

RESPONSE DOCUMENT

RIVERLEA MAJOR DEVELOPMENT

Precinct 3A Subdivision

APPLICATION TO AMEND THE EIS

RIVERLEA, RIVERLEA PARK

JULY 2026

PREPARED BY WALKER PASTORAL PTY LTD
9 BONNIN CRESCENT, RIVERLEA PARK SA 5120

We acknowledge the Traditional Owners of the many lands we live and work on. We respect First Nations Elders, past and present, and thank them for their continued care of their country, culture, and community.

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Abbreviations

TERM	MEANING
AEIS	Amended Environmental Impact Statement
AEP	Annual Exceedance Probability
AHA	<i>Aboriginal Heritage Act 1988</i>
AI	Infrastructure Agreement
CHAR	Cultural Heritage Assessment Report
CEMP	Construction and Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CoH	Commissioner of Highways
The Council	City of Playford
DEW	Department for Environment and Water
DIT	Department of Infrastructure and Transport
DHUD	Department for Housing and Urban Development
EPA	Environment Protection Authority
ETA	Empirical Traffic Advisory
GARP	Greater Adelaide Regional Plan
GPT	Gross Pollutant Trap
LMA	Land Management Agreement
LSA Act	<i>Landscape South Australia Act 2019</i>
The Minister	Minister for Planning
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NVA	<i>Native Vegetation Act 1991</i>
NVB	Native Vegetation Branch
NVC	Native Vegetation Council
NVR	<i>Native Vegetation Regulations 2017</i>
Pentelic	Pentelic Advisory
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
SMP	Stormwater Management Plan
TIA	Traffic Impact Assessment
Walker	Walker Pastoral Pty Ltd
WGA	Walter Gilbert Aztec Pty Ltd
WSUD	Water Sensitive Urban Design

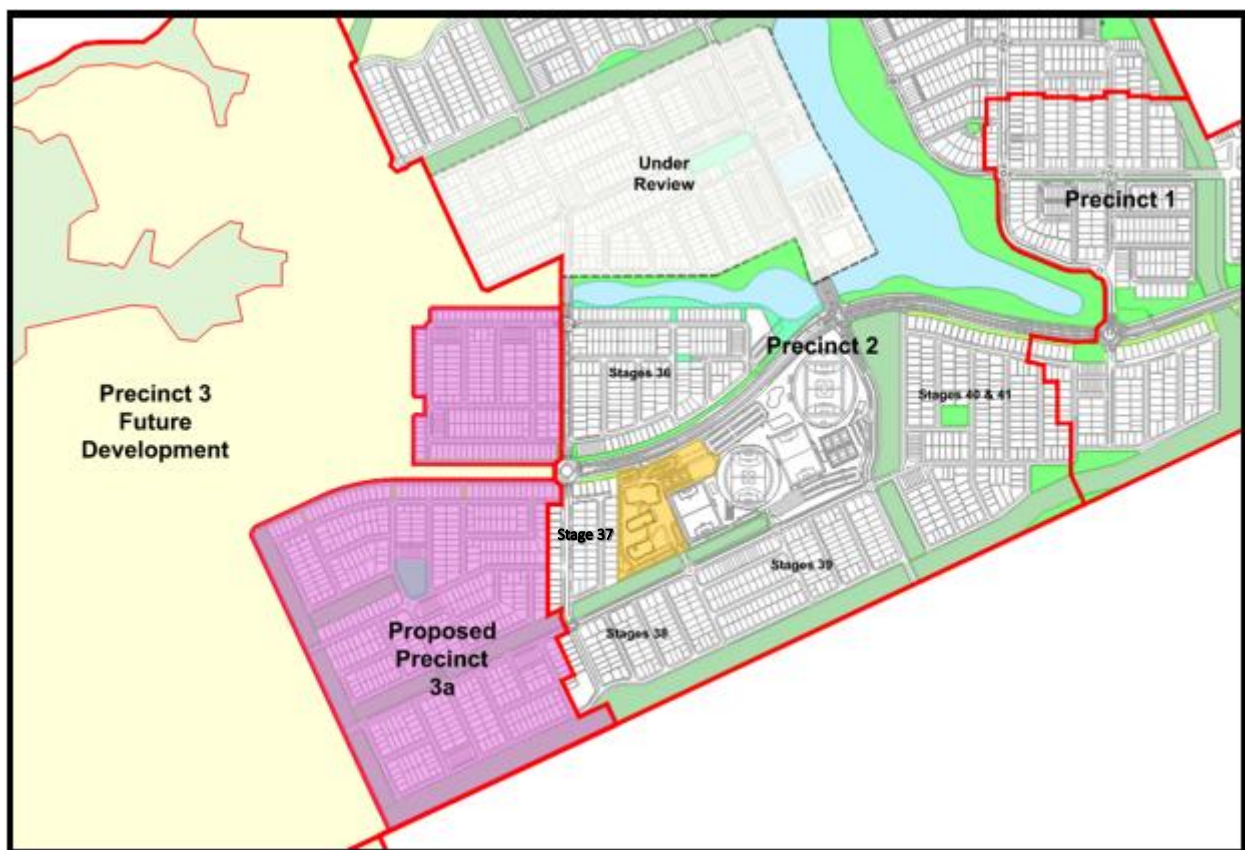
Executive Summary

This Response Document (the Document) responds to the submissions received during notification of the Precinct 3A amended Environmental Impact Statement (AEIS) for the Riverlea major development (the Riverlea development) at Riverlea Park.

The Precinct 3A AEIS relates to a small area of approximately 50 hectares extracted from the larger Precinct 3 area to create a logical extension of Precinct 2. The smaller development area (aptly named Precinct 3A) progressed ahead of the larger Precinct 3 area, as it is relatively small and has limited planning issues, forming a contiguous and expected progression of Stages 36, 37, and 38 in Precinct 2 of the Riverlea development.

The Precinct 3A subdivision masterplan can realise an additional 737 allotments (incorporating 141 Affordable Housing properties). Accordingly, for the timely and logical expansion of Riverlea, Walker Pastoral Pty Ltd (Walker) seeks to undertake a two-step AEIS process to commence a smaller Precinct 3A - AEIS immediately and intends for a Precinct 3B – AEIS process to follow in 2027.

The Precinct 3A AEIS underwent public notification from 16 December 2025 to 14 January 2026. Walker received no submissions during the notification process. Referral of the AEIS to relevant State agencies and the Council also commenced on 16 December 2025 and continued until late February 2026, when the last submission was received.



This Document itemises "**What We Heard**" during the AEIS formal referral process, the submissions received from State Government agencies and the Council, and details the issue(s) raised and Walker's response.

Several "**Key Issues**" emerged that required a more detailed response regarding vegetation management. Walker provides a more detailed response to the issues raised, mostly surrounding native vegetation, including the actions it is or will undertake to address the substance of the topic(s).

Walker also highlights “*changes made to the proposal*” since the completion of the notification and referral processes, mainly due to refinements of the proposal plans.

The Document also summarises various “*Secondary Approval*” processes (mandated by other legislation), such as authorisations following the *Aboriginal Heritage Act 1988* and vegetation clearance approvals following the *Native Vegetation Act 1991 (NVA)*, among others. Walker must comply with other approval processes regardless of the AEIS.

However, there are instances where processes and authorities extend beyond the Precinct 3A area or planning processes (e.g., for external stormwater management measures). The “*Statement of Commitments*” details Walker's assurances to undertake these secondary approval processes and other actions (as necessary) to reaffirm Walker's awareness of the affiliated processes.

The expansion of Riverlea will support the implementation of the State Government's strategic housing objectives by shortening the delivery of much-needed housing and encouraging the continued growth of northern Adelaide with a focus on the north-western spine. The continued expansion of Riverlea aligns with several State Government priorities by bringing additional housing supply online to the Outer North with targeted infrastructure commitments.

Given the limited planning issues and lead time to undertake a Precinct 3A AEIS process, and the current demands for housing, allowing Walker to commence the Precinct 3A subdivision expeditiously will enable the expansion of Riverlea and assist in delivering the State Government's ambitious housing agenda.

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1. Background

The Buckland Park Township development (now known as Riverlea) was approved by the Governor of South Australia on 4 February 2010 under the *Development Act 1993* (having previously undergone an Environmental Impact Statement (EIS) level of assessment).

Riverlea is a master-planned community that will deliver up to 12,000 residential properties, supported by open spaces, schools, retail and commercial activity centres, and public transport. Riverlea is estimated to reach approximately 33,000 residents once complete.

Two Riverlea Precincts are currently approved, and construction commenced in 2021. Precincts 1 and 2 comprise approximately 830 and 2750 residential allotments, respectively. The Precinct 2 Master Plan is undergoing various improvements, including numerous apartment buildings, potentially increasing the dwelling yield to 3,936 allotments/dwellings.

Walker Pastoral Pty Ltd (Walker) lodged a request with the Minister for Planning (the Minister) to amend the latest authorisation to accommodate the Precinct 3A subdivision. The Environmental Impact Statement (AEIS) seeks to vary the current authorisation by incorporating the Precinct 3A subdivision within Riverlea Park and updating the approved subdivision Masterplan accordingly.

The updated subdivision comprises six additional subdivision stages (comprising a total of 737 residential allotments). Each stage will accommodate a diverse range of allotment types, dimensions, and sizes with associated civil and earthworks, and open drainage channels.

The subdivision is considered to have relatively limited planning issues and will form a contiguous and expected progression of Stages 36, 37 and 38 of the Riverlea development. Precinct 3A maximises and builds upon the existing planned road network and stormwater management systems.

