


An aerial photograph of a city, likely Auckland, New Zealand, showing a major highway (Great South Road) cutting through residential areas. The highway has multiple lanes and is surrounded by houses, trees, and some commercial buildings. In the background, a city skyline is visible under a clear sky.

TECHNICAL REPORT 10

CONSTRUCTION TRAFFIC IMPACT SUPPLEMENTARY ASSESSMENT

GREAT SOUTH ROAD INTERSECTION

DECEMBER 2016

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Revision schedule					
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Executive Summary

This supplementary assessment to Technical Report 10 – Construction Traffic Impact Assessment has been prepared to assess the impact on traffic of construction of a revised intersection at the East West Link / Great South Road / Sylvia Park intersection. The intersection is proposed to be grade separated. The revised intersection affects Sectors 3 and 4; for simplicity Section 8 – Sector 3 of Technical Report 10 is replaced by this supplementary assessment and changes are noted to Section 9 – Sector 4.

The methodology adopted in assessing the impact of construction of the intersection is consistent with the original methodology described in Technical Report 10.

The grade separation of the Great South Road intersection increases the complexity of temporary traffic management at the intersection to enable the construction of bridge piers. It is envisaged that a number of stages will be required that will require adjustments to the alignment of traffic lanes along Great South Road. The works require the footprint of the intersection to be enlarged which enables the existing number of lanes to be retained during normal operation.

For some operations (such as placement of bridge beams or tie-in of new construction works) limited lane closures or occasional complete closure of the north and southbound movements of Great South Road may be required. Where this occurs, these would be managed so that closures are carried out at quiet traffic times such as overnight and would be well publicised.

To construct bridge piers on the western and eastern side of the Sylvia Park Road intersection temporary pedestrian crossing points will be required; pedestrian routes will require diversion around the intersection utilising the temporary crossings. Pedestrian facilities at the intersection will be maintained.

It is expected that the effects of the temporary intersection arrangements with additional pedestrian crossings will be minor and can be managed. More detailed traffic impact assessment will be undertaken once full construction methodology is known.

For Sector 4, greater working space is achieved as the east and westbound carriageways are located slightly further to the north and south respectively. As a result the effects due to construction on traffic remain unchanged as a result of the revised intersection.

The possible mitigation measures for Sector 3 are summarised below and are the same as those summarised in Technical Report 10 except items 4 and new item 8:

1. Measures to mitigate the effects on the Waikaraka cycleway are outlined in Section 7.3 of Technical Report 10;
2. Consider restrictions to work site access points at Great South Road / Sylvia Park Road intersection on movements allowed and times of access and egress so as to not adversely affect the road network;
3. Early engagement with AT and ATOC to discuss amended intersection arrangements and phasing at the Great South Road / Sylvia Park Road intersection;
4. Alternative provision for pedestrians to provide safe routes through or around the intersection due to closure of footpaths or crossing facilities. Early engagement with AT and ATOC will be required to discuss the provision of an additional signalised pedestrian crossing on the northern arm of the Great South Road / Sylvia Park Road intersection to divert pedestrians;
5. Planning of works and assessment of the operation of the intersection need to consider measures that reduce the impact on buses along Great South Road and through the Sylvia Park Road intersection;
6. Early engagement with property owners and / or tenants should be undertaken where property access is affected;
7. Advanced notice of changes to parking should be provided to motorists and businesses so that motorists may be able to make alternative arrangements; and

8. Provide advanced notice and publicity of any closures at the Great South Road / Sylvia Park Road intersection using Variable Message Signs (VMS), communication to the local community and advertising using appropriate media.

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1 Introduction

1.1 Purpose and scope of supplementary assessment

The purpose of this Technical Report 10 – Construction Traffic Impact Supplementary Assessment is to assess the construction traffic effects associated with the revised design of the East West Link (EWL)/Great South Road/Sylvia Park Road intersection.

The original Technical Report 10 – Construction Traffic Impact Assessment was completed in November 2016. Engagement with stakeholders and the wider community has continued in parallel, including design review in response to matters raised.

As a progression of the work to date, the design of the EWL/Great South Road/Sylvia Park Road intersection has been revised from the at grade design originally proposed, to a grade separated design. Grade separation of the east west through movements at this intersection will provide improved reliability and future resilience.

