

WestConnex Stage 2 EIS – Review of Strategic Alternatives and Socio- economic Impacts

Final Report

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Independent insight.



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EXECUTIVE SUMMARY

First announced in 2012, WestConnex is a suite of projects, including the M4 Widening, the M4 East, the New M5, a M4-M5 Link, a Western Harbour Tunnel, the Southern Gateway (a link to the Illawarra), and the Sydney Gateway (a link to the port and airport). Should all stages of WestConnex be completed it would be the largest continuous motorway in Australia.

The Environmental Impact Statement (EIS) for WestConnex Stage 2 was released on the 27 November 2015. The purpose of the EIS is to identify comprehensive mitigation and management measures that would be implemented to avoid, manage, mitigate, offset and/or monitor impacts during construction and operation of the project.

The WestConnex Stage 2 (New M5) EIS followed the release of the M4 Widening EIS in August 2014, the Stage 1 (M4 East) EIS in September 2015 and the Updated Strategic Business Case in November 2015. These documents and the Strategic Review and Transport Modelling of WestConnex prepared by SGS Economics and Planning and Veitch Lister Consulting comprise the only detailed public information on the potential impacts of WestConnex.

The purpose of this report is to review the Strategic Alternatives and the Social and Economic Impact Assessment chapters of the WestConnex Stage 2 EIS.

Five Strategic Alternatives are identified in the EIS, however, there are a number of significant issues with the information presented, including:

- No detail on how the alternatives were developed
- A lack of sufficient detail on the scope, timing and cost of each alternative
- No integrated solution considered, which combines road, public transport, land use management and demand management projects.

The approach to assessment of these alternatives also lacks rigour as:

- Each alternative is only assessed against WestConnex Stage 2 project objectives rather than by a more rigorous Cost Benefit Analysis or Multi Criteria Analysis
- The project objectives themselves effectively prevent any non-road based solution from being assessed positively.

This assessment of socio-economic impacts is limited by methodological flaws, particularly:

- The mismatch of the Study Areas used by the Social and Economic Impact Assessment and the Traffic and Transport assessment
- The lack of consideration of the city shaping impact of such a project
- The limited timeframe of assessment in the EIS.

This means the full extent of the social and economic impacts has not been considered in the EIS. In addition to issues with the methodology, analysis of the assessment raised the following issues:

- WestConnex Stage 2 does not connect people to areas with jobs growth and high value jobs in Global Sydney, a key priority for the Central Subregion in A Plan for Growing Sydney
- The impact on Sydney Park has not been fully addressed
- The impact on the urban renewal at Green Square and Ashmore has not been adequately addressed
- The impact to congestion in King Street, Newtown has not been adequately addressed.

A number of further issues were also identified in the EIS review including:

- The assumption that all sections of WestConnex would be completed by 2031
- Inconsistent reporting of transport modelling with limited assessment of WestConnex Stage 2 in 2031 as a singular piece of infrastructure rather than as part of the full WestConnex project.
- Induced traffic is incompletely and inflexibly treated, so that impacts on public transport patronage and active transport volumes are not fully examined
- Inconsistencies in technical aspects of the reporting.

The information contained in the EIS does not reduce any of the concerns around the adverse impacts previously raised in the Strategic Review and Transport Modelling of WestConnex prepared by SGS Economics and Planning and Veitch Lister Consulting. That is, WestConnex will not address the transport challenges being faced by Sydney in the future.

1 INTRODUCTION

1.1 About WestConnex Stage 2 – New M5

The WestConnex Stage 2 - New M5 Beverly Hills to St Peters (WestConnex Stage 2) Environmental Impact Statement (EIS) was released on 27 November 2015. WestConnex Stage 2 includes a new, tolled multi-lane road link between the M5 East Motorway at Kingsgrove and St Peters, an interchange at St Peters and connections to the existing road network (see Figure 1).

FIGURE 1 WESTCONNEX STAGES AND INDICATIVE TIMING



Source: WestConnex Delivery Authority, 2014

Note: Figure refers to King Georges Interchange, however, this is not mentioned in the project description and there is assumed to no longer part of stage 2.

Stage 2 of WestConnex is a complex road project. The EIS describes it as including:

- Twin motorway tunnels between the existing M5 East Motorway (between King Georges Road and Bexley Road) and St Peters. Each tunnel would be around nine kilometres in length and would be configured as follows:
 - Between the western portals and Arncliffe, the tunnels would be built to be three lanes wide but marked for two lanes as part of the project. Any change from two lanes to three lanes would be subject to future environmental assessment and approval
 - Between Arncliffe and St Peters, the tunnels would be built to be five lanes wide but marked for two lanes as part of the project. Any change from two lanes to any of three, four or five lanes would be subject to future environmental assessment and approval
- Tunnel stubs to allow for a potential future connection to Stage 3 of the WestConnex program of works (the M4-M5 Link) and a potential future connection to southern Sydney (known as the Southern extension) at Arncliffe

- Surface road widening works along the M5 East Motorway between east of King Georges Road and the new tunnel portal at Kingsgrove
- A new road interchange at St Peters, which would initially provide road connections from the main alignment tunnels to Campbell Road and Euston Road, St Peters and to a new bridge crossing Alexandra Canal and joining to Gardeners Road
- A second new road bridge across Alexandra Canal, linking Campbell Road, St Peters with Gardeners Road and Bourke Road, Mascot
- Closure and remediation of the Alexandria Landfill site, to enable the construction and operation of the new St Peters interchange
- Works to enhance and upgrade local streets and intersections near the St Peters interchange
- Temporary construction facilities and temporary works to facilitate the construction of the project
- Tolling infrastructure for electronic tolling on the existing M5 East Motorway
- Surface road upgrade works within the corridor of the M5 South West Motorway and M5 East Motorway

WestConnex Stage 2 will also interact with a number of other proposed projects, including a new M4 East (WestConnex Stage 1), a M4-M5 Link (WestConnex Stage 3), the Southern Gateway (a link to the Illawarra), the Sydney Gateway (a link to the port and airport), and the Western Harbour Tunnel.

1.2 Project brief

The City of Sydney has commissioned SGS Economics and Planning (SGS) to undertake a peer review of the EIS and its:

- Strategic alternatives to WestConnex
 - The extent to which alternatives to WestConnex have been adequately explored within the EIS.
 - Critical analysis of the alternatives identified within the EIS.
 - Identification of further alternatives that may exist.
- Socio-economic impacts, local, regional and metropolitan
 - Economic impacts on the Sydney CBD.
- Other related issues that may be identified.

The Project Brief also called for the review to consider the program of road building proposed by the Government and the impacts of interim stages in the long term, for example:

- New M5 (Stage 2) complete, no further extension (M4-M5 link, Sydney Gateway)
- New M5 (Stage 2) and M4-M5 link (Stage 3), no further extension (Sydney Gateway).

This review focuses on the southern parts of the City of Sydney LGA, including Sydney Park, urban renewal areas of Ashmore and Green Square, King Street (Newtown) and the Sydney CBD.

1.3 Secretary's Environmental Assessment Requirements (SEARs)

The EIS is prepared as per the provisions made for environmental assessment of State Significant Infrastructure projects under Part 5.1 of the *Environmental Planning and Assessment Act 1979*. The Act stipulates that the EIS be prepared to provide assessment of all potential environmental issues identified during the planning and assessment of the project. The public exhibition of the EIS commenced on the 27 November 2015 and ends 29 January 2016.

The intent of an Environmental Impact Assessment (EIA) is to collect, assess and account for the potential environmental effects of a development proposal to enable the Department to decide whether it should be approved.

For State significant infrastructure, Part 5.1 of the *Environmental Planning and Assessment Act 1979* No 203 (the Act) notes that ‘When an application is made for the Minister’s approval for State significant infrastructure, the Secretary is to prepare environmental assessment requirements in respect of the infrastructure’ (Section 115Y of the Act).

The EIS identifies that WestConnex Stage 2 is of state significance. The Secretary’s Environmental Assessment Requirements (SEARs) issued on 26 August 2015 outline the general requirements of the EIS and a range of key issues which the EIS must address. In broad terms an EIS must include:

- A description of the project
- The main effect(s) the proposal is likely to have on the environment
- A description of measures envisaged to avoid, reduce or remedy significant environmental effects, and
- An outline of the main alternatives studied by the proponent.

The SEARs provide for a range of requirements. Pertinent to the focus of this peer review, the following requirements for the EIS are noted:

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

- *an analysis of alternatives/options considered, having regard to the proposal objectives (including an assessment of the environmental costs and benefits of the proposal relative to alternatives and the consequences of not carrying out the proposal), and whether or not the proposal is in the public interest.*

Land Use, Social and Economic — including, but not limited to:

- *a description of the existing socio-economic environment;*
- *impacts on directly affected properties and land uses, including impacts related to access, land use, settlement and subsidence associated with tunnel excavation, property acquisition (including relocations and expenses for those properties acquired) and amenity related changes;*
- *social and economic impacts to businesses and the community within the vicinity of the proposal, with associated property acquisition, traffic, access, property, public domain and open space, and amenity and health related changes (including the broader regional impacts associated with the closure of the Alexandria landfill site should this be part of the proposal);*
- *opportunities for local centre and street revitalisation near the St Peters interchange.*

Source: Revised Secretary’s Environmental Assessment Requirements¹

The Stage 2 EIS is one of a number of EIS documents produced to date to obtain approval for the overall WestConnex project. The M4 Widening EIS was released 13 August 2014. The New M5 King Georges Road Interchange Upgrade EIS was released 22 October 2014. The Stage 1 (M4 East) EIS was released 1 September 2015. No date has been announced for the release of EIS documentation for subsequent stages. The Updated Strategic Business Case for WestConnex was released 20 November 2015 and relates to Stages 1, 2 and 3 of the project, providing justification for the project.

1.4 Report Purpose and Outline

The focus of this review is on the strategic alternatives and socio-economic impacts described in the WestConnex Stage 2 EIS specifically. Where relevant, the overall project planning process is referred to but it is not the purpose of this review to examine the project as a whole. SGS has previously undertaken a Strategic Review of the WestConnex Proposal² and the M4 East EIS³ for the City of Sydney.

¹ Issued 26 August 2015 and available at:

<https://majorprojects.affinitylive.com/public/c7a3ea21009138a018a0542800cf1f22/WestConnex%20New%20M5%20-%20Revised%20SEARs.pdf>

² http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0008/227690/140511-Final-Report_150409.pdf

³ http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0008/245780/Report-150344-M4-East-EIS-Review-Final-Report.pdf

This review is structured as follows:

- Section 2 analyses the Strategic Alternatives presented and assessed in the EIS
- Section 3 examines the Socio-Economic Impacts described
- Section 4 presents other issues identified through the review.

2 STRATEGIC ALTERNATIVES TO WESTCONNEX STAGE 2

2.1 Introduction

The Secretary's Environmental Assessment Requirements (SEARs) for WestConnex Stage 2 include the following requirement for the assessment of Strategic Alternatives:

- An analysis of alternatives / options considered, having regards to the proposal objectives (including an assessment of the environmental costs and benefits of the proposal relative to the alternatives and the consequences of not carrying out the proposal), and whether or not the proposal is in the public interest (EIS, p. 4-1).

This chapter examines the Strategic Alternatives presented in the EIS and provides:

- An assessment of the extent to which alternatives to WestConnex have been adequately explored within the EIS.
- A critical analysis of the alternatives identified within the EIS.
- Identification of further alternatives that may exist.