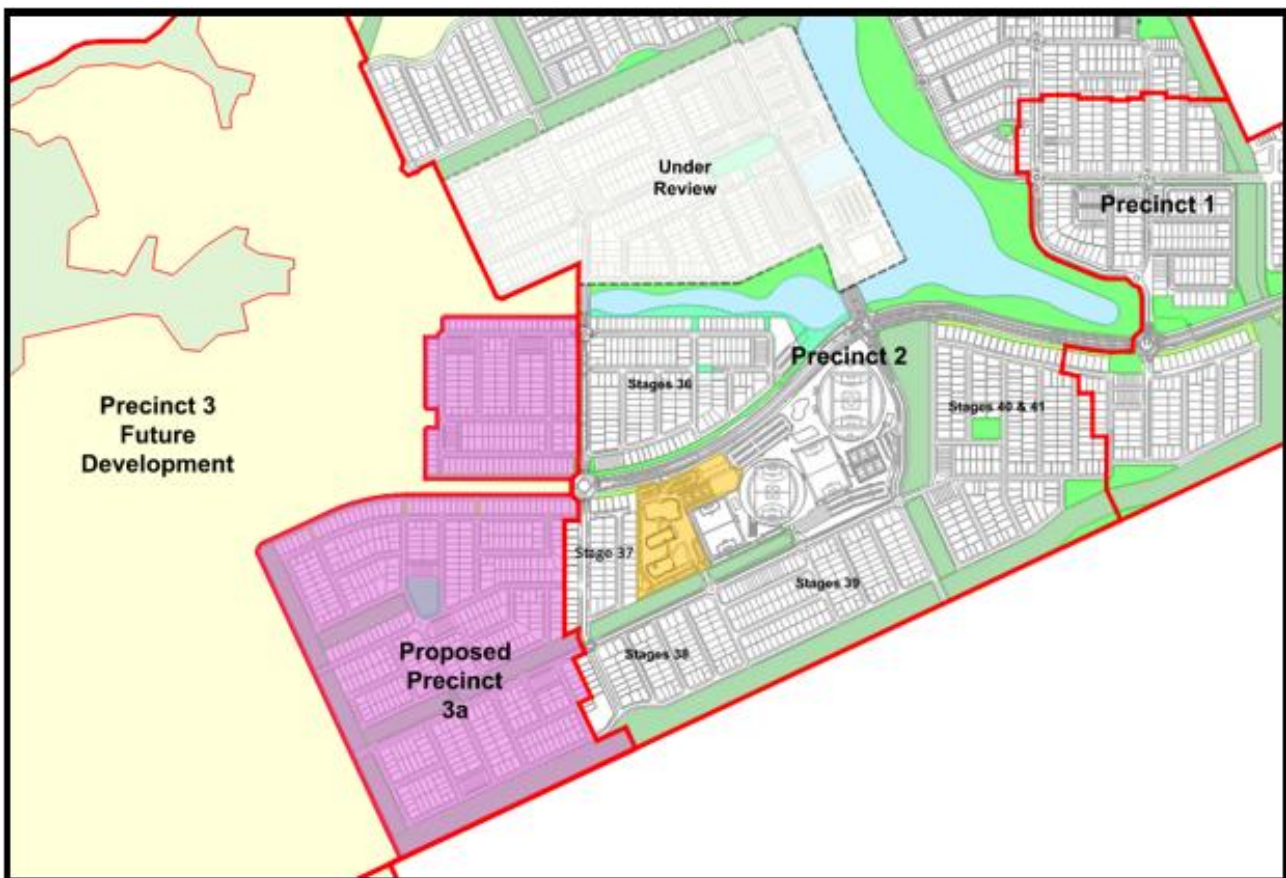


Figure 1 – Precinct 3A and its relationship to Stages 36, 37 & 38 in Precinct 2

The Precinct 3A subdivision will be connected and integrated with the broader road network, near planned schools, a proposed emerging activity centre, vegetated open drainage channels, various open space areas and community facilities established within Precincts 1-2.

Walker submitted the Precinct 3A AEIS in October 2025, and the application underwent public consultation from 16 December 2025 until 14 January 2026. No submissions were received.

The Precinct 3A AEIS was also referred to selected State government agencies and the Council from 16 December 2025, with the last submissions received in late February 2026. A submission from each of the following agencies was received:

- Aboriginal Affairs and Reconciliation, Attorney-General's Department (AAR)
- Affordable Housing and Market Solutions, Department for Housing and Urban Development (DHUD)
- The City of Playford (the Council)
- The Environment Protection Authority (EPA)
- The Native Vegetation Council (NVC)
- Department for Environment and Water (DEW)
- Department for Infrastructure and Transport (DIT)

This Response Document (the Document) itemises "**What We Heard**" during the AEIS referral process from each State Government agency and the Council, and briefly details the issue(s) raised and Walker's response to them (**Section 2 – What We Heard**).

Any "**Key Issues**" that emerged from the submissions that Walker considers require a more detailed explanation or response, including the actions it is, has or will undertake to address the substance of the topic(s), follow in the subsequent section (**Section 3 – Key Issues**).

This Document then details **Section 4 – Changes made to the proposal** as a result of subdivision refinements, and explains the consequences of those changes.

The Document also summarises various "**Secondary Approval**" processes (mandated by other legislation), such as authorisations following the *Aboriginal Heritage Act 1988* (AHA) and native vegetation clearance approvals following the *Native Vegetation Act 1991* (NVA), among others. Walker must comply with other approval processes regardless of the AEIS outcome.

However, there are instances where processes and authorities extend beyond the Precinct 3A area or planning processes (e.g., for external stormwater management measures). The "**Statement of Commitments**" details Walker's assurances to undertake these secondary approval processes and other actions (as necessary) to reaffirm Walker's awareness of the affiliated processes.

As previously stated, Precinct 2 is undergoing alterations that are increasing dwelling yields. The documentation and assessment, particularly regarding traffic and stormwater management, have factored in the effects of these refinements on the overall Riverlea development (including Precinct 3A). **Figure 2 – Current Development Status** highlights the Precinct 3A area in relation to the Precincts 1 and 2 and details the current construction status of the Riverlea development.

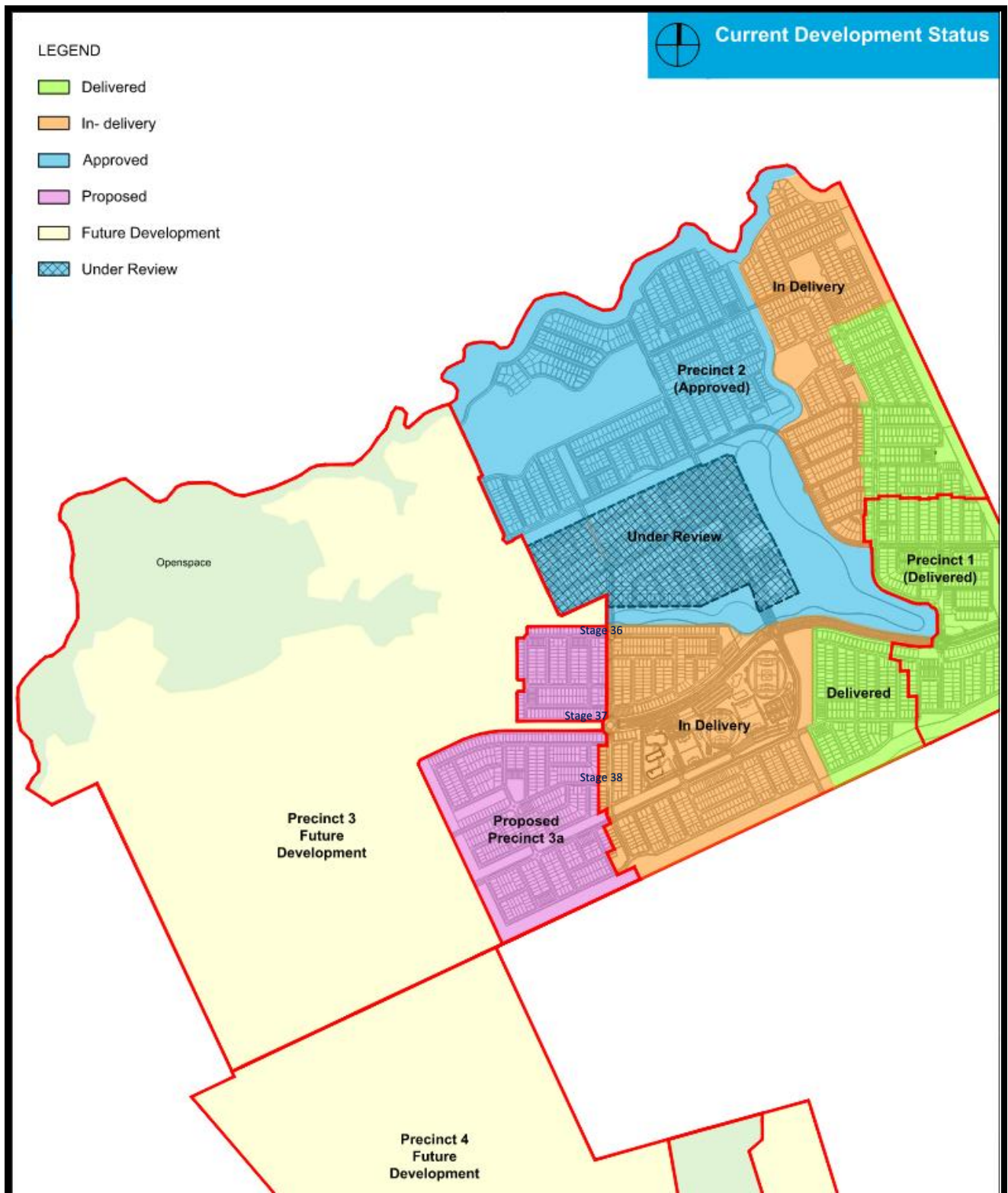


Figure 2 – Riverlea - Current Development Status (including proposed Precinct 3A)

2. What We Heard

The Department for Housing and Urban Development (DHUD) referred the Precinct 3A AEIS to selected State government agencies and the Council for comment. A summary of submissions from each agency and Walker's response follows.

2.1 Aboriginal Affairs and Reconciliation, Attorney-General's Department

The Aboriginal Affairs and Reconciliation (AAR) noted the Executive Summary in the AEIS application stated that 'Walker has commenced the application process to facilitate further project works, including the construction of the necessary stormwater channels. AAR noted 'that the application for authorisations is to facilitate the construction of the stormwater channels only'.

Walker and AAR later determined that Walker has two applications with the Minister. One is for authorisations over the remaining areas of Precincts 3 & 4 (for areas not already granted authorisations by the Minister). The other, more pressing application for Walker, is to facilitate the construction of the stormwater channels only.

AAR also noted the Precinct 3A AEIS summarised Cultural Heritage management, applications for Ministerial authorisations, and the connections between authorisations, conditions, and the Cultural Heritage Management Plans (CHMP).

However, AAR considers it important also to note changes to the Aboriginal Heritage Act 1989 (AHA), which came into effect on 1 January 2025, including the notification of Aboriginal heritage discoveries under section 20A. Section 20A of the AHA requires the reporting of discoveries to the Minister for Aboriginal Affairs, including while working under an authorisation under section 21 and/or section 23 of the AHA. There are also significantly higher penalties under that section for damaging, disturbing, or interfering with Aboriginal Heritage without authorisation.

The Riverlea major development area retains high cultural heritage sensitivity, and section 20A establishes that the Minister's authorisations do not reduce the cultural sensitivity of land containing Aboriginal heritage under the AHA. While it is prohibited to excavate and damage, disturb, or interfere with Aboriginal Heritage without authorisation, authorisations can allow impacts to Aboriginal heritage within the authorised areas, subject to the strict conditions of the authorisation.

