

All traffic modelling that was undertaken, including for WestConnex, all surrounding arterial roads and all local roads

3) It should be noted that, in the history of transportation planning, no traffic model has ever been able to predict the short- and long-term traffic impacts of a major road project with any accuracy (1).

4) The traffic model developed for WestConnex and the Rozelle Interchange was rudimentary – and not sufficiently sophisticated to forecast with any accuracy or comprehensiveness the traffic impacts of such a major change to Sydney's transport system. Specifically:

   a) It modelled very few of the changes in individual/household/business travel behaviour and location choice that such a major change to a city's strategic road network would be expected, based on experience and evidence (2,3), to cause. The modelled changes in travel behaviour and location choice are compared to those that would be expected in Table 1 below.

Table 1: Expected vs. modelled changes in travel behaviour and location choice

Expected changes in travel behaviour/location choice	Example(s)	Included in the WestConnex traffic model (as far as can be determined from the documented methodology)?
Change of home location	• A Balmain household moving to Haberfield because the project makes it easier to drive to the CBD from Haberfield than it is to drive to the CBD from Balmain (at least until induced traffic growth results in the WestConnex M4 East reaching capacity).	No
Change of school location	• A Haberfield household moving their child from a local school to a school in the Eastern Suburbs because the project enables them to drive to the Eastern Suburbs in a reasonable time (at least until induced traffic growth makes the journey time unreasonable). • A Balmain household moving their child from a school in the Eastern Suburbs to a local school to avoid the congestion on Victoria Rd caused by the project.	No
Change of work location	• A Balmain resident moving to a job located closer to home to avoid the congestion on Victoria Rd caused by the project. • A Haberfield household moving from a local job to one located in North Sydney, because the project enables them to drive to North Sydney in a reasonable time (at least until induced traffic growth makes the journey time unreasonable).	No
Change of trip frequency	• A Balmain resident reducing the number of times per week they drive to their workplace, and working from home more days instead, to avoid congestion on Victoria Rd caused by the project. • A Haberfield resident increasing the number of times per week they drive to their workplace, and working from home fewer days, because the project makes it easier/faster for them to drive to their office.	No

Expected changes in travel behaviour/location choice	Example(s)	Included in the WestConnex traffic model (as far as can be determined from the documented methodology)?
Change of departure time	• A Balmain resident who previously left for work during the AM peak choosing to leave for work before the AM peak to avoid congestion on Victoria Rd caused by the project. • A Haberfield resident who previously left for work before the AM peak choosing to leave for work during AM peak, because the project enables them to drive to work in an acceptable time during the peak.	No
Change of departure day	• A Balmain resident who previously worked from home on Fridays and drove to their workplace on Tuesdays switching these days around to avoid peak congestion on Tuesdays.	No
Change of destination	• A Balmain resident choosing a local supermarket instead of a more distant one, to avoid congestion on Victoria Rd caused by the project. • A Haberfield resident choosing a distant supermarket instead of a local one, because the project enables them to drive to the distant one in an acceptable time.	Partially
Change of transport mode	• A Balmain resident choosing to travel to work by e-bike instead of car to avoid the congestion on Victoria Rd caused by the project. • An Ashfield resident choosing to travel to work by car instead of train because the project makes driving quicker for them than the train.	Partially (between public transport and car only)
Change of route	• A Lilyfield resident choosing to drive to the CBD via Parramatta Rd instead of City West Link/Anzac Bridge because the project makes the Anzac Bridge option slower.	Partially (modelled network does not include local, residential streets)
Change of business location	• A business moving from a location close to a train station to a (cheaper) location close to a WestConnex interchange. Many of its employees and customers then switch from public transport to car to access the new location.	No

b) When major changes to a transport system are made, the consequential changes in travel behaviour/location choice can occur over months or even years. The traffic model did not consider this lag – it assumed that all change would occur the instant the Interchange opened. This is why it could not predict the significant delays that were observed in the days following the opening of the Interchange.

c) The modelled area included only the CBD, Inner West and Inner South. However, such a momentous change to Sydney's transport system would be expected to change travel and location choices throughout Greater Sydney and beyond.

d) The modelled road network did not include local, residential streets. Therefore, the traffic model was unable to predict the traffic impacts on these streets (rat running).

e) The traffic model consisted of two separate models: (a) a strategic transport model (WRTM), and (b) an operational model (VISSM) for forecasting intersection delay

(level of service). While the strategic model provided inputs for the operational model, there appears to have been no feedback from the operational model to the strategic model (Figure 1). Thus, the traffic model would not have been capable of modelling a scenario where the delay at an intersection becomes so intolerable that it causes some motorists to avoid the intersection, resulting in the traffic volume declining.