2.2 Strategic Alternatives identified in the EIS

The Strategic Alternatives identified in the EIS are as follows:

- Alternative 1 – The base case or 'do nothing / do minimum'
- Alternative 2 – Optimising the performance of existing infrastructure
- Alternative 3 – Investment only in public transport and rail freight improvements
- Alternative 4 – Demand management
- Alternative 5 – Construction of the New M5 as part of the WestConnex program of works.

These are described further in the following table.

TABLE 1 STRATEGIC ALTERNATIVES TO WESTCONNEX STAGE 2 PRESENTED IN THE EIS

Strategic Alternative	Summary
1. Do nothing	The M5 East Motorway would retain its existing arrangement with only minor improvements provided over time to improve capacity in addition to ongoing maintenance activities.
2. Optimising existing infrastructure	Could potentially include undertaking improvements to the existing arterial network and to the existing M5 East Motorway by widening the surface sections of the motorway and/or providing additional capacity within the existing tunnels.
3. Public transport and rail freight improvements	Public transport improvements are focused on passenger rail and buses. Opportunities for rail upgrades are identified as those in the <i>State Infrastructure Strategy</i> and the <i>State Infrastructure Strategy Update</i> and include:

	<ul style="list-style-type: none"> Progressing Stage 2 of Sydney's Rail Future including introducing simpler timetables and automatic train operations, transition to dedicated fleet types for some lines, enhancing track infrastructure, redesign of platforms and completion of the South West Rail Link, station upgrades and the Rail Clearways Program Progressing the planning and development of the Sydney rapid transit network (now Sydney Metro). <p>Bus improvements include the opportunities identified in <i>Sydney's Bus Future</i> and the <i>State Infrastructure Strategy</i>⁴. <i>Sydney's Bus Future</i> proposes the redesign of Sydney's bus network by providing rapid service routes to connect major centres along transport routes with mass transit demand. Suburban and local service routes would build on the foundation of the rapid routes to improve access to local, neighbourhood destinations. The <i>State Infrastructure Strategy</i> includes the Bus Priority Infrastructure Program which is a rolling program of infrastructure and traffic management works to improve network reliability and travel speeds.</p> <p>Rail freight improvements are those outlined in the <i>Long Term Transport Master Plan</i> and include:</p> <ul style="list-style-type: none"> Road upgrades and improved rail operations at Port Botany Development of intermodal terminals at Enfield and Moorebank Completion of the Southern Sydney Freight Line A Western Sydney Freight Line and terminal project.
4. Demand management	<p>Demand management initiatives include:</p> <ul style="list-style-type: none"> Land use planning policies which promote urban consolidation and the establishment of town centres to reduce the need for travel Policies restricting parking provision in new developments to encourage alternative modes of transport Intelligent transport systems to improve public transport operation, management of clearways and transit lanes and to provide greater priority over general traffic Pricing transport operations to reduce travel demand such as demand based tolling or transport pricing to discourage discretionary travel by private vehicles for trips that can be catered by public transport.
5. Construction of new M5	A new, tolled multilane road link between the existing M5 East Motorway, east of King Georges Road, and St Peters.

Source: EIS p. 4-8.

The following sub sections focus on how the Strategic Alternatives were developed, and the manner in which they are assessed in the EIS.

2.3 Development of Strategic Alternatives

There is a lack of detail presented on Strategic Alternatives

The level of detail presented on the Strategic Alternatives varies and is generally at a high level. Whilst options to alleviate congestion along the M5 were first considered back in 2009 as part of the *M5 Transport Corridor Feasibility Study* very little detail on each alternative is presented in this EIS. This lack of detail prevents a rigorous assessment of the Alternatives. The alternatives are also presented as mutually exclusive options and do not take an integrated approach. That is, a combined package of road improvements, demand management, public transport and road investments as a solution to the challenges within the WestConnex Stage 2 corridor is not considered.

⁴ It is unclear from the EIS whether this refers to the State Infrastructure Strategy or the State Infrastructure Strategy Update.

Alternative 1 – The base case or ‘do nothing / do minimum’

There is no detail on the scope of the works that constitute the ‘minor improvements’ such as:

- The nature of the works proposed
- The location of the works
- The timeframe or trigger points for undertaking the upgrades
- How much capacity these works would add to the corridor
- There is also no information on the cost of undertaking these improvements.

Alternative 2 – Optimising the performance of existing infrastructure

Again, there is very limited detail on the scope and impact of the works that constitute this alternative. The description states that improvements to the surrounding arterial road network would potentially relieve road congestion in the short term but provides no detail on the type of work proposed, the location of these improvements and by how much these works would reduce congestion and over what time period.

There is more detail on the scope of works involved to improve the existing M5 East Motorway. Surface road works involve widening the road way but this would have limited impact on the speed and reliability of the M5 Motorway. Tunnel works could include either widening the outer sides of the tunnels to provide an additional lane or excavating the existing tunnel ceilings to provide a double decker arrangement. The EIS concludes that this would increase the capacity of the tunnels and reduce congestion in the tunnels and provide some capacity within the tunnels to cater for the future growth in transport demand. These works, however, “would be costly and highly disruptive to existing traffic during construction” (p. 4-10). Despite this description significant gaps still remain in the information provided including:

- By how much the existing M5 East Motorway would be widened and the impact this would have on capacity
- The extent to which tunnel works would reduce congestion and whether this reduction would meet the project requirements
- The cost of surface road and tunnel works, the timeframe of the construction period and what this means for the surrounding road network.

Alternative 3 – Investment only in public transport and rail freight improvements

Alternative 3 is not a strategic alternative as it just identifies initiatives already detailed in existing planning documents. No new projects, or changes to timing are identified to address the issues seeking to be solved. What is provided is a list of initiatives that constitute Stage 2 of *Sydney’s Rail Future* and a statement that this alternative also includes the opportunity to progress the planning and development of the Sydney bus rapid transit network. Beyond these statements, detail is limited. For example there is no information on:

- The scope and location of works:
 - For the rail network this includes for which rail routes simpler timetables would be introduced, which stations would be upgraded and the scope of other work that constitutes the Rail Clearways Program
 - For the bus network this includes where rapid service routes will be provided and which centres they will connect, the changes to suburban and local service routes, or the scope and location of infrastructure and traffic management works
 - For the rail freight network this includes detail on what constitutes “road upgrades and improved rail operations” at Port Botany, what the development of intermodal terminals at Enfield and Moorebank and the completion of the Southern Sydney Freight Line means for both shifting freight to rail and what the resulting demand for road transport from Port Botany and therefore the impact on surrounding roads
- The timeframe of works
- How these works would affect mode shares of different transport options and therefore what this alternative means for capacity and congestion on the road network
- The cost of undertaking this work.

Alternative 4 – Demand management

The EIS lists measures including land use planning policies, parking restrictions in new development, intelligent transport systems and pricing transport options. Again, detail is limited with no information provided on:

- where these measures would be implemented
- when these measures would be implemented
- what the impact on road use or congestion would be
- whether each measure was assessed in isolation or in combination
- the cost of implementing these measures.

Alternative 5 – Construction of the New M5 as part of the WestConnex program of works

Alternative 5 is the preferred alternative which is assessed in the EIS. Chapter 4.2, which details the Strategic Alternatives, has no information on the scope of works that make up the New M5. This chapter discusses this alternative only as a key component of strategic planning and transport documents and as forming part of a broader integrated transport solution. Subsequent sections of Chapter 4 detail the motorway options considered including duplication of the M5 East, a Southern alignment option, Central alignment option, and a Northern alignment option.

The Strategic Alternatives do not consider an integrated option

The process for how Strategic Alternatives were formulated is not explained in the EIS. History around WestConnex's inception and evolution as a project is detailed prior to the presentation of the Alternatives. An objectives-led, first principles approach to development of options is absent. This contributes to existing uncertainty that WestConnex is the best transport solution to meet the needs of a growing Sydney.

At the same time, it is noted that the focus of an EIS is on managing the impact of a project, rather than questioning its merits. To this extent, the purpose of the SEARs including an assessment of the Strategic Alternatives is redundant. Notwithstanding this issue, the approach to developing the Strategic Alternatives presented appears to be a missed opportunity to consider an integrated solution, which combines road, public transport, land use management and demand management projects.

Strategic Alternatives 2, 3 and 4 present mechanisms which have the potential to reduce demand for road usage. However, these have been scoped in a way which makes it difficult to assess them as being legitimate alternatives to the New M5. Strategic Alternatives which 'bundle' different elements of the alternatives are not presented.

For example, a Strategic Alternative which looks to improve public transport and rail freight, optimising existing road infrastructure and introduce demand management mechanisms has not been explored. A holistic, integrated transport solution is not presented. The EIS does point to the potential value of doing so, but stops short of describing and assessing such options:

Although the introduction of demand management measures would contribute to relieving congestion and would create opportunities for improved public transport initiatives, the implementation of these measures alone would not satisfy the project objectives. (EIS, p. 4-17).

Holistic approaches – Case studies

The value of holistic, integrated approaches to meeting transport demands is recognised in a number of global cities. Following are four case studies from cities that have used a combination of measures to address congestion on the road network.

Vancouver

Transportation 2040 Plan includes a number of actions, in addition to road infrastructure projects, that are aimed at reducing congestion. This includes mechanisms to increase public transport usage such as include altering fare structures, introducing a smartcard system with distance and time-based elements, discounted fares in off-peak periods and increase user convenience. It also includes mechanisms to increase public transport usage such as optimisation of the road network through improved coordination of signal timing, monitoring of traffic volumes and peak-hour parking regulations (reducing congestion through appropriate pricing). Other demand management tools identified within the plan are aimed at businesses to encourage workers to use public transport through increasing the cost of parking and using the funds generated by this to provide workers with transit passes. A congestion charge policy is being further investigated as a long term initiative.

Rome

The *Sustainable Urban Mobility Plan* divides Rome into zones based on distance from the city centre with restrictions on traffic within each zone applied. A 'Zona a Traffico Limitato' (limited traffic zone) has been introduced within the centre of the city. Any vehicles entering this zone require a permit and must pay for this permit. Within the other zones, various restrictions have been implemented which seek to reduce emissions, vehicles, tourist vehicles and alter parking restrictions. Public transport usage is encouraged through expansion of the cycling and public transport networks and promotion of car sharing.

San Francisco

The *San Francisco Transportation Plan 2040* introduces a number of mechanisms to address congestion. The Plan identifies the need to continue to develop pricing approaches to congestion, such as a peak-period congestion charge would reduce vehicle delay in the north-east cordon by 21 percent. Congestion is also proposed to be managed through direct regulation of journey to work vehicle trips including employer outreach and incentives (e.g. transit promotion and ride sharing) and partnerships with private sector and community-based organisations (e.g. shuttles to existing public transport stops).

2.4 Analysis of Strategic Alternatives

Inadequate assessment of project alternatives

Notwithstanding the lack of detail around Strategic Alternatives presented and the manner in which these have been developed, the approach to assessment lacks rigour. The Strategic Alternatives are assessed, in text, against the New M5's strategic objectives in Table 4-2 of the EIS (see Figure 2).