This supplementary assessment describes the potential and actual construction traffic effects associated with construction of the revised intersection design at Great South Road. The assessment considers whether the type or scale of effects on the existing environment have changed as a result of the revised design and where necessary recommends additional management and mitigation measures.

This supplementary assessment should be read in conjunction with Technical Report 10. Where this assessment supersedes and/or updates information in Technical Report 10, this has been expressly noted.

This supplementary assessment forms part of the suite of technical reports that inform the Assessment of Effects on the Environment (AEE) and supports the Notice of Requirement for a new designation, alteration to an existing designation, and resource consent applications for the Project.

1.2 Project description

The revised intersection design at Great South Road is described in Section 6 of the AEE. Key features of the revised intersection design include:

- Extending the Ann's Creek viaduct by about 330m over Great South Road. The viaduct would grade down to Sylvia Park Road, approximately 200m east of Great South Road.
- Altered through movements and connections to local roads at the intersection –
 - Through movements on EWL would occur on the elevated structure above Great South Road
 - Movements to and from EWL to Sylvia Park Road and Great South Road would be at grade providing connectivity to the local street network
 - North and south movements on Great South Road would remain unchanged, passing under the elevated EWL structure.
- A grade separated pedestrian and cycle crossing for east west movements on the southern side of the Anns Creek viaduct.
- Changes to the EWL/Hugo Johnston Drive intersection.
- Associated urban design and landscape treatments.

The revised intersection design is hereafter referred to in this supplementary assessment as “the revised intersection design at Great South Road”, or “the revised design”. The previously proposed layout (as assessed in Technical Report 10) is referred to as the “at grade intersection design at Great South Road”, or “the at grade design”.

2 Assessment Methodology and Existing Environment

2.1 Assessment Methodology

The approach to the assessment of the traffic effects due to the construction of the revised intersection at East West Link / Great South Road / Sylvia Park Road is consistent with the approach detailed in Technical Report 10 - Construction Traffic Impact Assessment.

2.2 Existing environment

The existing environment to be assessed is as outlined in Technical Report 10 - Construction Traffic Impact Assessment.

3 Assessment of Effects

The assessment of the revised intersection design at Great South Road / Sylvia Park Road has been assessed against the existing environment. The intersection is located within Sector 3 although there are minor amendments along Sylvia Park Road which are located within Sector 4. For ease of reference, Section 8 (Sector 3) of Technical Report 10 should be replaced with the Section 3.1 below. Where changes are noted within Sector 4 these are detailed in Section 3.3 of this report.

3.1 Sector 3 – Revised Assessment of Effects

This sector extends from Ports of Auckland to just east of the Great South Road / Sylvia Park Road intersection.

