IMPORTANT

This letter contains important information. If you do not understand it please ask a relative or friend to translate it or come to Council and discuss the letter with Council's staff using the Telephone Interpreter Service.

English

IMPORTANTE

Questa lettera contiene delle informazioni importanti. Se non capisce il contenuto è pregata di chiedere aiuto ad un parente o un amico, oppure La Invitiamo di venire in persona al Municipio a parlarne con un nostro implegato, utilizzando il Servizio Interprete Telefonico.

Italian

IMPORTANTE

Esta carta contiene información importante. Si usted no la entiende, pídale a un familiar o a un amigo que se la traduzca, o venga a la Oficina de la Municipalidad y hable acerca de la misma con el personal de la oficina a través del Servicio Telefónico de Intérpretes.

Spanish

TIN QUAN TRỌNG

Tin tức trong thơ này rất quan trọng. Nếu bạn không hiểu, hãy nhờ thân nhân hoặc bạn bè dịch cho bạn nghe hoặc tới văn phòng Hội Đồng Thành Phố để thảo luận với nhân viên qua dịch vụ thông ngôn điện thoại.

Vietnamese

ΠΡΟΣΟΧΗ

Το γράμμα αυτό περιέχει σπουδαίες πληροφορίες. Αν δεν το καταλαβαίνετε, παρακαλέστε ένα συγγενή ή φίλο να σας το μεταφράσει, ή ελάτε στο Δημαρχείο και συζητείστε το γράμμα με το προσωπικό του Δημαρχείου χρησιμοποιώντας την Τηλεφωνική Υπηρεσία Διερμηνέων.

Greek

重要借息

此信包含重要内容。若有不明白之處，可請親戚或朋友幫助翻譯。或請到市政會来，通過電話傳譯服務與市政會人員討論信的内容。

Chinese

Council Ref: C522/15
Contact: Clare Harley
Phone: 9367 9226
Date: 2 November 2015

LEICHHARDT COUNCIL

ABN: 92 379 942 845
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PO Box 45, Leichhardt NSW 2040
Phone: (02) 9367 9222 Fax: (02) 9367 9111
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Carolyn McNally
Secretary
Department of Planning and Environment
GPO Box 39,
Sydney NSW 2001

Dear Ms McNally,

RE: Application Number SSI 14_6788 – WestConnex New M5 Environmental Impact Statement

I am writing to provide you with a draft submission from Leichhardt Council in response to the exhibition of the WestConnex New M5 Environmental Impact Statement. As previously discussed with officers of your Department this submission has been prepared by officers of Leichhardt Council and will be presented to Council for its consideration at its meeting on 9 February 2016. Subsequent to adoption or alteration by Council a final version of the submission will be forwarded to the Department

Council's submission is incorporated into this letter (including an independent review of the WestConnex *Updated Strategic Business Case* commissioned by Council). Additionally, a copy of the relevant Council report is attached to provide additional detail on Council's consideration of the EIS.

Leichhardt Council has developed a comprehensive integrated planning approach over the past decade, commencing with its initial Strategic Plan (Leichhardt 2020) that was refined as Leichhardt 2025+. Included in this approach was the adoption of Leichhardt's Integrated Transport Plan in February 2014.

Through an extensive community consultation program, Leichhardt's Integrated Transport Plan established the following guiding principles:

- sustainable transport modes that meet user needs should be the priority for policy, investment and service provision decisions;
- the role of private motor vehicles for access to, and travel within, the City should be reduced to ease congestion and improve sustainable outcomes;
- transport modes and services must be integrated with other uses to create seamless and continuous access opportunities; and
- the development of a multi–layered, well–integrated transport system must consider and understand the needs of different users.

It is within this context that Leichhardt Council has prepared its submission on the Stage 2: New M5 EIS.

Council's key submission points are as follows:

1) Council requests additional information including:
   a) detailed information about Stage 3 of the WestConnex Motorway Project;

   b) further information and consideration by the NSW State government is requested to ensure that the WestConnex project is considered in light of the extensive list of related urban projects which are currently in planning and development phases;

   c) a fully co-ordinated, evidence based assessment of how the WestConnex project will contribute to the liveability and social, economic and environmental sustainability of the Sydney, particularly Sydney's Inner West;

2) Based on the review of the EIS:
   a) it is considered that the WestConnex Motorway Project, including the New M5, is not in keeping with world's best practice urban development, particularly in terms of its encouragement of private vehicle use over public transport. Consequently, it is requested that the proposed New M5 be benchmarked against other high quality international land use/transport solutions to deem its relevance and appropriateness, or otherwise;

   b) the New M5 is a key component of the WestConnex Motorway Project and should be considered in relation to the total project including its proposed northern and southern extensions;

   c) it is requested that an alternative which combines strategic, site specific road improvements with public transport improvements should be examined and compared to the tunnelled motorway option currently being pursued;

   d) a broader base of environmental consideration should be used to assess the project. Such consideration should include a larger scale analysis of the implications of encouraging private car use ahead of public transport;

   e) it is essential that, as the motorway tunnels are being constructed to accommodate three-five lanes each direction, the EIS should assess the impacts of the project's ultimate capacity rather than:
      - examining an artificially constrained capacity of two lanes in each direction, and
      - addressing the project's ultimate capacity in subsequent assessments.

      This is of particular concern as the, currently proposed, incremental approach would diminish the rate of growth of traffic by comparing the ultimate volumes with increased traffic that will result from the two x two lane configuration rather than the existing baseline traffic volumes.

      It should be noted that such an approach is likely to have far reaching implications in relation to the surface road network (both parallel routes and feeder roads).

f) assessment of the project should consider the implications of leaching patrons from existing (or likely future) public transport services and how that reduction in patronage may impact on Sydney's public transport systems in the longer term;

g) concern is expressed that the analysis does not include any consideration of the overall environmental costs or benefits of the various project alternatives. Additionally, the alternatives considered did not include a hybrid version which included public transport and rail freight investment in combination with limited strategic road improvements.

h) the EIS generally focusses on a narrow corridor of influence with little consideration being given to the broader impacts of such a major shift in the approach to catering for travel demand across the Sydney Region. The impacts of a motorway project of this magnitude, particularly in terms of the overall WestConnex Motorway Project (including its potential northern and southern extensions) are far reaching and the assessment should include large scale impacts including broader environmental, sustainability, public health and wellbeing, and land use/transport integration issues

i) it is considered that the traffic modelling included in the Environmental Impact Statement is limited and may significantly underestimate future traffic volumes and congestion that will be experienced both in the 2021 and 2031 scenarios. The significant investment of public and private funds which will be required to deliver the projects justify a fully co-ordinated, evidence based assessment of the how the WestConnex Motorway Project will contribute to the liveability and social, economic and environmental sustainability of the city.

j) concern is expressed that the timing of the WestConnex Motorway Project (including Stages 1b, 2 and 3) is such that the traffic model could not effectively include the specific demographic information that is likely to result from numerous urban revitalisation projects currently proposed for the Sydney Region;

k) specifically in relation to the traffic and transport modelling conducted by the proponent concern is generally raised regarding:
    - insufficient detail provided to determine the accuracy of the various land use assumptions that have been made particularly in relation to:
        - the future demand of Sydney Airport once the Western Sydney Airport has become operational;
        - implications of the Moorebank Intermodal Freight Terminal;
        - major land use initiatives across the Sydney Region including those currently associated with the Parramatta Road Urban Transformation Project, Bays Precinct, Waterloo Rejuvenation, as well as Urban Growth NSW various Western Sydney portfolio, such as Oran Park Town, Newbrook and Macarthur Heights
    - insufficient detail provided to determine the accuracy of various social assumptions including:
        - the value of time to different classifications of traveller;

        - toll sensitivity for freight vehicles in contrast to private drivers;
        - whether potentially reduced travel times will encourage residents of western Sydney to remain in existing areas, or travel for the same amount of time and move further afield to more affordable areas (thus travelling greater distances in the same time as they currently travel);
    - Existing and likely future mix of heavy vehicles (particularly in relation to the proportion of dangerous goods vehicle , which are unlikely to be permitted to use the tunnels);

l) while the Secretary's Environmental Assessment Requirements specifically includes reference to consideration of the implications of induced traffic on both existing public transport and future public transport opportunities there does not appear to be any quantification of:
    - The total amount of additional traffic induced by the creation of the motorway (ie car trips that would not have been made if the motorway was not constructed);
    - The total amount of public transport patrons who would move from public transport to private vehicles as a result of the increased road capacity (on both the motorway and the surface road network), and the impact this migration of patrons will have on the viability of public transport;

m) a thorough investigation of public transport alternatives, including consideration of the greenhouse gas savings compared to the New M5 project and WestConnex, as a whole. This information should be placed on public exhibition for community consideration prior to decision making about the project.

n) confirmation is required that the NSW EPA has approved the alternative assessment methodology used in the EIS, as the approach does not satisfy all of the requirements of the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'. If the approach adopted in the EIS is not consistent with the relevant EPA requirements for modelling and assessment further studies should be undertaken and publically exhibited to ensure that the assessment is undertaken in a manner consistent with the requirements of the EPA.

o) additional information regarding the 'worst case' assessment of air quality which considers the maximum emission rates (in g/s) and a peak congested scenario should be provided;

p) There is a need for the completion of a quantitative construction air quality assessment, focusing on the risk of particulate impacts and including the potential for release of crystalline silica.

q) In the event of approval of the project the following conditions should be applied:
    - Portal emission monitoring

- Dampers should be provided in the western ventilation outlet to allow for varying outlet diameters.

r) staff of relevant Councils and State bodies should be consulted with regards to local biodiversity plans, objectives, actions and data. Some species considered common through NSW and not protected by threatened species legislation, such as the superb fairy wren, are locally vulnerable and Councils and the local community are working to preserve these species. By focusing on the minimum requirement to protect threatened species, populations and ecological community only, the importance of biodiversity within the local urban context is over-looked;

s) further detail needs to be provided regarding how the loss of established vegetation is to be mitigated;

t) further justification needs to be provided regarding the selection of the boundary study areas and exclusion of key biodiversity spaces;

u) concern is expressed that the limited scope of the surveys and proposed mitigation measures may mean that the flora and fauna impacts are greater than those suggested by the EIS;

v) as the EIS details that no like-for-like credits were available for purchase, in relation to its biodiversity off-set strategy it is considered that the biodiversity proposed to be cleared will not be adequately substituted.

w) the construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase;

x) it is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS.

y) the construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase.

z) it is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS

aa) it is important to note that this assessment considers the impact of future climate change on the project, rather than the impact of the project on future of climate change. It would be beneficial to assess the impact of the project on climate change.

bb) it is important that regular reporting is conducted on the sustainability objectives and targets throughout the construction and later phases of the project.

3) as the overall premise of the WestConnex Motorway Project is based on WestConnex *Updated Strategic Business Case* Leichhardt Council commissioned an independent review of the business case. Based on the key concerns highlighted in this review (and include below) Council considers that the overall WestConnex Motorway project and the assessment processes associated with it are flawed. Consequently, Council requests that no further action be taken to progress any stage of WestConnex until the issues raised in the (attached) review of the project's *Updated Strategic Business Case* have been addressed.

   Of particular concern in relation to the *Updated Strategic Business Case* are the following:

   a) the Updated Strategic Business Case does not consider any strategic alternatives to WestConnex.

   b) the description of the transport modelling applied to WestConnex is opaque and confusing, and the toll regime that is used in traffic forecasts is not fully explained.

   c) once the Western Harbour Tunnel and Northern Beaches Link are in operation (by 2031), the Updated Strategic Business Case suggests that WestConnex will be close to capacity. If wholly completed by 2021, this would result in $16.8 billion being spent for around ten years of marginally improved travel times.

   d) establishing a motorway through The Bays Precinct appears counterintuitive to the aims of the urban renewal project.

   e) the costs of WestConnex are high and have the potential to increase.

   f) the traffic modelling has a range of issues which are concerning for a project of this scale. These issues include the treatment of induced demand and its impact on the project benefits, a lack of sensitivity testing and the lack of modelling for a more distant future year (e.g.2046).

   g) the benefit cost ratio (BCR) of 1.71 seems questionable based on information provided in the document. Dividing the present value of benefits against the present value of costs results in a benefit cost ratio of 1.64.

   h) if travel time savings of less than five minutes are excluded, the travel time benefits are reduced from $12.9 billion to $5.9 billion, consequently reducing the BCR from the recalculated 1.64 to 1.12.

   i) the rationale for the large proportion of business trips is unclear. 33 per cent of travel time benefits are attributed to cars – privately registered for business

use. However, justification on why there are so many business car users is not provided in the Updated Strategic Business Case.

j) land acquisition costs or the opportunity cost of land being used for the project do not appear to be included in the WestConnex project costs or in the broader benefit cost analysis.

k) the health impacts, local amenity impacts and related land use implications are not discussed by the Updated Strategic Business Case.

If you require any further information please do not hesitate to contact Ken Welsh, Strategic Transport Planner on 9367 9241.

Yours sincerely,

Clare Harley
Director
Environmental and Community Management

WESTCONNEX STAGE 2 M5 - ENVIRONMENTAL IMPACT STATEMENT PUBLIC EXHIBITION

Division	Environment and Community Management
Author	Director Environmental and Community Management Strategic Transport Planner
Meeting date	9 February 2016 Policy Meeting
Strategic Plan Key Service Area	Community well-being Accessibility Place where we live and work A sustainable environment Business in the community Sustainable services and assets

SUMMARY AND ORGANISATIONAL IMPLICATIONS

Purpose of Report	To provide Council with a draft submission on the New M5 (WestConnex Stage 2) Environmental Impact Statement (State Significant Development Application SSI 14 6788) , which is on public exhibition until 29 January 2016
Background	The WestConnex Motorway Project was first proposed in the *NSW State Infrastructure Strategy 2012 – First Things First* and subsequently included in the *NSW Long Term Transport Master Plan.* The project comprises of three stages to connect the existing M4 motorway from Parramatta to the M5 motorway at Beverly Hills. On 27 November 2015, the Sydney Motorways Corporation (formerly WestConnex Delivery Authority) submitted a development application and supporting Environmental Impact Statement (EIS) to the Department of Planning and Environment for the New M5 (WestConnex Stage 2). This application proposes the extension of the M5 motorway with paired tunnels running for some 9 kilometres between Kingsgrove and St Peters.
Current Status	The New M5 Environmental Impact Statement (EIS) is on public exhibition until 29 January 2016.
Relationship to existing policy	Relates to previous resolutions: **C480/12**, **C495/12**, **C85/13**, **C537/13**, **C11/14**, **C12/14**, **C99/14**, **C157/14**, **BDC164/14**, **C492/14** **C13/19P** and **C522/15**
Financial and Resources	NIL at this time

Implications	
Recommendation	That Council: 1. Forward a submission to the Department of Planning and Environment (based on the submission points included in this report) and advise that Council is opposed to the State Significant Development Application (SSI 14 6788) for the New M5 (WestConnex Stage 2) as the proposed development, as outlined in the Environmental Impact Statement is inconsistent with the relevant aims of Leichhardt Council's strategies, most particularly its Integrated Transport Plan, and will not: i) create a legible, direct and safe pedestrian and cycling environment; ii) encourage public transport use; iii) provide a safe and efficient road network for all road users; iv) facilitate integration of land use, transport and community & cultural activities; v) promote health and wellbeing; vi) improve environmental conditions; and vii) support Councils adopted 10 Year mode shift targets, including a reduction of private car use from 44% to 28%. 2. Advise the Department of Planning and Environment that Council requests additional information and data as outlined in Section 2 - Review of the New M5 Environmental Impact Statement, including: i) detailed information about Stage 3 of the WestConnex Motorway Project; ii) further information and consideration by the NSW State government is requested to ensure that the WestConnex project is considered in light of the extensive list of related urban projects which are currently in planning and development phases; iii) a fully co-ordinated, evidence based assessment of how the WestConnex project will contribute to the liveability and social, economic and environmental sustainability of the Sydney, particularly Sydney's Inner West;

3. Based on the review of the EIS, the following points are recommended for inclusion in Council's submission:
   i) it is considered that the WestConnex Motorway Project, including the New M5, is not in keeping with world's best practice urban development, particularly in terms of its encouragement of private vehicle use over public transport. Consequently, it is requested that the proposed New M5 be benchmarked against other high quality international land use/transport solutions to deem its relevance and appropriateness, or otherwise;

   ii) the New M5 is a key component of the WestConnex Motorway Project and should be considered in relation to the total project including its proposed northern and southern extensions;

   iii) it is requested that an alternative which combines strategic, site specific road improvements with public transport improvements should be examined and compared to the tunnelled motorway option currently being pursued;

   iv) a broader base of environmental consideration should be used to assess the project. Such consideration should include a larger scale analysis of the implications of encouraging private car use ahead of public transport;

   v) It is essential that, as the motorway tunnels are being constructed to accommodate three-five lanes each direction, the EIS should assess the impacts of the project's ultimate capacity rather than:
      - o examining an artificially constrained capacity of two lanes in each direction, and
      - o addressing the project's ultimate capacity in subsequent assessments.

This is of particular concern as the, currently proposed, incremental approach would diminish the rate of growth of traffic by comparing the ultimate volumes with increased traffic that will result from the two x two lane configuration rather than the existing baseline traffic volumes.

It should be noted that such an approach is likely to have far reaching implications in relation to the surface road network (both parallel routes and feeder roads).

vi) assessment of the project should consider the implications of leaching patrons from existing (or likely future) public transport services and how that reduction in patronage may impact on Sydney's public transport systems in the longer term;

vii) concern is expressed that the analysis does not include any consideration of the overall environmental costs or benefits of the various project alternatives. Additionally, the alternatives considered did not include a hybrid version which included public transport and rail freight investment in combination with limited strategic road improvements.

viii) the EIS generally focusses on a narrow corridor of influence with little consideration being given to the broader impacts of such a major shift in the approach to catering for travel demand across the Sydney Region. The impacts of a motorway project of this magnitude, particularly in terms of the overall WestConnex Motorway Project (including its potential northern and southern extensions) are far reaching and the assessment should include large scale impacts including broader environmental, sustainability, public health and wellbeing, and land use/transport integration issues

ix) it is considered that the traffic modelling included in the Environmental Impact Statement is limited and may significantly underestimate future traffic volumes and congestion that will be experienced both in the 2021 and 2031 scenarios. The significant investment of public and private funds which will be required to deliver the projects justify a fully co-ordinated, evidence based assessment of the how the WestConnex Motorway Project will contribute to the liveability and social, economic and environmental sustainability of the city.

x) concern is expressed that the timing of the WestConnex Motorway Project (including Stages 1b, 2 and 3) is such that the traffic model could not effectively include the specific demographic information that is likely to result from numerous urban revitalisation projects currently proposed for the Sydney Region;

xi) specifically in relation to the traffic and transport modelling conducted by the proponent concern is generally raised regarding:

- Insufficient detail provided to determine the accuracy of the various land use assumptions that have been made particularly in relation to:
  - the future demand of Sydney Airport once the Western Sydney Airport has become operational;
  - implications of the Moorebank Intermodal Freight Terminal;
  - major land use initiatives across the Sydney Region including those currently associated with the Parramatta Road Urban Transformation Project, Bays Precinct, Waterloo Rejuvenation, as well as Urban Growth NSW various

Western Sydney portfolio, such as Oran Park Town, Newbrook and Macarthur Heights

- Insufficient detail provided to determine the accuracy of various social assumptions including:
  - The value of time to different classifications of traveller;
  - Toll sensitivity for freight vehicles in contrast to private drivers;
  - Whether potentially reduced travel times will encourage residents of western Sydney to remain in existing areas, or travel for the same amount of time and move further afield to more affordable areas (thus travelling greater distances in the same time as they currently travel);
- Existing and likely future mix of heavy vehicles (particularly in relation to the proportion of dangerous goods vehicle , which are unlikely to be permitted to use the tunnels);

xii) while the Secretary's Environmental Assessment Requirements specifically includes reference to consideration of the implications of induced traffic on both existing public transport and future public transport opportunities there does not appear to be any quantification of:

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xiii) a thorough investigation of public transport alternatives, including consideration of the greenhouse gas savings compared to the New M5 project and WestConnex, as a whole. This information should be placed on public exhibition for community consideration prior to decision making about the project.

xiv) confirmation is required that the NSW EPA has approved the alternative assessment methodology used in the EIS, as the approach does not satisfy all of the requirements of the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'. If the approach adopted in the EIS is not consistent with the relevant EPA requirements for modelling and assessment further studies should be undertaken and publically exhibited to ensure that the assessment is undertaken in a manner consistent with the requirements of the EPA.

xv) additional information regarding the 'worst case' assessment of air quality which considers the maximum emission rates (in g/s) and a peak congested scenario should be provided;

xvi) there is a need for the completion of a quantitative construction air quality assessment, focusing on the risk of particulate impacts and including the potential for release of crystalline silica.

xvii) in the event of approval of the project the following conditions should be applied:
- Portal emission monitoring
- Dampers should be provided in the western ventilation outlet to allow for varying outlet diameters.

xviii) staff of relevant Councils and State bodies should be consulted with regards to local biodiversity plans, objectives, actions and data. Some species

	considered common through NSW and not protected by threatened species legislation, such as the superb fairy wren, are locally vulnerable and Councils and the local community are working to preserve these species. By focusing on the minimum requirement to protect threatened species, populations and ecological community only, the importance of biodiversity within the local urban context is over-looked; xix) further detail needs to be provided regarding how the loss of established vegetation is to be mitigated; xx) further justification needs to be provided regarding the selection of the boundary study areas and exclusion of key biodiversity spaces; xxi) concern is expressed that the limited scope of the surveys and proposed mitigation measures may mean that the flora and fauna impacts are greater than those suggested by the EIS; xxii) as the EIS details that no like-for-like credits were available for purchase, in relation to its biodiversity off-set strategy it is considered that the biodiversity proposed to be cleared will not be adequately substituted. xxiii) the construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase; xxiv) It is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS. xxv) The construction of motorways is not considered to be consistent with best

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Notifications	NIL
Attachments	<< Enter Attachments or enter NIL >>

Purpose of Report

To provide Council with a draft submission on the New M5 (WestConnex Stage 2) Environmental Impact Statement (State Significant Development Application SSI 14 6788) , which is on public exhibition until 29 January 2016.