Nonetheless, it remains best practice to avoid and/or limit impacts to Aboriginal heritage, where possible, within the authorised areas, with excavation and damage, disturbance, or interference occurring in circumstances where it cannot be avoided, subject to the conditions of an authorisation.

Walker Response: While Walker acknowledges the advice above, there were no suggested changes to the Precinct 3A subdivision proposal as a result of AAR's submission. Walker will continue to work closely with AAR to undertake the necessary processes to seek the required authorisations for the remaining Riverlea project area.

2.2 Affordable Housing and Market Solutions, Department for Housing and Urban Development

Affordable Housing and Market Solutions, Department for Housing and Urban Development (DHUD) determined that the delivery of appropriate affordable housing was secured by the following:

- *Walker and DHUD have executed Affordable Housing Land Management Agreements (LMA) between Walker Pastoral Pty Ltd and the Minister for Planning, requiring the delivery of 15 per cent affordable housing on the relevant land.*

- Walker and the Affordable Housing and Market Solutions team have agreed on an Affordable Housing Plan to deliver 15 per cent affordable housing across the Riverlea development. The Affordable Housing Plan has been updated and expanded to include precinct 3A.

Accordingly, the ongoing delivery and management of affordable housing at Riverlea will be through the Land Management Agreements and the Riverlea Affordable Housing Plan, in collaboration between Walker and Affordable Housing and Market Solutions.

While the Affordable Housing and Market Solutions directed that there be no conditions on the Precinct 3A AEIS application, they reserved the right to impose conditions or enter into land management agreements on any future development applications.

Walker Response: Walker concurs with the Affordable Housing and Market Solutions submission and will continue to collaborate with them as Riverlea evolves.

2.3 The Environment Protection Authority

The Environment Protection Authority (EPA) reviewed the Riverlea Precinct 3A Subdivision AEIS to ensure that it identifies and considers all environmental issues within the scope of the objects of the Environment Protection Act 1993 and relevant State Planning Policies.

The EPA noted the WGA - Precincts 1, 2, and 3A Interim and Ultimate Development - Stormwater Management Plan (SMP) (3 October 2025) report, which addresses stormwater management for Precincts 1, 2, and 3A before construction of the saltwater lakes and considers longer-term options.

The SMP considers water quantity and flooding, includes modelling to assess flooding issues, MUSIC modelling of the proposed water sensitive urban design (WSUD) elements, and climate change projections. The EPA provided its support to this report.

While construction of the final main stormwater channel will be to the outfall channel adjacent to Thompsons Creek, it will, in the short term, accommodate storage provisions within the development to reduce flows to the existing Thompsons Creek. No stormwater will discharge into the Gawler River.

The proposed WSUD features include vegetated swales and ephemeral wetland pools (shallow, densely vegetated basins) that will cater for a 20 mm rain event. Stormwater from stages that interface with the saltwater lakes will flow to gross pollutant traps and Atlan Flow filter cartridge systems before being discharged to the lakes. The EPA acknowledged that confirmation of the exact stormwater management devices will be at the detailed design stage, when Walker will optimise the number of GPTs

The EPA suggests that the SMP consider including the maintenance requirements for all proposed WSUD features. The EPA also recommends amending the Soil and Erosion Management Plan to refer to the IECA guidelines (International Erosion Control Association (Australasia) 2008, Best Practice Erosion and Sediment Control), rather than the Codes of Practice for Building Sites.

Walker Response: Walker welcomes the EPA's comments and will make the necessary change in the next reiteration of the Stormwater Management Plan (SMP) and Soil and Erosion Management Plan.

2.4 The City of Playford

The Council reviewed the Riverlea Precinct 3A Subdivision AEIS and provided comments on engineering, landscaping, traffic and planning matters. Many of the issues raised by the Council relate to technical matters, with a substantial number subject to detailed engineering design as individual stages seek engineering approvals and refinement of the technical documentation for Council approval.

2.4.1 Engineering Matters

2.4.1.1 Stormwater and Flood Management

The Council referred to a priority list of stormwater infrastructure and emphasised the importance of delivering Channel 1 as a priority to facilitate the continued development of Riverlea, including Precinct 3A.

The Council raised an issue with the SMP, identifying that the interim arrangements lack the necessary trigger point(s) and delivery timing tied to the development's progress. Since Precinct 2 AEIS was approved, the delay in extending the drainage channels (Channel 1) was due to cultural heritage constraints.

The Council mentioned WGA's recent Technical memo (Nov 2025) and how it does not address the Council's requirement to draw down the backed-up channel's water within 3 days for a 1% Annual Exceedance Probability (AEP) major storm event, and that WGA is still reviewing the drawdown period for a 10% AEP storm event based on rainfall probability.

Walker Response: Walter Gilbert Aztec Pty Ltd (WGA), a professional consulting engineering firm, assisted Walker in addressing many of the stormwater management issues raised by the Council on the Precinct 3A AEIS.

Authorisation and implementation of the channel construction works will ensure the free-flowing gravity system reaches the ultimate legal point of discharge (the Thompson's Outfall channel) and alleviate the Council's concerns. WGA notes that as future development occurs, updates to the Interim Modelling scenarios and outcomes will be required.

The WGA response to the Council submission is in [Appendix A](#).

Walker has submitted the required documentation to AAR seeking authorisation from the Minister for Aboriginal Affairs to undertake the channel construction works. AAR is aware of the urgency of these works and is progressing the application as a priority. Consultation on Walker's application commenced in February 2026 and concluded in April 2026.

Walker is forecasting the drainage channel construction to commence in late 2026, subject to the Minister for Aboriginal Affairs granting authorisation. Walker will finalise the scheduling for the commencement of channel construction, pending the Minister's decision.

The Council also requested further clarification on the trigger point for the provision of an interim detention basin, if this is the case. Walker indicated that the lower stretches of the future drainage channel (beyond Carmelo Road) will have initial retention before construction of the interim detention basin.

Walker Response: Walker previously communicated to Council that Walker was exploring delivering Channel 01 across two phases to assist with cash flow. These phases included:

1. Phase 1 – to initially extend the channel south of Carmelo Road and retain water, and
2. Phase 2 – to ultimately extend the channel south and provide a gravity connection to the Thompson Creek Outfall channel.

Walker has since reconsidered the above approach and will now proceed to extend Channel 01 to its ultimate alignment by providing the gravity connection to the Thompson Creek Outfall channel.

The excavation aspect of the proposal is with AAR for cultural heritage assessment and consideration by the Minister of Aboriginal Affairs and Reconciliation. Should Ministerial Approval be obtained, it will allow Walker to commence excavation of Channel 01, thereby providing the ultimate gravity connection, enabling the stormwater channel to be free-draining.

Note that the delivery of the basin is not part of the above Channel 01 extension; rather, Walker will monitor the channel's performance and tailwater levels to give Walker's consultants time to develop a defined wetlands concept for the Council's review and approval.

As further subdivisions are approved and delivered, Walker agrees to work collaboratively with the Council and undertake further flood modelling to determine when the interim/ultimate basin is required.

The channel will only detain water in larger storm events (refer to Figure 3 to illustrate the extent of Channel 01 to be excavated).



Figure 3 – Proposed delivery extent for Channel 01 ultimate (excl. interim basin)

Council would require Walker to enter into an Infrastructure Agreement for the delivery of each associated channel, to ensure Walker completes the works before issuing S138 clearance for a specific staging trigger point or lot yield.

The trigger points need to be considered and reviewed holistically at this assessment stage and agreed for an Infrastructure Agreement, rather than reserving the matter to an individual stage detailed design review.

Walker Response: Walker agrees to work collaboratively with the Council and to consider entering into an Infrastructure Agreement (IA), cognisant that there has been no IA on the channels to date. Walker will require a review of the terms surrounding an AI and the initial drafting instructions for Walker's consideration before agreeing to be a party to an AI.

2.4.1.2 Stormwater Quality Management

The Council states that the SMP shows the permanent channels to be 'planted out' to treat stormwater runoff discharging into Gulf St Vincent, but noted the drainage channel landscaping generally lags behind other planting schemes to meet the community's needs. The Council sought clarification on the implementation of interim measure(s) to meet EPA's Water Quality minimum pollutant reduction targets before establishing the channels' planting.

Walker Response: WGA develops Interim Channel Sediment and Erosion Management plans for channel construction to achieve suitable water-quality improvements during the interim period before planting. The interim measures include the use of the following types of treatments in the channel system:

- Mulch buffer strips at the top of channel slopes.
- Sediment traps upstream of the inline culvert structures.
- Sandbag check dams every 200m or so along the channel low-flow.
- Hydro-mulching of the exposed channel faces to encourage interim vegetation growth until fully planted-out channels occur.

2.4.1.3 Sedimentation Basin

The Council requested a permanent sedimentation basin at Channel 1 downstream of Channel 5 to serve Precincts 1, 2, and 3A and facilitate easier maintenance of the drainage channels.

Walker Response: Walker (on the expert advice of WGA) believes that a sedimentation basin at the Council-suggested location is too close to houses and would impact the amenity in that area.

Walker considers a preferred position for the proposed detention basin to be at the southern end of the site. The proposed basin would be a combined wetland/detention basin similar to Greenfields Wetlands in the City of Salisbury, as it would have almost identical operating levels and groundwater interactions.

WGA further recommend incorporating a sedimentation basin into the design upstream of the point where the channel's low flows would discharge into the wetland.

2.4.1.4 Removal of Channel 8

The Council's preference is to remove drainage channel 8, if possible.

Walker Response: Walker reiterates that this section of channel is the most feasible solution for effectively managing stormwater and mitigating flood risk for this catchment within the Precinct 3A subdivision. WGA further elaborates, explaining that Channel 8 reduces the impacts of importing fill in this area.

WGA explain that the closer a road network is to an open-channel drainage system, the lower the site levels in the immediate area can be. Due to the length of Riverlea Boulevard and its distance from adjoining channels, fill levels in this Precinct are significant, and the introduction of Channel 8 at the western end allows lower levels in this location.

Accordingly, removing this section of the channel is not feasible, as Walker relies on the site won material to raise site levels and mitigate the risk of flooding. Importing the required fill is very costly and impractical when a more cost-effective solution is possible. Without Channel 8, the volume of fill increases by 77,800 m³.

2.4.1.5 Typical Cross Section of Channels 5 & 6

The Council requested that Walker demonstrate space proofing for all paths, existing retained trees, channels, slope batter, SWL intake and outfall, etc.