3.1.1 Preliminary Traffic Management Methodology

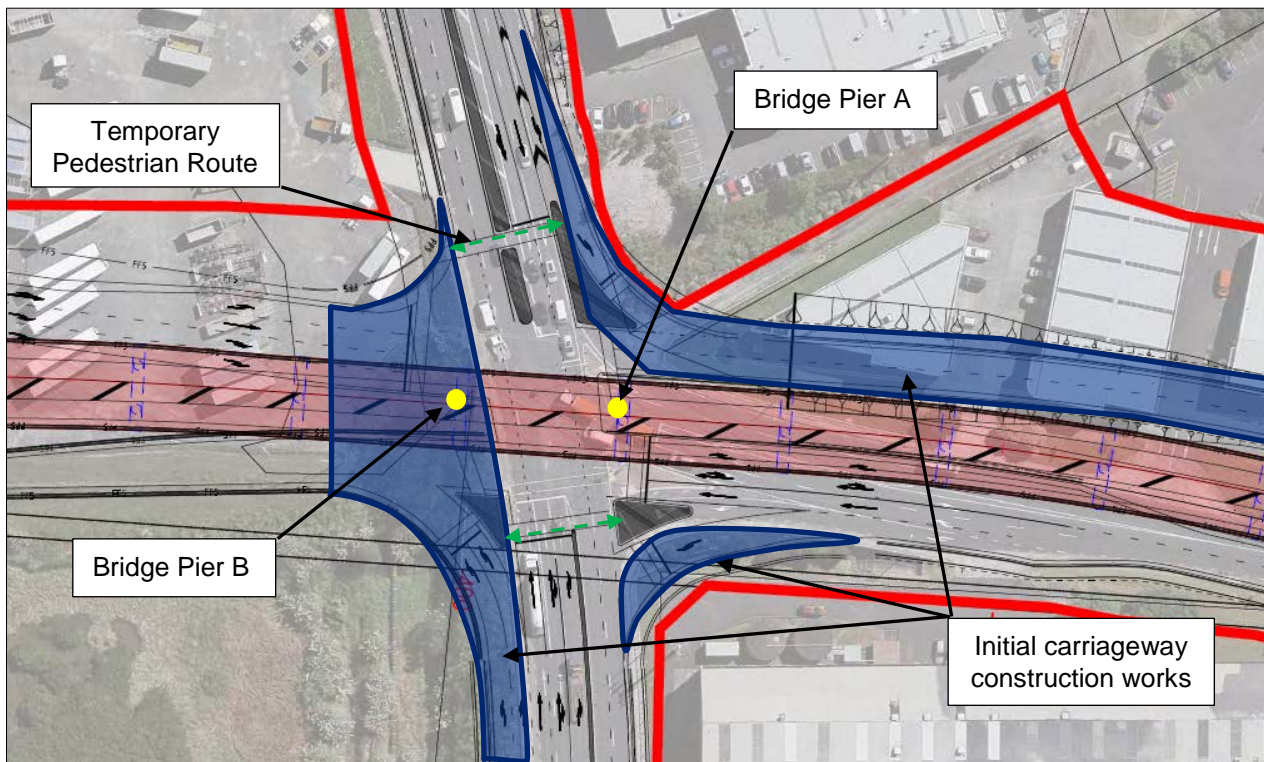
The majority of the construction activity for this sector is isolated away from the road traffic network and will have negligible traffic impact. The intersection of Great South Road and Sylvia Park Road will be the exception. This intersection is proposed to be grade separated and there is a pedestrian / cycle bridge to be constructed on the southern side of the intersection. As a result, the proposed intersection footprint increases compared to the existing intersection, much of which can be constructed offline. However, to construct bridge piers, changes to the alignment of Great South Road are required to provide safe working space together with amendments to pedestrian facilities at the intersection. In addition, lane widths may need to be narrowed and temporary speed limits applied for safety and to maximise the possible work area. As widening works at the intersection are completed, this provides flexibility to adjust lane locations to facilitate further pavement or utilities works.

Temporary intersection arrangements are typically coordinated with the Auckland Traffic Operations Centre (ATOC) and AT as the road controlling authority (RCA). No long term closures of intersection movements are anticipated although overnight closures of Great South Road at the intersection may be required for some operations. The anticipated traffic management methodology is outlined below:

- The initial phase of works will be to construct the new east and westbound carriageways on Sylvia Park Road and the at grade parts of the new fourth leg of the intersection, including widening on the western side of Great South Road as indicated by the blue areas in **Figure 3-1**. These works will be undertaken off-line although some narrowing of traffic lanes may be required to provide safe working space. Once these are constructed, traffic on Sylvia Park Road will be moved onto the new carriageways thereby providing space in the centre of Sylvia Park Road to construct bridge piers. A temporary signalised intersection will be required for this arrangement as the geometric layout will be elongated.
- To construct the eastern bridge pier (Bridge Pier A in **Figure 3-1**) adjacent to the intersection, it is anticipated that traffic will need to be deviated slightly to the west through the intersection. This would be achieved utilising the carriageway in the new fourth leg on the western side of the intersection. The current number of lanes through the intersection would be retained.