(In anticipation of Council's first 2016 meeting being held after the close of submissions Council Officers have requested an extension of the submission date and forwarded a preliminary submission noting that it was not, at that time, formally adopted by Council and that Council's formal submission would be forwarded subsequent to its meeting on 9 February 2016).

Recommendation

That Council:

1. Forward a submission to the Department of Planning and Environment (based on the submission points included in this report) and advise that Council is opposed to the State Significant Development Application (SSI 14 6788) for the New M5 (WestConnex Stage 2) as the proposed development, as outlined in the Environmental Impact Statement is inconsistent with the relevant aims of Leichhardt Council's strategies, most particularly its Integrated Transport Plan, and will not:
    i) create a legible, direct and safe pedestrian and cycling environment;
    ii) encourage public transport use;
    iii) provide a safe and efficient road network for all road users;
    iv) facilitate integration of land use, transport and community & cultural activities;
    v) promote health and wellbeing;
    vi) improve environmental conditions; and
    vii) support Councils adopted 10 Year mode shift targets, including a reduction of private car use from 44% to 28%.

2. Advise the Department of Planning and Environment that Council requests additional information and data as outlined in Section 2 - Review of the New M5 Environmental Impact Statement, including:
    i) detailed information about Stage 3 of the WestConnex Motorway Project;

    ii) further information and consideration by the NSW State government is requested to ensure that the WestConnex project is considered in light of the extensive list of related urban projects which are currently in planning and development phases;

    iii) a fully co-ordinated, evidence based assessment of how the WestConnex project will contribute to the liveability and social, economic and environmental sustainability of the Sydney, particularly Sydney's Inner West;

3. Based on the review of the EIS, the following points are recommended for inclusion in Council's submission:

i) it is considered that the WestConnex Motorway Project, including the New M5, is not in keeping with world's best practice urban development, particularly in terms of its encouragement of private vehicle use over public transport. Consequently, it is requested that the proposed New M5 be benchmarked against other high quality international land use/transport solutions to deem its relevance and appropriateness, or otherwise;

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viii) the EIS generally focusses on a narrow corridor of influence with little consideration being given to the broader impacts of such a major shift in the approach to catering for travel demand across the Sydney Region. The impacts of a motorway project of this magnitude, particularly in terms of the

overall WestConnex Motorway Project (including its potential northern and southern extensions) are far reaching and the assessment should include large scale impacts including broader environmental, sustainability, public health and wellbeing, and land use/transport integration issues

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xii) while the Secretary's Environmental Assessment Requirements specifically includes reference to consideration of the implications of induced traffic on both existing public transport and future public transport opportunities there does not appear to be any quantification of:

- The total amount of additional traffic induced by the creation of the motorway (ie car trips that would not have been made if the motorway was not constructed);
- The total amount of public transport patrons who would move from public transport to private vehicles as a result of the increased road capacity (on both the motorway and the surface road network), and the impact this migration of patrons will have on the viability of public transport;

xiii) a thorough investigation of public transport alternatives, including consideration of the greenhouse gas savings compared to the New M5 project and WestConnex, as a whole. This information should be placed on public exhibition for community consideration prior to decision making about the project.

xiv) confirmation is required that the NSW EPA has approved the alternative assessment methodology used in the EIS, as the approach does not satisfy all of the requirements of the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'. If the approach adopted in the EIS is not consistent with the relevant EPA requirements for modelling and assessment further studies should be undertaken and publically exhibited to ensure that the assessment is undertaken in a manner consistent with the requirements of the EPA.

xv) additional information regarding the 'worst case' assessment of air quality which considers the maximum emission rates (in g/s) and a peak congested scenario should be provided;

xvi) there is a need for the completion of a quantitative construction air quality assessment, focusing on the risk of particulate impacts and including the potential for release of crystalline silica.

xvii) in the event of approval of the project the following conditions should be applied:
- Portal emission monitoring
- Dampers should be provided in the western ventilation outlet to allow for varying outlet diameters.

xviii) staff of relevant Councils and State bodies should be consulted with regards to local biodiversity plans, objectives, actions and data. Some species considered common through NSW and not protected by threatened species legislation, such as the superb fairy wren, are locally vulnerable and Councils and the local community are working to preserve these species. By focusing on the minimum requirement to protect threatened species, populations and ecological community only, the importance of biodiversity within the local urban context is over-looked;

xix) further detail needs to be provided regarding how the loss of established vegetation is to be mitigated;

xx) further justification needs to be provided regarding the selection of the boundary study areas and exclusion of key biodiversity spaces;

xxi) concern is expressed that the limited scope of the surveys and proposed mitigation measures may mean that the flora and fauna impacts are greater than those suggested by the EIS;

xxii) as the EIS details that no like-for-like credits were available for purchase, in relation to its biodiversity off-set strategy it is considered that the biodiversity proposed to be cleared will not be adequately substituted.

xxiii) the construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase;

xxiv) It is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS.

xxv) The construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase.

xxvi) It is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS

xxvii) It is important to note that this assessment considers the impact of future climate change *on the project*, rather than *the impact of the project on future of climate change*. It would be beneficial to assess the impact of the project on climate change.

xxviii) It is important that regular reporting is conducted on the sustainability objectives and targets throughout the construction and later phases of the project.

Executive Summary

Council has continually expressed its opposition to the WestConnex Motorway Project, since it was first proposed in 2012. Most recently in its submission on the M4 East Extension (November 2015).

The NSW State Government has now released the Environmental Impact Statement (EIS) for the extension of the M5 motorway, referred to as the “New M5”. In essence this extension is in the form of two x two lane parallel tunnels.

While these tunnels are to be marked as two lanes in each direction; *Section 1.2 of Appendix G* notes that the tunnels are being constructed to accommodate three lanes (Western Portals to Arncliffe) and five lanes (Arncliffe to St Peters). Further, the traffic assessment in Appendix G proposes that any change from the two lane marked configuration, to its capacity as constructed, would be subject to a future environmental assessment.

It is considered that the assessment of the project's traffic impacts significantly underestimates the potential traffic volumes by artificially constraining the capacity of the tunnels and that it is essential that the project's traffic impacts be assessed in relation to its ultimate capacity.

In summary, while there is little direct impact on Leichhardt LGA, the submission is designed to express Council's concern regarding:

- The project's principle of encouraging private vehicle travel rather than public transport;
- The long term regional implications of extending Sydney's motorways rather than investing in public transport network enhancements;
- The need to analysis this proposal as part of the overall WestConnex Motorway Project (including its northern and southern extensions and the ultimate capacity of New M5 tunnels);
- The absence of significant environmental or sustainability-based objectives in the assessment process;
- Requests for further detail on various aspects of the proposal;
- The need for confirmation of various elements of the air quality analysis and on-going monitoring of air quality;
- The need for greater detail in its consideration of greenhouse gases and climate change.

This report provides Council with a draft submission on the New M5 EIS, generally covering the above issues.

Background

The WestConnex Motorway Project was first proposed in the *NSW State Infrastructure Strategy 2012 – First Things First* and subsequently included in the *NSW Long Term Transport Master Plan.* The project comprises three stages to connect the existing M4 motorway from Parramatta to the M5 motorway at Beverly Hills.

On 27 November 2015, the Sydney Motorways Corporation (formerly WestConnex Delivery Authority) submitted a development application and supporting Environmental Impact Statement (EIS) to the Department of Planning and Environment for New M5 (WestConnex Stage 2). This application proposes the extension of the M5 motorway with twin tunnels from King Georges Road, Beverley Hills and Bexley Road, Arncliffe to Campbell Street, St Peters.

Report

1 Strategic Context

The WestConnex motorway project was first proposed in the *NSW State Infrastructure Strategy 2012 – First Things First*. Table 1 summarises the key forward planning documents which have been prepared by the NSW State government and which make reference to the WestConnex Motorway Project.

Date	Document	Details
October 2012	*NSW State Infrastructure Strategy 2012 – First things first*	Recommended that the NSW Government progress the development of the WestConnex motorway and that the urban renewal of Parramatta Road be placed at the heart of the WestConnex project. Key benefits included: • relieving congestion on the existing M4/Parramatta Road and M5 East; • supporting freight movements between Sydney's Gateways and the logistic hubs in Western and South Western Sydney; • supporting people movements to Sydney Airport; • acting as a catalyst for urban regeneration along key corridors, particularly Parramatta Road; • enhancing orbital road connectivity South and West of the CBD; and • facilitating improvements in public transport, particularly on the Parramatta Road corridor.
December 2012	*NSW Long Term Transport Master Plan*	WestConnex identified as an immediate priority to complete critical links in Sydney's motorway network. Also shown on plans are the following connections to WestConnex: • WestConnex Northern Extension – tunnel link enabling a connection to Victoria Road and Anzac Bridge from the WestConnex Motorway. • WestConnex Southern Extension – tunnel link between the M5 and Presidents Avenue, Rockdale. • Western Harbour Tunnel – proposed new harbour tunnel to provide a link between WestConnex and North Sydney, bypassing Sydney's CBD. • Beaches Link – proposed tunnel from Seaforth to the Warringah Freeway.
November 2014	*Rebuilding NSW – NSW Infrastructure Strategy Update 2014*	NSW Government released an update to the *NSW State Infrastructure Strategy 2012 – First things first* that outlined an amended, northern alignment route for Stage 3 M4-M5 link of the WestConnex motorway for further analysis. The Update also included the proposed motorway connections identified in the *NSW Long Term Transport Master Plan.*
December 2014	*A Plan for Growing Sydney 2014*	Plan identifies the need to set aside corridors for future road infrastructure, including: • WestConnex Motorway and its extensions; • Beaches Link; and • Western Harbour Tunnel. Proposes that the WestConnex Motorway will be: • catalyst for major urban renewal and regeneration along the Parramatta Road corridor; • support Sydney Airport and Port Botany; • allow the transformation of centres and suburbs due to decreased traffic on the Parramatta Road corridor;

Date	Document	Details
		• improvements to local amenity by reducing through traffic on surface roads and allowing for enhanced north-south local connectivity; and • Government will investigate the feasibility of light rail along Parramatta Road for the length of the corridor.

Table 1 - WestConnex Strategic Planning

The WestConnex motorway project is being progressed by the WestConnex Delivery Authority and has three stages:

- **Stage 1: M4**
  - **Stage 1a:** M4 Widening – Parramatta to Homebush; and
  - **Stage 1b:** M4 East - the extension of the M4 between Homebush and Haberfield in the form of the twin tunnels, the subject of the current application and environmental impact statement;
- **Stage 2: New M5**
  - King Georges Road intersection upgrade; and
  - King Georges Road, Beverly Hills to St Peters; and
- **Stage 3: M4 – M5 link**
  - proposed twin tunnels between Haberfield to St Peters.

Figure 1 illustrates the three stages of the WestConnex motorway project, including the anticipated start and completion years of each stage.

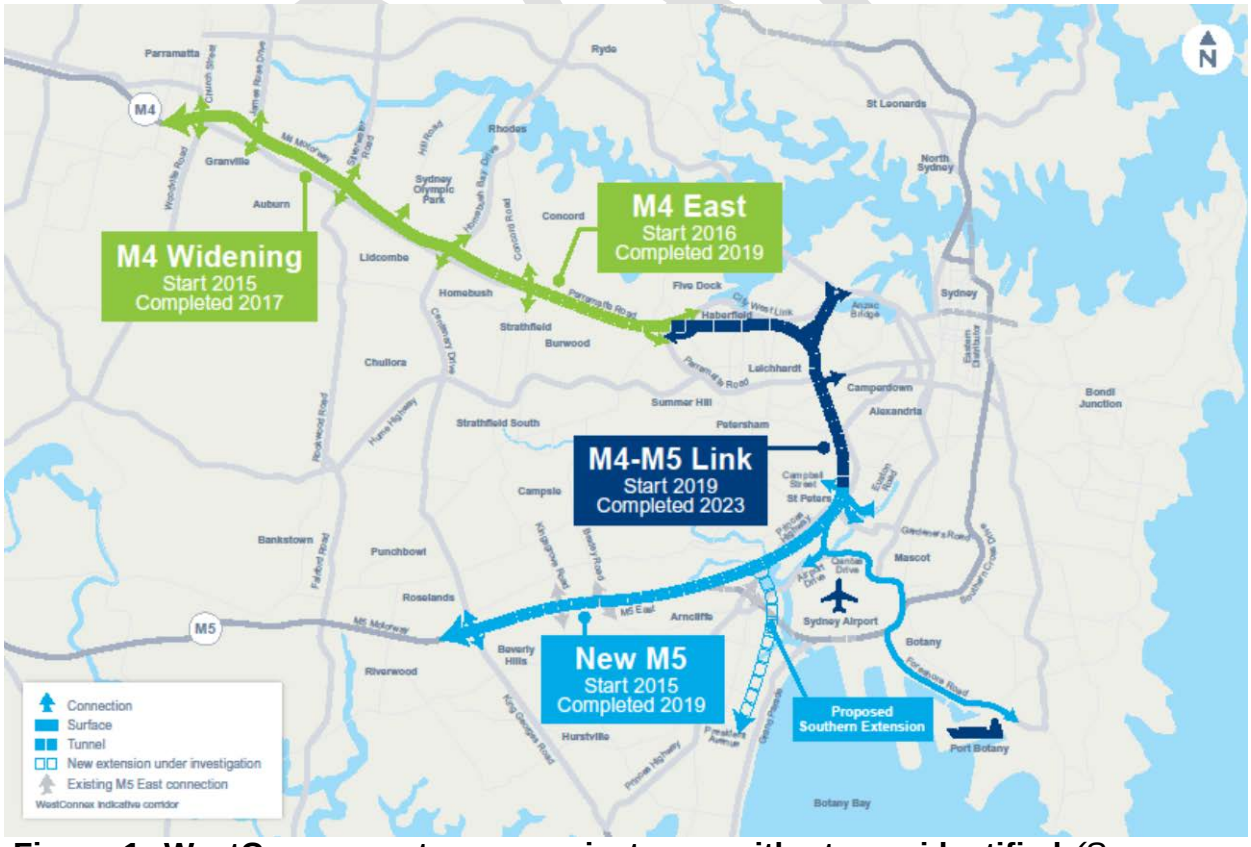

Figure 1: WestConnex motorway project map with stages identified *(Source - New M5 EIS)*

1.1 Summary of Stage 2: The New M5

The generalised configuration of the proposed New M5 is shown in Figures 2 and 3.

Key components of the New M5 project include:

- Twin motorway tunnels between the existing M5 East Motorway (between King Georges Road and Bexley Road) and St Peters. Each tunnel would be approximately 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. *(It is proposed that 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*. (It is proposed that 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);
    - 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 tunnels to Campbell Road and Euston Road, St Peters and to a new bridge crossing Alexandra Canal and joining to Gardeners Road;
- Four new dedicated through lanes (two in each direction) to connect the M5 South West Motorway and King Georges Road to the New M5;
- Two new bypass lanes comprising an eastbound and a westbound ramp connecting the King Georges Road interchange and the M5 East Motorway, bypassing the New M5;
- Realignment of the four existing dedicated, surface, through lanes (two in each direction) along the M5 East Motorway between King Georges Road and the M5 East Motorway tunnel portals;
- Extension of the underpass within the Beverly Grove Park Infrastructure to introduce tolling on the existing M5 East Motorway Pavement and linemarking works along the carriageways of the M5 East Motorway to tie-in to the project;
- 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;
- Ancillary infrastructure and operational facilities for electronic tolling, signage (including electronic signage), ventilation structures and systems, fire and life safety systems, and emergency evacuation and smoke extraction infrastructure;
- A motorway control centre that would include operation and maintenance facilities;
- New service utilities and modifications to existing service utilities;

- 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.

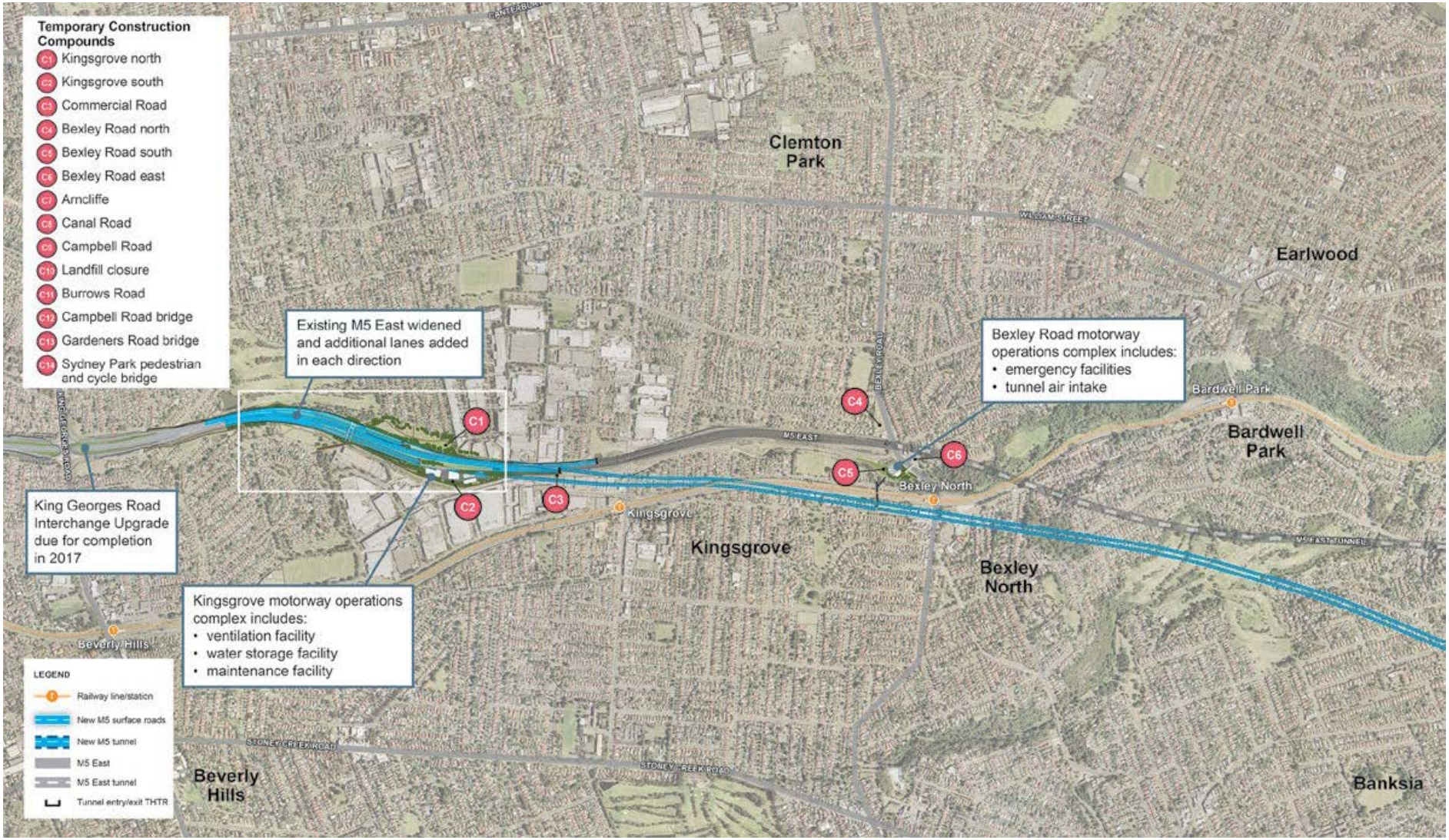

Figure 2 – Eastern Section of New M5 *(Source - New M5 EIS)*

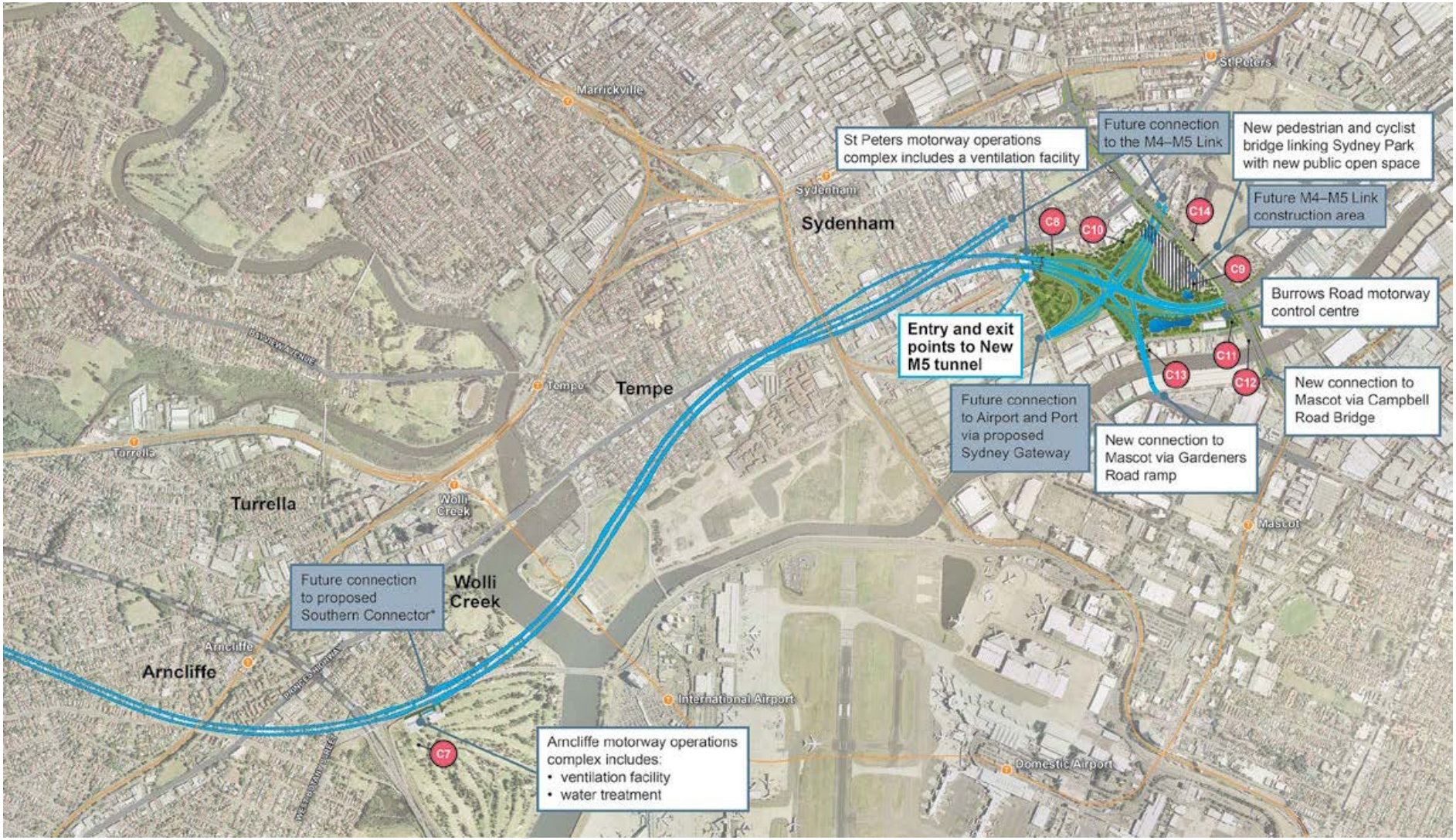

Figure 3 – Western Section of New M5 *(Source - New M5 EIS)*

1.2 Leichhardt's Local Context

Over the past ten years Leichhardt Council has established a specific strategic position regarding many environmental issues. This position includes a positive stance on the reduction of private car dependency and a conversion of private car travel to more sustainable transport modes (public transport and active transport). Additionally, Council's various strategic documents strongly support environmental improvements and contain numerous objectives relating to the achievement of practical sustainability within an enhanced urban environment.