FIGURE 2 SUMMARY ASSESSMENT OF STRATEGIC ALTERNATIVES – TABLE 4-2 OF EIS

Project objective	Alternative 1 Base case or do nothing	Alternative 2 Optimising the performance of existing infrastructure	Alternative 3 Investment in public transport and rail freight improvements	Alternative 4 Demand management	Alternative 5 Construction of the New M5
Support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways and Western Sydney and places of business across the city	x	x	x	x	✓
Relieve road congestion so as to improve the speed, reliability and safety of travel in the M5 Motorway corridor, including parallel arterial roads	x	✓	x	✓	✓
Cater for the diverse travel demands along these corridors that are best met by road infrastructure	x	✓	x	x	✓
Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure	x	x	✓	x	✓
Fit within the financial capacity of the State and Federal Governments, in partnership with the private sector	✓	✓	✓	✓	✓
Optimise user pays contributions to support funding in an affordable and equitable way	x	x	x	x	✓
Provide for integration with other WestConnex projects while not significantly impacting on the surrounding environment in the interim period	x	✓	✓	✓	✓

The SEARs require that 'environmental costs and benefits of the proposal relative to alternatives' are assessed. However, the method by which this assessment of alternatives occurs is not prescribed.

The project objectives are biased towards the construction of a motorway. This is discussed in the following section. Also some of the outcomes seem to be counter intuitive. Under the assessment, Alternative 4 Demand Management fails to meet the project objective of '*cater for the diverse travel demands along these corridors*' and '*optimise user pays contributions*', which given international experience (as described in the previous section), appears an unjustified assessment.

A 'checklist' approach against project objectives does not take into account any broader benefits or costs generated by the Strategic Alternatives, and does not consider the environmental costs and benefits of the proposal relative to alternatives or the fact that some aspects of the Project Objectives may be more important than others.

NSW Government Guidelines for Economic Appraisal provide NSW Treasury's established requirements for the evaluation of capital works. Whilst these guidelines are adhered to in business cases, they are not only for this purpose. The preface of the *Guidelines* notes: "*In general, an economic appraisal is required for all individual projects with a total cost in excess of \$1 million*".

Further to this, the *Guidelines* state: "*The purpose of an economic appraisal is not to validate a specific proposal, but to help choose the best means to satisfy a specified objective, and to rank competing proposals when resources are limited. All capital works and programs are provided as a means to an end*".

The *Guidelines* describe major economic appraisal techniques. Cost Benefit Analysis is the most commonly applied evaluation technique for transport projects. It considers benefits and costs of alternatives, translating outcomes of options into comparable terms (such as Net Present Value and Cost Benefit Ratio) to enable evaluation and decision making. Assessments of transport projects typically consider:

- Capital costs
- Operational costs
- Environmental externalities (e.g. CO2 emissions)
- Road safety improvements (e.g. number of accidents), and
- Travel time improvements.

The EIS does not consider any of these parameters when assessing the Strategic Alternatives to Stage 2 of WestConnex. As a Cost Benefit Analysis of Strategic Alternatives is not prescribed by SEARs, a less onerous yet useful assessment approach may be a multi-criteria analysis. The assessment of Strategic Alternatives against project objectives does this in some part, but the project objectives themselves effectively prevent any non-road based solution from being assessed positively.

Project objectives can only be met by a road solution

The objectives-led assessment of Strategic Alternatives prevent a non-road based solution from being preferred.

The project objectives are:

- Support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways and Western Sydney and places of business across the city.
- Relieve road congestion so as to improve the speed, reliability and safety of travel in the M5 motorway corridor, including parallel arterial roads
- Cater for the diverse travel demands along these corridors that are best met by road infrastructure
- Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure

- Fit within the financial capacity of the State and Federal Governments, in partnership with the private sector
- Optimise user pays contributions to support funding in an affordable and equitable way
- Provide for integration with other WestConnex projects while not significantly impacting on the surrounding environment in the interim period.

These objectives explicitly refer to achieving economic growth through improved motorway access and meeting travel demand through road infrastructure. All Strategic Alternatives assessed, except for the New M5, would therefore fall short.

State transport objectives

Broader transport objectives for Sydney and New South Wales, however, are outlined in state transport and planning strategies. These are focused on reducing congestion and improving accessibility and include:

Premier's Priorities and State Priorities

There are 12 Premier's priorities including:

- Creating jobs with an aim of 150,000 new jobs by 2019
- Building infrastructure with an infrastructure program to support 40 percent more train trips, 30 percent more car trips and 31 percent more households

There are five State priorities including:

- Strong budget and economy, to be achieved partly through encouraging business investment and accelerating major project assessment
- Building infrastructure, to be achieved through improving road travel reliability and increasing housing supply
- Better services, to be partly achieved through ensuring on-time running for public transport

A Plan for Growing Sydney (2014)

The Plan sets out four goals and associated directions which include:

- Goal 1: A competitive economy with world-class services and transport
 - Direction 1.1: Grow a more internationally competitive Sydney CBD
 - Direction 1.4: Transform the productivity of Western Sydney through growth and investment
 - Direction 1.5: Enhance capacity at Sydney's gateways and freight networks
 - Direction 1.6: Expand the Global Economic Corridor
 - Direction 1.7: Grow strategic centres - providing more jobs closer to home
 - Direction 1.11: Deliver infrastructure
- Goal 2: A city of housing choice, with homes that meet our needs and lifestyles
 - Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs.

The Plan also identifies priorities for the Central Subregion which includes central Sydney, the eastern suburbs and the inner west. The priorities include:

- A competitive economy, to be achieved partly through preserving a corridor for Sydney Rapid Transit and enabling delivery of key transport projects to facilitate better connections to Global Sydney
- Accelerate housing supply, choice and affordability and build great places to live
- Facilitating the delivery of the UrbanGrowth NSW project for Green Square Town Centre.

NSW Long Term Transport Master Plan (2012)

The Master Plan identifies a number of transport challenges and proposes a range of objectives and actions to address these. Eight transport objectives have been identified:

- Improve quality of service
- Improve liveability
- Support economic growth and productivity
- Support regional development
- Improve safety and security

- Reduce social disadvantage
- Improve sustainability
- Strengthen transport planning processes

The Master Plan identifies four types of actions: integrating transport services, modernising the system, growing networks to meet future demand and maintaining road and public transport assets.

NSW State Infrastructure Strategy (2012)

The Strategy comprises recommendations for investment in specific major projects as well as wider policy and market reforms to improve how infrastructure is planned, procured and delivered. This Strategy is where the WestConnex program of works was first introduced, although with different alignments and staging to the current EIS scope of works. The Strategy is underpinned by three principles:

- Incremental improvement to address infrastructure problems more quickly and cost effectively than one-off major projects, and should be considered first to resolve problems.
- Investing in NSW's strengths. The priority is the sectors of the economy with the highest growth potential, which are constrained by inadequate infrastructure capacity.
- Rigorous prioritisation of infrastructure investment to ensure projects and reforms recommended deliver strong positive economic return to NSW.

For Global Sydney, the Strategy identifies infrastructure priorities including:

- Infrastructure that supports growing the economy including improving public transport access to and through the CBD and adjoining centres.
- Infrastructure that supports the growth of Global Sydney and its international gateways, particularly through ensuring efficient landside transportation; relieving congestion on the road network in the short term through targeted pinch point investment and greater use of public transport to Sydney Airport and, in the medium term, through upgrades to the capacity and connectivity of motorways that support the gateways; and investment in rail and intermodal infrastructure to shift rail freight more viable.

If the Strategic Alternatives had sufficient detail and were assessed against these broader transport and planning objectives, a road solution is unlikely to be the preferred solution. In fact, a road project may in fact compromise the realisation of some of these objectives such as growing a more competitive CBD or facilitating renewal in Green Square (discussed further in Chapter 3).

2.5 Unexplored issues

One of the project objectives for Stage 2 of WestConnex is to support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways. However, the assessment only considers access to Sydney Airport and Port Botany and the demand these locations generate. The impact of a second airport at Badgerys Creek has not been adequately considered.

The opening of a second airport in approximately ten years would likely have significant implications for the movement of people, particularly in western Sydney, and for the distribution of employment.

Between 2026 and 2041, operation at the Western Sydney Airport will ramp up (see Table 2). This will likely impact the use of arterial roads servicing Sydney Airport.

TABLE 2 AIRPORT PASSENGERS PER YEAR

Airport	2021	2026	2041
Sydney Airport	43,000,000	52,000,000	78,000,000
Future Western Sydney Airport	-	1,000,000	12,709,000

Deloitte, 2012

Considering the EIS identifies Sydney Airport as one of the main generators of traffic for WestConnex Stage 2 the impact the second airport needs to be considered.

The fact that the New M5 does not connect with Sydney Airport has also not been adequately considered in the assessment of options. From the information available, it appears that without the Southern Gateway there is no direct connection between WestConnex Stage 2 and Sydney Airport. Vehicles travelling from western Sydney will need to travel past the airport and exit at the St Peters Interchange and then double back to the airport. The existing M5 East has a more direct connection and therefore may continue to be the preferred route for journeys from western Sydney to the airport.

3 ASSESSMENT OF SOCIO-ECONOMIC IMPACTS

3.1 Introduction

The Secretary's Environmental Assessment Requirements (SEARs) for the Social and Economic Impact Assessment are:

- Look at impacts to businesses within the vicinity of the proposal (property acquisition, traffic, access, property, public domain and open space and amenity and health related changes). Broader regional impacts associated with the closure of the Alexandria landfill site.
- Assess the impact of the proposal on community facilities, including profiling current use of existing facilities, options/opportunities for relocation and/or reconfiguration during construction and operation (Appendix M, p. 4).

Appendix M of the WestConnex EIS is the Social and Economic Impact Assessment. Its focus is entirely on the preferred Strategic Alternative of the new M5 and the preferred alignment. This Chapter examines the methodology and conclusions of this assessment.

The following sub sections focus on the approach used in the socio-economic assessment and the issues that are identified.

3.2 Methodology for the Social and Economic Impact Assessment

The Social and Economic Impact Assessment is focused on localised effects. The existing environment (demographic, workforce, business and freight) is profiled along with existing travel patterns for road, public transport and active transport. Community values are then profiled prior to the impact assessment from a social and economic perspective for the construction and operation of WestConnex Stage 2.

Study Area does not capture the full extent of the impact

City shaping impacts

The study focuses its profiling of existing characteristics and impact analysis on a set of LGAs which it defines as being in the vicinity of the project (the Study Area):

- Canterbury
- Hurstville
- Rockdale
- Marrickville
- Botany Bay
- Sydney

To this end, the Study Area meets the SEARs directive of focusing on the vicinity of the proposal. However, this approach fails to account for the city shaping impact of WestConnex Stage 2.