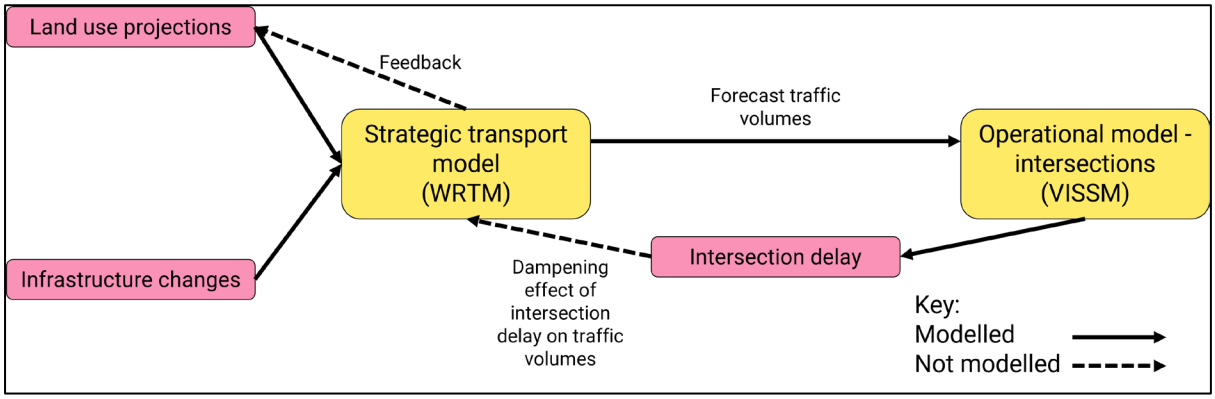

Figure 1: Missing feedback pathways in WestConnex traffic model

5) The above limitations of the traffic model were not acknowledged in the traffic modelling reports in the business cases or EISs. Forecasts were presented without confidence intervals and with no sensitivity analysis.

6) A significant error was made in the traffic model inputs: the modellers mistakenly classified Parramatta Rd between Burwood Road and Haberfield as having two traffic lanes and one bus lane in each direction in the 'with project' scenarios. This section of Parramatta Rd had three general traffic lanes in each direction before the project, and still does today. The WestConnex project made no changes to Parramatta Road's lane configuration, and the traffic volume on Parramatta Rd did not substantially change after any of the WestConnex stages opened (4).

   Parramatta Rd eastbound feeds into the Rozelle Interchange via City West Link. Because of this mistake, the model underestimated the volume of traffic approaching the Rozelle Interchange vis the Parramatta Rd and City West Link corridor during the AM peak.

Figure 2: The WestConnex traffic model assumed Parramatta Rd would have only four general traffic lanes – it clearly has six

(There was a Secretary's Environmental Assessment Requirement placed on the WestConnex M4 East project: for two lanes of Parramatta Rd to be "solely dedicated" for public transport, but no time limit for meeting this requirement was set.)

Questions:
• *Was the reclassification of Parramatta Rd from six to four general traffic lanes in the WestConnex traffic model done intentionally so that the business case and EIS could claim that WestConnex would significantly reduce traffic on Parramatta Rd?* • *What communications were there between NSW Government ministers, Transport for NSW, NSW Planning, consultants, and industry partners (including Transurban) concerning the lane configuration for Parramatta Rd to be used in the WestConnex traffic modelling?*

Design decisions that restricted or compromised traffic flows, including any changes from the original plans or modelling

7) In both the original plans and the final design, the six existing general traffic lanes on Parramatta Rd between Burwood Road and Haberfield were retained.