Walker Response: A typical cross-section of Channel 5 (shown in Figure 4 and in Appendix A) demonstrate space proofing for all paths, the retention of existing trees, the channel's slope batter, and the proposed intake & outfall pipework for the saltwater lakes.

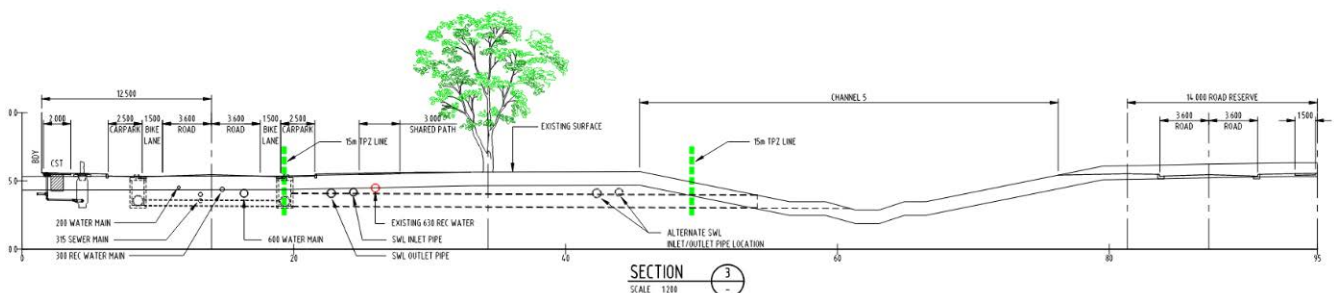


Figure 4 - Channel 5 - Typical cross sections

The Council requested that Walker demonstrate space proofing for a shared-use path (northern side), maintenance path, channel's slope batter, indented parking bays, street tree planting, etc.

Walker Response: A typical cross-section of Channel 6 (shown in Figure 5 and Appendix A) is between road corridors on either side, with adjacent lots on one side and the road on the opposite side.

The typical cross-sections demonstrate space proofing for the shared-use path, maintenance path, channel slope batter, indented parking bays, and street tree planting along the southern side of Macquarie Drive.

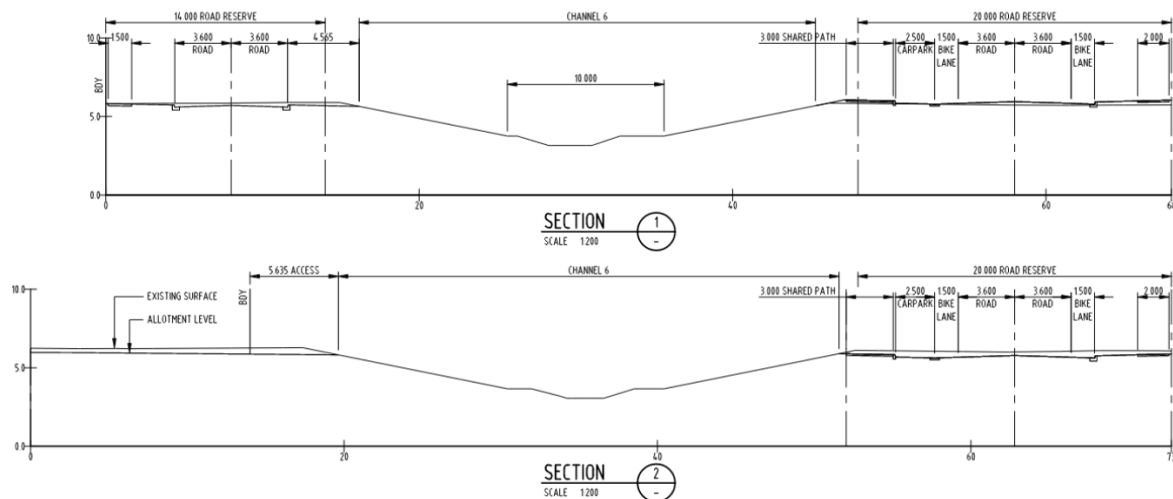


Figure 5 - Channel 6 - Typical cross sections

2.4.1.6 Collector Road – Macquarie Drive

The Council noted the relocation of the row dwellings (formerly located fronting Macquarie Drive) to the south side of that subdivision block. The Council suggested retaining the row dwellings fronting Macquarie Drive to reduce driveway crossovers /traffic conflict points on the collector road.

Walker Response: This arrangement, as previously referred to the Council, resulted from the implementation of a roundabout at that intersection associated with the north-south connector road between Stages 43 and 44. Reinstating the row dwellings would result in a loss of dwelling outcomes due to the widened intersection.

In addition, there are minimal driveway crossovers/traffic conflict points on Macquarie Drive (an additional two to three as a result of relocating the row dwellings to the south), which will comply with relevant standards. Hence, this aspect of the proposal remains unchanged.

2.4.1.7 Indented Parking Bays along Collector Road

The Council requested a review of the pedestrian crossing points and indented parking bays, as the current parking arrangement does not appear to consider potential pedestrian crossing points.

Walker Response: The detailed engineering design will specify the required pedestrian crossing points at the indented parking bays on the north side of Macquarie Drive.

2.4.1.8 Murdoch Street

The Council noted that Murdoch Street is 16m wide (the width of a local road), and required confirmation that it would not function as a collector/distributor road based on future road connectivity.

Walker Response: Murdoch Street, shown as 16m wide (being the width of a local road), is proposed as a local street and will not function as a collector/distributor road based on future road connectivity.

Empirical Traffic Advisory (ETA) notes in [Appendix B](#), Murdoch Street is to remain a local street, providing access to Stages 35, 44 and 45, and Precinct 3A (as proposed), with no road connectivity to Riverlea Boulevard to the west of these stages in the short term. Once Precinct 3 is developed, there will be additional access to Riverlea Boulevard for Precinct 3A and Stages 44 and 45 (and others), reducing traffic volumes on the eastern section of Murdoch Street.

Notwithstanding the above, Walker, at the request of the Council, increased the width of Murdoch Street to 18.5m.

2.4.1.9 Roundabouts at Lots 34015/34213 (Stage 34) and Lots 43002/43017 (Stage 43)

The Council requested that Walker review the footpath and refuge crossings at the roundabout locations to ensure adequate clearance distance.

Walker Response: Walker will review the locations of all roundabouts to ensure adequate provision of footpaths and refuge crossings with sufficient clearance during the detailed engineering design.

2.4.2 Landscaping Matters

The Council raised an issue concerning the number of swales to be vested in it, given the ongoing maintenance obligations and additional asset costs to the Council. Conversely, the Council had an issue with the proposed open space area, which is less than 10% of the desired minimum of 5,000 square metres.

Walker Response: Walker considers it more relevant to determine the actual type and level of amenities for the reserve. Nonetheless, Walker increased the reserve's size as much as was reasonably practical, given its central location within the development and to accommodate the Council's Urban Design Guidelines.

2.4.2.1 Cross-section of Macquarie Drive

The Council requested a detailed cross-section for Macquarie Drive.

Walker Response: A typical cross-section of Macquarie Drive, including the swale and street tree provision to improve amenity and to support Council's tree canopy targets, is shown in Figure 6.

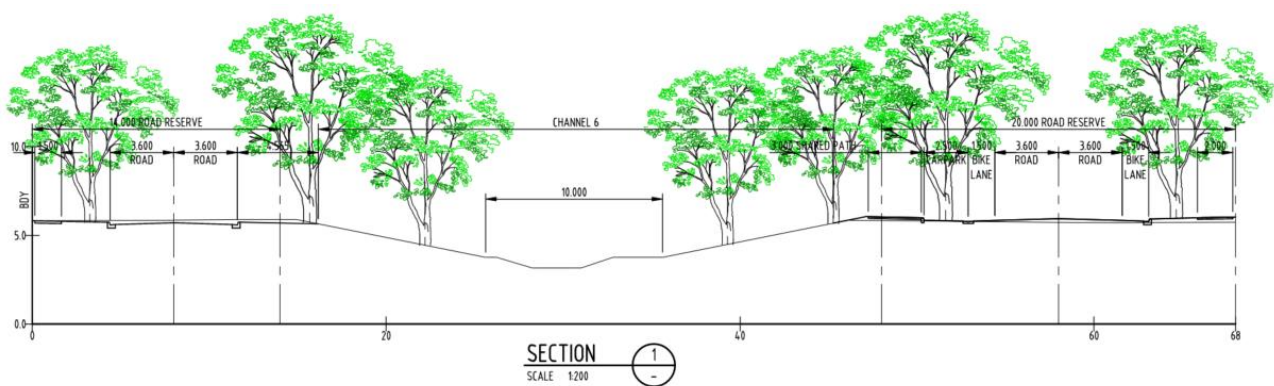


Figure 6 - Macquarie Drive - Typical cross sections

2.4.3 Traffic Matters

The Council requested that Walker address the following matters.

- *Provide concept plans for all proposed roundabout treatments. RAB is to include pedestrian refuges on all approaches. Adequate clearance is required from the RAB to driveways and on-street parking bays such that sight distances are not compromised.*

Walker Response: Walker notes the Council's comments. The detailed engineering design will include pedestrian refuges on all approaches. The designs will ensure adequate clearance between roundabouts, driveways, and on-street parking bays, so that sight distances are not compromised.

- *Sight distance assessments shall confirm that SISD, ASD and SSD are achieved for all movements.*

Walker Response: Walker notes the Council's comments. The detailed engineering design will ensure that sight-distance assessments for SISD, ASD, and SSD for all movements are satisfied.

- *Confirm if access to Stage 35 requires any auxiliary turn treatments (to be assessed in accordance with AGTM Part 6), considering forecast traffic volumes, turning demands, and road function.*

Walker Response: ETA notes that, in accordance with AGTM Part 6, once there is a single turning movement, a basic turn treatment is required. As discussed earlier, Murdoch Street is to remain within typical residential traffic volumes based on future road network development to the west. Hence, a right turn treatment on Monash Avenue is not considered necessary. Further, the peak flows associated with school traffic will not coincide with the PM peak period on Murdoch Street, when most right turns occur (i.e. when people are returning home).

- *The Council notes that on-street parking bays are near intersections, roundabouts, and T-junctions. It requests that sight-distance assessments demonstrate that parked vehicles do not obstruct sight lines for vehicles entering or exiting intersections.*

Walker Response: Walker notes the Council's comments. The detailed engineering design will confirm that parked vehicles do not obstruct sight lines for vehicles entering or exiting intersections.

- *Sight distance to driveways to be assessed for the affordable housing dwellings located adjacent to 90-degree bends in Stage 45.*

Walker Response: Walker notes the Council's comments. The detailed engineering design will confirm that the affordable housing dwellings located adjacent to 90-degree bends are satisfactory.