Previous research (Eddington, 2009; Graham, 2006) has shown that major infrastructure projects can, quite literally, re-sculpt the pattern of metropolitan development. They are city shaping projects whose impacts are felt across the metropolitan area, and sometimes beyond, as the resulting shifts in

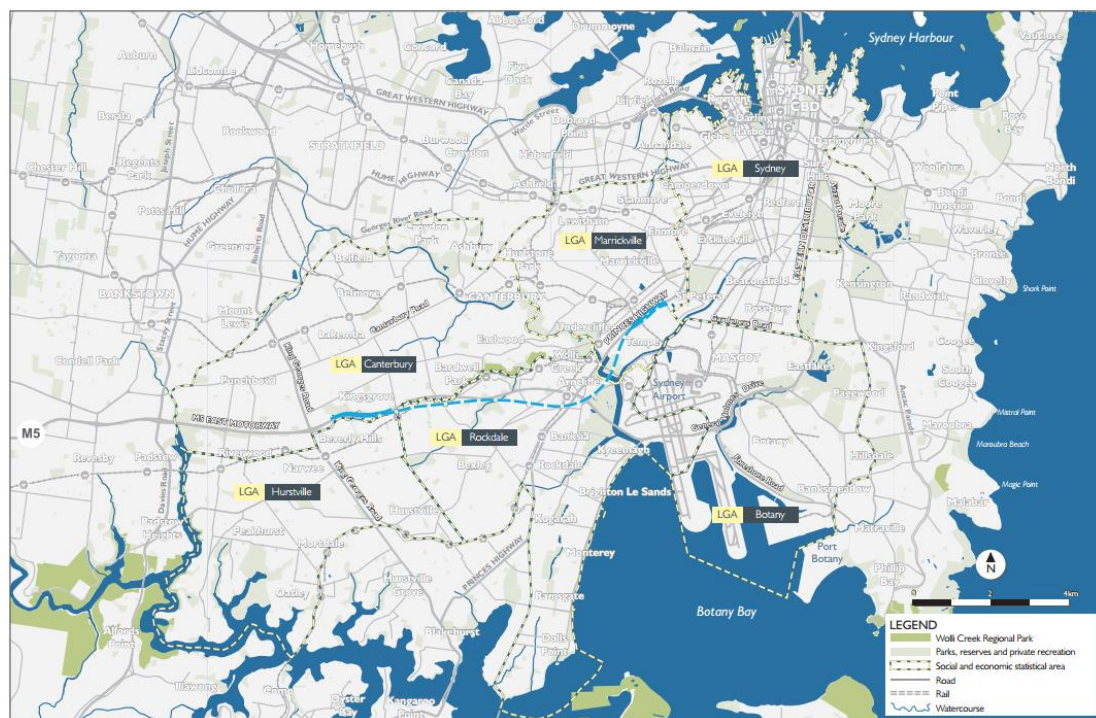
accessibility change the location choices of firms and households setting in place a new geography of land values. The outcome is a shift in the amount and distribution of land uses across the City and their connectivity and accessibility. This can have significant impacts on household and business location and investment decisions.

Previous work by SGS (2012) has found that major transport investments are a powerful and, perhaps, the pre-eminent policy lever, for determining metropolitan structure. The study area therefore needs to be expanded to the metropolitan area to capture the city shaping impact of the project. This further emphasises the need for the WestConnex Stage 2 project objectives to align to broader planning, land use and transport policy objectives set for Sydney by the NSW Government.

Mismatched study areas

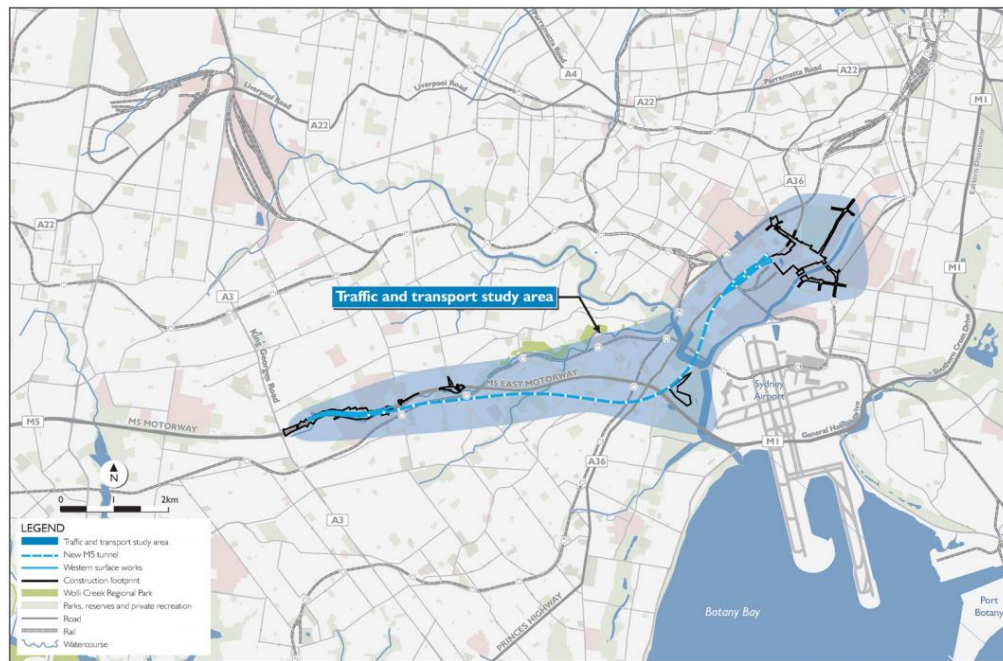
Whilst the social and economic impact assessment study area includes the full extent of the surrounding LGAs, the study area for the transport assessment is much more limited only covering the construction area but not where the road users are located. For a comparison of study areas see Figure 3 and Figure 4.

FIGURE 3 SOCIAL AND ECONOMIC IMPACT ASSESSMENT STUDY AREA



Source: Aecom 2015

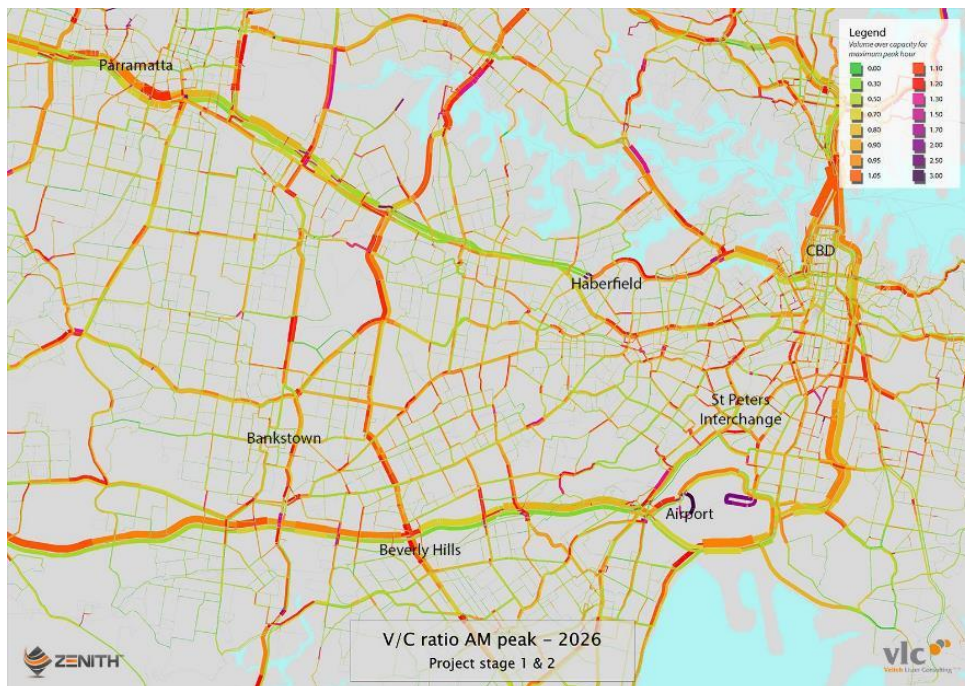
FIGURE 4 TRAFFIC AND TRANSPORT STUDY AREA



This mismatch in the study areas means an understanding of how the operation of WestConnex Stage 2 will affect traffic volumes on many of the local roads in each LGA has not informed the assessment of social and economic impacts.

The Strategic Review and Transport Modelling of WestConnex undertaken by SGS and Veitch Lister Consulting (VLC) shows there are risks that WestConnex Stage 2 will generate additional traffic that will only be addressed by other sections of WestConnex (see Figure 5). This shows WestConnex Stage 2 will likely make congestion worse on many local roads in the City of Sydney which has the potential to cause significant social and economic impacts.

FIGURE 5 VOLUME CAPACITY RATIO 2026 (PROJECT STAGE 1 & 2)

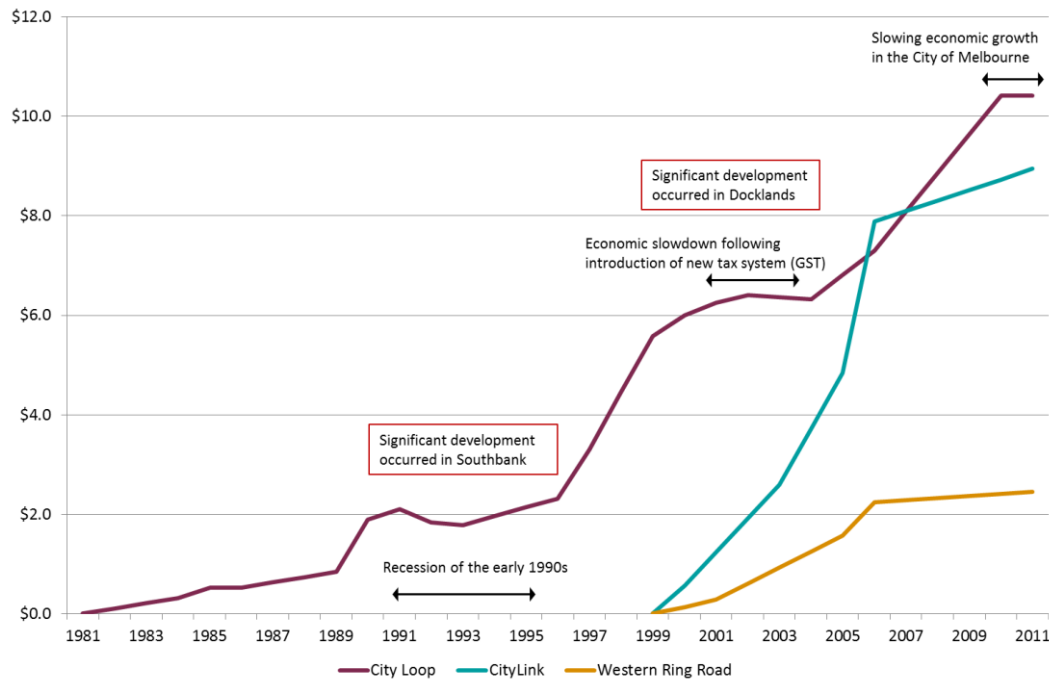


Timeframe of analysis does not reflect long-term nature of project

The absence of long term modelling (for example to 2041) in the WestConnex Stage 2 EIS means that any longer term traffic or socio-economic impacts from the operation of WestConnex Stage 2 are not being identified, mitigated or monitored.

Previous work by SGS (2012) has shown that the impacts of large infrastructure projects can extend in excess of 30 years. For example, the benefit stream for the City Loop⁵ climbed to be approximately \$10 billion/per annum 30 years after it was constructed (see Figure 6).

FIGURE 6 BENEFIT STREAM ACROSS TIME, \$BILLION



Source: SGS Economics and Planning 2012

Analysis from VLC shows the impacts of WestConnex Stage 2 will continue to at least 2041. Table 3 and Table 4 shows traffic along the corridor increases significantly (in some cases over 10,000 additional trips) between 2026 and 2041.

TABLE 3 EASTBOUND DAILY TRAFFIC VOLUMES (CLOCKWISE⁶)

Section	2026 base	2026 S123	2026 S123 % diff	2041 S123
M5 exit - Bexley Road and Kingsgrove Road	52,300	66,800	28%	79,900
Bexley Road and Kingsgrove Road - King Georges Road	70,400	80,800	15%	94,200
M5 Fairford Road	6,300	7,000	11%	7,600
M5 Henry Lawson Drive	6,000	5,900	-2%	6,700
M5 Main Toll Plaza	64,400	64,300	0%	72,900

Source: Veitch Lister Consulting

⁵ The City Loop is a largely underground rail loop in Melbourne's CBD opened between 1981 and 1985.