Key to this is Council's concern regarding increased use of private vehicles, particularly at the expense of public and active transport. This position is clearly stated in many of Leichhardt's strategic documents including:

- Leichhardt 2025;
- Integrated Transport Plan;
- Environmental Sustainability Plan;
- Community and Cultural Plan;
- Employment and Economic Development Plan;
- Local Environment Plan; and
- Development Control Plan.

Prior to its inclusion in Council's strategies, this position was the subject of extensive research, benchmarking against world's best practice examples and extensive public consultation. In developing its objective to reduce private car dependency, in favour of sustainable transport, Council considered many issues, including:

- public health;
- community health and well-being;
- road safety;
- mode choice, travel desire-lines and community-wide travel characteristics;
- opportunities for environmental improvement including air quality and noise;
- place making and community building elements such as; opportunities to:
  - reduce area isolation associated with large traffic volumes which create barriers between communities;
  - improve visual amenity and streetscape;
- economic considerations relating to:
  - enhanced vitality of main street shopping areas; and
  - road maintenance.

The Leichhardt 2025+ Strategic Plan provides direction for all other strategies prepared by Council. In summary, it highlights Council's desire to:

- reduce car dependency;
- encourage the use of public transport;
- achieve integration between land use, transport and community/cultural development;
- promote the health and well-being of its community; and
- develop a connected, sustainable, liveable environment.

Subsequently all of Council's strategic plans have incorporated Leichhardt 2025+'s various goals and objectives. Of particular note in relation to the M4 East are the principles contained in Leichhardt's Integrated Transport Plan (ITP).

Building on the direction provided by Leichhardt 2025+, and integrating with other strategies (including the Community and Cultural Plan and Environmental Sustainability Plan), Leichhardt's Integrated Transport Plan (ITP) was developed after two years of research and community consultation. The ITP was subsequently adopted in February 2014.

Through the ITP's community consultation, the following Guiding Principles were established:

- sustainable transport modes that meet user needs should be the priority for policy, investment and service provision decisions;
- the role of private motor vehicles for access to, and travel within, the City should be reduced to ease congestion and improve sustainable outcomes;
- transport modes and services must be integrated with other uses to create seamless and continuous access opportunities; and
- the development of a multi–layered, well–integrated transport system must consider and understand the needs of different users.

In particular, the ITP objectives aim to:

- improve accessibility within and throughout the LGA;
- create a legible, direct and safe pedestrian and cycling environment;
- encourage public transport use;
- provide appropriate levels of parking;
- provide a safe and efficient road network for all road users;
- facilitate integration of land use, transport and community & cultural activities;
- provide convenience for users of Leichhardt;
- promote health and wellbeing; and
- improve environmental conditions.

Intrinsic to the ITP is also a series of 10 Year Mode Shift Targets, as shown in Table 2. Of particular relevance to the M4 East Environmental Impact Statement, are the targets to reduce private car use from 44% to 28%.

Mode	Existing	Proposed	Change
Vehicle driver	32%	20%	-12%
Vehicle passenger	12%	8%	-4%
Train	2%	2%	-
Bus	12%	14%	+2%
Walk only	36%	40%	+4%
Other modes	6%	1%*	-
Cycling	-	10%	-
Light Rail	-	5%	-
Total	100%	100%	-

* Excludes cycling and light rail

Table 2 – Leichhardt Integrated Transport Plan 10 Year Mode Shift Targets

1.2.1 Council Resolutions

Council has previously considered the WestConnex Motorway Project on a number of occasions. (Table 3.)

Date	Resolution	Summary of resolutions
October 2012	C480/12	o Write to the Minister for Planning and Infrastructure and Transport to request the creation of a WestConnex Taskforce that comprises of representatives of State Government agencies and affected Councils. o Confirm that Council's priority is for increased and better public transport. o Request information regarding the proposed alignment of the WestConnex motorway and ventilation stacks.
October 2012	C495/12	o Request that the NSW Government amend the Draft NSW Long Term Transport Master Plan to incorporate information on the merits and impacts of transit-oriented development undertaken in the context of motorway development such as the WestConnex project relative to transit-oriented development in the context of heavy rail, light rail or 'metro rail' type transit corridors.
March 2013	C82/13	o Write to the Minister for Roads and Maritime Services requesting that Council be represented through a decision making Taskforce to enable them to be informed about the implications of the project for the local community. o Hold a public meeting to inform residents and businesses about details of the WestConnex project.
November 2013	C573/13	o Write to the WestConnex Delivery Authority and Urban Growth and request that Council be provided with the following information specific to the WestConnex motorway: • testing of various toll scenarios and their impact on surface traffic volumes; • mode share assumptions and measures proposed to achieve the proposed mode share; • density assumptions for the designated "investigation areas"; • additional traffic and public transport modelling and analysis of the WestConnex motorway that takes into account: ▪ the forecast population levels associated with the urban revitalisation project, including its geographic distribution;

Date	Resolution	Summary of resolutions
		▪ a series of land use revitalisation scenarios that examine a variety of land use scenarios along the corridor (including a scenario that maintains existing densities in the eastern section of Parramatta Road); ▪ reductions in width of Parramatta Road, to 1 through lane and 1 public transport lane in each direction, between Hawthorne Canal and Camperdown; ▪ the 'constrained case' for Sydney's Kingsford-Smith Airport (as discussed in the 'Joint Study on Aviation Capacity of the Sydney Region') in combination with a new major airport in Sydney's western suburbs; ▪ locations being considered for 'Urban Activation Precincts' in the local government area and inner west generally; • any urban design/built form analysis completed in relation to the route, in particular within Leichhardt; • any urban economic modelling carried out in relation to the route, in particular within Leichhardt, covering matters such as FSR, value capture etc; • any traffic / transport modelling relating to vehicle numbers using the tunnel and vehicle numbers using the ground level route, especially in relation to Leichhardt; • a comprehensive community consultation programme be instigated to consult with the Leichhardt Community on the WestConnex motorway; • given the scarcity of the data and evidence about the benefits of the WestConnex motorway, that Council is unable to support it at this time; • that the NSW Government project public information on the WestConnex, including: ▪ the exact route; ▪ the location of entry and exit ramps; ▪ the location of the air pollution stacks; ▪ the analyses done on travel times/vehicle volumes/peak hour traffic; ▪ the analyses done on the routes of trucks/cars that don't want to pay the toll; ▪ location of additional parking for additional cars reaching the Inner West and CBD; and ▪ the cost benefit ratio. o That Leichhardt Council convene a meeting with nearby councils (inviting all interested Councillors) that have already come out opposing the WestConnex (Marrickville, Ashfield) to discuss how best to collaborate moving forward.
February 2014	C11/14	o Council agrees to participate in the Mayoral Governance Group in order to represent Council's views on the WestConnex. o Write to all members of the Legislative Council requesting that they urgently support the release of the business case for the WestConnex project.
April 2014	C99/14	o Mayor write to all NSW MPs asking that they seek the appointment of a mediator to consider the release of the papers that have been restricted through parliamentary privilege with particular focus on the release of the information as has been requested by Leichhardt Council. o Council reiterate its request for outstanding information on the WestConnex project.
February	C13/15P	o Note that in December 2014 the WestConnex Delivery Authority

Date	Resolution	Summary of resolutions
2015		announced an amendment to the proposed alignment of Stage 3 of the WestConnex motorway. o Note that the WestConnex motorway, including the M4-M5 link (between Haberfield and St Peters) and a potential harbour tunnel extension from Rozelle Goods Yard are illustrated in *A Plan for Growing Sydney*, the *NSW Infrastructure Strategy Update 2014* and the *NSW Long Term Transport Master Plan 2012*. o Write to the WestConnex Delivery Authority and Minister for Roads and Maritime Services stating concern that the WestConnex motorway proposal in conjunction with other recent motorway announcements has the potential to: • Result in increased motorway catchment that may alter surface road travel times consequently both attracting additional traffic and potentially diminishing the attractiveness of adjacent public transport; • Impact on the distribution of traffic desire lines along its length, and consequently increasing the number of vehicles at the various portals and on associated surface feeder roads; • Attract additional cars that may impact on the capacity of the motorway to accommodate the additional truck movements that it was originally intended to capture; • Experience higher than expected traffic levels discharging onto Parramatta Road, the City West Link and nearby streets, from Stage 1 prior to the completion of Stage 3; • Result in increased filtration of surface traffic ("rat runs") through Leichhardt's streets endeavouring to access tunnel portals; • Result in detrimental air quality issues associated with increased traffic, associated with the greater than previously planned motorway catchment, as well as the various tunnel vents that will be required. o Note the findings of the NSW Auditor General's report on the WestConnex of December 2014, that found serious flaws in the project's governance, and lack of independent monitoring of the project's concept, business case and monitoring.
February 2015	C14/15P	o Council support the call for a Parliamentary inquiry into WestConnex.
June 2015	C292/15	o Note that $40,000 has been allocated in the 2015/16 budget for studies of the WestConnex project. o Establish a taskforce, made up of 3 Councillors (elected by proportional representation) to oversee the expenditure of funds allocated to WestConnex planning studies. Members of the WestConnex Action Groups are to be invited to meet with the Taskforce to contribute to this planning.
August 2015	C354/15P	o Council write to the Premier and the Minister for Planning requesting that the exhibition period for the WestConnex M4 East, New M5 and all future WestConnex Environmental Impact Statements be a minimum of 90 days. o Council write to the Premier and the Minister for Planning its concern at the piecemeal approach to consideration of the planning issues through the EIS process and the need to consider WestConnex as a whole project. o Council write to the Premier and the Minister for Roads, Maritime and Freight the need for the immediate release of the detailed WestConnex business case.
October 2015	C522/15	o Council Notes that critical matters in relation to the environmental and economic impact of the Sydney metropolitan area as a whole are not

Date	Resolution	Summary of resolutions
		addressed in the released EIS for Stage 1 of WestConnex and forwards a submission to and therefore requests that these matters be addressed through the provision of further information … o Due to the significant impacts and the shortage of information; a. Council is opposed to the building of the WestConnex tollway. b. The time allowed for EIS submission for the M4 East has been inadequate for both Council and the community and that Council reiterates its request for 90 days. c. The finalisation of Council's submission be deferred until after the public meeting on the 29 October to allow any further issues raised by the public to be incorporated.
		o Forward a submission to the Department of Planning and Environment and advise that Council is opposed to the State Significant Development Application (SSI-6307) for WestConnex Stage 1B: M4 East ….. o Advise the Department of Planning and Environment that Council requests additional information and data as outlined in Section 2 - Review of Stage 1b: M4 East Environmental Impact Statement.

Table 3 - Council's previous resolutions of WestConnex

1.3 Other Considerations

In December 2014, the City of Sydney engaged SGS Economics and Planning to undertake a strategic review of the WestConnex proposal. This was completed in February 2015. A review of that report indicates that the key findings were:

- increased clustering of jobs with good access to public transport has resulted in decreased value of recent motorway projects (Cross City Tunnel and Lane Cove Tunnel);
- there has been an increase in rail patronage and decrease in growth of kilometres travelled by car;
- Sydney has differing levels of public transport accessibility that can result in concentrations of social and economic disadvantage;
- construction of Sydney's second airport at Badgerys Creek and intermodal terminals around Sydney may mean the M5 extensions are not required;
- it is unlikely that there will be sufficient demand to ensure viability of the WestConnex toll roads;
- it is not guaranteed that WestConnex will remove traffic from local roads;
- stated travel time savings are a result of the construction of all the road sections;
- the need for large scale public works to stimulate additional economic activity is questionable;
- alternatives to support Sydney's population and economic growth are available.

The City of Sydney also engaged SGS Economics and Planning with Veitch Lister Consulting to undertake detailed transport modelling to assess the impacts of the WestConnex motorway using the Zenith transport model. Key findings of the modelling include:

- WestConnex will only make minor differences to Sydney's traffic;
- WestConnex will not improve access to the Sydney CBD;

- traffic flows on parts of Parramatta Road will increase by over 20 per cent as vehicles avoid paying the toll;
- there will be increased traffic volumes on the M5 East by up to 25 percent;
- there will be increased congestion on local road networks around St Peters; and
- the construction of the first two stages of the WestConnex project is likely to result in a need for the construction of the proposed northern extension and southern extension to support WestConnex.

2. Review of the New M5 Environmental Impact Statement

Council officers have reviewed the Environmental Impact Statement for the 'New M5' (WestConnex Stage 2) and identified the following key issues as having relevance to the Leichhardt Council:

- o Project Objectives
- o Alternative Projects
- o Transport and Traffic
- o Configuration
- o Air Quality
- o Biodiversity
- o Greenhouse Gases

2.1 Project Objectives

The primary project objectives for the New M5 relate to improved traffic flow and give little consideration to environmental consequences. The only environmental objective listed for the project is to:

Protect natural and cultural resources and enhance the environment through the following key approaches:

- o *Manage tunnel ventilation emissions to ensure local air quality meets NSW Environment Protection Authority (EPA) standards;*
- o *Maintain regional air quality;*
- o *Manage in-tunnel air quality to stringent air quality standards;*
- o *Minimise energy use during construction and operation;*
- o *Manage noise in accordance with the NSW Road Noise Policy and realise opportunities to reduce or mitigate noise;*
- o *Provide for improvement of social and visual amenity;*
- o *Minimise impacts on natural systems including biodiversity;*
- o *Minimise impact on Aboriginal and non-Aboriginal cultural heritage;*
- o *Protect surface and groundwater sources and water quality including management of contaminated areas;*
- o *Reduce susceptibility to, and minimise impacts of, flooding;*
- o *Integrate sustainability considerations throughout the design, construction and operation of the project, including consideration of the Infrastructure Sustainability Council of Australia (ISCA) Sustainability Rating tool scorecard.*

Based on this it appears that consideration has not been given to the overall environmental impact of increasing private car use and the possible leaching of patrons from public transport to private cars. Additionally, there is no evidence of

consideration being given to the regional environmental and sustainability implications of increased car travel resulting from new car trips that would not occur if the project did not proceed (induced demand).

2.2 Alternative Projects Considered

Strategic alternatives assessed as part of the project included:

- o The base case or 'do minimum' (no project);
- o Optimising the performance of existing infrastructure;
- o Investing only in public transport and rail freight improvements;
- o Managing demand;
- o Constructing the New M5 as part of the WestConnex program of works.

Subsequently, constructing the New M5 as part of the WestConnex program of works was identified by the proponent as the preferred option because it was considered to best satisfy the following project objectives:

- o *Supports Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways, south-western Sydney and places of business across the city*
- o *Relieves road congestion so as to improve the speed, reliability and safety of travel in the M4 and M5 corridors*
- o *Caters for the diverse travel demands along these corridors that are best met by road infrastructure*
- o *Enhances the productivity of commercial and freight generating land uses strategically located near transport infrastructure*
- o *Fits within the financial capacity of the State and Federal governments, in partnership with the private sector*

Concern is expressed that this analysis does not include any consideration of the overall environmental costs or benefits of the various project alternatives. Additionally, the alternatives considered do not include any alternatives which combine network-wide public transport and rail freight enhancements with limited strategic road improvements.

The EIS generally focusses on a narrow corridor of influence with little consideration being given to the broader impacts of such a major policy shift in the approach to catering for travel demand across the Sydney Region. The impacts of a motorway project of this magnitude, particularly in terms of the overall WestConnex Motorway Project (including its potential northern and southern extensions and the ultimate capacity of the New M5 tunnels) are far reaching and clearly beyond the study area identified for the EIS's traffic and transport analysis (Figure 4 below).

This limited scope of the EIS is further reflected in the absence of any significant project objectives relating to environmental issues, sustainability, public health and well-being and land use/transport integration issues.

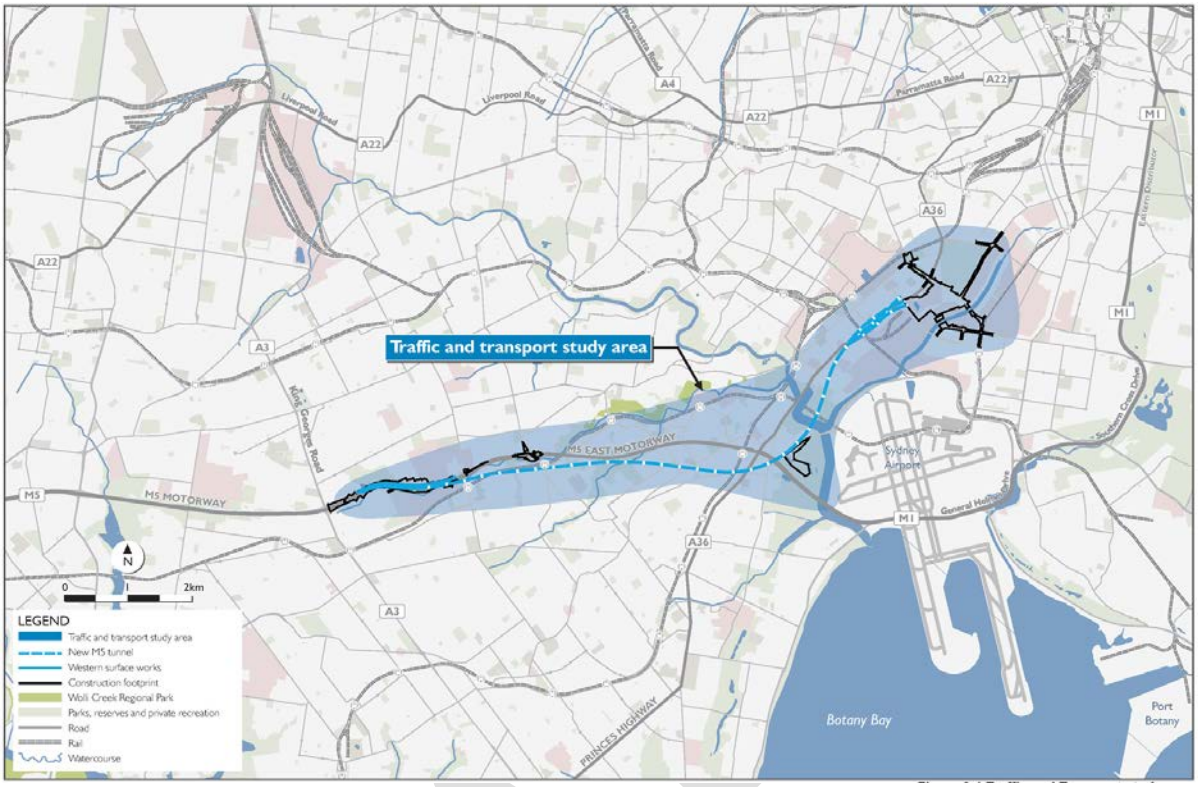

Figure 4 – Traffic and Transport Study Area *(Source - New M5 EIS)*

2.3 Traffic and Transport Impacts

2.3.1 Modelling

The traffic model examined a total of seven scenarios:

- o Three scenarios without the project:
  - the existing road network (2012), which incorporates population and employment projections, based on the September 2014 Bureau of Transport Statistics data.(This data has been projected from 2011 Census data and incorporates known major urban renewal and developments);
  - the road network at the opening of the project (2021). While the NSW Government has committed to achieving completion of the New M5 Motorway by 2019, using 2021 allows for full ramp-up of traffic demand as travellers respond to the provision of the project;
  - the road network 10 years after opening the project (2031)
- o A construction scenario (2016);
- o Two scenarios which include the project:
  - the opening of the New M5 in 2021;
  - ten years after opening (2031);
- o One cumulative scenario, 10 years after opening of the New M5 (2031), with all three stages of the WestConnex program of works and the future Southern extension operational.