- *Provide a road hierarchy plan for the entire internal road network within the development.*

Walker Response: Recognising that this development application relates to the Precinct 3A catchment, please refer to section 5 of the ETA Traffic Impact Assessment (TIA). Should Council require further understanding of the road hierarchy relative to Precincts 1 & 2, please refer to the Precinct 2 TIA lodged with the EIS application. Walker anticipates lodging a further Precinct 3B TIA and road hierarchy plan encompassing Precincts 1, 2, and 3 in Q1 of 2027.

- *There are inconsistencies between the proposed street cross-sections and the CoP UDG. (Collector - 16m wide, laneway 9m, 12m).*

Walker Response: The street cross-sections are the same as those of other similar typical cross-sections throughout the Riverlea development.

- *Walker to provide a plan showing the indicative location of footpaths, shared paths, kerb ramps, street lighting, and other relevant supporting infrastructure across the development.*

Walker Response: The detailed engineering design will confirm the location of footpaths, shared paths, kerb ramps, street lighting, and other relevant supporting infrastructure across the development.

- *Walker to show shared paths with a minimum width of 3.0 metres and footpaths with a minimum width of 1.5 metres following the nominated road hierarchy and applicable standards.*

Walker Response: Walker notes the Council's comments.

- *Swept path analysis shall be provided for all intersections using: B99 passenger vehicles, 9.8m service vehicles, 19m articulated buses (where collector roads or bus routes are proposed).*

Walker Response: The detailed engineering design will include swept path analysis for all intersections using B99 passenger vehicles, 9.8m service vehicles, and 19m articulated buses (where collector roads or bus routes are present).

- *Provide simultaneous turn movements of B99 vehicles on the 90-degree bends.*

Walker Response: The detailed engineering design will include simultaneous turn movements of B99 vehicles on the 90-degree bends.

- *Driveway and crossover locations shall comply with AS 2890.1 and shall not be located within 6 metres of a tangent point or within the intersection influence area.*

Walker Response: Walker notes the Council's comments.

- *Provide an on-street parking concept plan identifying all proposed driveways and crossover locations for each allotment. The plan shall assess impacts on on-street parking availability and demonstrate compliance with required clearances. The plan shall also identify all usable kerbside parking spaces, accounting for intersections, driveway exclusions, and no-stopping areas.*

Walker Response: The detailed engineering design will provide an on-street parking concept plan identifying all proposed driveways and crossover locations for each allotment. The plan will demonstrate

on-street parking availability, usable kerbside parking spaces, and compliance with required clearances, accounting for intersections, driveway exclusions, and no-stopping areas.

- *SIDRA modelling for intersections 3 and 5 does not meet the performance criteria for signalised intersections as outlined in the DIT traffic modelling Guidelines: SIDRA intersection. Will be assessed in detail as part of "The Island" and Stages 18, 21 and 26 DA variation lodgement. To be reviewed and verified by DIT for signal phasing, cycle length and inter-green times.*

Walker Response: Walker referred this matter to ETA, which noted that the modelling for Precinct 3A is an update to the modelling completed as part of the previously approved Precinct 2 development. The traffic volumes were updated to reflect the changes in dwellings/staging of the development.

Further, the intersection modelling meets DIT requirements except for a level of service (LOS) E at Intersection 5 in the ultimate scenario. ETA notes that the ultimate scenarios will be subject to review as development of a secondary access to Riverlea progresses and will be reflected in the lodgement of the Precinct 3B AEIS application in Q1 of 2027. Accordingly, the LOS E will improve to meet DIT requirements, as traffic movements are split across two strategic access points to the Port Wakefield Highway corridor.

2.4.4 Planning Matters (including conditions of AEIS)

2.4.4.1 Drainage channel cross-sections

The Council required a cross-section of the drainage channel to demonstrate how Walker will retain the row of existing trees (while noting the future north-south collector road must also retain the row of trees).

Walker Response: A typical cross-section of Channel 5 (shown in Figure 4 above and Appendix A) demonstrates how Walker intends to retain the existing row of trees. Walker intends to retain the row of trees along the future north-south collector road (as part of future Precinct 3B).

- *As the extension of Riverlea Boulevard is not built as part of this stage, has the provided SIDRA modelling captured the level of service relating to Monash Avenue? Specifically, how does the road function in the interim with the level of traffic generated by the proposed development?*

Walker Response: In ETA's advice in Appendix B, ETA explains that the SIDRA modelling assumed there would be no extension of Riverlea Boulevard as part of this stage, and the SIDRA modelling indicates that the Monash Avenue/Riverlea Boulevard intersection (Intersection 6) will operate effectively in the interim.

2.4.4.2 Aboriginal heritage

The Council sought confirmation that DHUD had referred the Precinct 3A AEIS to Aboriginal Affairs and Reconciliation, Attorney-General's Department.

Walker Response: DHUD referred the Precinct 3A AEIS/application to the Department of Aboriginal Affairs & Reconciliation (AAR) for review and comment. AAR's comment has been received and actioned (refer to Section 2.1 above).

2.4.4.3 Intersection Analysis

- *As per Paragraphs 3 & 4 – The assumptions relating to traffic/intersection capacity modelling and capacity taking into account "approx. 650 dwellings from the future Precinct 3 west", and "...the increase in Precinct 2 island yield." should be confirmed with a schedule of all approved and known increases in dwelling numbers i.e. including the full changes to the Island, Stages 18-21 +26, Stage 36, Stage 37 so that Council (and DIT) have the full understanding and the subsequent assessment required.*

Please note that Condition 20 of the Precinct 2 AEIS DA approval stated that:

20. Before approval of a master plan for the development of any part or component of Precinct 3, an amended Traffic Impact Assessment (TIA) shall be prepared and submitted to provide the following information and achieve the identified outcomes as follows:

- *Analysis of secondary access to the development and associated traffic volumes supported by updated AIM—SUM network and SIDRA modelling.*
- *Capacity of Riverlea Boulevard and the traffic volumes servicing future Precincts and 4.*
- *Works associated with intersection upgrades required to accommodate a minimum of 50% of occupied residential dwellings in Precinct 3 (or a minimum of 1,500 dwellings in addition to total Precinct 2 dwellings).*
- *Analysis of the ultimate intersection scenario supported by SIDRA re-modelling to understand final intersection footprints and consequential impacts on intersection land curtilage and acquisition requirements.*

Therefore, technically, Condition 20 has been triggered as Precinct 3A is "....a part of or a component of Precinct 3."

The highlight bullet point is relevant to consider as the threshold/trigger "....a minimum of 1,500 dwellings in addition to total Precinct 2 dwellings)." has changed as the total Precinct 2 dwelling number are incrementally increasing by virtue of increases from the Island, Stages 18-21 +26, Stage 36, Stage 37, thus reducing the 1,500 dwelling threshold as the total unassessed dwelling numbers in Precinct 2 are now proposed to be increased significantly.

Therefore, Council requires clarity on the above, and Walker must provide approved and updated (projected) dwelling numbers for Precinct 2 and Precinct 3 overall.

Walker Response: The Precinct 3A TIA considered the increase in apartments/dwellings of Precinct 2. The modelling of Precinct 2 Supplement and Precinct 3A accounts for the lower traffic generation associated with apartments compared to typical detached dwellings (consistent with DIT's advice on the Precinct 2 dwelling numbers and the associated traffic generation).

In Attachment B, ETA further notes that there has been an increase in dwellings in the Precinct 2 island, as part of the dwelling breakdown of Precinct 2 supplement report and the trip distribution of Precinct 3A (which also considered internal and external trips of the various uses within the Precinct 2 island including assuming more local trips to the commercial uses in the island for instance from Precinct 3A).

However, the intersection upgrades have been reassessed based on approximately 1,380 dwellings in Precinct 3 (738 Precinct 3A dwellings, 650 future dwellings) compared to 1,500 assumed within the original Precinct 2 TIA report (which accommodates the increase in Precinct 2 island).

2.4.4.4 Construction Traffic Damage to Legoe Road, Tippetts Bridge Road & Carmelo Road

The Council raised the issue that, with the level of construction traffic accessing the western precincts of Riverlea, including Xavier College's private construction activities, the road network at that location is deteriorating. The Council considers that a condition of approval is therefore warranted, requiring Walker to enter into an infrastructure agreement prescribing a level of maintenance or financial contribution to the Council.

Walker Response: The matter raised by the Council is not relevant to the Precinct 3A application, as Walker is the sole cause of deterioration. Walker does not consider it suitable (or reasonable) to impose a condition requiring Walker to enter into an Infrastructure Agreement on this matter with the Council.

Nonetheless, construction access to the project via Carmelo and Tippetts Bridge Road will commence in March 2026 and continue through to August 2026. During this time, Walker commits to maintaining the unsealed sections of Carmelo and Tippetts Bridge Roads to the Precinct 3A project entrance.

Upon achieving practical completion of Riverlea Boulevard Stages 4 & 5 in August 2026, all Riverlea construction traffic will be rerouted via Port Wakefield Highway and Riverlea Boulevard for construction access until further notice of construction with Riverlea Boulevard Stage 6.

2.5 The Native Vegetation Council

Native Vegetation Council (NVC) formally responded to the referral of the Precinct 3A AEIS and appropriately referenced the WSP Native Vegetation Clearance Data Report – Riverlea Precinct 3A, September 2025 (the Data Report). The Data Report forms the substance of a separate application to the NVC for clearance associated with the subdivision.

Walker Response: In February 2026, the Native Vegetation Branch (NVB), on behalf of the Native Vegetation Council (NVC), requested further information to assist the NVC in determining the application. Walker provided the information to the NVB. The NVC will decide whether Walker's proposed SEB is sufficient when evaluating the clearance application (a secondary approval process conducted separately from the Precinct 3A AEIS subdivision application).

The NVC noted that the proposed clearance footprint remained unchanged from the initial referral, but that an amended Data Report had addressed the previous variance identified by the NVC.

Walker Response: Given that Walker must raise site levels across the subdivision to address flooding risk, the clearance footprint remained unchanged.

The NVC noted the AEIS and Data Report include evidence of the proponent's attempts to address the regulatory mitigation hierarchy requirements (to avoid, minimise, rehabilitate/restore, offset) when discussing the development and its potential impact (see AEIS section 8.7.4; Data Report section 4.4). Specifically, the NVC noted Walker's attempts at:

- *Avoiding the clearance of vegetation with higher biodiversity value and developing previously cleared farmland,*
- *Minimising the clearance of established planted mature trees and the extent of clearance through site selection,*
- *Establishing several man-made waterways that could provide habitat for threatened and migratory shorebird species, incorporating planted native vegetation into open space design and stormwater management measures, weed control, encouraging subsequent natural regeneration of native flora species such as samphire and Austral Seablite (*Suaeda australis*), and*
- *Offsetting the clearance of two scattered trees and 3.84 ha of native vegetation by paying into the Native Vegetation Fund.*

The NVC supports the use of native vegetation in the design of formal revegetation/landscaping works, as it maximises biodiversity outcomes and provides the maximum benefit for wildlife. Additionally, the NVC encourages greater specificity regarding the timing of landscaping and formal revegetation work, noting that previous conditions of consent required revegetation work within 1 year of construction completion.