⁶ A journey starting at the western end of the M4 and travelling to the southwestern end of M5 along WestConnex

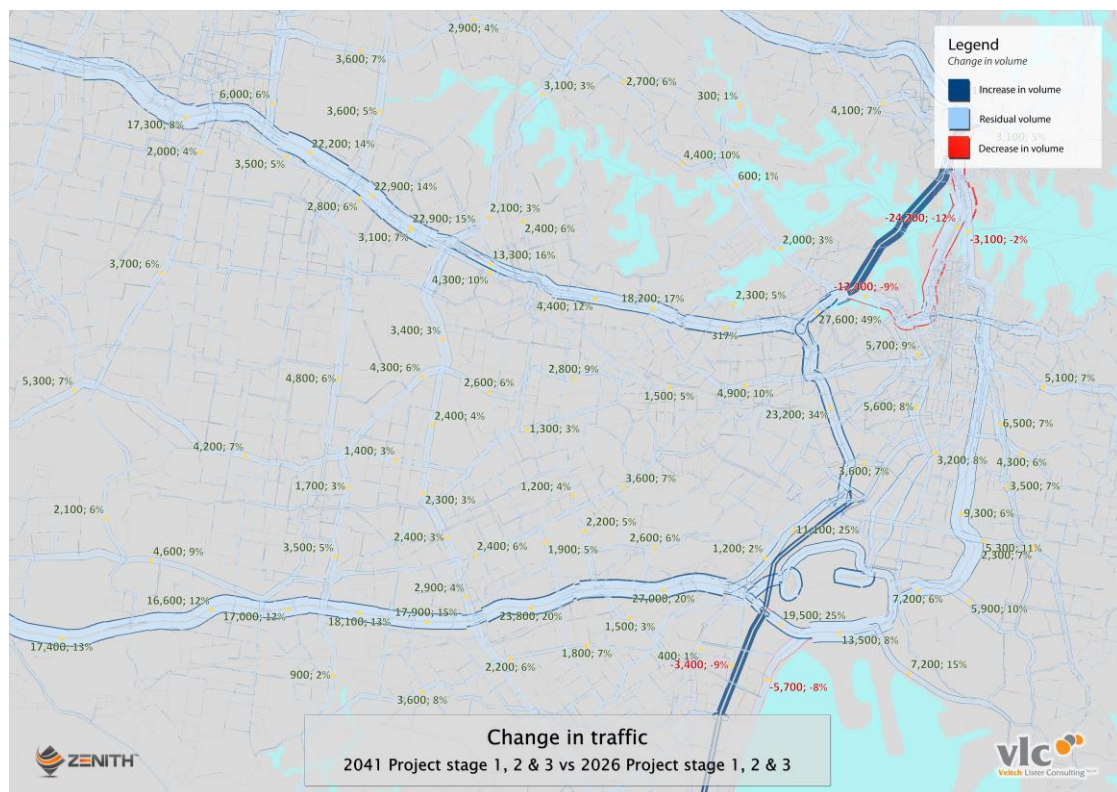
TABLE 4 WESTBOUND DAILY TRAFFIC VOLUMES (COUNTERCLOCKWISE⁷)

Section	2026 base	2026 S123	2026 S123 % diff	2041 S123
M5 exit - Bexley Road and Kingsgrove Road	53,400	68,500	28%	82,500
Bexley Road and Kingsgrove Road - King Georges Road	71,500	83,000	16%	96,800
M5 Fairford Road	5,800	6,700	16%	7,300
M5 Henry Lawson Drive	5,300	5,500	4%	6,200
M5 Main Toll Plaza	70,700	70,800	0%	79,700

Source: Veitch Lister Consulting

Figure 7 maps these changes for the project case from 2026 to 2041. It shows that traffic volumes will continue to grow beyond 2031. In particular, there will be substantial growth on the M4 and M5 corridors as well as on the corridor to the south, on the Princes Highway.

FIGURE 7 CHANGE IN VOLUMES FROM 2026 TO 2041 (STAGE 1, 2 AND 3)



Source: VLC 2016

3.3 Issues identified in the Social and Economic Impact Assessment

WestConnex Stage 2 does not connect people to high value jobs

A key justification for WestConnex Stage 2 is that it improves access to Sydney Airport and Port Botany. Employment in these centres is anticipated to grow between 2016 and 2041 with Port Botany and environs anticipated to add 3,610 jobs over this period and Sydney Airport and Environs forecast to add 8,946 jobs (see Table 5). WestConnex Stage 2 may improve access to employment in these locations for people living in the city's South West. However, compared to other centres, and particularly those in

⁷ A journey starting at the southwestern end of M5 and travelling to the western end of the M4 along WestConnex

Global Sydney⁸, growth in these locations is minimal. Sydney CBD is projected to be the fastest growing centre with 9.6 percent of all employment growth in metropolitan Sydney between 2016 and 2041. Port Botany and Sydney Airport are only anticipated to account for 0.3 percent and 0.8 percent of growth respectively.

The Sydney CBD is anticipated to be the fastest growing centre between 2016 and 2041 with an additional 105,200 jobs anticipated. The EIS also identifies that, of the 527,700 people who worked in the study area in 2011, 75 percent were employed in Sydney LGA. Sydney CBD is the location of the majority of high value financial and insurance and professional, scientific and technical service jobs. At present, very few people travel by car from the South West to the CBD for work. For example, 7 per cent of workers living in South West Sydney work in the CBD and 88 per cent of these travel by public transport⁹. Notwithstanding the low proportion of commuters travelling by car to the CBD, the M5 ends at the St Peters Interchange, essentially delivering people from South West Sydney to a midway point on the corridor to the Sydney CBD.

TABLE 5 EMPLOYMENT GROWTH, SELECTED CENTRES

Centre type	Centre name	2016	2041	16-41 Change	Proportion of total growth 16-41
Global Sydney	Sydney CBD	339,300	444,500	105,200	9.6%
Specialised Precinct	Port Botany and Environs	14,000	17,600	3,600	0.3%
	Sydney Airport and Environs	41,000	50,000	9,000	0.8%

Source: BTS 2011

Note: Figures rounded to the nearest hundred.

Analysis by SGS and VLC shows the termination of WestConnex Stage 2 at St Peters is anticipated to increase congestion on local roads in the south of the City of Sydney. This increased local congestion will make it harder for people living in these areas to access the employment, services, recreation and education on offer across the Sydney CBD by bus, private vehicle or by cycling.

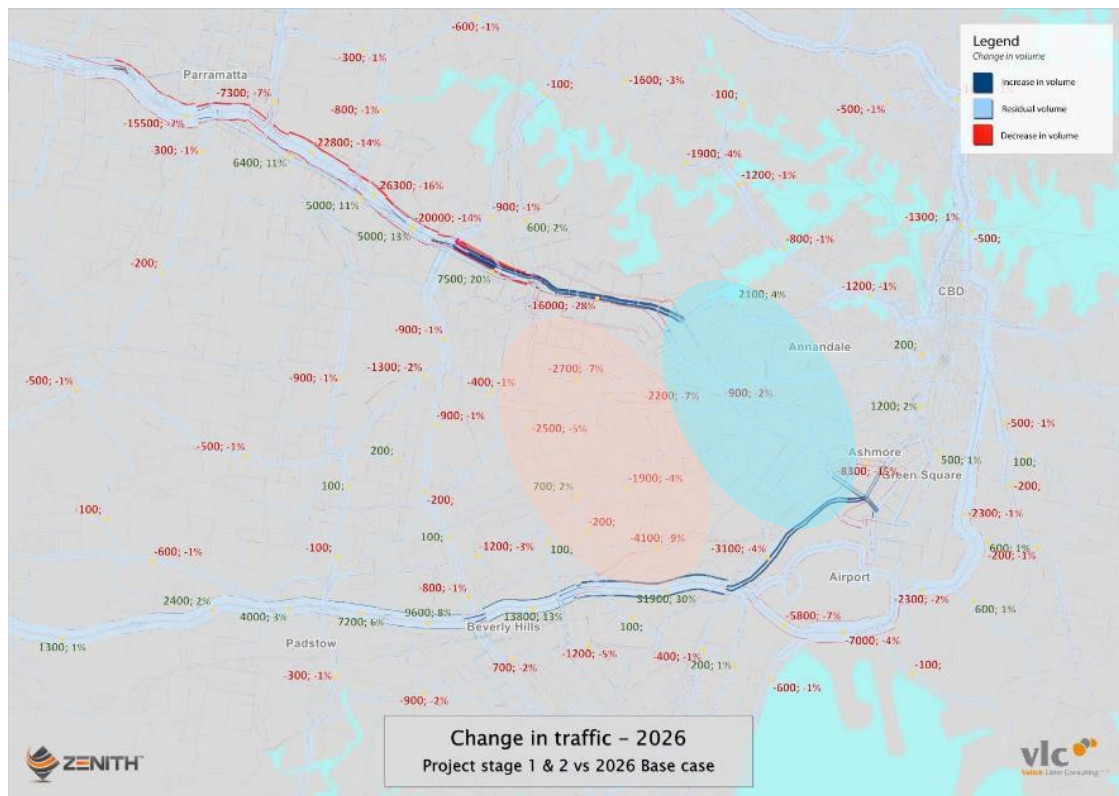
Figure 8 shows that WestConnex stage 1 and 2 will create two distinct areas of impact on the local network:

- The first area (in red) is where the traffic volumes generally decrease by a small amount;
- The second area (in light blue), between Haberfield and St Peters precincts, traffic volumes generally increase. Most of this area is outside of the traffic and transport study area.

⁸ City East-Central Sydney, Education and Health Precinct – Central Sydney North Sydney, Redfern-Central Sydney, Sydney CBD, U<imo-Pyrmont-Central Sydney

⁹ Source: Analysis of Australian Bureau of Statistics Census 2011

FIGURE 8 CHANGE IN VOLUMES 2026 (STAGE 1 & 2 VS BASE)



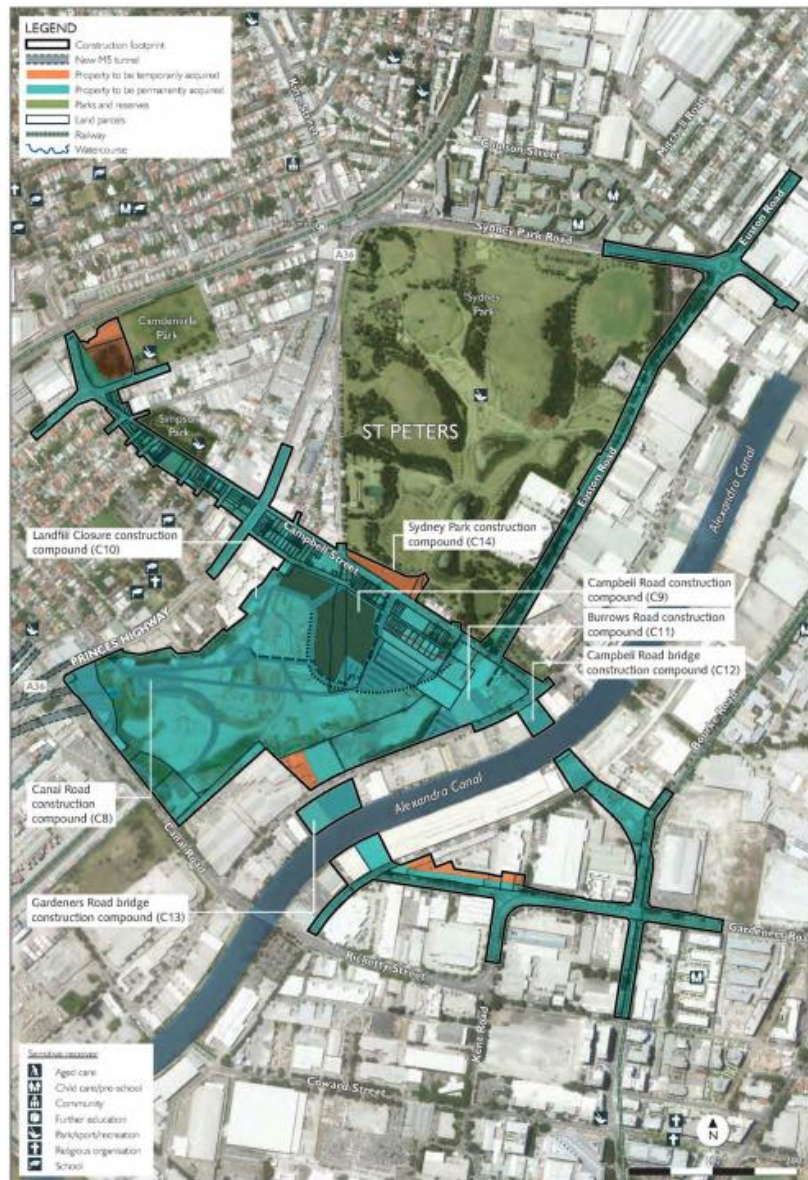
Source: Veitch Lister Consulting 2014

The impact on Sydney Park not fully addressed

The Social and Economic Impact Assessment describes Sydney Park has having regional importance. It provides both passive and active open space with walking and cycle paths, playing fields and playgrounds and is home to a number of sporting and community clubs. Sydney Park also has significant ecological value in terms of biodiversity and habitat generation.