- To construct Bridge Pier A, the pedestrian crossings across Sylvia Park Road would need to be closed. Pedestrians would be diverted via the signalised crossing on the southern arm of the intersection, a temporary pedestrian footpath or route on the western side of the intersection and a new signalised crossing on the northern side of the intersection and vice versa. This northern crossing is likely to be the signalised crossing required for the final alignment but will be dependent on the final geometry of the intersection. The northern pedestrian crossing may only initially be utilised as a temporary measure for pedestrian diversion until the EWL is complete.
- Once Bridge Pier A is constructed, traffic would be diverted back to the east through the intersection to construct Bridge Pier B. As there is more room available to the west of Bridge Pier B for construction plant, sufficient work space can be achieved by narrowing the lanes through the intersection. Pedestrians utilising the western footpath would be diverted via the southern and northern pedestrian crossings and a route along the eastern side of the intersection.
- Following completion of Piers A and B it is expected that pedestrian routes would be available on both the west and eastern sides of the intersection and traffic would utilise the final lanes through the intersection.

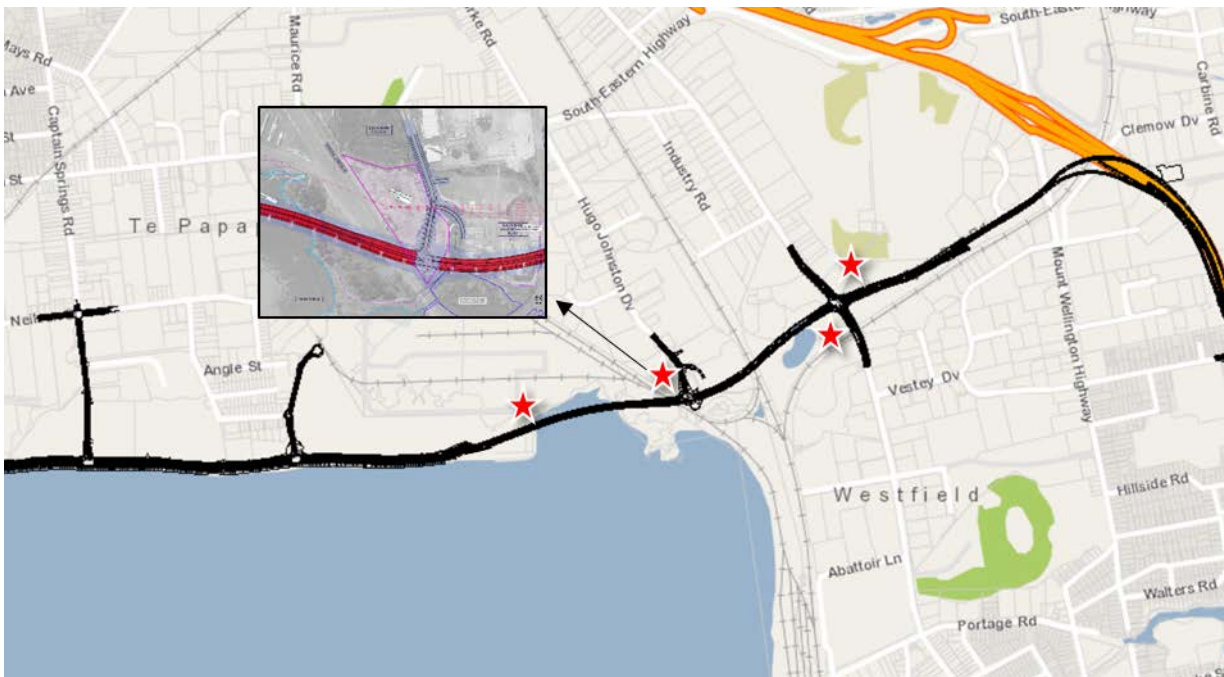
Figure 3-1 - Traffic Management Areas



There are four construction yards proposed for this sector which are illustrated in Figure 3-2 and these will be located as described below:

1. In the south east corner of the Ports of Auckland land by Anns Creek.
2. At the end of Hugo Johnston Drive and will be used for the majority of work that will take place at Anns Creek.
3. West of the intersection of Great South Road and Sylvia Park Road (where the fourth arm of the intersection is being constructed). Access restrictions may be applied to manage vehicle movements into and out of Great South Road.
4. North of Sylvia Park Road east of the Great South Road / Sylvia Park Road intersection. Access restrictions may be applied to manage vehicle movements into and out from this yard.

Figure 3-2: Location of Site Compound - Sector 3



3.2 Identification and Mitigation of Traffic Impacts

3.2.1 Impacts arising from site access locations and movements

The construction yard in the Ports of Auckland land will be used to construct the embankment and the structures across Anns Creek. Access will be gained via Miami Parade and along the embankment.