Walker Response: Walker utilises native vegetation in the revegetation/landscaping works in many of its public spaces and stormwater channels (discussed further in Section 3.1). However, in many cases, the requirement for successive consents often delays the commencement and completion of works. Walker frequently requires authorisations under the *Aboriginal Heritage Act 1988*, approvals under the *Roads (Opening and Closing) Act 1991*, *Local Government Act 1993* for road closures, and engineering approvals for various aspects of the subdivision works. Works can only commence once Walker has obtained all necessary authorisations, which often results in delays.

The NVC noted that introducing species from different biogeographic regions may displace native species, thereby adversely impacting biodiversity. However, the Landscape Board for the Hills and Fleurieu region has compiled a list of suitable native species that may assist with this work.

The NVC noted that the Precinct 3A AEIS did not reflect any attempt to investigate the potential use of native vegetation to mitigate the effects of climate change, noting that native species are more likely to resist climate change than introduced species that have acclimated to hot, dry conditions.

Walker Response: While perhaps not covered in the Precinct 3A AEIS, Walker considers the use of native vegetation species in many of its revegetation/landscaping works, primarily because they are more likely

to resist the possible effects of climate change, particularly species that have acclimated to hot, dry conditions. This matter is discussed further in Section 3.1.

The NVC noted that Cottonbush (M. aphylla) open shrubland provides habitat for the nationally vulnerable Thick-Billed Grasswren (Amytornis modestus). The NVC further acknowledged that retained and/or regenerated native vegetation may provide alternate corridors for movement.

Walker Response: Walker actively undertakes revegetation/landscaping works that retain and/or encourage the regeneration of native vegetation. The species *Maireana aphylla* (among numerous other native species) is currently being pre-grown and will be planted by the hundreds this Winter in association with a wetland landscape, providing potential alternative corridors for fauna movement. This matter is discussed further in Section 3.1.

The NVC acknowledged the poor and degraded condition of remnant understorey vegetation, the presence of alternative habitats for species impacted by the clearance of hollow-bearing trees, and that clearance areas are unlikely to create critical habitat for species threatened at both the national and state levels.

Nonetheless, the NVC noted the difficulty in offsetting the impact of removing tree hollows, as the period of natural development can exceed one hundred (100) years. The NVC acknowledged that the presence of alternative habitats may mitigate this impact and urged the project design to accommodate the retention of felled trees on site to ensure continued habitat provision (or to install nesting boxes within the proposed open spaces).

Walker Response: Walker is providing alternative habitats to mitigate potential impacts and to retain and utilise felled trees (and fallen limbs) on site, ensuring continued habitat provision. This matter is discussed further in Section 3.1. Walker is also open to installing nesting boxes within the proposed open spaces.

The NVC also noted PO 13.1 from the P&D Code, which recommends using native vegetation in the proposed street tree planting design to enhance urban amenity and create a comfortable microclimate.

Walker Response: Walker uses native vegetation in many public realm planting designs, as it is easily maintained and can enhance urban amenity and create a comfortable microclimate. This matter is also discussed further in Section 3.1

2.5 Department for Environment and Water

DEW raised the issues below:

- *Inaccuracies in the native vegetation and stormwater management documentation suggest that further survey/modelling work is required to make an accurate assessment of the impacts.*
- *Stormwater management and potential future flood risks. Comments received indicate that the downstream channel capacity has not been adequately assessed, creating uncertainty about future flood risk for development.*
- *Native Vegetation. Comments on the extent of clearance and cumulative impact not being clearly assessed due to the nature of staged approvals. It would be ideal if additional surveys were undertaken to confirm the presence of the Orange-bellied Parrot, Elegant Parrot, and Blue-winged Parrot, and to verify remnant grassland and shrubland extent.*
- *Groundwater. The potential for contamination has been raised, with the concern that contaminated water could discharge into nearby groundwater-dependent ecosystems (GDEs) or the marine environment.*
- *Urban Greening. Green Adelaide commented that the proposal does not articulate how it will contribute to the Greater Adelaide tree canopy target. Green Adelaide encourages the proponent to add this to future proposals and to collaborate with them, incorporating Biodiversity Sensitive Urban Design (BSUD) principles.*

DEW officers reviewed the proposal and provided the following comments:

Precinct 1, 2 and 3A Interim and Ultimate Development Stormwater Management Plan – 2025.

DEW comments that the approved stormwater management strategy developed in previous stages has largely remained unchanged. Concern remains that the downstream channel's capacity to accommodate future development has not been adequately assessed, and that unresolved issues could result in flooding.

Walker Response: Regarding the Riverlea Detention Basin and Open Channel performance, WGA and Walker have been working closely with WaterTech and the consultants who prepared both the Smith Creek SMP and the Gawler River Flood study in relation to the Riverlea development.

The Smith Creek Catchment SMP includes an older version of the Riverlea Development with a large detention basin, so the impacts of the Riverlea development on the downstream channel (Thompson Creek Outfall channel) were already considered to some degree (refer to Figure 7).

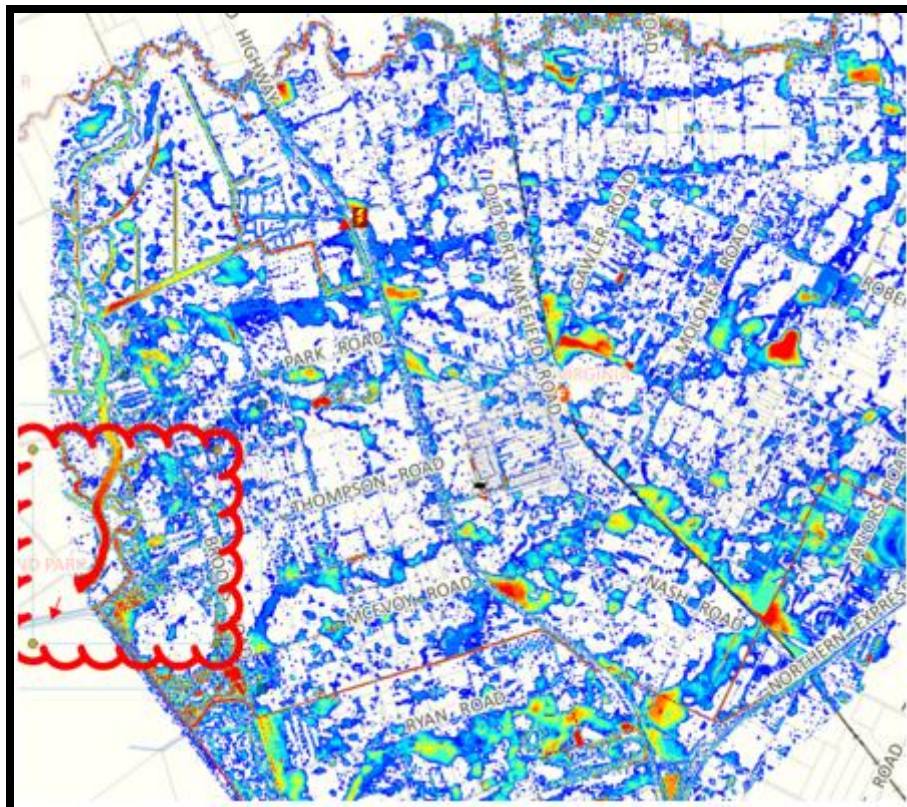


Figure 7 – Smith Creek flood hazard study, incorporating an existing version of the Riverlea channel network and basin, for the 1% AEP storm event.

In consultation with WaterTech, Walker extracted data from the Smith Creek model. The critical duration storm for Thompson's Outfall Channel as it passes the Riverlea development is the 24-hour storm with a time to peak of 38 hours. The critical duration storm from the Riverlea development in the Riverlea-specific TUFLOW model is a 6-hour storm with a time to peak of just over 6 hours.

Therefore, the impacts of detention within the smaller Riverlea catchment do not overlap with those of the much larger Smith Creek catchment, preventing combined peak effects.

Extending all models to include the Thompson Creek Outfall channel would effectively require including the entire Smith Creek Catchment. Given that Riverlea is already included in the current Smith Creek SMP, and that WGA and WaterTech have assessed the impacts on coincident peaks, WGA does not feel this is necessary at this stage, as the peaks do not coincide.

2.5.1 Native Vegetation

DEW comments that a more detailed recognition of the site's existing vegetation would strengthen the EIS assessment. DEW asserts that it is inaccurate to state that vegetation removal will have a limited impact on native vegetation and states that the Maireana aphylla shrubland community present on the site is likely to be one of the largest remnant parcels (albeit degraded) left on the northern Adelaide Plains.

Further, the contiguous nature of the remnant vegetation with other remnant plant communities in the area (such as *Eucalyptus camaldulensis* riparian areas) makes it even more valuable from a conservation perspective.

DEW notes that Precinct 3A appears to contain high-value remnant vegetation that is not fully reflected in the current native vegetation surveys. Additional survey work would help assess the proposal, particularly to confirm the presence or absence of Orange-bellied Parrots, Elegant Parrots, and Blue-winged Parrots, and to verify the extent of remnant grassland and shrubland vegetation communities present on the site.

Walker Response: In 2025, Walker engaged WSP Australia (WSP), a recognised native vegetation consultancy, with accredited staff on the Native Vegetation Council (NVC) Accredited Consultants 2025 list. The WSP Accredited Consultants surveyed Precinct 3A and the remaining Precinct 3 area to assess the impact on vegetation against the subdivision Master Plan.

Much earlier in 2007 and 2008, Dr Bob Anderson conducted a field survey of the site's flora and produced the results in the Buckland Park Flora Technical Report, February 2009.