Additionally, a scenario combining the New M5 project with the M4 East was assessed, at a relatively high level, to determine the potential impacts on traffic

volumes and patterns within the study area (inclusive of the King Georges Road Interchange Upgrade and the M4 Widening projects).

A summary of the EIS's scenarios and key impacts considered is provided in Table 4, below.

Model year	Without project	With project	Modelling Scenario	Description	Impact measured
2012	✓		Existing case	The existing road network with no new projects or upgrades.	NA
2016	✓		Construction	The current road network with no new projects or upgrades, with construction traffic movements for the project. This considers the worst case construction traffic generating scenario and includes traffic movements associated with spoil removal.	Construction impacts on the existing road network.
2021	✓		Base case without the project	The base case 'without project' 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. This scenario assumes that on-going improvements will be made to the broader transport network including some new infrastructure and intersection improvements to improve capacity	Consequence of not proceeding with the project on the existing network.
2021		✓	Base case with the project	The base case 'with project' assumes the New M5 is complete and open to traffic, without the future Sydney Gateway, M4 East (WestConnex Stage 1B) or the future M4-M5 Link (WestConnex Stage 3) components of the WestConnex program of works.	Operational impacts associated with the completion of the project as described in Chapter 5 (Project description).
2031	✓		Future case without the project	The future case 'without project' assumes the King Georges Road Interchange upgrade and M4 Widening projects are complete, but the remainder of the WestConnex program of works has not been built. This scenario assumes on-going improvements will be made to the broader transport network including some new infrastructure and intersection improvements to improve capacity and to cater for	Consequence of not proceeding with the project on the existing network
2031		✓	Future case with the project	The future case 'with project' 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.	Operational impacts associated with the completion of the project as described in Chapter 5 (Project description).
2031		✓	Cumulative case (full WestConnex program of works and the future Southern extension)	All components of the WestConnex program of works and the future Southern extension completed. The full WestConnex program of works and the future Southern extension is considered to be a cumulative scenario.	Operational impacts associated with the operation of the three stages of the WestConnex program of works as well as the future Southern extension.

Table 4 – Traffic Modelling Scenarios *(Source - New M5 EIS)*

In relation to the traffic and transport modelling conducted by the proponent concern is generally raised regarding:

- Insufficient detail provided to determine the accuracy of the various land use assumptions that have been made particularly in relation to:
    - The future demand of Sydney Airport once the Western Sydney Airport has become operational;
    - Implications of Moorebank Intermodal Freight Terminal;
    - Major land use initiatives across the Sydney Region including those currently associated with the Parramatta Road Urban Transformation Project, Bays Precinct, Waterloo Rejuvenation, as well as Urban Growth NSW various Western Sydney portfolio, such as Oran Park Town, Newbrook and Macarthur Heights
- Insufficient detail provided to determine the accuracy of various social assumptions including:
    - The value of time to different classifications of traveller;
    - Toll sensitivity for freight vehicles in contrast to private drivers;
    - Whether potentially reduced travel times will encourage residents of western Sydney to remain in existing areas, or travel for the same amount of time and move further afield to more affordable areas (thus travelling greater distances in the same time as they currently travel);
- Existing and likely future mix of heavy vehicles (particularly in relation to the proportion of dangerous goods vehicle , which are unlikely to be permitted to use the tunnels);
- While the Secretary's Environmental Assessment Requirements specifically includes reference to consideration of the implications of induced traffic on both existing public transport and future public transport opportunities there does not appear to be any quantification of:
    - The total amount of additional traffic induced by the creation of the motorway (ie car trips that would not have been made if the motorway was not constructed);
    - The total amount of public transport patrons who would move from public transport to private vehicles as a result of the increased road capacity (on both the motorway and the surface road network), and the impact this migration of patrons will have on the viability of public transport;

2.3.2 Medium Term Projected Traffic Volumes (2021)

For the Medium Term (2021) much of the traffic modelling conducted for the EIS examines operation of the M5 motorway itself, with only limited reference to the adjacent surface road network. The analysis provided generally indicates that the completion of the New M5 will improve traffic flow on the M5. The key locations examined are junctions of the M5 with :

- King Georges Road;
- Bexley Road; and
- Cooks River Road.

As shown in Figure 5, analysis of the adjacent surface road network generally indicates increased traffic volumes including:

- 86% northbound and 41% southbound on Euston Road during the AM Peak;

- 56% northbound and 45% southbound on Euston Road during the PM Peak;
- 42% eastbound and 30% westbound on Railway Road during the PM Peak

While King Street is anticipated to experience a mix of increased and decreased traffic volumes (by direction) during peak period:

- AM Peak - -10% northbound and 11% southbound;
- PM Peak – 10% northbound and -2% southbound.

It is considered that the vitality of King Street is such that any increases in traffic volume should be very carefully considered.

Location	Direction	AM peak hour			PM peak hour		
		2021 'without project'	2021 'with project'	Change in flow	2021 'without project'	2021 'with project'	Change in flow
		veh/hr	veh/hr	%	veh/hr	veh/hr	%
King Street, south of Alice Street	Northbound	880	800	-10%	830	910	10%
	Southbound	560	620	11%	1,030	1,010	-2%
Railway Road, west of Princes Highway	Eastbound	540	590	9%	640	910	42%
	Westbound	630	730	16%	1,150	1,490	30%
Princes Highway, south of Railway Road	Northbound	2,590	2,580	0%	1,710	1,760	3%
	Southbound	1,060	980	-8%	2,390	2,360	-1%
Euston Road, north of Sydney Park Road	Northbound	1,050	1,950	86%	820	1,280	56%
	Southbound	790	1,110	41%	1,340	1,940	45%
Edgeware Road, west of Edinburgh Road	Eastbound	720	780	8%	1,060	1,090	3%
	Westbound	770	910	18%	830	1,030	24%
Gardeners Road, west of O'Riordan Street	Eastbound	1,230	1,350	10%	1,410	1,570	11%
	Westbound	1,150	1,150	0%	1,060	1,270	20%

Source: AECOM (2015)

Figure 5 – Comparison of 2021 Traffic Volumes with and without New M5 *(Source - New M5 EIS)*

2.3.3 Longer Term Projected Traffic Volumes (2031)

In the longer term (2031) the EIS considers a completed WestConnex Motorway and the proposed "Southern Extension".

As shown Figure 6 it is evident that the completed WestConnex Project (including the Southern Extension) will result in significantly increased traffic volumes on the adjacent surface road network., including:

- Northbound peak period increases on Euston Road of 114% and 96% for the AM and PM respectively;
- Southbound peak period increases on Euston Road of 63% and 44% for the AM and PM respectively
- Southbound peak period increases on King Street of 62% and 23% for the AM and PM respectively;

- Westbound peak period increases on Gardner's Road of 23% and 46% for the AM and PM respectively.

Location	Direction	AM Peak 2031 'without project'	AM Peak 2031 'full WestConnex and Southern extension'	AM Peak Change in flow	PM Peak 2031 'without project'	PM Peak 2031 'full WestConnex and Southern extension'	PM Peak Change in flow
		veh/hr	veh/hr	%	veh/hr	veh/hr	%
King Street, south of Alice Street	Northbound	1,100	870	-21%	890	940	6%
	Southbound	450	730	62%	980	1,210	23%
Railway Road, west of Princes Highway	Eastbound	490	650	33%	700	680	-3%
	Westbound	630	990	57%	1,280	1,910	49%
Princes Highway, south of Railway Road	Northbound	2,550	2,180	-15%	1,660	720	-57%
	Southbound	1,150	550	-52%	2,310	2,110	-9%
Euston Road, north of Sydney Park Road	Northbound	990	2,120	114%	780	1,530	96%
	Southbound	970	1,580	63%	1,500	2,160	44%
Edgeware Road, west of Edinburgh Road	Eastbound	760	820	8%	1,030	1,110	8%
	Westbound	830	920	11%	730	1,040	42%
Gardeners Road, west of O'Riordan Street	Eastbound	1,280	1,790	40%	1,560	1,650	6%
	Westbound	1,150	1,410	23%	1,140	1,660	46%

Source: AECOM (2015)

Figure 6 – Comparison of 2031 Traffic Volumes with (including proposed Southern Extension) and without New M5 Parking *(Source - New M5 EIS)*

In order to accommodate these increased flows the Project proposes to permanently remove approximately 400 kerbside car parking spaces (outlined in Figure 7 below).

Road section	Indicative impact
Campbell Street, between Princes Highway and Unwins Bridge Road	Addition of 34 on-street and 26 off-street spaces
Albert Street	Loss of 44 spaces along both sides
Campbell Road, between Barwon Park Road and Burrows Road	Loss of 111 spaces along both sides
Burrows Road, south-west of Campbell Road	Loss of 8 spaces along both sides
Burrows Road, north-east of Campbell Road	Loss of 15 spaces along both sides
Euston Road, north of Sydney Park Road intersection	Loss of 24 spaces along both sides
Huntley Street, east of Euston Road	Loss of 28 spaces along both sides
Princess Highway	Loss of 18 spaces along both sides
May Street	Loss of 38 spaces along both sides
Unwins Bridge Road	Loss of 33 spaces along both sides
Brown Street	Possible loss of up to 6 spaces during integration / tie-in works
Florence Street	Possible loss of up to 6 spaces during integration / tie-in works
St Peters Street	Possible loss of up to 6 spaces during integration / tie-in works
Gardeners Road, between Kent Road and cul-de-sac of Gardeners Road	Loss of 47 on-street spaces
Bourke Road, north of Bourke Street / Gardeners Road intersection	Loss of 16 off-street spaces

Figure 7 – Indicative Permanent Removal of Kerbside Parking *(Source - New M5 EIS)*

Ultimately this indicates that the project will encourage increased private car travel, reduced on-street parking and increased on-site parking provision in new developments (or the provision of public off-street parking areas), all of which are contrary to currently accepted good planning practice.

2.3.4 Submission Points

Based on the review of the Traffic and Transport sections of the EIS, the following points are recommended for inclusion in Council's submission:

- It is considered that the WestConnex Motorway Project, including the New M5, is not in keeping with world's best practice urban development, particularly in terms of its encouragement of private vehicle use over public transport. Consequently it is requested that the proposed New M5 be benchmarked against other high quality international land use/transport solutions to deem its relevance and appropriateness, or otherwise;

- The New M5 is a key component of the WestConnex and should be considered in relation to the total project including its proposed northern and southern extensions;

- It is requested that an alternative which combines strategic, site specific road improvements with public transport improvements should be examined and compared to the tunnelled motorway option currently being pursued;

- A broader base of environmental consideration should be used to assess the project. Such consideration should include a larger scale analysis of the implications of encouraging private car use ahead of public transport;

- Assessment of the project should consider the implications of leaching patrons from existing (or likely future) public transport services and how that reduction in patronage may impact on Sydney's public transport systems in the longer term;

- Detailed information about the overall WestConnex Motorway Project including its proposed northern and southern extensions;

- Further information and consideration by the NSW State government is requested to ensure that the WestConnex Project is considered in light of the numerous urban revitalisation projects currently proposed for the Sydney Region;

- Concern is expressed that the analysis does not include any consideration of the overall environmental costs or benefits of the various project alternatives. Additionally, the alternatives considered did not include a hybrid version which included public transport and rail freight investment in combination with limited strategic road improvements.

- The EIS generally focusses on a narrow corridor of influence with little consideration being given to the broader impacts of such a major shift the approach to catering for travel demand across the Sydney Region. The impacts of a motorway project of this magnitude, particularly in terms of the overall WestConnex Project including its potential northern and southern extensions) are far reaching and should include large scale impacts including broader environmental, sustainability, public health and wellbeing, and land use/transport integration issues

- It is considered that the traffic modelling included in the Environmental Impact Statement is limited and may significantly underestimate future traffic volumes and congestion that will be experienced both in the 2021 and 2031 scenarios. The significant investment of public and private funds which will be required to deliver the projects should justify a fully co-ordinated, evidence based assessment of the how the WestConnex project will contribute to the liveability and social, economic and environmental sustainability of the city.

- Concern is expressed that the timing of the WestConnex Motorway Project (including Stages 1b, 2 and 3) is such that the traffic model could not effectively include the specific demographic information that is likely to result from numerous urban revitalisation projects currently proposed for the Sydney Region;

- Specifically in relation to the traffic and transport modelling conducted by the proponent concern is generally raised regarding:
    - Insufficient detail is provided to determine the accuracy of the various land use assumptions that have been made particularly in relation to:

        - the future demand of Sydney Airport once the Western Sydney Airport has become operational;
        - Implication of Moorebank Intermodal Freight Terminal;
        - major land use initiatives across the Sydney Region including those currently associated with the Parramatta Road Urban Transformation Project, Bays Precinct, Waterloo Rejuvenation, as well as Urban Growth NSW various Western Sydney portfolio, such as Oran Park Town, Newbrook and Macarthur Heights
    - Insufficient detail is provided to determine the accuracy of various social assumptions including:
        - The value of time to different classifications of traveller;
        - Toll sensitivity for freight vehicles in contrast to private drivers;
        - Whether potentially reduced travel times will encourage residents of western Sydney to remain in existing areas, or travel for the same amount of time and move further afield to more affordable areas (thus travelling greater distances in the same time as they currently travel);
    - Existing and likely future mix of heavy vehicles (particularly in relation to the proportion of dangerous goods vehicle , which are unlikely to be permitted to use the tunnels);
    - While the Secretary's Environmental Assessment Requirements specifically includes reference to consideration of the implications of induced traffic on both existing public transport and future public transport opportunities there does not appear to be any quantification of:
        - The total amount of additional traffic induced by the creation of the motorway (ie car trips that would not have been made if the motorway was not constructed);
        - The total amount of public transport patrons who would move from public transport to private vehicles as a result of the increased road capacity (on both the motorway and the surface road network), and the impact this migration of patrons will have on the viability of public transport.

2.4 Proposed Configuration

While the current EIS addresses a tunnel configuration of 2 lanes in each direction, the project description states that:

- 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; and
- 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;

It is considered that this raises two key concerns:

- the current EIS, and its associated traffic projections significantly under estimate the ultimate capacity of the proposal;
- in constructing tunnels capable of accommodating, up to, 5 lanes it is likely to prove difficult to physically manage the reduction of such a space to two lanes.

While some merit can be seen in planning for future growth it is considered that any environmental (and/or economic) analysis should include the ultimate configuration of up to 5 lanes in either direction. Unless such analysis is undertaken at this time the true impacts of the project will not be known and any future assessment would consider the traffic volumes accommodated and induced travel demand created by this configuration of the proposal to be the "existing situation". Therefore it would only assess an incremental increase over "future" volumes rather than the true increase over today's baseline volumes.

2.4.4 Submission Points

It is essential that, as the motorway tunnels are being constructed to accommodate three-five lanes each direction, the EIS should assess the impacts of the project's ultimate capacity rather than:

- examining an artificially constrained capacity of two lanes in each direction, and
- addressing the project's ultimate capacity in subsequent assessments.

This is of particular concern as the, currently proposed, incremental approach would diminish the rate of growth of traffic by comparing the ultimate volumes with increased traffic that will result from the two x two lane configuration rather than the existing baseline traffic volumes.

It should be noted that such an approach is likely to have far reaching implications in relation to the surface road network (both parallel routes and feeder roads).

2.5 Air quality

2.5.1 Submission Points

The following general points require either clarification or inclusion in the project's environmental assessment

- Confirmation is required that the NSW EPA has approved the alternative assessment methodology used in the EIS, as the approach does not satisfy all of the requirements of the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'. If the approach adopted in the EIS is not consistent with the relevant EPA requirements for modelling and assessment further studies should be undertaken and publically exhibited to ensure that the assessment is undertaken in a manner consistent with the requirements of the EPA.

- additional information regarding the 'worst case' assessment of air quality which considers the maximum emission rates (in g/s) and a peak congested scenario.

- there is a need for the completion of a quantitative construction air quality assessment, focusing on the risk of particulate impacts and including the potential for release of crystalline silica.

- In the event of approval of the project the following conditions should be applied:
  - Portal emission monitoring
  - Dampers in the western ventilation outlet should be provided to allow for varying outlet diameters.

2.6 Biodiversity

The biodiversity impacts of WestConnex Stage 2 M5 have been considered in relation to the following categories:

- Impacts on flora and fauna
- Ecological assessment methodology
- Mitigation of impacts

2.6.1 Impacts of flora and fauna

There are five groundwater dependent ecosystems (GDE) that have the potential to be impacted as a result of groundwater drawdown due as a result of the construction works. The maximum amount of groundwater drawdown is expected to be five to ten metres which would have a low-moderate impact on the GDEs including:

- Lowering water table which is likely to place this vegetation under stress
- Signs of stress in prolonged dry periods

The EIS determined that the Green and Golden Bell Frog (*Litoria aurea*) is the only threatened species known to occur in the study area. No other threatened fauna are likely to occur in the study area due to the limited and degraded nature of suitable habitat present. The EIS considers the RMS ponds to be the key source of adult frogs for the local population, which disperse across the Kogarah Golf Course. The ponds and course contains a range of habitats for the Green and Golden Bell Frog, which are both outside the construction compound boundary.

The project would remove up to 7.82 hectares of foraging, dispersal and sheltering habitat for the Arncliffe key population at Kogarah Golf Course. This is equivalent to about 20% of the currently available habitat). The breeding habitat provided by the RMS Ponds would not be directly disturbed by the project, and a buffer/ exclusion zone of around 32 metres would be provided between the RMS Ponds and the Arncliffe construction compound.

The EIS considers that impacts to the frog population would be temporary for the duration of the construction however admits that removal of foraging, dispersal and sheltering habitat would decrease the viability of the population at this location.

There are no Grey-headed Flying-fox (*Pteropus poliocephalus*) breeding or roosting habitats located within the construction and operational footprint. However there would be direct impacts to potential foraging habitat for this species.

Construction of the project would result in the clearance of around 10.76 hectares of vegetation, including 3.31 hectares of native vegetation and 7.45 hectares of urban native and exotic vegetation. The loss of 10.76 hectares of vegetation is not insignificant within the context of Southern Sydney.

The project is anticipated to require clearing 1.4 hectares of Cooks River Castlereagh Ironbark Forest, which is equivalent to less than 0.1 per cent of the estimated remaining remnant area of this community within the Sydney Basin Bioregion.

The EIS determined that despite the provision of mitigation measures, there is likely to be a significant impact on this threatened ecological community. This reflects the limited remaining areas of this community within the Sydney Basin bioregion and its status as a critically endangered ecological community.

Based on the above, concern is expressed that the proposed mitigation measures may not satisfactorily compensate for the impacts of the proposal.

2.6.2 Flora and fauna assessment methodology

The methodologies for the biodiversity assessment within the EIS were:

- A desktop assessment to describe the existing environment and landscape features of a study area and to identify threatened biota potentially affected by the project
- Field surveys to verify the results of the desktop review
- Assessment of potential impacts of the project on threatened biota and biodiversity values

A field survey program was developed and implemented over a period of 12 days between November 2014 and May 2015. In some cases, the survey periods for this assessment did not align with the preferred seasonality requirements for certain threatened species. Some areas could not be accessed during the field surveys because they are located on private property.

Due to the limited scope of the survey, not all species present (including threatened species) will have been recorded. Vegetation on private property has not been verified and could contain native vegetation communities that have not been accounted for in the EIS.

Although the various NSW databases are accessed to identify threatened species that may occur, other local biodiversity plans and data held by local councils have not been considered, or their local biodiversity objectives.

Additionally, it is unclear how the biodiversity study areas have been selected. There are a number of key biodiversity areas that have been excluded from the study area

including groundwater dependent ecosystems which are within the extent of land impacted by groundwater drawdown. These include:

- Bardwell Valley Parkland and Broadford Street Reserve
- Stotts Reserve, Bexley North
- Forest between the southern bank of Wolli Creek and the rail line behind Wolli Creek Station

Consequently, it is considered that the assessment may not have adequately identified all of the species present and the project's total impact on local flora and fauna.

2.6.3 Mitigation of Impacts

There are a number of measures identified in the EIS to avoid, minimise and offset potential impacts to biodiversity and the preparation of an offset strategy where impacts could not be fully mitigated. Mitigation measures include:

- Noise and vibration management measures
- Lighting mitigation
- Erosion and sediment control measures

A Green and Golden Bell Frog Plan of Management has been developed which outlines several mitigation and management measures. This includes a program to create an additional breeding habitat at Marsh Street and the establishment of a captive breeding program.