The construction yard at Hugo Johnston Drive will provide direct access to the construction activities for Sector 2 and 3. Access to the wider road network would be via Hugo Johnston Drive which is currently utilised by heavy vehicles servicing various industrial activities.

Access to the construction yard to the south west of the Great South Road / Sylvia Park Road intersection is anticipated to be gained from or near this intersection. This may include introducing an additional phase into the traffic signals to accommodate construction related vehicular movements or by setting up the access point off set from the intersection movements. This access may need to be managed to reduce the effect on the operation of this intersection, particularly at peak times of day.

The construction yard on Sylvia Park Road is accessed from Sylvia Park Road. The form of this access will be dependent on the construction staging of EWL in this location. Consideration of restricting turning movements to and from the yard should be given in the detailed planning phase for the safe operation of Sylvia Park Road.

Part of the construction of the alignment involves the creation of a bridge structure over the KiwiRail corridor. Therefore access to the KiwiRail corridor will be required to undertake construction of the overhead bridge structures. It is expected that access will be requested via the standard KiwiRail procedures. Early engagement with KiwiRail and AT will be required to ensure access to the rail corridor can be achieved, including any rail block of lines needed for the safe construction of the structures over the rail corridor. Due to the limited construction activity that will require rail block of lines, it is envisioned that these can be accommodated in coordination with other requirements on the rail network or otherwise outside of the peak periods for rail movements.

Access into Anns Creek will be required for construction of the bridge structure.

3.2.2 Impacts arising from construction of the Sylvia Park Road / Great South Road Intersection

For works at Sylvia Park and Great South Road intersection, it is expected that a number of temporary layouts will be required to build the outer portion of the intersection and the bridge piers as outlined in Section 3.1.1. With the availability of a larger footprint as a result of the final design, it is expected that the existing number of lanes and movements can be maintained for all temporary intersection layouts. The temporary layouts are likely to include narrowing lane widths and temporarily removing the free left turn slip lanes during off-peak periods and enabling the left turn movement through the signalised lanes.

The busiest movements that operate at this intersection are the north and south bound movements on Great South Road with volumes in the order of 1200 (AM peak) and 900 vph (PM peak) respectively. The total intersection volumes are in the order 2500 – 3000 vph (from SCATS data collected in March 2016). This is forecasted to increase to the order of 4000 plus vph in the permanent arrangement (four arm intersection) in the year 2026 with seven additional signalised pedestrian crossings.

The impact of the temporary changes in comparison to the existing operations are expected to be minor and can be managed upon confirming the construction methodology in conjunction with a more detailed traffic impact assessment at a later time. This assessment will be undertaken in accordance with procedures outlined in the Construction Traffic Management Plan Framework (CTMPF). It is noted that pedestrians will likely experience notable diversions when certain crossings are closed off. Any changes to the operation of this intersection would need to be discussed and agreed with AT and ATOC. Changes to the intersection may need to be undertaken in stages. To minimise the impact on the operation of the intersection some works may need to be undertaken over weekends or at nights so as to minimise the impact on the operation of the intersection.

Safety for all modes of transportation will need to be carefully incorporated into the traffic management staging as the required work spaces for significant construction elements like the bridge piers could, for example, affect sight distance to traffic signals and pedestrians.