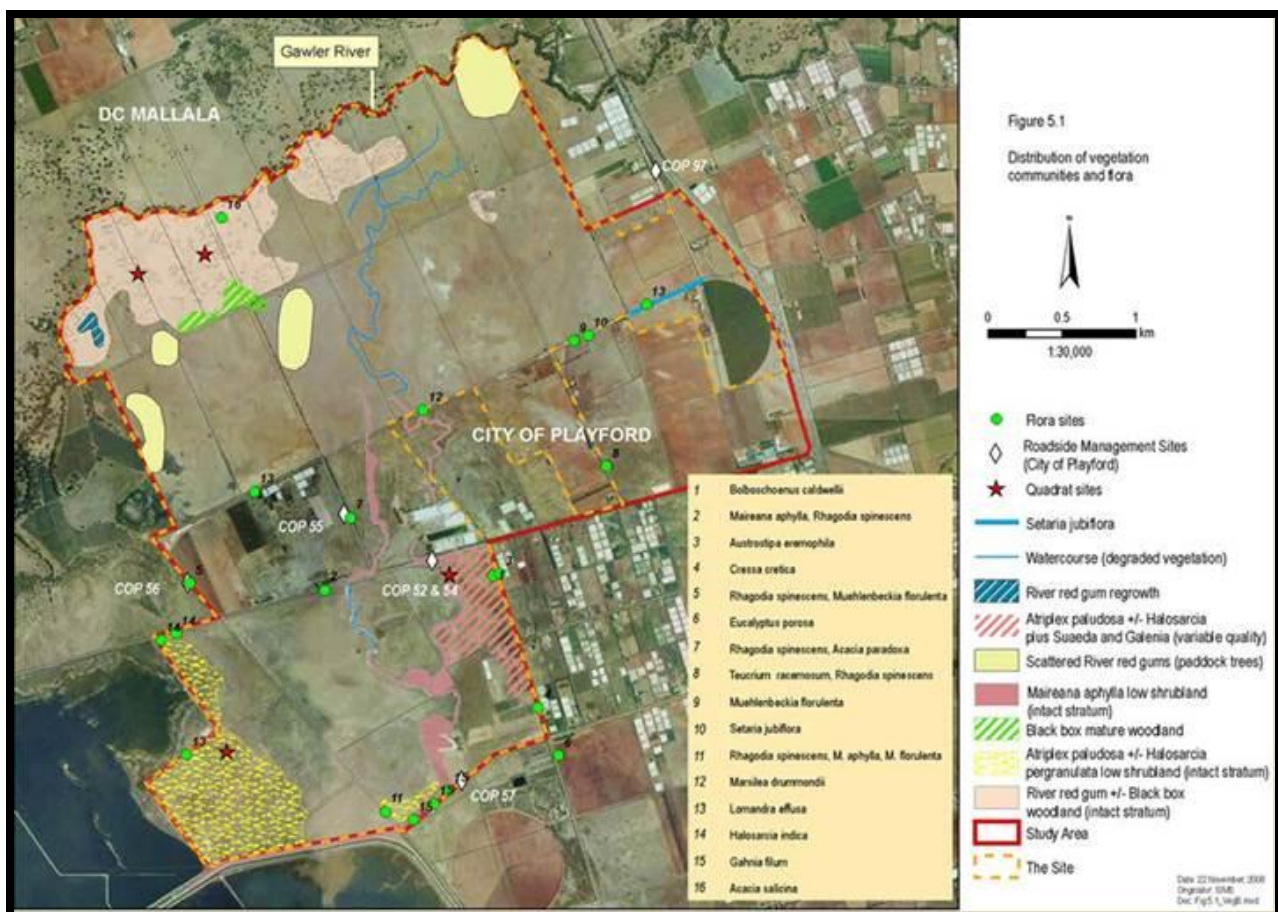


Figure 8: Map – Anderson – Cotton Bush in Precinct 3A

In that report, Anderson identified remnant Cotton Bush low shrubland along parts of Thompson Creek towards the centre and southern parts of the area. The map above indicates a small area of Cotton Bush in Precinct 3A (figure 8). The higher concentrations appeared within the Perpetual site, the Council reserve adjacent, and further south along Thompson Creek, in the lower sections of Precinct 4 and adjoining private land to the south. No other high-value remnant vegetation was identified in that location by Anderson.

Other surveys, conducted in 2013 and 2022, also by NVC Accredited Consultants, did not detail high-value remnant vegetation in this area or the Cotton Bush vegetation association at those times. It is unknown if the Cotton Bush vegetation was less than 5% or in poorer condition due to drier conditions and/or was subject to higher grazing pressures, ploughing, or pasture management that reduced the presence of this species.

The WSP's Precinct 3A 2025 survey appears to have been the first to document the Cotton Bush vegetation association in any detail since the initial Anderson surveys in 2007 and 2008, and neither survey noted the presence of other high-value remnant vegetation in the area.

Due to the nature of the individual applications for each Precinct being assessed in isolation over time, the cumulative impacts of past, current, and future vegetation clearance could be greater than indicated and fail to provide a clearer picture of the long-term implications of vegetation clearance.

Walker Response: Since the initial native fauna and flora surveys by Dr Bob Anderson in 2007 and 2008, Walker has engaged many NVC Accredited professional Consultants to undertake fieldwork surveys for each Precinct and to prepare clearance applications as the detailed conceptual design evolves.

DEW encourages the proponent to design a weed-management approach that avoids adverse impacts on soil quality, particularly those associated with chemical control methods.

Clearing the Maireana aphylla (Cottonbush) open shrubland could reduce habitat availability for the nationally Vulnerable Thick-billed Grasswren. Retaining or establishing native vegetation elsewhere within the site may help maintain movement corridors that support this species.

DEW acknowledges the retention of the River Red Gums along the western boundary, the protection of higher-value biodiversity areas within Precinct 3, Walker's use of locally native species in landscaping, and the natural regeneration of native flora within the stormwater channels. DEW further notes that remnant River Red Gums contain long-developing hollows that provide important habitat. Because these values are difficult to offset, avoiding clearance wherever possible is encouraged. If clearance cannot be avoided, mitigation measures such as retaining felled hollow-bearing material on site, installing nesting boxes, or identifying suitable replacement hollows within the nearby River Red Gums should be considered.

Walker Response: As discussed in Section 2.4 (and in Section 3.1), Maireana aphylla (among numerous other native species) is being pre-grown and will be planted by the hundreds this Winter in association with a wetland landscape. Walker also retains felled trees (and fallen limbs) on its land for use in Riverlea's landscaping treatments, providing potential alternative corridors for fauna movement.

DEW notes that Walker proposes to achieve a Significant Environmental Benefit (SEB) by paying into the Native Vegetation Fund and that the Native Vegetation Branch (NVB) in DEW will support the Native Vegetation Council (NVC) in assessing whether the SEB the developer proposes is adequate.

The NVC is required to take into account, and seek to further, the Principles of Clearance of native vegetation (S. 14(2) of the Native Vegetation Act 1991). Following a preliminary assessment of information provided in the Native Vegetation Clearance Data Report. The proposed clearance is seriously at variance with Principles of clearance 1(a), 1(b), 1(d) and 1(e) of the Native Vegetation Act 1991.

Walker Response: While avoiding clearance is not always feasible due to the need to raise site levels to mitigate flooding risk, Walker has offered, subject to Native Vegetation Council approval, to pay a Significant Environmental Benefit (a payment-in-lieu made to the Native Vegetation Fund)

Higher concentrations of the Maireana aphylla (Cotton Bush vegetation) association appear to be predominantly present on adjoining Council land (an isolated Council reserve) and further downstream of Thompson Creek. The higher concentrations appeared within the Perpetual site, the Council reserve adjacent, and further south along Thompson Creek, in the lower sections of Precinct 4 and the adjoining private land of Precinct 4 (refer to the Anderson Map in Figure 8 above).

Walker is exploring an SEB offset area (approximately 3 hectares) in the lower reaches to the south-east of the Precinct 4 land for the restoration of the cotton bush (weed management and replanting) and conservation, in collaboration with the NVC & NVB. This is land adjacent and segregated from future urban development by an approved stormwater and floodwater mitigation channel through part of that land (refer to Native Vegetation Application No. 2024/3292/292).

Maireana aphylla (among other similar Chenopods & Saltbush species) is on Walker's revegetation species trial list, specifically within segments of the drainage channel system, because it appears tolerant of extreme, often prolonged hot weather and infrequent inundation, and should adapt well to climate change events.

2.5.2 Water Resources

DEW refers to Section 8.7.32 Clearance Consideration, on page 20 of the Precinct AEIS report, which notes, "much of Riverlea has high (often fluctuating) groundwater levels with elevated salinity. The Council and service authorities encourage the installation of all services (water, sewer, stormwater connections, power, etc.) above groundwater levels."

DEW understands that, due to shallow groundwater depth, there is a potential risk of groundwater contamination should, for example, a leak occur from sewer pipes, leading to contaminated water discharging into nearby groundwater-dependent ecosystems (GDEs) or the marine environment. DEW suggests the proponent consider and address this risk in the risk assessment.

Walker's Response: Walker referred this matter to WGA, whose response is provided in Appendix C, as follows.

Vacuum sewer systems are used at Riverlea to ensure the sewer system is above groundwater levels. The sewer mainline is welded High-Density Polyethylene (HDPE), so the risk of leakage at the joints is not likely. Additionally, vacuum sewers operate under negative pressure; thus, any leak in a pipe would normally draw air into the system rather than push it out. Leaks in the system would be identified as line faults and require repair, unlike in a gravity system, where leaks can go undetected.

The stormwater investigations to date do not sufficiently address downstream risks, and the modelling for Precinct 3A contains several inaccuracies and an inadequate assessment of detention basin performance. These issues undermine confidence in the modelling and the potential impacts of the proposed development.

Ideally, the proponent would revise the modelling to shift the downstream boundary to the point where the Smith Creek channel discharges at the western extent of the salt fields, to properly understand the downstream channel capacity and address concerns about potential flooding on adjacent land.

Walker's Response: WGA and Walker have been working with WaterTech and the consultants who prepared both the Smith Creek SMP and the Gawler River Flood study regarding the Riverlea development. The Smith Creek Catchment SMP already considers the impacts of the older Riverlea Development, which includes a large detention basin, on the Thompson's Outfall channel.

In consultation with WaterTech, WGA have extracted data from the Smith Creek model. The critical duration storm for Thompson's Outfall Channel as it passes the Riverlea Development is the 24-hour storm with a time to peak of 38 hours. The critical duration storm from the Riverlea Development in the Riverlea-specific TUFLOW model is a 6-hour storm with a time to peak of just over 6 hours.

Therefore, the impacts of detention within the smaller Riverlea catchment do not overlap with those of the much larger Smith Creek catchment, resulting in no combined peak effects.