There is a biodiversity offset strategy proposed in relation to residual impacts to threatened ecological communities and threatened fauna which includes securing like for like offsets to retire credits. The items that will be offset include:

- Cooks River Castlereagh Ironbark Forest
- Paperbark swap forest
- Green and Golden Bell Frog (*Litoria aurea*)

The EIS details that no like-for-like credits were available for purchase. This indicates that the project should not be undertaken since the biodiversity that is proposed to be cleared will not be adequately substituted through offsets. Every effort should be made to find like-for-like biodiversity offsets so that the biodiversity cleared has been sufficiently compensated for through offsetting.

2.6.4 Submission Points

- Staff of relevant Councils and State bodies should be consulted with regards to local biodiversity plans, objectives, actions and data. Some species considered common through NSW and not protected by threatened species legislation, such as the superb fairy wren, are locally vulnerable and Councils and the local community are working to preserve these species. By focusing on the minimum requirement to protect threatened species, populations and ecological community only, the importance of biodiversity within the local urban context is over-looked.

- Further detail needs to be provided regarding how the loss of established vegetation is to be mitigated.
- Further justification needs to be provided regarding the selection of the boundary study areas and exclusion of key biodiversity spaces.
- Concern is expressed that the limited scope of the surveys and proposed mitigation measures may mean that the flora and fauna impacts are greater than those suggested by the EIS;
- As the EIS details that no like-for-like credits were available for purchase, in relation to its biodiversity off-set strategy it is considered that the biodiversity proposed to be cleared will not be adequately substituted.

2.7 Greenhouse Gas

The greenhouse gas (GHG) impacts of the WestConnex Stage 2 M5 have been considered in relation to the following categories:

- Methodology and assumptions
- Projected operational greenhouse gas emissions impact and savings

2.7.1 Methodology and assumptions

To assess the emissions associated with the fuel consumed by vehicles using the project, and to evaluate any potential GHG emissions savings as a result of this project, five specific road use scenarios were considered by the EIS:

- Base case (2021) without the project
- Base case (2021) with the project
- Future case (2031) without the project
- Future case (2031) with the project
- Future case (2031) cumulative case

There is no evaluation of an “existing case” for GHG emissions include in the EIS and consequently no existing baseline for comparison. Further, the model appears to consider the currently proposed road network, with no new projects or upgrades, meaning that the ultimate assessment (2031) does not include the impact of additional works such as the northern and southern extensions.

Projected operational greenhouse gas emissions impact and savings

The results for 2021 indicate that the project would generate an additional 109,600 tCO2-e of Scope 3 emissions from fuel use of light and heavy vehicles using roads within the study area, compared with the ‘2021 without project’ scenario.

However, the results for the 2031 future case indicate that the project would **reduce** greenhouse gas emissions due to the benefits of road tunnel usage in urban areas, where travel along a more direct route at higher average speeds results in decreased vehicle emissions. The EIS acknowledges that as drivers realise the full benefits of the WestConnex network, it is anticipated that the traffic volumes will increase and greenhouse gas savings will decrease.

It is estimated that the project would generate about 473,000 tCO_2-e during construction of the project. The breakdown of emissions by scope is summarised as:

- Scope 1: 83,700 tCO_2-e
- Scope 2: 109,200 tCO_2-e
- Scope 3: 280,300 tCO_2-e

The majority of GHG emissions associated with the construction of the project are attributed to indirect Scope 3 emissions (59%). Direct Scope 1 and indirect Scope 2 emissions account for 18% and 23% of total construction emissions respectively.

The additional greenhouse gas emissions represent around 0.02% of the Australian national inventory, and 0.07% for the NSW inventory which is not insignificant.
The greenhouse gas emissions savings represent around 0.04% of the Australian national inventory and 0.16% of the NSW inventory for 2013.

This seems to 'offset' the additional emissions generated by the construction of the project. However it is important to realise that there will be continuous additional greenhouse gas emissions generated during operation and maintenance of the project including:

- Road infrastructure operation
- Road infrastructure maintenance
- Vehicles using the New M5 during operation

The emissions related to the operation and maintenance of the project have not been estimated past 2031.

2.7.2 Submission Points

- The construction of motorways is not considered to be consistent with best practice greenhouse gas abatement projects related to transportation and the EIS itself acknowledges that greenhouse gas savings will decrease over time as traffic volumes increase.

- It is necessary to carry out a comprehensive evaluation of a public transport alternative and compare this to the project in terms of greenhouse gas emissions in the EIS.

2.8 Climate Change Risk and Adaptation

The climate change risk and adaptation aspects of the New M5 has been considered in relation to the following categories:

- Assessment methodology
- Assessment of potential impacts
- Environmental management measures

Road networks and infrastructure assets are exposed and vulnerable to climate change because of their long design life, during which many impacts of climate change may become more significant.

Roads and Maritime determined that the assessment of the potential impact of climate change on the project is warranted due to the significant investment required for the project, the long design life and its potential exposure to flooding impacts.

2.8.1 Assessment methodology

It is important to note that this assessment considers the impact of future climate change *on the project*, rather than the impact of the project on the future of climate change. It would be beneficial to assess the impact of the project on climate change.

The focus of the EIS is on operational impacts, not the impacts of the construction phase. The EIS has assumed that impacts of construction would be negligible due to the relatively short timeframe.

2.8.2 Assessment of potential impacts

The EIS undertook a full risk analysis for climate change risk and adaptation and determined that high and extreme risks should be mitigated for. The risk assessment did not identify any risks rated as high or extreme. Of the 28 risks that were analysed for the project, 13 were identified as having a medium risk. These risks rated as medium included measures such as:

- Increase in the intensity and frequency of extreme rainfall combined with sea level rise
- Increase in atmospheric CO_2 and the frequency and intensity of extreme heat events
- Increased frequency and intensity of bushfire events

It is important to note that these effects, while classified as 'medium' risk, may still pose a significant impact on the project.

2.8.3 Environmental management measures

During the detailed design phase a Climate Change Risk Assessment will be undertaken. The assessment will identify and implement adaptation measures to comprehensively address high and extreme risks. The decision to implement adaptation measures for medium risks will also be considered during detailed design.

2.8.4 Submission points

It is important to note that this assessment considers the impact of future climate change *on the project*, rather than the impact of the project on the future of climate change. It would be beneficial to assess the impact of the project on climate change.

2.9 Sustainability

The EIS details how sustainability aims and principles have been applied to the design, construction and operation of the project. The EIS has applied the principles from a number of plans including:

- Long Term Transport Master Plan
- NSW Government Resource Efficiency Policy
- NSW Waste and Avoidance and Resource Recovery Strategy 2014-21

- WestConnex Sustainability Strategy

The EIS details sustainability objectives and targets for the project across a number of key areas such as:

- Road congestion and travel times
- Resource efficiency and waste management
- Energy and carbon
- Water
- Land
- Waste and soil
- Climate change
- Transport design
- Sustainable procurement
- Equitable training and employment opportunities

The overarching sustainability objectives for the project would be met through the implementation of a sustainability management plan and project-specific sustainability initiatives. The implementation of these initiatives would contribute to the project achieving an Infrastructure Sustainability (IS) rating of “Excellent”.

The EIS details that principles of ecologically sustainable development (ESD), the precautionary principle and inter-generational equity have been considered and applied during the design and development of the project.

2.9.1 Submission points

- It is important that regular reporting is conducted on the sustainability objectives and targets throughout the construction and later phases of the project.

Attachments

Independent peer review Appendix H Air Quality Assessment West Connex … king

Attachments

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WestConnex Business Case Review

Draft Report

Leichhardt City Council

January 2016

SGS Economics & Planning

Independent insight.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

WestConnex is a series of road projects including the M4 Widening, the M4 East, a M4-M5 Link and a New M5 from Beverly Hills to St Peters. WestConnex also sets the stage for other road projects including a link to the port and Sydney airport, a Western Harbour Tunnel running under Rozelle to the Northern Beaches Link and a Southern Gateway to the Illawarra. When all stages of WestConnex are completed it will be the largest continuous motorway in Australia and will be one of the most expense transport infrastructure project undertaken anywhere in the world. The project will influence land use and transport patterns over half of Sydney.

In November 2015, the WestConnex *Updated Strategic Business Case* was released to describe the need for the project, build the case that the project was the best solution, measure the benefits and identify project costs. However, the *Updated Strategic Business Case* fails to address many of the key requirements of a business case. The purpose of WestConnex and who will benefit from the project remains unclear. Issues with the *Updated Strategic Business Case include:*

Alternatives to WestConnex have not been considered

The *Updated Strategic Business Case* does not consider any strategic alternatives to WestConnex. This approach contrasts with Transport for New South Wales guidance which recommends the identification and analysis of solutions on the basis of physical circumstances and available technologies. For example, the proposed West Metro from Westmead to the Sydney CBD could have been considered as an alternative to the M4 sections of WestConnex.

Project objectives prevent a non-road based solution from being considered
The project objectives for WestConnex are inherently road-based – preventing an integrated transport solution which considers public transport and / or demand management alongside a road. In addition, none of the stated objectives aim to deliver an environmentally sustainable outcome.

Other global cities are focusing on integrated transport solutions

Other global cities have recognised that congestion cannot be solved by building more roads and in turn, have refocused efforts in transport infrastructure onto public transport and demand management.

The longevity of the project is unclear

Once the Western Harbour Tunnel and Northern Beaches Link are in operation, the *Updated Strategic Business Case* suggests that WestConnex will be close to capacity by 2031. If wholly completed by 2021, this would result in $16.8 billion being spent for around ten years of marginally improved travel times.

The impact of WestConnex on the Bays Precinct will be significant

The Bays Precinct may benefit from road access provided by WestConnex, but the proposed realignment of WestConnex Stage 3 to include an interchange at Rozelle connecting to the Anzac Bridge and future Western Harbour connection has significant implications for traffic flow and congestion in and around The Bays Precinct. Establishing a motorway through The Bays Precinct appears counterintuitive to the aims of the urban renewal project to create.

Costs are high and are likely to be even higher

WestConnex is estimated to cost $16.8 billion in the *Updated Strategic Business Case*. However, this cost estimate is provided at a P50 level, meaning, there is a 50 per cent chance that the actual project cost will vary. For a project of this scale, it is best practice to produce a P90 cost.

Since 2013 it appears that the cost for comparable sections of WestConnex has not changed. Whilst additional road links and supporting costs have been added to the total, the cost of the remainder of the project remains at $14.8 billion – an outcome which suggests that over two years, no additional analysis has been undertaken on project costs and inflation has not been accounted for either.

At $16.8 billion, WestConnex would be considerably more expensive than other international and national projects on a per kilometre basis. At 33 kilometres in length, WestConnex would be approximately $510 million per kilometre. In contrast the Channel Tunnel (UK) cost $426 per kilometre and the Eastern Distributor was $223 per kilometre, in 2015 dollars.

The traffic modelling has a range of issues

The description of the transport modelling applied to the WestConnex project is opaque and confusing and the toll regime that is used in traffic forecasts is not fully explained.

The treatment of induced demand is questionable. The forecasts of induced demand are concerning, as they suggest a very high level of new trips will be induced by WestConnex, but the transport benefits do not appear to have been reduced with this increase in traffic. This result is hard to comprehend.

All results in the *Updated Strategic Business Case* are presented as absolute numbers rather than in ranges. The sensitivity of the modelling should have been tested against reasonable variations to input parameters to provide credibility to the estimates. The absence of modelling for more distance future year (e.g. 2046) is concerning.

As a result of increased congestion and the introduction of tolls, transport modelling suggests that a very small percentage of Leichardt residents will use public transport more when WestConnex is complete.

The cost benefit analysis is littered with issues

The *Updated Strategic Business Case* has costs of $13,547 million and benefits of $22,204.9 million and a benefit cost ratio of 1.71. However, dividing the present value of benefits against the present value of costs results in a benefit cost ratio of 1.64. This difference is too large to be the result of a rounding error.

If travel time savings of less than five minutes is excluded, the travel time benefits are reduced from the benefits would fall from $12.9 billion to $5.9 billion – reducing the BCR from the recalculated 1.64 to 1.12. These small travel time savings were one of the issues with the Lane Cove and Cross City Tunnels, where Roads and Maritime Services described that "*the majority of travel time savings were less than five minutes (which are often not realised and can be considered inframarginal in economic terms)*".

The rationale for the large proportion of business trips is unclear. 33 per cent of travel time benefits are attributed to cars – privately registered, business use. However, it is unclear why so many business car users have been included in the analysis – justification is not provided in the *Updated Strategic Business Case.*

Land acquisition costs or the opportunity cost of land being used for the project do not appear to be included in the WestConnex project costs or in the broader cost benefit analysis. The health impacts, local amenity impacts and related land use implications are not discussed by the *Updated Strategic Business Case.*

In summary, the *Updated Strategic Business Case* fails to establish WestConnex as the best transport solution for Sydney.

1 INTRODUCTION

1.1 Project context

WestConnex will have an impact on the Leichhardt LGA. A number of these implications have been identified by SGS and in a recent submission by Leichhardt Council regarding the M4 East Environmental Impact Statement. The submission was produced in response to the release of the WestConnex Stage 1B Environmental Impact Statement. Key implications associated with WestConnex intersecting with the LGA include:

- WestConnex Stage 1B is inconsistent with the aims of Leichhardt Council's adopted Integrated Transport Plan. The plan seeks to improve accessibility within and throughout the Local Government Area (LGA), create a legible, direct and safe pedestrian and cycling environment and encourage public transport use.
- The EIS does not consider the future relationship the road corridor may have with major planning projects currently underway within the subregional context of Leichhardt such as the Bays Precinct and Sydney Metro.
- Traffic around Leichhardt's local road network is likely to increase with the completion of Stage 1B M4 East as traffic is likely to be diverted from the congested Parramatta Road and Dobroyd Parade. This may influence Leichhardt's precincts by reducing accessibility and amenity within the local street network.
- Potential Increased traffic generation due to the flow on effect from the Anzac Bridge and Parramatta Road extension and congestion of Victoria Road and Anzac Bridge.
- An exit tunnel at Victoria Road near the Anzac Bridge could increase traffic along the already congested Victoria Road and increase local traffic along Johnson Street and other streets with more cars entering the local road network.
- If WestConnex does relieve pressure on Parramatta Road, it could create a better urban environment along the southern boundary of the Leichhardt LGA. However, if as expected, traffic along Parramatta Road increases, this will exacerbate the urban quality irrespective of the urban renewal vision of UrbanGrowth NSW.

1.2 Project brief

SGS Economics and Planning (SGS) was commissioned by Leichhardt City Council to review the *Updated Strategic Business Case* for WestConnex. The focus of this review is:

- The sustainability and environmental objectives and performance of the project
- The economic analysis of WestConnex and the underlying assumptions, including project costs and how health and wellbeing have been accounted for, and
- The transport implications of the project, including induced demand and possible loss of public transport patronage.

These three foci form the structure of this report.

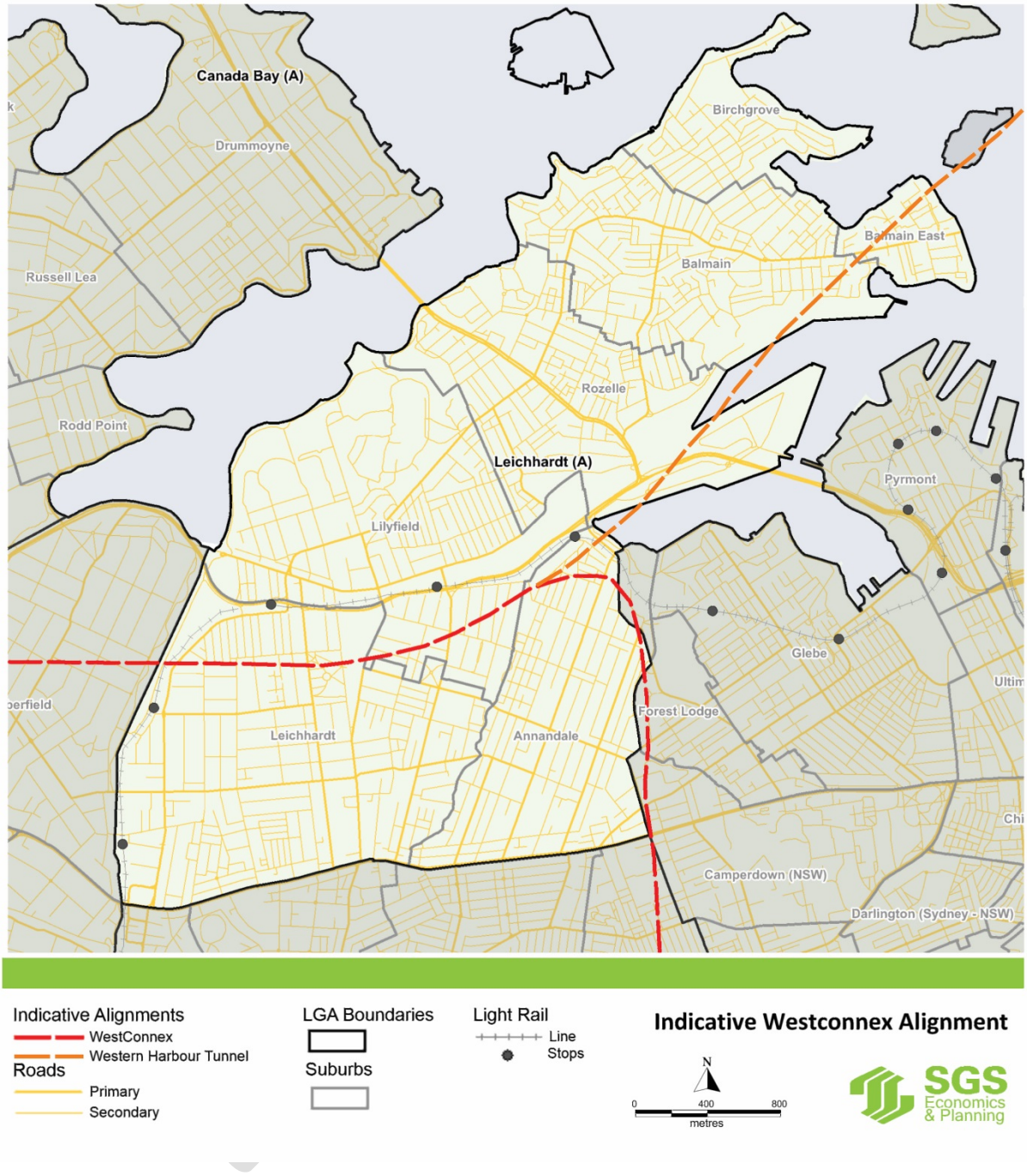


FIGURE 1. PROPOSED WESTCONNEX ALIGNMENT

1.3 History of WestConnex

The NSW Government announced WestConnex in 2012 as part of *NSW'S State Infrastructure Strategy* (SIS). Under the SIS, Infrastructure NSW identified WestConnex as a "catalyst to renew and transform the parts of Sydney through which is passes. WestConnex is intended to develop as an integrated land use and transport scheme delivering on road transport, urban renewal and public transport outcomes" (Infrastructure NSW, p88).

As outlined in the SIS, WestConnex was designed to integrate the M4 extension from Parramatta towards the Airport with an expansion of the M5 East. Figure 1 details the key opportunities and benefits envisaged for WestConnex.

FIGURE 1. WESTCONNEX ALIGNMENT 2012

Source: Infrastructure NSW, 2012

The SIS also promoted WestConnex as supporting freight and people movements to Sydney Airport, relieving congestion and facilitating improvements in public transport. The strategic benefits of the project were justified under the SIS and included:

- relieving congestion on the existing M4/Parramatta Road and M5 East
- supporting freight movements between Sydney's Gateways and the logistics hubs in Western and South Western Sydney
- supporting people movements to Sydney Airport
- acting as a catalyst for urban regeneration along key corridors, particularly Parramatta Road
- enhancing orbital road connectivity South and West of the CBD
- facilitating improvements in public transport, particularly on the Parramatta Road corridor.

However, the SIS outlined that existing assets should be maximised before investing in new projects.

> *"NSW should also maximise the use of existing assets wherever possible before investing in new projects because it is both cost effective and it is capable of delivering quick improvements for the community that are sacrificed when there is too great a focus on big projects with long lead times" (Infrastructure NSW, p24).*

This statement reflects that rather than embarking on major construction projects, the existing M4 and M5 motorways should be tolled in order to manage demand.

In October 2012, the NSW Government announced it would proceed with the recommendation put forward by Infrastructure NSW, to develop a business case for Westconnex. The recommendation formed part of the future Sydney motorway network identified in the SIS and the NSW Government's Draft Long Term Transport Master Plan. In August 2013, the business case was approved by the NSW

Government and the WestConnex Delivery Authority (WDA) was established to manage the project in October 2013.

The text box below details the concern raised by the NSW Auditor General around the development of the business case process. The Auditor General noted that "the preliminary business case submitted for Gateway review had many deficiencies and fell well short of the standard required for such a document. Further, on our analysis, the business case put to the Government still included some deficiencies that independent Gateway reviews and external assurance arrangements, if they had occurred, should have identified" (NSW Auditor-General 2014, p3).

WestConnex Assurance to the Government

In December 2014 the NSW Auditor-General issued a report into assurance processes associated with WestConnex. This highlighted that the process undertaken to date is not considered satisfactory. The focus of the audit was to determine whether WestConnex assurance processes are consistent with key principles underlying NSW Government major projects assurance frameworks and have been effectively implemented to provide sound, independent assurance to Government and project sponsors.