Based on the EIS, during construction approximately 0.2 hectares of Sydney Park, will be temporarily acquired to accommodate a construction compound. A small area will also be permanently acquired for road widening. The southern boundary of the Park also abuts a significant construction site with works continuing along Euston Road at the Park's eastern boundary and part of Sydney Park Road along the northern boundary. See Figure 9.

FIGURE 9 WORKS IN VICINITY OF SYDNEY PARK



Source: Aecom 2015

The EIS details many of the impacts to Sydney Park including that the location of the construction compound and surrounding works, including the construction of the pedestrian overpass and widening of Campbell and Euston Roads, will change the character of the park and affect the visual amenity. The widening of Euston Road would also change the character of the edge of Sydney Park as a number of entrances to the park are along Euston Road. The assessment concludes that these impacts may negatively affect park users' sense of place and the perceived identity of the surrounding community, however, as only a small part of the park will be occupied, impact should be limited. Users are also expected to be impacted by construction noise but only when in close proximity to construction compounds and works.

However, the Social and Economic Impact Assessment does not consider the direct impact the construction compound will have on the City Farm development which includes the growing of food.

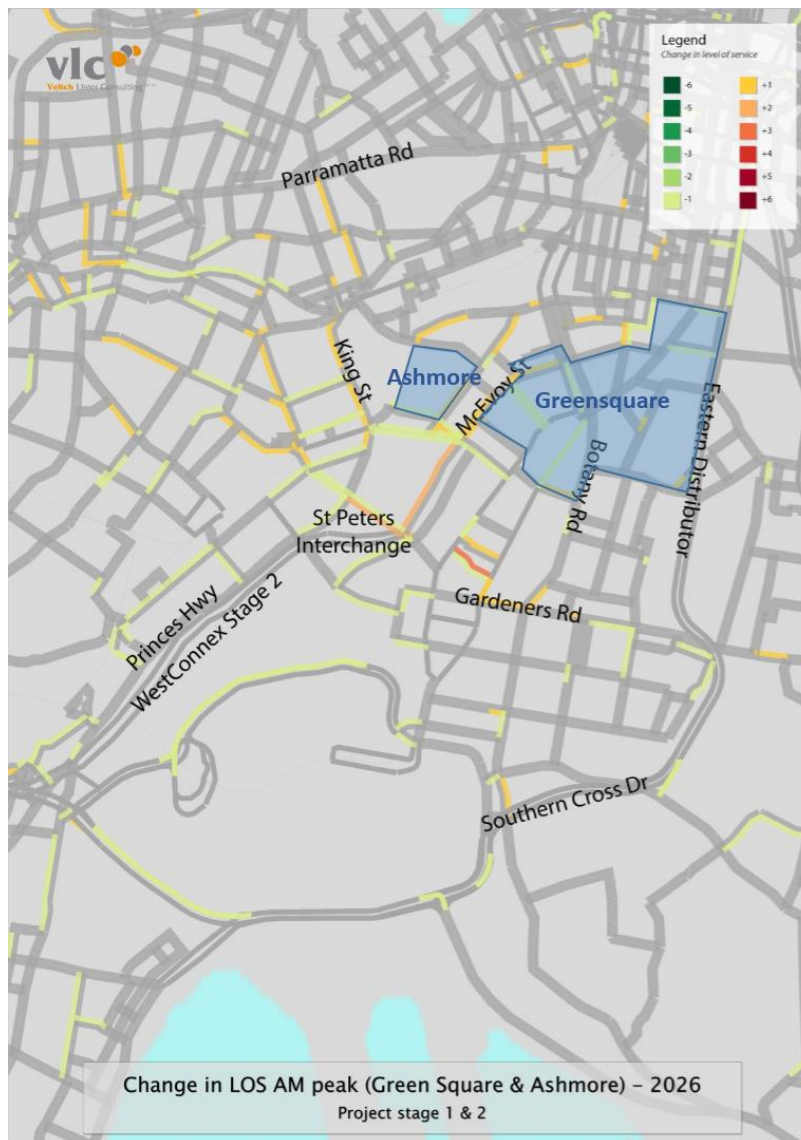
Given population forecasts in the area surrounding Sydney Park are high, it could be expected that usage of the park will increase over time. Furthermore, the developed nature of St Peters and surrounds limits the capacity for additional open space to be provided in the future. This increases the importance of

Sydney Park as a recreational resource for residents, exacerbating any construction period impacts and net loss of open space.

Impact on Urban Renewal in Ashmore and Green Square not adequately addressed

Urban revitalisation is critical for Sydney considering its rapid population growth. Infill development is essential to the functioning of a growing city. Sustainable Sydney 2030 identifies that Green Square will have close to 40,000 residents and 22,000 workers by 2030 and that Ashmore will be revitalised as a new residential neighbourhood. As a result, these locations are expected to see significant increases in transport demand and needs. The EIS shows that, as a result of WestConnex Stage 2, the Green Square urban renewal area will see an increase in traffic in some areas. The increase is especially pronounced prior to the construction of Stage 3, as visible in Figure 10. Roads which have their level of service (LOS) improved (e.g. from B to A) are coloured in green, while roads where the level of service gets worse (e.g. from B to C) are coloured in yellow and red. The impact from the decline in the level of service on these local roads will decrease the amenity in this area and may have the impact of reducing the yield or delaying development. As Green Square is now an established apartment market, developers are more likely to be able to deal (in terms of gaining finance and marketing the product to buyers) with the adverse impact than Ashmore which is yet to mature as an apartment market.

FIGURE 10 CHANGE IN LOS 2026 (STAGE 1 & 2 VS BASE)



Source: Veitch Lister Consulting

Congestion in King Street, Newtown is not addressed

King Street is located in Newtown towards the south-west of the City of Sydney LGA, and spans the suburbs of Newtown, Camperdown, Erskineville and Alexandria. Its economy is driven by small businesses with food and drink, retail and personal services, and higher education and research as the top three employing industries (City of Sydney, 2015).

Transport modelling undertaken by VLC found that King Street, Newtown is at capacity under the base case. As the road is already at capacity, the introduction of WestConnex Stage 2 does not significantly impact on congestion levels and therefore does not have an adverse impact, however, it does not resolve the congestion issue either.

4 FURTHER ISSUES

This section presents a number of further issues identified, but not directly related to the assessment of Strategic Alternatives or the Social and Economic Impact Assessment. Whilst these are outside of the Project Brief, they are significant considerations which the EIS does not adequately address.

Assumptions that all sections of WestConnex completed by 2031

This issue was previously discussed in the SGS review of the M4 East EIS, however, is repeated here as the assumption also underpins the transport modelling presented in the WestConnex Stage 2 EIS.

The transport modelling at 2031 assumes all of WestConnex and other associated road links will be approved, accepted and completed by 2031. Future motorway extensions related to WestConnex (namely the Western Harbour Tunnel, Sydney Gateway and the Southern Gateway) are shown in Figure 10 and are all subject to separate approval processes, most of which are yet to begin.

WestConnex Stage 1 – M4 East

The first stage of the WestConnex project includes the widening and realignment of the M4 between Homebush Bay Drive and Underwood Road at Homebush and the construction of two 5.5 km three-lane tunnels extending from west of Underwood Road at Homebush to near Alt Street at Haberfield. Access to the existing M4 to Concord Road would be maintained via Sydney Street and interchange at Wattle Street (City West Link) at Haberfield. An EIS has been prepared for this Stage. Approval is still pending but construction is anticipated to commence mid-2016.

WestConnex Stage 3 – M4 to M5 Link

The third stage of the WestConnex project is a link between Stages 1 and 2 of WestConnex. WestConnex Stage 3 features in the *State Infrastructure Strategy Update* (the *Strategy Update* 2014) and *A Plan for Growing Sydney* (2014) but as yet there have been no detailed arrangements made for funding or construction of the project and only broad indications of the location of interchanges and connections with other parts of the road network.

FIGURE 11 VISION FOR SYDNEY'S MOTORWAY NETWORK



Western Harbour Tunnel

The *State Infrastructure Strategy Update* identifies a third Sydney Harbour road crossing is under investigation by the State Government as part of its strategic motorway planning program. There is currently no design or costing for this project, however, investigation of the viability of the project is currently underway, with the *Strategy Update* identifying that a business case should be prepared to assess the project in conjunction with, or immediately after, the delivery of the WestConnex Stage 3.

Southern Gateway

The *Strategy Update* identifies that an investigation into the potential options for providing increased connectivity to the Sutherland Shire and Illawarra Regions via the A1 (Princes Highway), A3 (King Georges Road), A6 (Alfords Point Road) and F6 Corridors is being undertaken by government. At this stage the investigative study is yet to be completed and there is no design or costing for this project, however, the *Strategy Update* notes that substantial upgrades to these corridors are likely to be very expensive and within constrained urban environments.

Sydney Gateway

The Sydney Gateway was identified in the 2012 *NSW Long Term Transport Master Plan* as a potential alignment to be investigated for “enhanced Port Botany links” but with no detailed description provided. The project was again identified in the *Strategy Update* with an indicative alignment for which further investigation is required. There is currently no design or costing for this project.

The design and timing of Sydney Gateway will have a significant impact on WestConnex Stage 2 as the Airport is a major generator of passenger traffic and the Port is a major generator of freight traffic. The EIS is very unclear around the access to Sydney Airport via the Sydney Gateway.