   In the WestConnex traffic modelling, however, Parramatta Rd was assumed to have only four traffic lanes (see item (6) above). Had Parramatta Rd actually been reduced to four general traffic lanes as part of the project, this would have reduced the traffic flow/volume on the Parramatta Rd/City West Link corridor approaching the Rozelle Interchange.

The planning, design and development of the Rozelle Interchange project and its impact on the efficient and on-time running of buses, ferries and all other public transport

8) As part of the project, the citybound kerbside bus lane on Victoria Road between Terry St and Robert St was converted to an offset bus lane. Offset bus lanes improve bus reliability and efficiency by easing interference caused by buses stopping at bus zones and vehicles turning left.

9) There have been reports in the media of private vehicles using/blocking the offset bus lane, which would undermine its benefits.

10) The citybound Victoria Rd bus lane ends at the City West Link intersection. The bus lane then merges with four general traffic lanes (from Victoria Rd and City West Link) into a single citybound traffic lane on the Anzac Bridge. This bottleneck has been causing significant delays to bus passengers.

11) The traffic modelling in the EIS forecast that citybound bus travel times during the AM peak would increase from 11 minutes to 13 minutes along Victoria Rd between Iron Cove Bridge and Anzac Bridge (Appendix H, p.252). The EIS did not report forecast impacts on bus reliability (on-time running).

12) While Transport for NSW has been reporting journey times by day of the week for private vehicles after the Rozelle interchange opened (see https://www.transport.nsw.gov.au/projects/current-projects/rozelle-interchange), it has not been reporting journey times or reliability by day of the week for buses.

13) Bus journey times and reliability along the Vicotria Rd corridor could be significantly improved with low-cost bus priority measures. Traffic signals in NSW are already equipped with technology that can predict when a bus will arrive and ensure it has a green light when it does so – but it is rarely enabled (see https://www.transport.nsw.gov.au/projects/strategy/transport-technology-strategy/delivering-transport-outcomes-technology/transport-2).

The communication and consultation processes undertaken by Transport for NSW and other relevant stakeholders throughout the lifespan of the Rozelle Interchange Project

14) During the EIS consultation process, numerous submissions highlighted errors in the traffic modelling (see item (6) above); however, the response to submissions did not address these concerns.

The social, environmental and economic impacts of the Rozelle Interchange project on impacted communities

15) The EIS included studies describing the forecast operational impacts of the project on air quality, noise and vibration, human health, and greenhouse gas emissions. These studies were based largely on the traffic forecasts. Because the traffic forecasts were wrong, the forecasts in these other studies would also have been wrong.

16) Reducing urban road capacity has been shown to have numerous social, health, economic and environmental benefits. The temporary increase in driving journey times causes people/businesses to change their travel behaviour and location choices (see Table 1), leading to a reduction in traffic and congestion levels – along with reduced greenhouse gas emissions, air pollution, noise pollution, road danger/trauma, urban sprawl and transport costs (infrastructure, maintenance, vehicle purchase/operation etc.).

17) There have been many examples in Australia and worldwide of road capacity reduction leading to reduced traffic/congestion and associated benefits, for example.

    a) George St pedestrianisation in Sydney CBD (8).

    b) Demolition of the 14-lane Cheonggyecheon highway in central Seoul, North Korea (11).

18) In the case of the Rozelle Interchange, the reduction in road capacity and traffic volume on Victoria Road east of Iron Cove has created an opportunity to revitalise the corridor.

19) However, it needs to be acknowledged that local, state and federal governments have spent the last half century or so striving to make residents of Rozelle and surrounding suburbs dependent on cars for access to work, education, services, etc. through various policy decisions, including:

    a) demolishing the tram network;

    b) not building a rail line (the planned CBD-Rozelle metro was cancelled in 2010 and the target opening date for Metro West is 2032);

    c) not providing adequate bus priority;

    d) not developing a connected, low-stress micromobility network;

    e) giving priority to private motor vehicles over people at intersections;

    f) installing traffic signals and slip lanes;

    g) setting high/unsafe urban speed limits;

    h) building very few mid-block pedestrian crossings;

    i) significantly increasing car parking supply;

    j) car-oriented zoning/development (e.g., large shopping centres/supermarkets with large car parks, instead of shops located close to/in residential neighbourhoods);

    k) encouraging families to enrol children in non-local schools;

    l) road expansion;

m) toll subsidies;

n) generous tax deductions for motor vehicle purchase/lease;

o) low fuel excise (by OECD standards).