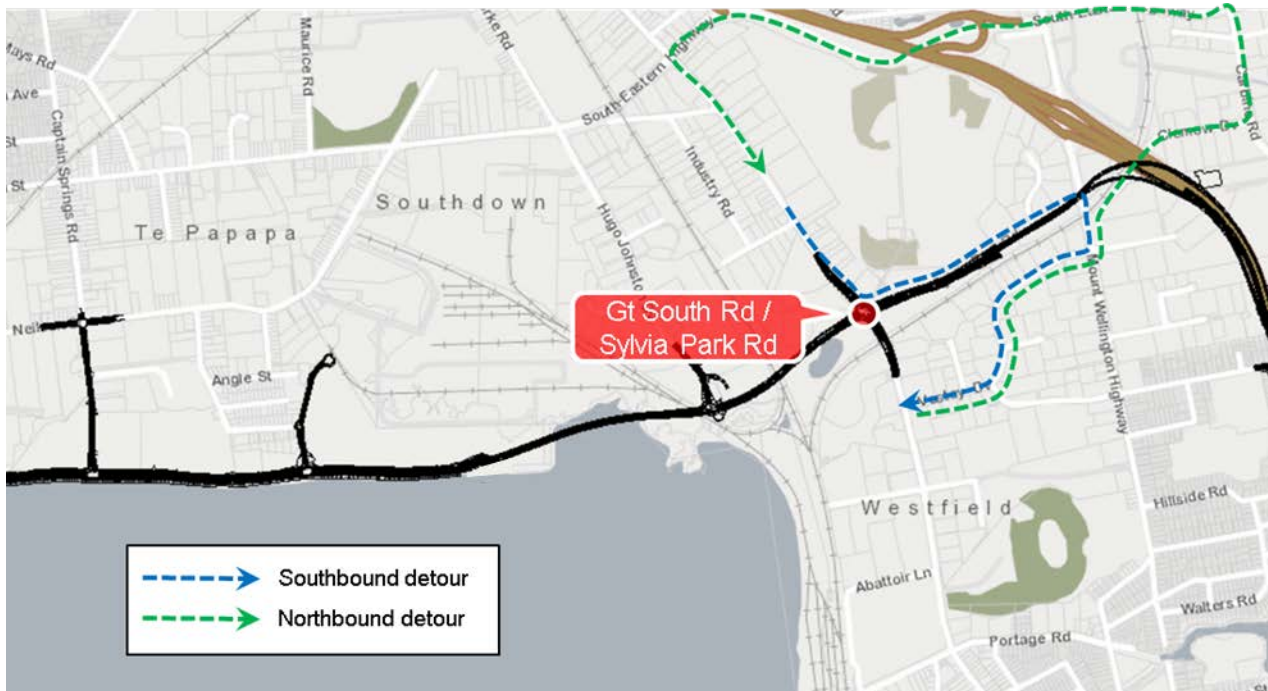
3.2.3 Impacts arising from temporary closures

It is expected that a number of night time lane closures will be required for construction of the intersection, particularly to tie into the existing carriageway. Closures are likely to be discrete and occur at night to minimise effects on traffic and access to properties. Details and staging of closures will be planned and managed by the appointed contractor in accordance with the processes and guidelines set out in the CTMPF.

For placement of bridge beams over Great South Road full closure of the Great South Road / Sylvia Park Road intersection may be required. Such closures should be minimised through the use of a gantry rather than the use of a crane. If the intersection is closed it is envisaged that the left turn movements from and to Sylvia Park Road would be retained. Therefore, only the north and southbound movements along Great South Road would be affected. The following routes are anticipated to be used for diverted traffic:

1. For southbound traffic on Great South Road, traffic is likely to be routed via Sylvia Park Road, Mount Wellington Highway and Vesty Drive.
2. For northbound Great South Road traffic, traffic is likely to be routed via Vesty Drive, Clemow Drive, Carbine Road and South Eastern Highway.

Figure 3-3 Proposed detours for north and south bound movements on Great South Road for Intersection closure at Sylvia Park Road



The northbound diversion is more substantial and therefore sufficient notice and publicity should be provided to enable motorists to choose alternative routes.

A designated over-height and over-dimension route runs along the northern arm of Great South Road and along Sylvia Park Road. During the detail design and development of Site Specific Traffic Management Plans, collaboration will be required with Auckland Transport and the Heavy Haulage Association to either maintain the existing route or provide an alternative route during occasional closures.

Site Specific Traffic Management Plans (SSTMP) will be prepared for the individual closures which will identify appropriate times for closures to occur depending on traffic flows. The procedures for developing the SSTMPs is outlined further in the CTMPF.

3.2.4 Impacts on rail services and public transport

The EWL alignment crosses over freight rail lines servicing MetroPort and passenger lines on NIMT and NAL rail line at Great South Road (refer to **Figure 3-4**).