Figure 12 shows the WestConnex volumes and trip origins in the project Stages 1 and 2. The size of the ‘pies’ are proportional to the number of trips on WestConnex originating in the travel zones. The larger the pie, the more trips on WestConnex are generated in that travel zone. The colour of the pie indicates

the direction of trips. Trips made on WestConnex in a clockwise direction are coloured in shades of blue depending on the WestConnex section they access first; anticlockwise trips are coloured in shades of purple. The bandwidths on WestConnex Stage 1 (M4 / M4 East) and Stage 2 (New M5) show the expected volume of traffic along WestConnex travelling in each direction. The bandwidth decreases as traffic volumes decrease. The various colours can be interpreted as follows:

Clockwise

- Trips accessing WestConnex Stage 1 and travelling east are coloured dark blue
- Trips accessing WestConnex Stage 2 and travelling west are coloured light blue

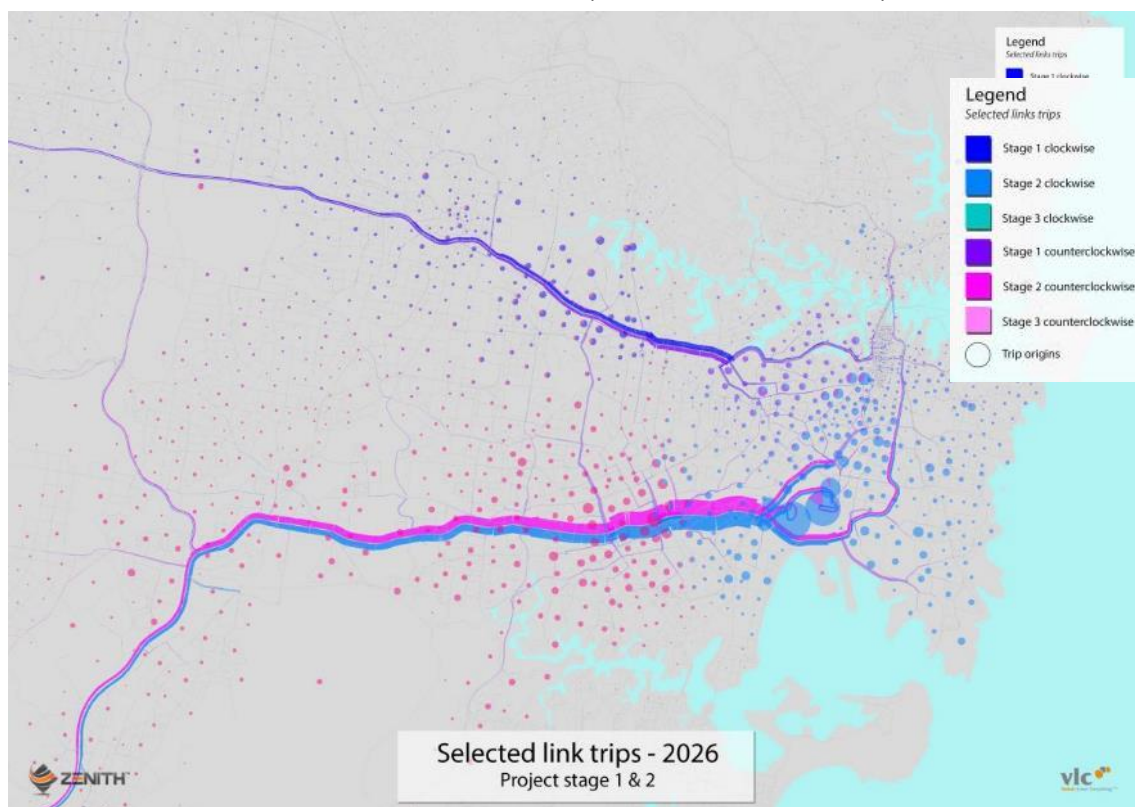
Anticlockwise

- Trips accessing WestConnex Stage 1 and travelling WB are coloured dark purple
- Trips accessing WestConnex Stage 2 and travelling EB are coloured light purple

Figure 12 makes clear that Stages 1 and 2 serve different markets. Stage 1 provides access to Parramatta and Haberfield, with vehicles at the end of Stage 1 at Frederick Street dispersing across the local network. Stage 2 serves mainly Sydney airport, Green Square and the eastern suburbs. It is the middle ring suburbs that are forecast to be the main users of Stage 1 and 2 of WestConnex, not the Western and South Western suburbs.

If WestConnex Stage 2 is built without the Sydney Gateway option which is superior (in terms of travel times) to the existing M5 then the traffic forecasts for WestConnex Stage 2 are questionable.

FIGURE 12 WESTCONNEX CATCHMENT 2026 (PROJECT STAGE 1 & 2)



Source: Veitch Lister Consulting, 2015

The Impact of WestConnex Stage 2 is not assessed

The data presented in tables 9-41 to 9-43 of Volume 1B of the EIS shows that the full program of WestConnex projects, including the Southern Extension, provides significant improvements in traffic conditions in 2031 compared to the WestConnex Stage 2 project on its own. However, as discussed

above, there is no certainty that the full WestConnex project will be completed by this time. It is therefore possible WestConnex Stage 2 will continue to operate beyond 2021 without all other components constructed, yet the impact of this is not analysed in the EIS.

Impacts on the performance of the road network in 2031 are examined in the document for three scenarios – without WestConnex Stage 2¹⁰, with WestConnex Stage 2¹¹ and with the Full WestConnex project including the Southern Extension¹². Table 9-47 shows that WestConnex Stage 2 will increase traffic significantly in 2031 (in the region of 15,000 more trips in each direction). However, from Table 9-48 to Table 9-54, the “with project” scenario is omitted from all evaluations for 2031. All results for 2031 are presented as a comparison of “without the project” and “full WestConnex program of works and the southern extension”. These tables show average travel time (in minutes), comparison of the road network performance, intersection performance, mid-block traffic flows on routes adjacent to the study area, and forecast crash statistics.

Underestimate of induced traffic overestimates benefits

The definition of induced demand in the EIS is unclear and does not appear to include an assessment of the full range of ways a road project might induce demand.

The Victorian Auditor-General (2011) summarised the various ways demand might be induced as:

- Changing route – drivers make the same journeys but use the improved route
- Changing destination—drivers decide to travel to more distant destinations because the improvement makes the journey time acceptable
- Changing mode—public transport passengers switch to car because the improvement makes road travel more attractive than rail
- Changing time of travel—drivers decide to travel in the commuting peak period because the improvement reduces journey times to an acceptable level
- Making additional journeys—people are willing to make additional car journeys because of the improvement
- Relocated trip—people and businesses relocate to take advantage of the improvement and so make journeys that are new to the area

The Auditor-General concludes that, whilst changing route is likely to be the overriding traffic impact, road improvements are likely to generate significant additional traffic where:

- roads around the project are already congested in peak periods and further traffic growth is expected with or without the project going ahead
- the project is expected to significantly cut journey times
- an improvement is likely to stimulate residential and business development

These circumstances arise where major road improvements are in urban areas with sustained population and economic growth. Failure to apply models that can estimate these more diverse impacts will significantly underestimate traffic and overestimate economic benefits (Auditor General’s Office, 2011).

In the WestConnex Stage 2 EIS induced demand is briefly defined in section 9.1.4 of Volume 1B and in section 4.1.1.5 of Volume 2B. In these sections, induced demand is defined as only comprising:

- regional growth in trips resulting from population growth and expanded economic activity
- trips attracted from competing routes or modes as a result of improved travel times
- induced traffic as a result of improved travel times between homes and destinations

¹⁰ Assumes the King Georges Road Interchange upgrade and future M4 Widening projects are complete, but the remainder of the WestConnex program of works has not been built.

¹¹ Assumes the New M5 is complete and open to traffic without the M4 East (WestConnex Stage 1) or the future M4-M5 Link components of the WestConnex program of works.

¹² Assumes components of the WestConnex program of works and the future Southern extension completed.

The third category is particularly unclear as it seems to assume that induced demand is related to latent trip-making that is released by faster travel times. However, it does not include the additional and important category of long-term induced trips that includes destination choice (or trip distribution) changes and land use responses to significant transport infrastructure.

Neither Volume 1B nor Volume 2B of the EIS describes the methodology used to account for induced demand. It is assumed the methodology is the same as described in the WestConnex *Updated Strategic Business Case* in that a do-nothing (or do-minimum) future is forecast using Sydney Strategic Traffic Model (STM) and then induced trips are added to the future trip matrices using travel time elasticities of travel demand in accordance with New Zealand economic evaluation guidelines contained in *Economic Evaluation Manual*, New Zealand Transport Agency, 2013. If this is the case, the forecasts have not included the additional trip making in the corridor that may arise from changes in destinations and changes in land use, both of which may contribute significant additional volumes.

This definition and methodology do not cover many of the categories highlighted by the Auditor-General and therefore traffic may be underestimated and economic benefits overestimated.

Confusion in technical aspects of the reporting

There are a number of inconsistencies throughout the report. Some examples follow.

1. Contradictions in level of service assessments

On page 9-25 of Volume 1B of the EIS, the fifth paragraph states:

“The motorway operates between a level of service B and C in both directions during the AM and PM peak, which is considered to be an acceptable level of service. However, it should be noted the surveyed demand could be representative of a suppressed demand due to congestion along the M5 East Motorway within the tunnels.”

The meaning behind this statement is not clear as LOS B and C do not indicate congestion. To attribute ‘suppressed demand’ to congestion therefore appears unfounded.

Table 9-9, ‘M5 East Motorway mid-block traffic and volumes and level of service (2014)’ contradicts the statement, reporting observed levels of service during the peak periods in both directions as being LOS C to E.

2. Inconsistencies in Tables 9-7 to 9-11

Table 9-7 presents counted, peak period, mid-block flows and average weekday traffic on the M5 taken in late 2014/early 2015. There are several issues with this table. Firstly, the text suggests that the traffic was counted in “late 2014/early 2015”, which in turn suggests December/ January, a time when traffic engineers try to avoid counting due to the impacts of the holiday period and school/university vacation periods. Secondly, the AM and PM volumes listed in table 9-7 for 2014/2015 are precisely the same as those listed for 2012 (existing case) in Table 9-11.

To complicate matters further, the mid-block traffic volumes reported in Table 9-9 are different again to the volumes presented in tables 9-7 and 9-11. Furthermore, the estimation of level of service presented in Table 9-9 appears to have several discrepancies. The table’s footnote states “the mid-block capacity adopted for the M5 East Motorway is 2,250 passenger car units (PCU) per hour per lane based on a freeway speed of 90 kph...”. Table 6 summarises these issues.

TABLE 6 INCONSISTENCIES IN VOLUMES LISTED IN TABLES 9-7, 9-9 AND 9-11

		AM Peak			PM Peak		
		Table 9-7		Table 9-11	Table 9-7		Table 9-11
		(2014/2015)	Table 9-9 (2014)	(2012 (existing))	(2014/2015)	Table 9-9 (2014)	(2012 (existing))
M5 East Motorway, East of King Georges Road	Eastbound	2,380	3,312	2,380	3,499	3,482	3,499
	Westbound	3,505	3,307	3,505	3,564	3,727	3,564
M5 East Motorway East of Bexley Road (in tunnel)	Eastbound	3,539	3,786	3,539	3,500	3,508	3,500
	Westbound	2,586	2,869	2,586	2,937	3,065	2,937
M5 East Motorway at Cook River	Eastbound	2,773	2,773	2,773	2,518	2,502	2,518
	Westbound	2,566	2,566	2,566	2,439	2,474	2,439

The capacity has then been implemented for two lanes as 4,300 PCU per hour rather than 4,500 PCU per hour. While this reduction amounts to only 4.5 percent, it is unexplained and it is significant given that the table reports volume/capacity ratios (v/c) to 2 decimal places. Indeed, we have not been able to replicate the v/c results, even when using 4,300 PCU per hour as a capacity, to the same degree of precision. The differences are small and will not change the outcome of the report, but the implications of unreported differences are a concern.