The audit did not examine the merit of the project or whether it represented value-for-money. The report found that additional independent gateway reviews should have been conducted. Only one review was conducted which found that the preliminary business case was deficient and fell well short of the standard required for such a document. Four additional gateway reviews should have been conducted.

A number of other conflicts of interest were raised in relation to governance arrangements and the board members of WDA. The final conclusion of the report was that "There were a number of deficiencies in governance and independent assurance over the early stages of the WestConnex project. Going forward, these need to be rectified to ensure that WestConnex achieves the expected benefits at a reasonable cost". Further to this, the report notes that "The preliminary business cases submitted raise deficiencies in business cases on which decisions have been made".

Updated WestConnex Route (2014)

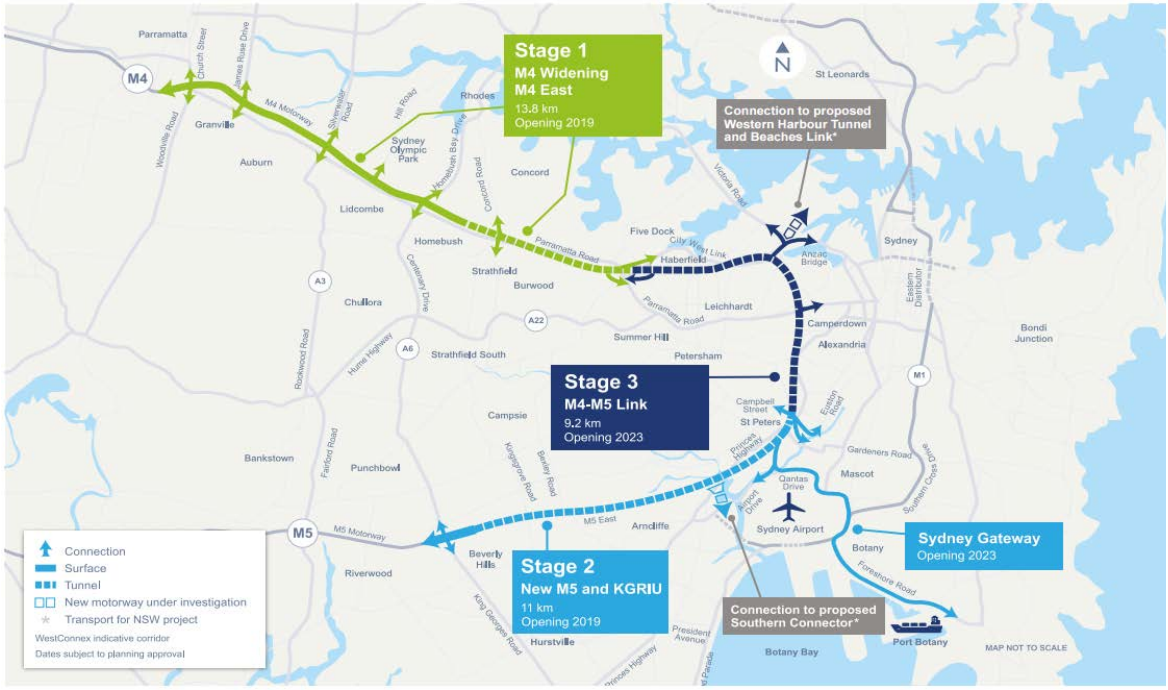
The NSW Government announced in June 2014 that the WestConnex Delivery Authority (WDA) would prepare a business case for two extensions to WestConnex. As part of the business case, northern and southern extensions were proposed, with the WDA to assess the feasibility and affordability of the change.

The northern and southern extensions were both identified under the NSW *Long Term Master Plan* as corridors for investigation. The northern extension will link the former Rozelle Goods Yard to Victoria Road to the north and the Anzac Bridge and Western Distributor to the east. The southern extension will connect the new M5 to President Avenue in Rockdale. However, it is not stated how this alignment is superior to the original (for example, in terms of cost benefit analysis).

With reference to the SIS Update 2014, these extensions aim to provide a western bypass of Sydney's CBD to alleviate existing pressure on the existing north-south corridor of Sydney's orbital network. Infrastructure NSW also focused on reducing journey times from the south. Stage 3 of WestConnex was rerouted towards the northern extension and away from Parramatta Road.

Figure 2 illustrated the updated alignment from December 2014 with Stage 3 linking the M4 and M5. As an outcome from the realignment, Parramatta Road is no longer duplicated from Haberfield to Petersham and there has been a connection introduced onto Parramatta Road at Camperdown. Hence the opportunity for urban renewal along Parramatta Road was lost.

FIGURE 2. WESTCONNEX ALIGNMENT (NOVEMBER 2015)



Source: WestConnex Delivery Authority, 2014

2015 Updated Strategic Business Case

In November 2015, the NSW Government released the *Updated Strategic Business Case.* It consolidates the work undertaken in the original business case, with additional modelling, analysis and changes to the reference design enhancements. This report will examine the WestConnex *Updated Strategic Business Case* in more detail.

Key implications of the current project compared to the original project include:

- The various stages of WestConnex will be constructed more quickly allowing benefits to be unlocked more quickly.
- The Stage 1 section is closer to the CBD and will generate increased congestion for those travelling to and from the CBD and Eastern suburbs. The ANZAC Bridge will be particularly adversely impacted.
- Urban amenity and local traffic conditions will not be improved along Parramatta Road by WestConnex, and the opportunities for urban renewal will not be improved by the project. Hence one of the key strategic reasons for the project has been lost.
- The route which will allow access to Sydney Airport and Port Botany is not fully explained and will be delivered four years after the opening of Stage 2 of WestConnex. The *Updated Strategic Business Case* is also silent on the potential impact of the Western Sydney Airport on future traffic demand. It is unclear if the access to Sydney's global gateways will be improved with the new airport, hence bringing into question one of the key strategic reasons for the project.

2 THE SUSTAINABILITY OF WESTCONNEX

2.1 Introduction

The strategic merit of WestConnex is not fully established by the *Updated Strategic Business Case* or in supporting Environmental Impact Statements (EIS) released to date. This has generated considerable uncertainty around whether WestConnex is a sustainable and superior solution for Sydney's transport issues. The following section draws on numerous parts of the *Updated Strategic Business Case* to examine the sustainability of WestConnex and what its potential impact may be on Leichhardt Council.

2.2 Is WestConnex the only solution?

Alternatives to WestConnex have not been considered

The *Updated Strategic Business Case* does not consider any strategic alternatives to WestConnex. Analysis of options appears to be limited to minor variations in route alignments, and this analysis is primarily incorporated into the M4 East and Stage 2 Environmental Impact Statements.

Section 3 of the *Updated Strategic Business Case* focuses on 'Solutions in a Strategic Context'. This section actually establishes the policy alignment of the WestConnex proposal, rather than considering solutions to identified problems. The strategic alignment of WestConnex to a range of policies is considered, including *NSW State Priorities, NSW 2021, 2012 State Infrastructure Strategy, NSW Long Term Transport Master Plan, 2014 State Infrastructure Strategy, NSW freight and Ports Strategy, A plan for Growing Sydney* and the *2014-15 NSW Budget*. The outcome of this analysis is qualitative reasoning supporting the strategic merit of WestConnex. However, this section does not consider broader potential solutions.

This approach contrasts with Transport for New South Wales (TfNSW) *Principles and Guidelines for Economic Appraisal of Transport Initiatives (2013)* which recommends the identification and analysis of solutions on the basis of physical circumstances and available technologies.

The *Guidelines* note that:

> *'The main risk of distorting the evaluation is the risk of neglecting relevant alternatives, in particular, low cost solutions such as managing and pricing solutions.'*
>
> TfNSW (2013, p. 27).

For a project as significant as the $16.8 billion WestConnex, it is concerning that other solutions and in particular, demand management (electronic road pricing) or public transport solutions, have not been assessed. A strategic alternative or option analysis may have identified the need for an integrated transport solution which could have included guided (or unguided) bus ways connecting between rail lines, intelligent transport systems, better integration of land use and transport strategies, and demand responsive systems. Failure to consider these options is a missed opportunity.

An example of consideration of strategic alternatives is the *East West Link Needs Assessment* undertaken by Sir Rod Eddington for the Victoria Government. This assessment developed four options which

integrated a range of road and public transport investment with the aim of improving east-west connectivity in Melbourne.

Project objectives prevent a non-road based solution from being considered

The objectives of WestConnex are primarily road-based. Shown in Section 4 of the *Updated Strategic Business Case*, these objectives centre on improving motorway access, relieving road congestion, catering to travel demands that are best met by road and improving productivity. For the most part, these objectives can only be fulfilled by *WestConnex.*

Whilst the *Updated Strategic Business Plan* does not identify strategic alternatives or assess these against these objectives, this assessment is presented in the Stage 2 EIS. Here, a range of high level strategic alternatives are dismissed on the basis of non-performance against stated criteria.

Whilst the failure to consider projects other than WestConnex, particularly integrated projects, is concerning, it is also of concern that sustainability objectives are not identified. The sustainability of the project in terms of longevity and environmental performance is not identified as an objective of WestConnex.

Other global cities are focusing on integrated transport solutions

Road congestion is a significant problem for Sydney. TomTom data suggests Sydney is the 21st most congested city in the world – a point that is used in the *Updated Strategic Business Case* as a key justification for developing WestConnex.

Table 1 contains an overview of selected cities from the TomTom data.

TABLE 1. CONGESTION RANKINGS

World rank	Filter rank	City	Country	Congestion Level	Morning peak	Evening peak	Highways	Non-highways
10	10	Los Angeles	United States	39%	60%	80%	36%	42%
13	13	Rome	Italy	38%	71%	65%	24%	43%
16	16	London	United Kingdom	37%	65%	67%	22%	43%
20	20	Vancouver	Canada	35%	53%	66%	13%	41%
21	21	Sydney	Australia	35%	66%	64%	31%	37%
22	22	Paris	France	35%	64%	64%	35%	35%
26	26	San Francisco	United States	34%	53%	68%	29%	39%

Source: TomTom, 2014

However, significant literature exists around the traffic inducement effect of new roads and as cities grow larger roads become a less viable transport solution. Many cities in Europe, North America and East Asia are also removing motorways from their inner city to improve liveability, improve transport sustainability, and effectively manage traffic congestion (Lavanchy 2014, Napolitan and Zegras 2008, Kang and Cervero 2009, Cervero 2006).

Other global cities recognise this issue and in turn, have refocused efforts in transport infrastructure onto public transport.

- Los Angeles, the 10th most congested city in the world, long known for its sprawling development pattern and reliance on cars, has seen significant investment in mass transit since the early 1990s. Over the last two decades, a number of new subway lines have been constructed, along with light rail lines and rapid bus lines. 'Measure R' was implemented in 2008 to enable taxes to create a dedicated funding stream for new transit.
- Rome, the 13th most congested city in the world, launched an *Urban Mobility Plan* in 2010 which places restrictions on traffic within specific zones in the city. Emissions reduction mechanisms, altered parking restrictions and expanded cycling and public transport form part of the plan to improve mobility while reducing reliance on cars.
- London, the 16th most congested city in the world, introduced a congestion charge in 2003. Almost half of the revenue has been reinvested into public transport, roads and active transport schemes and traffic volumes have been reduced by 10 per cent (Transport for London, 2014).
- In Vancouver, the 20th most congested city in the world, the *Transportation 2040 Plan* looks to improve public transport patronage by revising fare structures and introducing a smartcard system, optimising the road network through improved signalling and peak hour parking regulation, and through investigating a congestion charge policy in more detail.

Congestion is a common issue for global cities and Sydney is no exception. The potential investment of at least $16.8 billion into a toll road in Sydney is not consistent with the path taken by other international cities and is not supported by a rigorous assessment of alternatives.

The longevity of the project is unclear

It would be expected that a high cost project would generate benefits for decades to come. This does not appear to be the case for WestConnex.

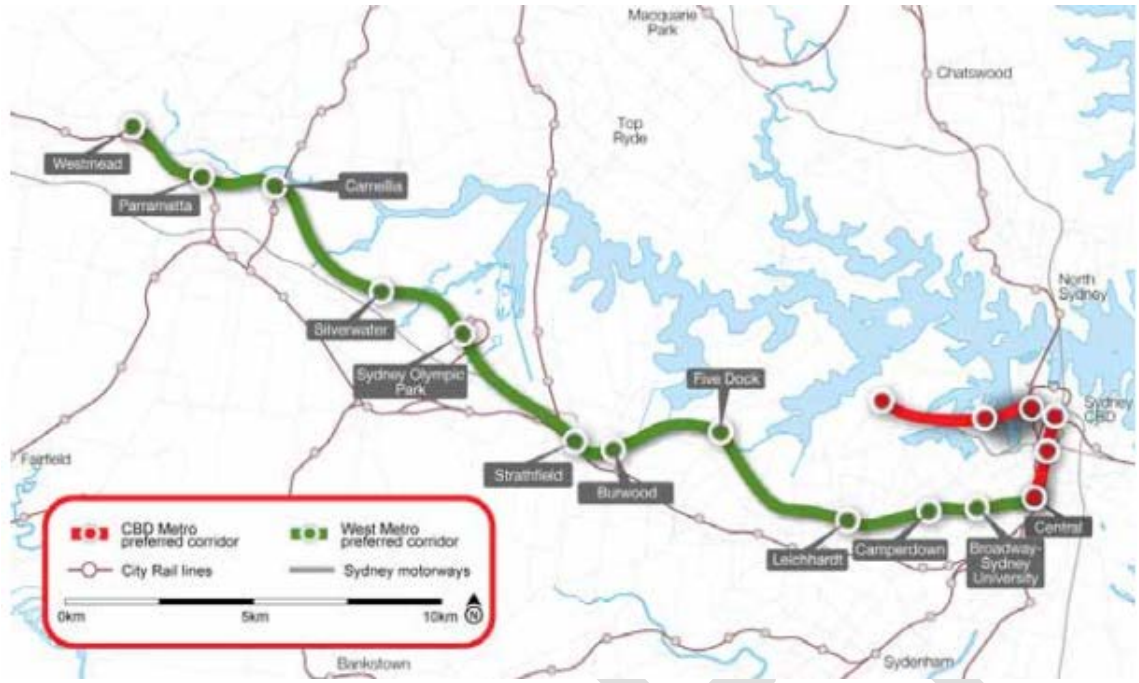
On-ramps at Rozelle will provide westbound access from Anzac Bridge to WestConnex. However, once the Western Harbour Tunnel and Northern Beaches Link are in operation, the *Updated Strategic Business Case* suggests that WestConnex will be close to capacity by 2031. If wholly completed by 2021, this would result in $16.8 billion being spent for around ten years of marginally improved travel times.

The West Metro project is not identified or compared against

The WestConnex Stage 2 EIS addresses public transport alternatives in very broad terms, with no specific proposals considered. The EIS concluded that as no one public transport project can provide for all passenger needs (private and freight), WestConnex is supported.

This report uses the shelved West Metro proposal as a comparison with WestConnex. West Metro was proposed in the mid-2000s to connect Westmead and Parramatta to the Sydney CBD via a high frequency metro line. West Metro was proposed as an extension of the CBD Metro line, proposed to run from Central Station to Rozelle. The proposed route for West Metro, shown in Figure 3, is very similar to the route of Stage 2 of WestConnex. West Metro was proposed to have trains operating every 2-3 minutes during peak hours and a maximum daytime wait of 5 minutes (NSW Government 2009, 4). Transport modelling prepared for the West Metro EIS found that by 2031, between 45,000 and 60,000 passengers would utilise West Metro in the AM peak (NSW Government 2009, 4).

FIGURE 3. WEST METRO



Source: NSW Government, 2009

As with WestConnex, the West Metro was found to reduce travel times for commuters during the AM peak at all proposed stations, however the travel time savings were more significant for West Metro. Travel time savings were noted for commuters at Westmead and Parramatta as the stations benefit from faster and more frequent rail services (NSW Government 2009, 21). The most pronounced travel time savings noted at Camellia, Silverwater, Five Dock and Leichhardt, with over 20 minutes saved (NSW Government 2009, 21). The West Metro EIS found that the introduction of a high speed rail line would provide significant relief to the Western rail line, diverting approximately 40 percent of passenger trips from the existing rail network to the West Metro during the AM peak (NSW Government 2009, 23).

West Metro provides a reliable service, with peak services proposed every 2-3 minutes. The rail network is separate from the road network and unlike buses are not subject to significant delays from road congestion. Current bus frequency and timetables are significantly impacted by traffic congestion and while there is potential for a dedicated bus lane along Parramatta Road with WestConnex, no indication has been made in the Stage 1b EIS regarding improved reliability of services.

In addition to faster travel times, the West Metro proposal provides benefits to residents and businesses in the Leichhardt LGA that simply cannot be achieved through the WestConnex project. West Metro has the potential to significantly reduce travel times for residents of Leichhardt LGA and surrounds into the CBD, providing a travel time saving of over 20 minutes (NSW Government 2009, 21). No travel time savings for areas east of Burwood have been provided in the Stage 1b EIS for WestConnex. It is therefore unclear whether any travel time saving is forecast for the majority of Sydney's Inner West.

Introducing a high speed rail network through the Inner West and the Leichhardt LGA has the potential to encourage greater public transport patronage, reducing car usage and car dependency and therefore relieving road congestion. The WestConnex proposal does the exact opposite, reinforcing car dependency across Sydney and providing to incentivise a modal shift away from private vehicles to public transport. Improving public transport and reducing congestion are recognised as vital actions to improve the liveability of Sydney in the *NSW Long Term Transport Master Plan* (2012, 176). While the proposed West Metro would have helped achieve this objective, WestConnex is unlikely to reduced private vehicle use.

The impacts of WestConnex project and the West Metro project are summarised in Table 2 below. It is evident from the comparison between the two projects that Westconnex is an inferior transport solution for the residents and businesses of the Leichhardt LGA, providing fewer benefits and more negative impacts than the previous West Metro proposal.

	Benefits to Leichhardt LGA	Costs to Leichhardt LGA
WestConnex	– Potential travel time savings by bus, however this is not clearly articulated in planning documents – Improved road connections to Parramatta – Improved motorway access	– Increased local traffic as motorists avoid tolls on WestConnex – Increased local traffic as staging of the project does not see the M4-M5 connection complete when Stage 1b is complete, depositing motorists in Haberfield. Local roads used to drive into the city. – Increased local traffic as Stage 3 deposits motorists at the Anzac Bridge or Victoria Road, adding additional vehicles to already congested road networks. – Potential air quality impacts however this is not clearly articulated in planning documents
West Metro	– Reduced travel times by over 20 minutes from Leichhardt LGA into the CBD – Reliable public transport unaffected by road congestion – Improved development potential around a proposed Leichhardt station and adjacent areas of Parramatta Road – Improved connections to Sydney and Parramatta CBDs – Improved public transport interchange, with bus interchange proposed at a proposed Leichhardt station – Encouraging less car dependency through improved public transport network	– Potential increase to local traffic and parking demand for metro station – Lack of benefit for northern areas of Leichhardt LGA (Rozelle, Balmain, Lilyfield) without CBD Metro or light network

TABLE 2. IMPACTS OF PROJECTS ON LEICHHARDT LGA

2.3 How WestConnex will affect Leichhardt

Issues identified in the previous EIS remain unaddressed

At its meeting on 27 October 2015, Leichhardt Council endorsed a submission in response to the Environmental Impact Statement (EIS) prepared for Stage 1b of the WestConnex proposal. In its submission, Leichhardt Council indicated it opposed the WestConnex development due to the significant impacts and lack of key information surrounding the proposal. The impact of the proposal on Sydney's road network (including road capacity, usage and travel times) and full costs and benefits were not provided as part of the EIS. Leichhardt Council also notes in their submission that the EIS also lacks a comparison of the cost and benefits of the WestConnex project to a public transport project of a similar scale. Several concerns raised by Leichhardt Council in previous submissions provided to the NSW Government prior to the release of the EIS for Stage 1b, such as concerns around air quality and impact on identified urban renewal precincts, have not been addressed and in some cases, no information has been provided.

In their submission, Leichhardt Council notes that the WestConnex project is inconsistent with the aims of Council's Integrated Transport Plan as the proposal does not:

- improve accessibility within and throughout the Leichhardt LGA;
- create a legible, direct and safe pedestrian and cycling environment;

- encourage public transport use;
- provide a safe and efficient road network for all road users;
- facilitate integration of land use, transport and community & cultural activities;
- provide convenience for users of Leichhardt;
- promote health and wellbeing;
- improve environmental conditions; and
- support Council's adopted 10 Year mode shift targets, including a reduction of private car use from 44% to 28%.

Leichhardt Council raised concerns about the traffic modelling produced for the EIS as the EIS does not give clear consideration of major projects planned for the surrounding area, such as the Bays Precinct, Central to Eveleigh urban renewal, and the Sydney Metro. Leichhardt Council's submission called for further information regarding how local street networks in Leichhardt LGA and surrounds from additional through traffic, including transportation of hazardous goods.

The impact of WestConnex on the Bays Precinct will be significant

As noted in Leichhardt Council's submission, the impacts of the WestConnex project on The Bays Precinct urban renewal project have not been explained in the Stage 1b EIS or in any detail in the *Updated Strategic Business Case*.

It is noted that while the government has outlined its intent for The Bays Precinct, no detailed information regarding resident or worker populations has yet been provided. The *Transformation Plan: The Bays Precinct Sydney* was released in October 2015 and present the high level vision for the urban renewal project. The Bays Precinct is separated into eight localities, each with its own vision, opportunities and challenges.