Figure 3-4 Proposed alignment over rail lines



Works across the rail lines can only be undertaken when the lines are not operating. Block of lines may need to be in place whilst works occur. This may require weekend closures of the rail lines and introduction of rail replacement bus services for passenger trains. Where works are across the freight line, this will affect the movement of goods to and from MetroPort. Due to the limited construction activity that require this, it is anticipated that these works can take place at the same time as other requirements for rail block of lines or be planned in advance for periods of time where it does not affect key rail operation requirements. In any case, early engagement with KiwiRail, MetroPort and AT will be required to agreed methods of working and to plan closures well in advance of the works with the least amount of disruption.

With regards to bus services, there are bus routes that use Great South Road, including Frequent Services (Route 32). These services will be affected by proposed works along Great South Road and at the Great South Road intersection with Sylvia Park Road. In planning works at this intersection, the impact on buses need to be considered and if necessary, measures such as bus lanes introduced to protect buses from increased delays.

3.2.5 Impacts on pedestrians and cyclists

Waikaraka cycleway may need to be closed during the construction of the Sector 3 alignment. The impacts associated with this closure are likely to be similar to those discussed in Section 7.2.3 of Technical Report 10. It is expected that during the construction of Sector 3, only the shared path sections that are affected within Sector 3 will be closed. It is envisaged that cyclists would share the footpath with pedestrians over these sections and continue to use the remaining portion of the cycleway. Appropriate signage would be required where pedestrians and cyclists are required to share.

The pedestrian footpath on the western side of Great South Road and the pedestrian crossings on the eastern side of the road at the Sylvia Park Road intersection will need to be temporarily closed at different times to enable the construction of the bridge piers adjacent to the intersection and the new western arm. These facilities would not be closed simultaneously. The final proposed layout includes a new signalised pedestrian facility on the northern side of the intersection and it is anticipated that this would be used to enable pedestrians to be re-routed in temporary arrangements.

Once the bridge piers have been constructed, a safe route for pedestrians along the western and eastern sides of the intersection will be provided.

3.2.6 Impacts on property access, parking and manoeuvring

The extension of the Hugo Johnston Drive cul-de-sac onto the EWL Main Alignment will affect access into private properties. Temporary access roads may be required for entry into the Southdown Co-Generation Plant. A number of on-street car parks will be removed on Hugo Johnston Drive south of Southpark Place as part of the construction of the road extension. Parking occupancy at the southern end of this street which is most affected by the proposed works is 40%. At the northern end of the street, occupancy is 73%. Therefore, it is considered that there is sufficient alternative parking on this street to accommodate displaced parking.

The Great South Road widening will impact access to private property. Therefore temporary access will be required to these properties. Adequate manoeuvring space will be required through the construction works particularly for truck movements.

A list of properties / roads that could be impacted are detailed below.

Southdown Co-Generation Plant – low impact

The construction of an embankment will be carried out in close proximity to the existing access road into the Southdown Co-Generation Plant. Property access into the Southdown Co-Generation Plant will be maintained.

Hugo Johnston Drive – low impact

Property access to properties along Hugo Johnston Drive will be maintained. The properties with two existing points of access into the property may experience full closure of one of the property access ways, if required, while the other access will be maintained. Property access will be maintained to those properties with only one point of access.

Sylvia Park Road/ Great South Road – low impact

- For properties at the Great South Road and Sylvia Park Road intersection that have more than one access driveway into the property, one access point may be closed, if required, while the other existing access(es) will be maintained. Property access will be maintained to those properties with only one point of access;
- It is likely that one of the existing two property accesses into 20 Sylvia Park Road will need to be closed with only one available at all times. All movements into and out of the property will need to be maintained. Right turn access into and out of the property may need to be closed for discrete periods from time to time during construction. The timing of such closures will be able to consider the operational requirements of the properties affected to minimise impact.

Stratex - low impact

Property access for Stratex will be maintained during road widening activities, however, entry and exit movements will be restricted to the westbound lanes only. This restriction on turning movements is proposed in the final EWL arrangement and has been discussed with the landowner.

3.3 Sector 4 – Amendments to Assessment of Effects

The Construction Traffic Impact assessment in this sector remains largely the same as that detailed in Section 9 of Technical Report 10. Accordingly, the indicative traffic management measures outlined in Section 9.1 of Technical Report 10 for this sector remain valid. However, the proposed grade separation of the Great South Road / Sylvia Park Road intersection results in the proposed new east and westbound carriageways being located slightly further to the north and south respectively which means that construction works will be easier to manage as there will generally be greater work space available.