Questions:
Having made Rozelle area residents so dependent on cars, was it ethical to then so dramatically, and with little warning, restrict residents' ability to access work, education and other destinations by car? *Could the NSW Government and Inner West Council have done more to provide residents with good-quality transport alternatives (e.g., public transport, active transport/micromobility) prior to restricting car access? (When Transport for NSW shuts down rail services, it organises rail replacement bus services.)*

The impact on foot traffic and active transport options, including due to the closure of Rozelle Parklands

20) Rozelle and the surrounding suburbs are within easy micromobility (bicycle/e-bike/e-scooter) distance of many major work, education and shopping destinations, including Pyrmont (~15 mins), CBD (~25 mins), RPA Hospital and University of Sydney (~20 mins), University of Technology Sydney and Broadway Shopping Centre (~25 mins), and Birkenhead Point Shopping Centre (~10 mins).

    Given this proximity, there is potential for a significant proportion of residents and businesses to use micromobility for everyday transport.

    However, even when micromobility is faster than other transport modes, most people will not choose it if there is not a low-stress, end-to-end route available (and known) to them – i.e., one that is separated from traffic and has a good level of service (minimal delay/conflict) at intersections.

    Rozelle/Balmain and surrounding suburbs did not have a connected, low-stress micromobility network before construction of the Interchange commenced. Construction made things worse, and the situation did not significantly improve after the Interchange and Parklands opened.

    The Interchange has made it more difficult for residents to access destinations by private car or bus, so many would be considering alternative transport modes. But, as long as Inner West Council and Transport for NSW remain reluctant to develop a connected, low-stress micromobility network in the area, the potential for a sizeable proportion of residents to use micromobility for everyday transport cannot be realised.

21) During construction of the Interchange, the Beatrice Bush Bridge was demolished (Figure 2). This relatively new pedestrian/bicycle bridge had previously connected Rozelle Bay and the Glebe Foreshore with the Anzac Bridge pedestrian/bicycle path.

    With the bridge gone, people walking/cycling must now wait for two signalised crossings with long wait times to cross Victoria Rd to/from Rozelle Bay.

Figure 3: Demolition of Beatrice Bush Bridge during construction of the Rozelle Interchange (source: https://www.groveoz.info/)

22) The pedestrian/bicycle bridge over Victoria Rd near Lilyfield Rd was also demolished during construction of the Interchange.

23) The new Rozelle Parkland includes some good-quality pedestrian/bicycle paths. However, connections to the Rozelle Parklands from surrounding areas are largely non-existent or not up to standard (5):

    a) There is no micromobility/bicycle path connecting Rozelle Parkland and the Bay Run via Lilyfield Rd.

    b) People using the Anzac Bridge pedestrian/bicycle path are exposed to elevated levels of noise and air pollution from the adjacent roadway. The gradient is a barrier to cycling for people without access to an e-bike.

    c) The pedestrian/bicycle paths on Victoria Rd and Robert St are narrow, uneven, unshaded, and obstructed by signage, infrastructure, bus shelters and other street furniture. Adjacent to the Victoria Rd path are six lanes of traffic with a 60 km/h speed limit. Users are exposed to elevated levels of air pollution and noise.

24) The Rozelle Parklands and its pedestrian/bicycle paths opened about two weeks after the Rozelle Interchange opened. It was during these first two weeks that traffic disruption was at its highest. Had it been open during this time, the Rozelle Parkland would have provided many residents with a way of avoiding the traffic chaos.

25) The EIS included no modelling of impacts on walking/active transport journey times or intersection delay (level of service).

Question:
• *Transport for NSW and Inner West Council would have known for years before it opened that the Rozelle Interchange would drastically reduce private car and bus access for Rozelle area residents, especially in the first few weeks. Could they have done more in this time to develop a connected micromobility network that would have given residents an alternative means of accessing work, education, services, etc.?*

Solutions to ease the congestion and gridlock that the opening of the Rozelle Interchange has created, including the impact of the Western Harbour Tunnel after opening

26) I am not aware of any gridlock (complete standstill) incidents since the opening of the Rozelle Interchange.