The Rozelle Rail Yards is the western-most locality of The Bays Precinct. Future uses of Rozelle Rail Yard identified in the *Transformation Plan: The Bays Precinct Sydney* includes a mix of different housing, including affordable housing, as well as public spaces and employment uses. The Rozelle Rail Yards is of particular importance to the WestConnex proposal as this is the proposed location for the Rozelle Interchange, providing connections to the Anzac Bridge, Victoria Road and, subject to planning and approval, a second Harbour Crossing and a Northern Beaches motorway. While this stage of WestConnex is currently marked as a tunnel, the detailed planning for Stage 3 has not yet commenced and it is uncertain how WestConnex may impact on the planned renewal of The Bays Precinct, including potential development yields, commercial and residential uses, and urban design outcomes.

Reference to the Bays Precinct in the *Updated Strategic Business Case* is limited to Section 7.2. Here, WestConnex's impact on the Bays Precinct is explained as:
- The Rozelle Interchange 'transforming' the former Rozelle Rail Yard
- The interchange having the potential to reconnect areas to the north and south of the Rail Yard and improving connectivity from Lilyfield to the harbour and Bays Precinct.

While residents and workers of The Bays Precinct may benefit from arterial road access, the proposed realignment of WestConnex Stage 3 to include an interchange at Rozelle connecting to the Anzac Bridge and future Western Harbour has significant implications for traffic flow and congestion in and around The Bays Precinct.

While no population, dwelling or employment numbers have been released, The Bays Precinct encompasses 95 hectares of land planned for 'transformation' and offers potential for significantly higher numbers of people living and working in the Precinct (UrbanGrowth NSW 2015). Traffic in and around The Bays Precinct along the City West Link, Victoria Road and the Anzac Bridge is already considerably congested. Congestion on Victoria Road has a significant negative impact on Sydney's productivity and economic output, with a delay cost per lane kilometre of $1.73 million (Infrastructure Australia 2015, 143). This is forecast to increase to a delay cost per lane kilometre of $4.69 million by 2031 (Infrastructure Australia 2015, 144). The *Updated Strategic Business Case* found that an additional

20,000 vehicles are forecast to use the Anzac Bridge on an average weekday (NSW Government 2015, 39) and Victoria Road will experience increased traffic volumes due to an introduced toll on the M4 (NSW Government 2015, 39). Introducing an interchange at Rozelle before the construction of the Western Harbour Tunnel is complete is a significant risk to the project and has the potential to exacerbate adverse traffic impacts for these main arterial routes and local streets as these main roads struggle to accommodate additional traffic demands.

The vision for The Bays Precinct is to be a hub for knowledge economy jobs. To ensure the maximum economic output and benefit from the knowledge economy, an efficient, effective mass public transit and active transport network is required to support and attract highly skilled workers (Lakshmanan 2011, Committee for Sydney 2015a, Committee for Sydney 2015b, Newman 2014, Newman et al 2013, Dirks et al 2010). These types of land uses that centre on knowledge economy workers largely do not require large motorway projects to support their operations as limited goods and freight are produced. Instead, a high quality urban environment with efficient public and active transport connections are more highly sought after for knowledge economy firms (Newman 2014, Newman et al 2013, Dirks et al 2010). Furthermore, the introduction of motorways has been found to lead to economic dispersal, limiting the clustering of knowledge economy enterprises and preventing additional jobs, ideas and innovation associated with agglomeration economies (Yu et al 2015).

By facilitating additional traffic movements into the Bays Precinct, WestConnex may in fact reduce development yield through increased car parking requirements. WestConnex may also hamper efforts to encourage sustainable transport use in the Bays Precinct through provision of car parking and access to the motorway.

Cities around the world are actively planning to remove cars from their CBDs and areas with concentration of economic activity, such as London, Singapore and Stockholm (Committee for Sydney 2015b, Newman et al 2013, Dirks et al 2010). Many cities in Europe, North America and East Asia are also removing motorways from their inner city to improve liveability, improve transport sustainability, and effectively manage traffic congestion (Lavanchy 2014, Napolitan and Zegras 2008, Kang and Cervero 2009, Cervero 2006). Establishing a motorway through The Bays Precinct appears counterintuitive to prevailing global trends and the aims of the urban renewal project to “drive an internationally competitive economy.” The proposal also fundamentally acts against international best practice for urban renewal in inner city areas (UrbanGrowth NSW 2015, iii).

3 REVIEW OF ECONOMIC APPRAISAL

3.1 Introduction

Overestimates of toll road patronage and the benefits stemming from this have plagued projects such as the Lane Cove Tunnel and Cross City Tunnel in NSW to the point where these roads have been financial disasters. This section considers the economic appraisal of WestConnex, which reflect sections 12, 13 and 14 of the *Updated Strategic Business Case* and the *Economic Appraisal* (KPMG 2015).

3.2 Project costs

Costs are high and are likely to be even higher
WestConnex is estimated to cost $16.8 billion in the *Updated Strategic Business Case*. However, this cost estimate is provided at a P50 level, meaning, there is a 50 per cent chance that the actual project cost will vary. For a project of this scale, it is common to produce a P90 cost – leading to a 10 per cent change that the actual project cost will be different.

It is also of concern that the $16.8 billion price of WestConnex does some exclusions. The *Updated Strategic Business Case* notes that:

"capital costs exclude land acquisition, network enhancements and development costs"
Source: *Updated Strategic Business Case,* p. 240.

These excluded costs have the potential to be significant.

In moving from the 2013 Business Case to the 2015 *Updated Strategic Business Case*, it appears that the cost for comparable sections of WestConnex has not changed (see Table 13.6 on page 240). Whilst additional road links and supporting costs have been added to the total, the cost of the remainder of the project remains at $14.8 billion – an outcome which suggests that over two years, no additional analysis has been undertaken on project costs and inflation has not been accounted for either.

At $16.8 billion, WestConnex would be considerably more expensive than other international and national projects on a per kilometre basis. At 33 kilometres in length, WestConnex would be approximately $510 million per kilometre. In contrast the Channel Tunnel (UK) cost $426 per kilometre and the Eastern Distributor was $223 per kilometre, in 2015 dollars.

Use of a Strategic Business Case alone is not appropriate
A further layer of complexity is created by the unclear intention of the *Updated Strategic Business Case* overall. A Strategic Business Case is not mandated by Treasury NSW – only a preliminary and full business case are. To this end, it is difficult to assess the adequacy of the document as it partially meets the requirements of a Preliminary and a Final Business Case. It is of concern that a Final Business Case has not been yet been released to the public and is unclear whether one has been prepared or is being prepared, particularly in light of the fact that some works for WestConnex have begun.

3.3 Cost benefit analysis

The cost benefit analysis provided in the *Updated Strategic Business Case* and the supporting economic appraisal attachment (KPMG 2015) generally meet requirements set out in TfNSW *Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives.* However, the manner in which crash cost savings and more broadly, health and wellbeing have been included is insufficient.

The benefit cost ratio provided is incorrect based on the information shown in the *Updated Strategic Business Case.* Table 7 of the document outlines sensitivity analysis results, including the project case (Central Scenario). Here, a present value of costs of $13,547 million and a present value of benefits of $22,204.9 million is shown, with a net present value of $8,657.9 and a benefit cost ratio of 1.71. However, dividing the present value of benefits against the present value of costs results in a benefit cost ratio of 1.64. This difference is too large to be the result of a rounding error.

The other results shown in Table 7 of the *Updated Strategic Business Case* show further inconsistencies, with discrepancies ranging from 0.05 to 0.31. This casts doubt over the accuracy of the calculations presented in the document and adds further uncertainty around the merit of WestConnex.

Crash cost savings – that is, reduced accidents resulting from improved traffic flow and reduced congestion, are calculated using a change in Vehicle Kilometres Travelled (VKT) and applying rates provided from Austroads and willingness to pay values from TfNSW. It could be argued that this approach is not sophisticated enough for a project as large as WestConnex. This approach does not appear to account for higher speeds resulting in more accident risk, possibly higher severity of crashes, reduced amenity of pedestrian amenity on existing roads, and increased flow of traffic as a result of on ramps to WestConnex. At the same time, this approach does not take into account potentially higher pedestrian and active transport flows resulting from urban renewal efforts along the WestConnex route.

The proposed Bays Precinct redevelopment will see significant population growth in Leichhardt City Council and in turn, a higher level of street and business activity in the area. This may increase the risk of traffic accidents resulting from WestConnex, including pedestrian-related incidents due to increased vehicular exposure, and it is possible that the positive economic impacts associated with increased foot traffic could be constrained due to the negative impact WestConnex will have the local environment.

Land acquisition costs do not appear to be included in the WestConnex project costs or in the broader cost benefit analysis. Page 240 of the *Updated Strategic Business Case* states "*For the purpose of this analysis capital costs exclude land acquisition, network enhancements and development costs".* The cost of these excluded elements is likely to be high. At a 2015 Budget Estimates Committee, the CEO of the Sydney Motorway Corporation, Mr Dennis Cliche, indicated that $140 to $150 million had been designated for land acquisition to facilitate the St Peters Interchange (General Purpose Standing Committee No. 2, 2015). This is in contrast to TfNSW *Guidelines* which states:

> *"Buildings or houses that have to be demolished to make way for the project should be valued at market prices (net of selling costs), plus demolition costs minus scrap or residual value. Labour costs should generally reflect market rates with an allowance for labour on-costs (generally around 30 per cent)" (TfNSW 2015, p.30).*

The opportunity cost of using land for WestConnex is not recognised. TfNSW *Guidelines* recognise the need to consider opportunity cost of proposals. The methodology provided (Section 9.4.1 of the Guidelines) state:

> *Underlying the valuation of inputs to a project or activity is the principle of opportunity cost. The use of resources (manpower, finance or land) in one particular area will preclude their use in any other. Hence the basis for valuing the resources used is the "opportunity cost" of committing resources; i.e. the value those resources would have in the most attractive alternative use. The adoption of this principle reflects the fact that the economic evaluation of public sector projects*

should be conducted from the perspective of society as a whole and not from the point of view of a single agency.

Commonly, the price paid for new capital, labour or other inputs will reflect the opportunity cost of the resources. The position may be less clear in the case of the use of existing land owned by the agency. In general it is considered that a cost equivalent to its maximum market value under current or likely realistic land-use zoning should be placed on such land.

The general principle applies even where the public sector may have access to an input at a cost different from its market value. In certain cases, where a resource has a market price, that price may not reflect the marginal social cost of using the resource.

Whilst the cost of land acquisition is not included in the *Updated Strategic Business Case*, the M4 East EIS notes that full and partial acquisition of 182 properties and 10 road reserves would be required, in addition, 98 properties owned by Roads and Maritime would be acquired (M4 East EIS 2015, p. ix). The cost of the land acquisition is not identified in the EIS. It is unclear what the market value of these properties is and what their 'highest and best use' might have been if not acquired for WestConnex's construction and operation.

High expansion factors are used. A key assumption in the cost benefit analysis is the use of an expansion factor which converts daily calculated benefits into an annual one. The *Updated Strategic Business Case* uses an expansion factor of 345. This suggests that vehicle movements on an 'average' day on WestConnex would be replicated 345 days per year. This is likely to overstate benefits, as there are 260 weekdays in a calendar year and school holidays and public holidays take up a further 68 days per year. This effectively leaves only 192 days where peak periods on WestConnex would be replicated by the transport model.

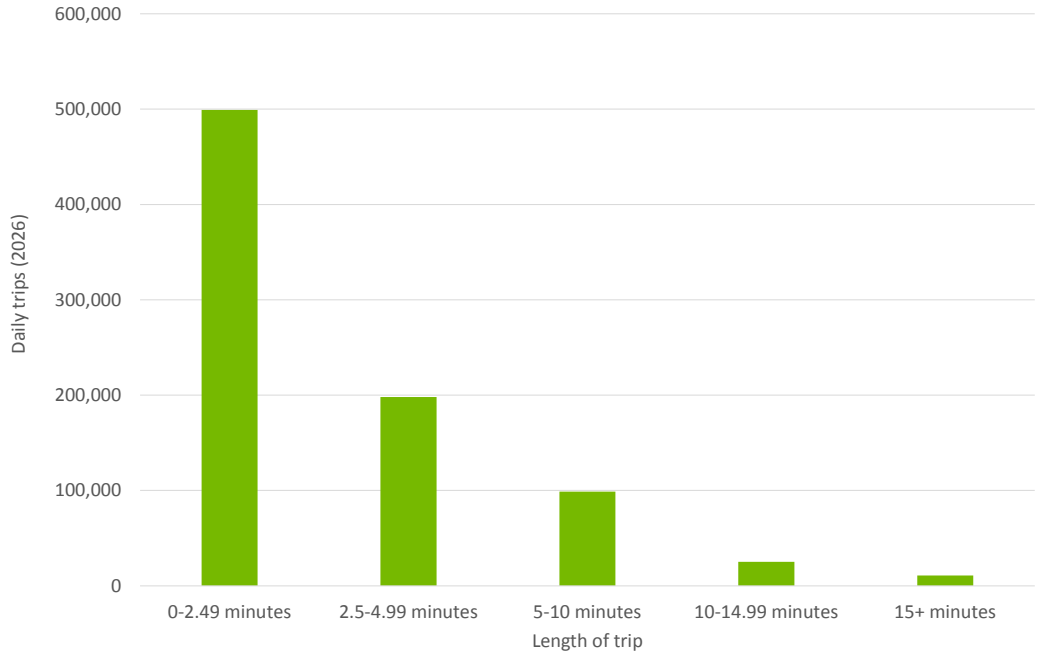
A more realistic expansion factor would be a weighted 320. This would use the following assumptions:
- 192 normal weekdays at 100% of traffic calculated
- 104 weekend days at 70%
- 11 public holidays at 65%, and
- 57 school holidays at 85%.

If a lower expansion factor of 320 is used, the BCR would fall from the recalculated 1.64 to 1.54. This is considered through the sensitivity analysis in the KPMG 2015 (table 11) through using an expansion factor of 300.

Travel time savings are likely to be overestimated. Travel time savings form the majority of user benefits generated by WestConnex. According to Table 12.6 of the *Updated Strategic Business Case*, the discounted value of travel time savings is $12,902.9 million in benefits (discounted) – 58 per cent of the present value of benefits.

Using transport modelling results from the Zenith Model (which produces similar results to the WestConnex Transport Model), the distribution of travel time savings are estimated. The data for 2026 generated by the Zenith model shows that a total of 832,000 trips will gain a travel time saving from WestConnex, but that the majority (60 per cent) will have a saving of up to 2.49 minutes. The following chart displays average travel time savings by number of trips in 2026 for users of WestConnex.

FIGURE 4. TRAVEL TIME SAVINGS BY NUMBER OF TRIPS WITH WESTCONNEX (2026)[1]



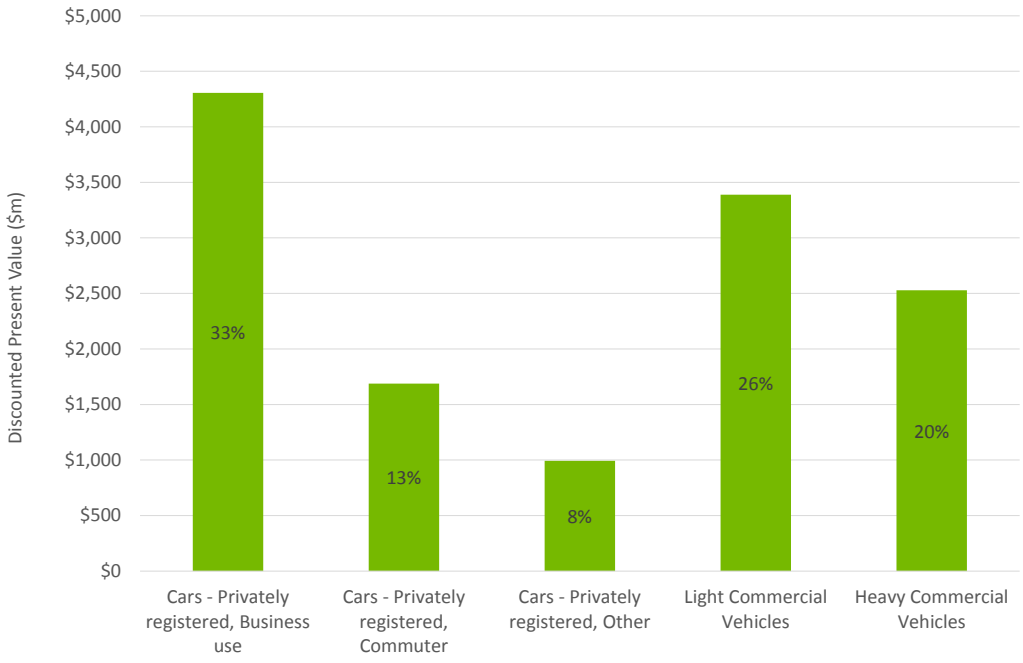
The low level of time saved by a majority of motorists is concerning as there is a risk that this time saving will not be discernible to WestConnex users. Small travel time savings or 'inframarginal' travel time savings were one of the issues with the Lane Cove and Cross City Tunnels, where Roads and Maritime Services (RMS) described that "*the majority of travel time savings were less than five minutes (which are often not realised and can be considered inframarginal in economic terms)*" (RTA 2010). Inframarginal means that they are within the margin of error of the modelling or/and cannot be observed by road users. In the case of the Lane Cove Tunnel, when travel time savings of less than five minutes were removed from the analysis, this BCR decreased by approximately 50 per cent.

The change to the net present value of benefits by excluding any benefits based on a travel time saving of five minutes or less is a fall from $12.9 billion to $5.9 billion – reducing the BCR from the recalculated 1.64 to 1.12.

The rationale for the large proportion of business trips is unclear. WestConnex benefits are primarily driven by travel time savings (58 per cent of total benefits). Section 12.5.1 of the *Updated Strategic Business Case* shows that WestConnex generates $22.4 billion in total benefits, $20.5 billion in user benefits and $12.9 billion in travel time savings. These are shown, by vehicle type, in the following chart.

FIGURE 5. PRESENT VALUE TRAVEL TIME BENEFITS BY VEHICLE TYPE

[1] Daily Average



Source: Adapted from Table 12.6 of Updated Strategic Business Case

As shown, 33 per cent of travel time benefits are attributed to cars – privately registered, business use. This comprises 19.4 per cent of total benefits for WestConnex. Part of this high benefit value is driven by the cost of time applied to business travellers ($53.60 per hour compared to commuters at $21.32 per hour) which is in line with Austroads advice. However, it is unclear why so many business car users have been included in the analysis – justification is not provided in the *Updated Strategic Business Case.* If these users were instead converted into commuters, then benefits would fall by $2.6 billion reducing the BCR from the recalculated 1.64 to 1.45.

Linked to the issue of business trips is how Wider Economic Impacts are estimated. The agglomeration component of Wider Economic Impacts is on the basis of firms interacting with each other more due to improved accessibility. The high value of travel time benefits for business motorists suggests that a sizeable agglomeration benefit would be calculated – a typical estimate would be 20 to 30 per cent of transport benefits overall. However, agglomeration benefits in the *Updated Strategic Business Case* are seven per cent of transport benefits – a misalignment with the very large time travel benefits for business travellers.

3.4 Consideration of health, wellbeing and land use impacts

The economic appraisal of WestConnex in the *Updated Strategic Business Case* uses a traditional cost benefit analysis framework which focuses on travel time improvements and vehicle kilometres travelled to estimate user benefits (value of time) and externalities such as increased/decreased accidents, carbon emissions and noise pollution. This approach to assessing the impact of a proposed road is well established and accordingly, guidelines and values are provided for in *TfNSW Guidelines*.

However, for a road as significant as WestConnex in terms of scale and cost, it could reasonably be expected that more extensive analysis would be prepared. This analysis, whilst not specifically required by the *Guidelines*, would reduce uncertainty generated by documents released to date, and would help to establish the strategic merit of WestConnex – something has not been achieved to date.

The manner in which crash cost savings (see Section 3.1 of this review) have been treated in the economic analysis does not appear to consider the broader ramifications of how WestConnex will affect non-users of the road. Further to this, analysis of health and wellbeing impacts does not form part of the *Updated Strategic Business Case.* It is noted that the M4 East and Stage 2 EIS do assess *localised* impacts,

but there is a significant gap in material released to date around the impact of WestConnex on how residents and workers will interact with the road as pedestrians or cyclists, and whether the negative impacts of the road (due to perceived safety, noise, visual pollution and so on) will affect their travel patterns. This may have impacts on local businesses (examined in the EIS documents), but more broadly, could reduce the appeal, and thus rates of active transport.

A 2008 (Medibank, 2008) study into the cost of physical inactivity showed that across Australia:

- $719 million per annum in direct net costs were attributable to physical inactivity
- Direct mortality costs of physical inactivity reached $3,812 million, and
- The total economic cost of physical inactivity in 2008 was $13,830 million.

It is possible to suggest that WestConnex will reduce rates of physical activity or at the very least, hamper continued improvements in rates of physical activity due to creating unpleasant local environments and through further entrenching car dependency.

4 TRANSPORT IMPACTS

4.1 Introduction

The comments in this section are based on the *Updated Strategic Business Case* and the supporting *Traffic Technical Paper* (Appendix 1) with a particular emphasis on the approach and assumptions that have been applied. The renewal of Parramatta Road is also considered here, as is the relationship between WestConnex and public transport patronage.