4 Recommended Mitigation

Only minor changes are required to the recommended mitigation for Sector 3. Item 4 has been amended to reflect the revised design of the Great South Road intersection and a new item 8 has been added to require advance public notice of any closures of the Great South Road intersection. No further or new recommended mitigation measures are proposed for Sector 4.

Potential mitigation measures in Sector 3 detailed in Section 8.3 of Technical Report 10 are replicated below, including alterations in the items stated above to take into account the revised assessment of effects.

1. Measures to mitigate the effects on the Waikaraka cycleway are outlined in Section 7.3 of Technical Report 10;
2. If site access points are established at key locations such as the intersection of Great South Road and Sylvia Park Road, restrictions to work site access should be considered. These could include restricting movements permitted and times for access and egress so not to adversely affect the road network;
3. Early engagement will be required with AT and ATOC to discuss amended intersection arrangements and phasing at the Great South Road / Sylvia Park Road intersection. Staging of the amendments to the intersection may be required to minimise effects on the intersection including possible weekend or night works;
4. Alternative provision for pedestrians should be considered to provide safe routes through or around the intersection due to closure of footpaths or crossing facilities on the western and eastern sides of Great South Road. Early engagement with AT and ATOC will be required to discuss the provision of an additional signalised pedestrian crossing on the northern arm of the Great South Road / Sylvia Park Road intersection to divert pedestrians. This could be achieved through the timing of the permanent works which provides a signalised crossing at this location;

5. Planning of works and assessment of the operation of the intersection need to consider measures that reduce the impact on buses along Great South Road and through the Sylvia Park Road intersection. Discussions with AT Metro should be undertaken at an early stage to discuss the implications of works at the intersection;
6. Early engagement with property owners and / or tenants should be undertaken where property access is affected to discuss the effects of these works on these property owners and to agree access amendments, either as a temporary or permanent solution;
7. Parking at the southern end of Hugo Johnston Drive will be temporarily removed by the works. Whilst there appears to be sufficient capacity on the street for parking, advanced notice to motorists and businesses should be provided so that motorists may be able to make alternative arrangements, such as carpooling or using public transport; and
8. Provide advanced notice and publicity of any closures at the Great South Road / Sylvia Park Road intersection using Variable Message Signs (VMS), communication to the local community and advertising using appropriate media.

5 Conclusion

This supplementary assessment has assessed the traffic effects due to the construction of a revised intersection at Great South Road / Sylvia Park Road. This mostly affects Sector 3 although there are minor changes to the alignment of the new carriageway along Sylvia Park Road in Sector 4.

For Sector 3, the assessment has demonstrated that the revised intersection can be undertaken whilst retaining the existing number of traffic lanes at the intersection. Careful planning and staging of the works is required to enable new parts of the carriageway to be constructed for the final scheme which can be utilised to minimise effects of construction on traffic.

To enable pedestrian connections to be maintained during the construction of bridge piers at the intersection, temporary pedestrian crossing facilities are likely to be needed. A pedestrian crossing across the northern arm of Great South Road would be required; the signalised crossing in the final scheme could be used, subject to the final intersection design. As the same number of lanes and movements will be maintained, the effects of the additional crossing (which will be present in the final EWL design) is expected to be minor and can be managed upon confirmation of construction methodology and a more detailed traffic impact assessment once full construction details are known.

Discrete lane closures are likely to be required at the intersection to enable the tie-in of new construction works. However, these lane closures are anticipated to occur outside of the peak hours at night or weekends when traffic flows are lower.

Occasional closures of the Great South Road carriageway under the proposed East West Link Viaduct may be required to enable the placement of bridge beams. These closures would occur at night and be managed and well publicised to enable motorists to amend their journeys as appropriate.

For Sector 4, the revised intersection design results in the east and westbound carriageways being located further to the north and south. This results in greater working space for the construction of the new carriageways. The assessment of effects due to construction on traffic remains unchanged by the proposed amendments to the intersection.