27) Congestion is measured as the difference in total travel time between free-flow conditions and congested conditions. E.g., one lane of traffic handling 10,000 single-occupant vehicles per day with an average congestion delay of 1 minute per vehicle results in 10,000 minutes of congestion per day. Whereas two lanes of traffic each handling 10,000 single-occupant vehicles per day with an average congestion delay of 1 minute per vehicle results in 20,000 minutes of congestion per day.

28) The increased traffic queues and delays observed on Victoria Rd (east of Iron Cove) and City West Link after the opening of the Rozelle Interchange have already begun to ease (4), and will continue to ease naturally as motorists change their travel behaviour and home/work/school location decisions to avoid congestion (see Table 1). Based on experience/evidence (6), the amount of traffic and congestion on these roads will eventually fall to below pre-project levels, if it has not done so already.

    Citybound AM peak delay at the Victoria Rd/Lyons Rd intersection may remain above pre-project levels due to the Iron Cove Link tunnel encouraging more citybound traffic on Gladesville Bridge, with motorists tolerating longer delays at Lyons Rd to access the new, free tunnel.

29) If it is desired to reduce congestion further, there are three proven solutions:

    a) Congestion pricing (7).

    b) Further road capacity reduction (6). As an example, after George St in the CBD was closed to motor vehicle traffic to enable light rail construction (and before the light rail started operating), the level of congestion on George St fell to zero, while overall traffic volume in the CBD fell by 8% (8). As a thought experiment, a city with zero road capacity would have zero road congestion.

    c) Lockdowns (stay-at-home orders) (9).

30) Given sizeable latent demand for driving in Sydney (e.g., the thousands of people who take the train to work but would otherwise drive if it were not for congestion), and the fact that congestion is self-limiting, the amount of traffic and congestion will adjust to the amount of road space. I.e., there will be as much traffic and congestion as we make space for (in the absence of tolls/congestion pricing) (6).

The cost of the Rozelle Interchange and the total cost of WestConnex

31) The cost of WestConnex to the NSW Government and Commonwealth is estimated to be more than $27 billion (see Table 2). This figure does not include administration costs (department staff/resources, consultants, business cases, environmental impact assessments, etc.), nor enabling works on existing roads (e.g., Sydney Park Junction).

Table 2: Reported and estimated government expenditure on WestConnex*

Item	Cost
NSW Government and Commonwealth grants	$5.1 billion
Cost of $2bn Commonwealth concessional loan	$0.64 billion
Property acquisitions	$1.5 billion
New toll concession on existing M4 given to WestConnex (Credit Suisse valuation)	$3.87 billion
New toll concession on existing M5 East given to WestConnex (Credit Suisse valuation)	$2.41 billion
30-year extension of toll concession on M5 Southwest beyond previous end date (2026) (Credit Suisse valuation)	$2.87 billion
Rozelle Interchange construction	$3.9 billion
Sydney Gateway construction	$2.6 billion
Extension of M5 Southwest toll rebate beyond 2026 (10 years)	$1 billion*
Vehicle registration refund scheme for frequent toll road users (2018–2023)	$0.5 billion*
$60 weekly toll cap (10 years)	$3 billion*
Total (not adjusted for inflation)	**$27.39 billion***

32) Consequential costs of WestConnex include the $6.7 billion Western Harbour Tunnel project (this tunnel would not have been seen as needed without WestConnex and the Rozelle Interchange bringing additional traffic to the Anzac Bridge and Western Distributor).

33) The NSW Government sold WestConnex to the Transurban-led Sydney Transport Partners consortium for $20.36 billion (not adjusted for inflation). This is about $7 billion less than the total cost.

34) The Sydney Transport Partners consortium is expected to earn an estimated $65 billion (in today's dollars) from WestConnex tolls over the next 37 years (10).

Questions:

- *How much did the NSW Government spend on the WestConnex business cases and environmental impact assessments, including traffic modelling, environmental modelling, health modelling, consultants and public consultation?*
- *What is the cost to the NSW Government of all surface road enabling works for WestConnex, including Sydney Park Junction, Campbell Rd/St, Campbell Rd bridge and Euston Rd?*

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