4.2 Issues in the analysis

The traffic modelling methodology is inconsistent. The description of the modelling applied is opaque and confusing. It is understood that in summary, the methodology applied followed these steps:

1. Road travel trip matrices for 2012 (base year) were extracted from the Sydney Transport Model (STM);
2. The 2012 trip matrices were then modified using matrix estimation;
3. Trip matrices for future years were estimated using the base year matrices and "future year traffic growth assumptions sourced from the STM (that takes account of data like demographics and transport networks)" (Technical Paper 1, Appendix A, page 2, dot point 4);
4. Induced trips were added to the project case trip matrices using travel time elasticity;
5. Matrices were assigned to the road network using the toll choice model to separate trips into various categories of vehicle class and toll/non-toll use using the toll road choice assignment model.

There are several areas of concern with this approach which are noted below:

- Base and future population and employment data was based on a September 2014 release by the Bureau of Transport Statistics, but the base year for matrix estimation is 2012. This inconsistency is not identified anywhere in text.
- Description of the development of the WRTM project model repeatedly makes reference to driver behaviour (see Appendix A, page 2) which is not a valid representation of the model – they represent statistical characteristics of a transport network, not driver behaviour.
- Reference to the 'WestConnex Scheme Study Area" is unclear as it is not defined anywhere in the *Updated Strategic Business Case*
- The reason for not using STM matrices more fully is not explained and not obtaining forecast matrices for 2021 and 2031 is questionable. STM matrices would have accounted for induced trips more adequately (negating the need to use elasticity-based calculations), and
- The absence of a 2041 or 2046 model year is concerning.

The treatment of induced demand is questionable. Infrastructure Australia highlighted that the original WestConnex Business Case had failed to account for induced demand. The *Updated Strategic Business Case* documents (Section 10.5 and Section 5.3.1 of the Technical Paper) state that induced trips make up only 0.4 per cent of the total WRTM network. However, this statement is not correct. The Auditor-General review of the initial WestConnex Business Case in fact noted that the road would generated significant additional traffic particular where congestion already exists in peak periods and further growth is expected.

Using '0.4 per cent of the total WRTM network' downplays the overall number of induced trips generated by WestConnex, as total network trips pertain to Sydney as a whole, rather than the study area specifically.

Examining Screenlines provided in Appendix A shows that induced trips make up nearly 80 per cent of traffic crossing Screenline 2 (morning peak), and 53 to 65 per cent of traffic crossing Screenlines 2 and 3 in terms of daily traffic volumes. 94 to 125 per cent of heavy vehicle traffic (daily) crossing Screenlines 2 and 3 are induced trips. These forecasts are concerning, as they suggest a very high level of new trips will be induced by WestConnex. Complicating this analysis is a lack of evidence of the source of the increased volumes and unclear presentation of charts.

In contrast, daily volumes crossing Screenline 8 (which includes the M5 East) are forecast to reduce total volumes by 5 per cent and heavy vehicle volumes by 22 per cent. As a result, the M5 East and new M5 motorways together will lose around 25,000 vehicles per day but this counterintuitive result is not explained. Projected volumes on surface roads do not increase substantially and do not account for the reduction in vehicles across the Screenline. This suggests that the M5 East motorways will have reduced traffic as a result of Stages 1 and 2 of WestConnex and Sydney Gateway, raising the question of whether the new M5 is in fact needed.

Many of the presented results are inconsistent. Counterintuitive results are presented for changes in average speed and vehicle capacity (V/C) ratios resulting from WestConnex (Table 5.4 of Technical Paper 1). These results may be caused by complex speed-flow calculations, but are not explained. They include:

- At Screenline 1, the M4 Motorway v/c ratio drops from 1.1 to 0.9 but the average travel speed increases to 82km/hour. At Screenline 8, the v/c ratio for the existing M5 East falls by a larger margin from 1.1 to 0.7, but average speed on the road increase to only 51km/hour, despite the two roads being reasonably similar
- At Screenline 1, Parramatta Road has a relatively low v/c ratio of 0.5 increasing to 0.6, but the average speed of travel in both cases is less than 10 km/hour, even though the road is well under capacity. By comparison, at Screenline 6, Iron Cove Bridge is well above capacity at v/c = 1.4 to 1.3, with speeds of less than 10km/hour
- At Screenline 7, the v/c ratio on Fairford Road/Joseph Street, it appears that the introduction of WestConnex will double travel speeds, from 24 to 50km/hour without any decrease in the v/c ratio, which would remain at 1.0.
- Similarly, the travel speed on Southern Cross Drive is forecast to increase substantially from 40 to 68 km/hour without any change in the v/c ratio.

Traffic forecasts are not adequately tested. Appendix A of Technical Paper 1 notes the complexity of traffic forecast modelling. However, all results in the *Updated Strategic Business Case* are presented as absolute numbers rather than in ranges. The sensitivity of the modelling should have been tested against reasonable variations to input parameters to provide credibility to the estimates.

Impact of tolls is not fully explored. The toll regime that is used in traffic forecasts is not fully explained. Some description in Section 9 of the *Updated Strategic Business Case* is provided, but it is not clear whether:

- toll capping will apply to WestConnex only
- the tolling regime for Western Harbour Tunnel will include tolling in both direction – given that demand for northbound and southbound travel will vary due to the presence of alternatives.

4.3 The renewal of Parramatta Road

The renewal of Parramatta Road is identified in the *Updated Strategic Business Case* (Section 2.6). However, the description of renewal efforts appears to support WestConnex as being an 'enabling' project for Parramatta Road's renewal – this is not supported by data. The WestConnex M4 Widening

Environmental Impact Statement (EIS) showed that under WestConnex, Parramatta Road will take more traffic in the future, not less (M4 Widening EIS, Appendix D, p. 144).

The EIS also found that tolls on the newly widened M4 would result in a 35 per cent increase in the number of weekday vehicles. When tolls were removed on the M4 in 2010, traffic on Parramatta Road fell by 24 per cent in the morning peak. If tolls are reinstated on the M4, it is reasonable to assume traffic will avoid the tolled M4 and use the free Parramatta Road.

Average weekday traffic volumes on Parramatta Road will increase under WestConnex for five of the 14 sections (refer to Figures 5-5, 5-6 and 5-11 of the *Updated Strategic Business Case).* Daily traffic, morning peak traffic and daily truck volumes are all projected to increase under WestConnex east of Glebe Point Road. The impact of these increases and more broadly, changes in traffic movements across Sydney, are not analysed in conjunction with urban renewal proposals. For example, it is not understood whether development potential of the Bays Precinct and Green Square will be hampered due to WestConnex. The link between WestConnex and how it may affect future supply of employment lands and housing is critically absent.

It is recognised that the *Updated Strategic Business Case* notes the *Urban Amenity Improvement Program* will be funded as part of WestConnex, delivering a $200 million package to improving the corridor (page 174) along its key growth precincts (see Figure 7.2 on page 173 of the *Updated Strategic Business Case*). However, the details of these improvements is not provided.

4.4 The impact on public transport patronage is low

Analysis of mode shift from public transport to roads as a result of WestConnex was undertaken for 2026. It showed that in total, around 3,500 trips would be converted from public transport to roads per day.

The following table lists changes in the number of public transport trips under a base case (no project) and a WestConnex scenario in 2026. Only LGAs with a change in public transport trips under WestConnex are shown. This table demonstrates that overall, WestConnex will not have a significant impact on public transport patronage. The Leichhardt LGA will see a small increase (2 per cent) in daily public transport trips as increased local congestion and the introduction of tolls see 800 trips a day move from road to public transport.

TABLE 3. DAILY TRIPS PUBLIC TRANSPORT – BASE CASE AND WITH WESTCONNEX, 2026

LGA - Origin	Base Case	WestConnex	Change in PT trips	% change
Leichhardt (A)	40,500	41,300	800	2.0%
Botany Bay (C)	37,800	38,300	500	1.3%
Waverley (A)	52,500	52,800	300	0.6%
Hunter's Hill (A)	6,300	6,500	200	3.2%
North Sydney (A)	103,700	103,900	200	0.2%
Warringah (A)	55,400	55,600	200	0.4%
Bankstown (C)	74,300	74,400	100	0.1%
Baulkham Hills (A)	73,900	74,000	100	0.1%
Hornsby (A)	75,100	75,200	100	0.1%
Lane Cove (A)	21,700	21,800	100	0.5%
Maitland (C)	13,200	13,300	100	0.8%
Marrickville (A)	63,000	63,100	100	0.2%
Mosman (A)	17,300	17,400	100	0.6%
Ryde (C)	71,100	71,200	100	0.1%
Willoughby (C)	79,000	79,100	100	0.1%
Woollahra (A)	45,600	45,700	100	0.2%
Blacktown (C)	119,200	119,100	-100	-0.1%
Burwood (A)	37,200	37,100	-100	-0.3%
Camden (A)	20,700	20,600	-100	-0.5%
Campbelltown (C)	49,000	48,900	-100	-0.2%
Canada Bay (A)	38,800	38,700	-100	-0.3%
Kogarah (A)	28,900	28,800	-100	-0.3%
Parramatta (C)	134,500	134,400	-100	-0.1%
Wollondilly (A)	4,100	4,000	-100	-2.4%
Ashfield (A)	27,500	27,300	-200	-0.7%
Hurstville (C)	51,500	51,300	-200	-0.4%
Penrith (C)	63,600	63,400	-200	-0.3%
Sutherland Shire (A)	67,000	66,800	-200	-0.3%
Auburn (A)	44,600	44,300	-300	-0.7%
Fairfield (C)	62,300	62,000	-300	-0.5%
Holroyd (C)	32,700	32,400	-300	-0.9%
Liverpool (C)	63,100	62,800	-300	-0.5%
Strathfield (A)	23,400	23,100	-300	-1.3%
Sydney (C)	853,600	850,000	-3600	-0.4%
Total	3,070,500	3,067,000	-3500	-0.1%

The logic behind these shifts in mode share is that the public transport network is CBD oriented, and that WestConnex does not get close enough to the city to provide an alternative to public transport. The smaller change at a CBD level appear to demonstrate that WestConnex only provides an alternative to local roads east of Stage 3, while its impact disappears west of Stage 3. Appendix A of this report provides further detail on the Zenith model which was used to develop these forecasts.

5 CONCLUSION

The construction of a major set of toll roads as proposed by WestConnex does not align with the needs of Sydney during the 21st Century. Other global cities have recognised that congestion cannot be solved by simply building more roads and in turn, these cities have focused on public transport and demand management to deal with congestion.

The WestConnex *Updated Strategic Business Case* should describe the need for the project, build the case that the project is the best solution for Sydney, measure the project's benefits and identify project costs. However, the *Updated Strategic Business Case* fails to address many of the key requirements of a business case. The purpose of WestConnex and who will benefit from the project remains unclear.

Aspects of the *Updated Strategic Business Case* which are of most concern are:

- The *Updated Strategic Business Case* does not consider any strategic alternatives to WestConnex.
- The description of the transport modelling applied to the WestConnex project is opaque and confusing and the toll regime that is used in traffic forecasts is not fully explained.
- Once the Western Harbour Tunnel and Northern Beaches Link are in operation, the *Updated Strategic Business Case* suggests that WestConnex will be close to capacity by 2031. If wholly completed by 2021, this would result in $16.8 billion being spent for around ten years of marginally improved travel times.
- Establishing a motorway through The Bays Precinct appears counterintuitive to the aims of the urban renewal project to create.
- The costs of WestConnex are high and are likely to be even higher.
- The traffic modelling has a range of issues which are concerning for a project of this scale. These include the treatment of induced demand and its impact on the project benefits, a lack of sensitivity testing and the lack of modelling for more distant future year (e.g.2046).
- The benefit cost ratio of 1.71 does not add up based on information provided in the document. Dividing the present value of benefits against the present value of costs results in a benefit cost ratio of 1.64. This difference is too large to be the result of a rounding error.
- If travel time savings of less than five minutes is excluded, the travel time benefits are reduced from $12.9 billion to $5.9 billion – reducing the BCR from the recalculated 1.64 to 1.12.
- The rationale for the large proportion of business trips is unclear. 33 per cent of travel time benefits are attributed to cars – privately registered for business use. However, justification on why there are so many business car users is not provided in the *Updated Strategic Business Case.*
- Land acquisition costs or the opportunity cost of land being used for the project do not appear to be included in the WestConnex project costs or in the broader cost benefit analysis.
- The health impacts, local amenity impacts and related land use implications are not discussed by the *Updated Strategic Business Case.*

APPENDIX A

About the Zenith Model

The Zenith Model is a transport model that is based on employment and population projections compiled by the Bureau of Statistics and Analysis at Transport for New South Wales. First established in 1988, the Zenith model is a mature travel demand model that is often applied to major projects across Australia, including:

- Cross-City Tunnel (provision of expert services in legal proceedings),
- M5 Motorway (for a toll road operator),
- Lane Cove Tunnel (forecasting demand post opening for ABN Amro),
- Sydney Metro (as part of submission to Infrastructure Australia).

Other major projects include:

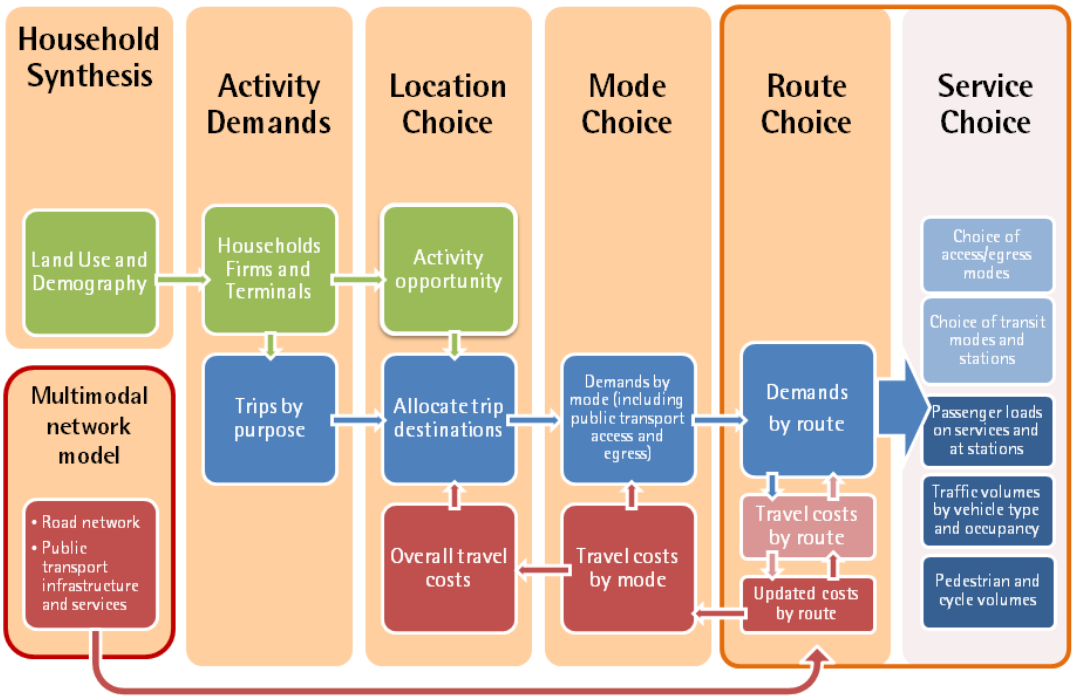
- East West Link Toll Road (for Victorian Government),
- Melbourne Metro Project (for submission to Infrastructure Australia),
- CityLink Toll Road (for Victorian Government),
- EastLink Toll Road (for Victorian Government).

The following subsection provides an overview of Zenith. More information can be obtained from: http://www.veitchlister.com.au/zenith/overview.

How the Zenith Model works

Zenith attempts to replicate demand for travel by residents and visitors in the Sydney region, which is derived from the demand for participation in activities. Travel choices can vary based on frequency, timing and duration of participation, location of activity, mode of travel and the route that is chosen. Zenith simulates travel behaviour of households, businesses and visitors using statistics such as employment by industry, enrolments at education facilities and demographic variables such as population and number of households. The overall process of the Zenith model is shown in the following figure.

FIGURE 6 KEY STAGES OF THE ZENITH MODELS



Source: Veitch Lister Consulting

Each region is divided into several thousand travel zones to enable a high degree of resolution of forecast movements between locations. It simulates travel considering:

- When the travel is made
- Why it is made (purpose)
- Where the travel is made to and
- The mode of travel that is used.

Travel demand forecasting is not a precise science and outside factors tend to complicate outcomes. For example, changes in government policy and fuel costs can affect travel decisions.

Zenith is based on an integrated multimodal transport network. Thus frequencies and schedule of public transport services and the speed or capacity available for certain vehicles may be defined separately for each period. Buses or goods vehicles may travel on the same section of road as cars, but with different average speeds and, where separate right-of-way is provided, can be assigned separate capacities. Walking and cycling is also possible on links which do not preclude access. In general, rail infrastructure and specific public transport right-of-way is only available to public transport services.

Services may be defined by operator, line group, or any other characteristic of interest in the model. Travel times for public transport services may be derived from the speed attributed to the underlying infrastructure or by definition of timetables, and can be subject to delays due to congestion or crowding. The current version of the Zenith model defines service times from the average operating speed on each link.

With that said, whilst strategic travel models are useful tools to forecast vehicle and people movements across the transport network through freeways, arterial and sub-arterial roads and major public transport infrastructure, traffic volumes forecast on collectors, local roads and access streets, should be treated with caution. Traffic volumes on local roads heavily depend on the adopted zone system and where centroids are connected to the network. Until transport modelling is able to simulate each household and business individually, forecast volumes on these lower order roads should be treated with caution.

Further technical detail is available in the *WestConnex Transport Modelling Summary Report*[2].

[2] http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0011/232697/150427_COUNCIL_ITEM35_ATTACHMENTA.PDF

REFERENCES

AECOM Australia Pty Ltd and GHD Pty Ltd (2015) *WestConnex M4 East Environmental Impact Assessment*. Prepared for WestConnex Delivery Authority. September 2015.

Cervero, Robert (2006) 'Freeway Deconstruction and Urban Regeneration in the United States. Proceedings from International Symposium for the first Anniversary of the Cheonggyecheon Restoration. 1 October 2006. Seoul.

Dirks, Susanne, Gurdgiev, Constantin and Keeling, Mary (2010) *Smarter Cities for Smarter Growth: How Cities Can Optimize Their Systems for the Talent-Based Economy*. IBM Institute for Business Value.

Kang, Chang Deok and Cervero, Robert (2009) 'From Elevated Freeway to Urban Greenway: Land Value Impacts of the CGC Project in Seoul, Korea', *Urban Studies*, 46(13), 2771-2794

KPMG (2015) *WestConnex Full Scheme: Economic Appraisal*

Lavanchy, Rene (2014) 'Congestion-beaters or roads to hell: is there still a place for urban motorways?', *The Guardian*, 8 July 2014, viewed 25 January 2016 <
http://www.theguardian.com/cities/2014/jul/08/congestion-roads-hell-urban-motorways>

Medibank (2008) *The Cost of Physical Inactivity.* Available online:
http://www.medibank.com.au/client/documents/pdfs/the_cost_of_physical_inactivity_08.pdf

Napolitan, Francesca and Zegras, P. Christopher (2008) 'Shifting Urban Priorities? Removal of Inner City Freeways in the United States', *Transportation Research Record: Journal of the Transportation Research Board*, 2046, 68-75.

Newman, Peter (2014) 'Peter Newman and the Bays Precinct: five principles emerge from summit', *The Fifth Estate*, 21 November, viewed 25 January 2016 http://www.thefifthestate.com.au/spinifex/bays-precinct-five-principles-emerge-from-summit/69895

Newman, Peter, Kenworthy, Jeffery, Glazebrook, Garry (2013) 'Peak Car Use and the Rise of Global Rail: Why This Is Happening and What It Means for Large and Small Cities', *Journal of Transportation Technologies*, 3(4), 272-287.

NSW Government (2009) *Sydney Metro West Metro Feasibility Study: Station Location Assessment - Zone 3.* March 2009.

NSW Government (2009) *West Metro Preliminary Environmental Assessment*. August 2009.

NSW Government (2015) *WestConnex Updated Strategic Business Case.* November 2015.

New South Wales Auditor-General (2014) *WestConnex: Assurance to the Government.* Available via:
https://www.audit.nsw.gov.au/ArticleDocuments/351/01_Westconnex_Full_Report.pdf.aspx?Embed=Y

New South Wales Treasury (2008) *Guidelines for Capital Business Cases* tpp 08-5. December 2008. Available via: http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0015/23820/TC12-19_Submission_of_Business_Cases_dnd.pdf

New South Wales Treasury (2012) *Treasury Circular NSW TC12/19 11 October 2012 'Submission of Business Cases'.* Available via: http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0015/23820/TC12-19_Submission_of_Business_Cases_dnd.pdf

T.R. Lakshmanan, T. R., (2011) 'The broader economic consequences of transport infrastructure investments', *Journal of Transport Geography*, 19(1), 1-12.

The Committee for Sydney (2015a) *#wethecity 2 From Possibilities to Practice: Sydney Issues Paper No. 10 – Volume 1*. November 2015

The Committee for Sydney (2015a) *Big City Analytics: Identifying Sydney's economic, employment and population Centres of Gravity*. April 2015.

Transport for New South Wales (2013) *Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives.* March 2013. Available via: http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/tfnsw-principles-and-guidelines-for-economic-appraisal-of-transport-initiatives.pdf

UrbanGrowth NSW (2015) *Transformation Plan: The Bays Precinct Sydney*. October 2015.

Yu, Nannan, de Roo, Gert, de Jong, Martin, and Storm, Servaas (2015) 'Does the expansion of a motorway network lead to economic agglomeration? Evidence from China', *Transport Policy*, 45, 218-227.

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