TABLE 7 CALCULATION OF V/C RATIO IN TABLE 9-9

Calculation of v/c Ratio in table 9-9

		AM Peak			PM Peak		
		Re-estimated v/c	v/c with estimated flow	v/c with 4,500 sat	Re-estimated v/c	v/c with estimated flow	v/c with 4,500 sat
		v/c	v/c	flow	v/c	v/c	flow
M5 East Motorway, East of King Georges Road	Eastbound	0.86	0.85	0.81	0.86	0.85	0.82
	Westbound	0.86	0.85	0.81	0.96	0.95	0.91
M5 East Motorway East of Bexley Road (in tunnel)	Eastbound	0.99	0.97	0.93	0.87	0.86	0.82
	Westbound	0.77	0.75	0.72	0.78	0.77	0.73
M5 East Motorway at Cook River	Eastbound	0.74	0.72	0.69	0.62	0.61	0.59
	Westbound	0.67	0.66	0.63	0.64	0.63	0.60

3. Capacity assessments

The second paragraph on page 9-33, under the heading Network Performance, begins “The volume / capacity ratios show the motorway operates at or close to capacity during the AM and PM peak”. Most of the calculated levels of service are LOS C and D. We would argue that these are not at or close to capacity. While Roads and Maritime Services generally identifies LOS D as being an indicator for a need to begin planning traffic capacity increases, LOS D itself does not imply operation at capacity.

The paragraph then continues:

“The level of service presented in Table 9-9 represents the operational performance of the M5 East Motorway based on the surveyed demand. It is recognised that the actual level of service may be lower than the surveyed level of service, which could be suppressed as a result of congestion at other sections of the M5 Motorway corridor, causing variations to travel times and speeds.”

It is not clear why the actual level of service may be lower than surveyed and no evidence for this is presented. It is also not clear what is suppressed. If the level of service is affected by congestion upstream of the sections being studied then it is inappropriate to use v/c as a measure of LOS and other methods should be used.

The issue with v/c as a measure of level of service is first that there are no specific standards that relate v/c values to level of service. Secondly, it is a measure that relies strongly on capacity, which is a highly abstract concept that is imprecisely defined, especially in strategic transport models. Most problematic

is that, in reality, on roads where demand exceeds capacity, queues will limit volumes for considerable lengths upstream. Strategic models do not replicate these queues. As a result, v/c measures on some links where v/c might be low, queues from bottlenecks will restrict their operation.

To avoid the problem of understating, (or suppressing) level of service, it should be possible to use:

- A comparison of free flow speed and actual travel speed along a route. Speed flow relationships in strategic models usually reduce speeds where demand exceeds capacity to almost zero. As a result, where the model underestimates speeds on some links, it will overestimate on capacity restricted links.
- The density per lane per kilometre on links, which can be calculated using speeds and flows or volumes and link length.

Construction traffic and impacts

The impact of construction traffic is modelled in detail using microsimulation of the areas impacted. While this is an acceptable and accepted methodology of evaluating impact, it is inherently limiting; all impacts are reduced to those at intersections and the impacts themselves are reduced to Levels of Service changes.

Impacts on users of public transport, including those who walk to bus stops or stations are not evaluated, despite measures for pedestrian facilities being listed. The impact on patronage and the choice of walking or driving (and the resulting increase in traffic) has not been addressed in the consideration of the impact of construction traffic.

Given the inconsistency of the current traffic volumes (exemplified in tables 9-7, 9-9 and 9-11) it is not clear that the volumes used for the micro-simulation have been adequately estimated. In addition, it appears that sensitivity testing was not carried out and potential variations of travel times, queues and delays have not been assessed.

5 CONCLUSION

The purpose of the WestConnex Stage 2 EIS is to identify comprehensive mitigation and management measures that would be implemented to avoid, manage, mitigate, offset and/or monitor impacts during construction and operation of the project. SGS has undertaken a review of the Strategic Alternatives and the Social and Economic Impact Assessment of the WestConnex Stage 2 EIS. This review has identified a number of issues.

For the Strategic Alternatives, the issues of most concern are:

- No detail on how the strategic alternatives were developed
- A lack of sufficient detail on the scope, timing and cost of each alternative
- No consideration of an integrated solution
- A lack of rigour in the assessment of these alternatives identified
- The project objectives effectively prevent any non-road based solution from being assessed positively.

For the Social and Economic Impact Assessment the issues of most concern are:

- Methodological issues that mean the full extent of the social and economic impacts has not been considered in the EIS
- The city shaping impacts have not been considered
- WestConnex Stage 2 does not connect people to areas with jobs growth and high value jobs
- The amenity at Sydney Park will be impacted
- The impact on the urban renewal at Green Square and Ashmore has not been adequately addressed
- The impact to congestion in King Street, Newtown not adequately addressed.

A number of further issues were also identified in the EIS review including:

- The assumption that all sections of WestConnex would be completed by 2031 with limited assessment of WestConnex Stage 2 in 2031 as a standalone project as part of the full WestConnex project
- Induced traffic is incompletely and inflexibly treated, so that impacts on public transport patronage and active transport volumes are not fully examined
- Inconsistencies in technical aspects of the reporting.

As previously stated, the information contained in the EIS does not reduce any of the concerns around the adverse impacts previously raised in the Strategic Review and Transport Modelling of WestConnex prepared by SGS Economics and Planning and Veitch Lister Consulting. That is, WestConnex will not address the transport challenges being faced by Sydney in the future.

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APPENDIX MODEL COMPARISON

The Zenith model was used by VLC to interpret results of the transport modelling used in the WestConnex Stage 2 EIS. This section presents a technical comparison of the various assumptions, inputs and outputs from the two transport models. This is a technical comparison between the models and not part of the review of the EIS itself.

While there are a range of differences, the models appear to be producing a broadly consistent picture of traffic travelling along WestConnex Stage 2 and the M5 East. In comparing the difference between the WestConnex and VLC models, there are some general observations to be made on the structure of the two modelling processes. These are discussed below.

The Modelling Process

The WRTM modelling has:

- a) Extracted a base case road traffic trip matrix from STM;
- b) Refined the trip matrix through matrix estimation;
- c) Project these matrices into the future using growth of traffic generators in zones;
- d) Introduced induced trips into the project case using elasticities travel time elasticities of demand for travel by car;
- e) The WRTM, a purely traffic assignment model, is used to assign the resulting trip matrices to the road network. This provides more detailed toll choice modelling than the STM is capable of producing;
- f) Forecast detailed volumes and turning movements where required by applying growth calculated from the difference in base year and future year to the base year values.

The WRTM process, while acceptable, includes many implicit assumptions and does not take any account of public transport or active transport. Because the WRTM does not include public transport assignment, active transport or even public transport demand forecasting, the EIS provides no information about the impact of WestConnex on public transport demand.

Zenith, on the other hand, is a multi-modal, 4-step model and, in the modelling of WestConnex, has implemented all four steps within a single model. It models active transport and public transport explicitly and assigns trips to networks representing links and services for those modes.

We have identified several differences in the assumptions contained in the two models and the procedures that were used to provide forecasts of traffic demand. These are itemised below.

Extent of Model

The Zenith WestConnex Model (ZWM) includes the Sydney Metropolitan area, the Illawarra Region, the Central Coast and the Hunter Region. The STM, which provided the base case trip matrix, has roughly the same coverage as ZWM. The WRTM, however, includes the Sydney Metropolitan area only. The major issue with the limited coverage is that WRTM has no mechanism to include route shifting between corridors. The most significant of these are the choice of route for travel between:

- Sydney Metropolitan Area and the Illawarra Region, where there is a choice between the Hume Highway and the F6
- Sydney Metropolitan Area and northern areas of Central Coast and the Hunter Region, where there is the choice between the Pacific Highway and the M2/Pennant Hills Road.

The former has connections to the WestConnex stage 2 corridor, and the project has the potential to impact significantly on the choice route for access into the Sydney area from the south.

Network Coding

The alignment of WestConnex Stage 2: In the WRTM, WestConnex Stage 2 is located south of the existing M5 East. In ZWM it is coded on the same alignment as the existing M5 East. This is unlikely to produce significantly different outputs as the lengths of road links are not significant.

ZWM does not include some of the detailed turning movement control changes that are mentioned in the document, but these are not likely to impact the forecasts of traffic significantly.

Demographics

It is unlikely that the demographics input to the models are the same. The WRTM forecasts to 2031, while the Zenith modelling study called for forecasts to 2026. In general, the Zenith road volume forecasts should therefore be slightly lower than the WRTM. However, we do not have enough detail about the WRTM demographics to make a full comparison of the demographic inputs into the two models.

Mode choice

EIS uses elasticities to calculate induced traffic, which includes the shift from public transport to cars. ZWM estimates mode choices within the model.

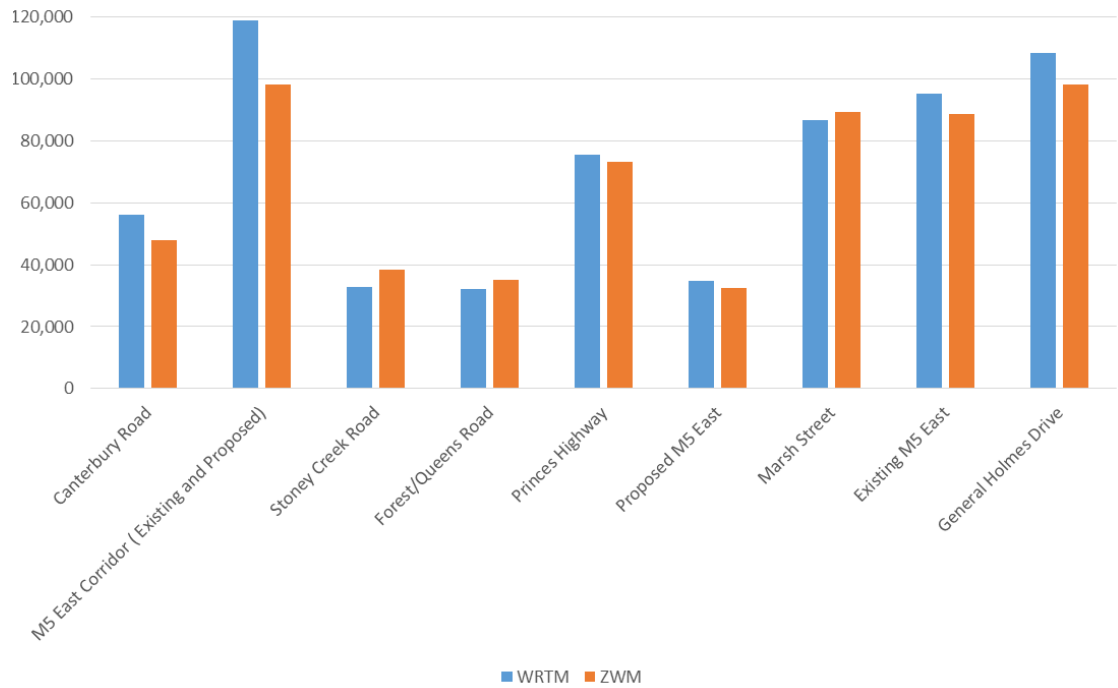
Tolls and Toll Strategy

The EIS does not explain how tolls and their perception changes into the future. We understand from other sources that there is an assumption that income increases in real terms by 1% per year. ZWM does take into account changes in perceptions of tolls and willingness to pay.

Direct Comparisons

The following figure compares the volumes across the four screenlines out of the two models. The two sets of results are remarkably similar.

FIGURE 13 COMPARISON OF DAILY 2-WAY VOLUMES CROSSING SCREENLINES



In general the chart shows that the ZWM forecasts are slightly lower than those of the WRTM, as expected. However, the forecasts from the two models are consistent.

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