DWE noted that the development of the stormwater hydraulic modelling prepared to support the stormwater management approach used three different modelling packages, with no single model providing full details. DEW suggested that Walker consider revising the modelling to:

- Include bend loss factors, and if there are none, this should be included in the 1D and 2D models*
- Extend all modelling to include the Thompson Creek and Smith Creek channels to assess downstream flood risk appropriately.*
- Revise existing conditions 1% and Developed Conditions 1% maps, including revision of the depth legend, which does not appear to match the colours and depths in the mapping.*
- Address inconsistencies in the associated commentary.*

Walker's Response: WGA's SMP used two hydrologic models (TUFLOW and DRAINS). DRAINS is better for assessing pit and pipe performance at the subdivision level. In contrast, TUFLOW is better for assessing overall flood capacity and the attenuation effects of open-channel systems/basins.

HEC-RAS has also been used in the Unsteady State to evaluate channel designs to determine tailwater conditions for internal drainage design. The catchment parameters used in DRAINS and TUFLOW are consistent, though the models operate differently.

Extending all models to include the Thompson's Outfall channel would effectively require including the entire Smith Creek Catchment. Given that Riverlea is already included in the current Smith Creek SMP, and that WGA and WaterTech have assessed the impacts on coincident peaks, WGA does not feel this is necessary at this stage, as the peaks do not coincide (refer to the Smith Creek SMP 1%AEP Map in Appendix A, which shows that an earlier version of Riverlea's open channels and basin is in the model).

Should DEW identify inconsistencies in the commentary on the stormwater hydraulic modelling prepared to support the stormwater management approach, please be specific so WGA can consider and address them.

2.5.3 Detention Basin

DEW questioned the assumptions used in the associated modelling for the emptying of the proposed 250ML detention basin, as the basin depends on capacity and water levels in the downstream channel.

DEW considers it likely that during the 9-hour storm, most of the flows in the Smith Creek channel will come from impervious areas, with little contribution from the hills' catchments, contrary to WGA's report. Flows from impervious areas will reach the bottom of the catchment much more quickly than the report assumes. Several large detention basins exist between the urban area and Riverlea, which will likely flatten and extend the hydrograph, meaning the peak flow down Smith Creek is likely to prevent outflows from Riverlea for an extended period.

Additionally, the proposed 250ML detention basin is at the southern end of the development area (as shown in Figure 5 of the WGA stormwater report), with groundwater levels at 0-1 metres, which could limit the storage volume available to mitigate peak flows and may have implications for the development's stormwater detention strategy.

WGA should revisit the detailed design of the proposed basin to understand whether the proposed approach is workable. If groundwater limitations make the proposed detention basin infeasible, Walker should consider alternative options.

Walker's Response: WGA references the discussion on the timing of the peaks: Riverlea Basin outfall at 6 hours and Smith Creek catchment at 24 hours, with a 38-hour time to peak.

The TUFLOW model in the report effectively simulates a 1m water depth for 15 hours at the outlet of the Riverlea Basin. Given the technical advice from WaterTech, this seems more than reasonable, given that the peak flow in Thompson's Outfall Channel is 38 hours in a 4-hour storm. WGA has considered the impacts of concurrent flows in Thompson's Outfall channel.

Specific to groundwater levels: what occurs on site, whether in naturally formed or engineered channels, is the interception of groundwater by the open channel and the natural drainage network within the area. The excavation of a basin with inverts matching the free-draining Thompson's Outfall channel will not compromise the basin's detention capacity, as it will not be possible to permanently store water above the free-draining outlet of the proposed basin.

2.5.4 Greening

Increasing total green cover (on both public and private land) is a key ambition of the State Government, as reflected in the tree canopy targets, associated actions, and strategic objectives of the Greater Adelaide Regional Plan. Given the site's low existing canopy cover, substantial urban greening will be required to support climate resilience, reduce heat, and improve liability. Although the EIS states that street tree planting and public open space will be provided in accordance with Council requirements, the documentation provides no discussion of how the proposed development will contribute to the Greater Adelaide Regional Plan and the Metropolitan Greening Strategy's 30% tree canopy target. DEW suggests Walker consider including information in future documentation that addresses expected canopy cover, how greening will integrate with stormwater and open space design, and how state-level targets will be met.

Green Adelaide is currently developing Biodiversity Sensitive Urban Design guidelines to guide an emerging approach to enhance biodiversity within urban environments. The guidelines will provide practical direction for on-ground implementation and encourage the incorporation of principles, including native understory and diverse plantings, habitat corridors, and integrated water-sensitive urban design to support both ecology and liveability. Green Adelaide is available to continue conversations with the proponent and Playford Council to discuss how biodiversity gains and increased greening can be incorporated into Riverlea.

Walker Comment: Walker, in collaboration with the Council, undertakes tree planting and open space plantings to enhance urban amenities within Riverlea, to support the Council's tree canopy targets, and the State Government's ambitious goals of increasing total green cover (on both public and private land) across the Greater Adelaide Region. The Council requires:

- A minimum of one street tree per dwelling in all residential streets, to create a head-to-head canopy at maturity;
- Verges abutting side fences should have plantings that create a head-to-head tree canopy at maturity;
- A minimum of one street tree every ten metres within non-residential streets, to create a head-to-head canopy at maturity.

The long-term vision (20–25 years) for Riverlea is to increase the canopy cover to achieve 25–35% by:

- Continuous street tree planting across every road at every stage
- Large park tree planting (high-density groves)
- Minimum 1–2 trees per residential lot
- Stormwater corridors planted as urban forests
- Protection of existing woodlands, riparian vegetation and other remnant vegetation (where practical, taking flood risk into account).

The Riverlea tree canopy will comprise private-yard trees, street trees, park/reserve trees, riparian vegetation, and native woodland patches. While Walker will still provide small shrubs, ground covers, and grassed areas (for biodiversity and water filtration, etc.), they will not count toward tree canopy targets. Walker will continue to collaborate with the Council on increasing tree canopy and biodiversity projects within the Riverlea development as the project continues.

Walker will further implement on-ground schemes that include diverse native plantings to promote habitat corridors, integrating water-sensitive urban design (WSUD) to enhance water quality, support ecology, and improve liveability. Walker and the Council welcome the completion of Green Adelaide's Biodiversity Sensitive Urban Design guidelines to determine whether they can further assist Walker's existing trial schemes, which aim to enhance biodiversity within the urban context (as covered more in Section 3.1).

2.6 Department for Infrastructure and Transport

The Department for Infrastructure and Transport (DIT) noted that the Precinct 3A site abuts several roads under the Council's control, and that Riverlea Boulevard connects to the Port Wakefield Highway and Angle Vale Road intersection, arterial roads under the care, control and management of the Commissioner of Highways (CoH).

Port Wakefield Highway is a Major Traffic Route and a Primary Freight Route under DIT's 'A Functional Hierarchy for South Australia's Land Transport Network', carrying approximately 18,600 vehicles per day (20.5% commercial vehicles). The speed limit is 80km/h at this location.

Angle Vale Road is identified as a Primary Freight Route and a Standard Frequency Public Transport Corridor under the above framework, carrying approximately 5,300 vehicles per day (13% commercial vehicles) and with a speed limit of 80km/h at this location.

2.6.1 Traffic Assessment

DIT has reviewed the two Traffic Impact Assessments (TIAs) by ETA:

- *Traffic Impact Assessment for Precinct 3A (refer Project No 1000045, Issue 2 dated 28 November 2025); and*
- *Traffic Impact Assessment for Precinct 2 (refer Project No. 1000045, Issue 1 dated 2 October 2025).*

DIT noted a yield of 830 allotments for Precinct 1 and a proposed increase in dwelling yield for Precinct 2, equating to 3936 allotments/dwellings (overall total of 4,766 allotments/dwellings). Based on these yields, traffic volumes remain within the capacity of the Port Wakefield Highway/Angle Vale Road/Riverlea Boulevard intersection due to the high number of apartments proposed for Precinct 2, as well as adjustments to traffic generation rates to conform with current guidelines.

Precinct 3A adds a further 738 allotments to the total number of allotments, resulting in a total of approximately 5,500 allotments/dwellings. DIT noted that the TIA for Precinct 3A did not provide a clear summary of all allotments/dwellings approved for all stages, nor did it provide an assessment of the projected impacts on the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection.

DIT noted that the ETA report acknowledged that, without a second access to the Riverlea development, the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection will nominally require upgrading at the creation of approximately 3000 allotments.

While DIT accepts that Walker and DIT are investigating additional access options for the broader Riverlea/Buckland Park/Virginia growth area, that work is in its early stages, and it is unlikely that DIT will identify a solution in the short term.

DIT therefore considered it necessary to undertake further assessment for the upgrading of the arterial road network, specifically the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection, before the release of 2500 allotments.

Walker Response: Riverlea is in a Mass Transit Investigation Area, and the State Government recently announced it will preserve a new 33km mass transit rail corridor connecting Adelaide's existing metropolitan rail network at Dry Creek through Waterloo Corner and Riverlea, extending to Two Wells. The planned corridor is to run directly through Riverlea, demonstrating the State Government's recognition of Riverlea in long-term transport planning for Greater Adelaide's north.

Notwithstanding this, the existing bus network will continue to be rolled out throughout all new catchments/Stages as the Riverlea development evolves. Walker will continue the rollout of the bus network in collaboration with Public Transport South Australia to identify preferred bus routes and internal connectivity to achieve the 400-metre catchment target.

DIT notes that the development provides for active travel movements, but recommends the design better reflect the Department for Infrastructure and Transport's 'Active Travel Design Guide'

Walker Response: Walker Notes DIT's 'Active Travel Design Guide', which Walker will consider during the planning and engineering design of future precincts and stages. At a high-level review of the design guideline, Riverlea already complies with a number of the movement objectives based on place. However, Walker has identified opportunities to integrate design principles further to promote active travel within Riverlea.

DIT confirmed its support for the Precinct 3A subdivision, subject to applying of approval concerning:

1. *The provision of an updated traffic impact assessment before the release of a total of 2,500 allotments within the overall development:*
2. *The upgrading of the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection before the release of 3000 allotments, or as agreed with the Department for Infrastructure and Transport*
3. *All upgrades to the arterial road network required to support the development are to be designed and constructed to the satisfaction of the Department for Infrastructure and Transport, with all costs to be borne by Walker.*

4. *The development is designed to cater for the existing and future public transport network, as shown in ETA TIA, with DIT and Public Transport South Australia consulted on preferred bus routes and internal connectivity to achieve the 400-metre catchment target per the TIA.*

Walker Response: Walker met with DIT representatives in March 2026 to clarify the wording and what appear to be arbitrary trigger points for an updated TIA (proposed Condition 1) and the upgrading of the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection (proposed Condition 2).

Walker advised that, based on the growth trajectory over the coming years and the work undertaken by Pentalic Advisory Pty Ltd (in [Appendix D](#)), the trigger for upgrading the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection should be closer to 4,600 occupied dwellings (rather than "before the release of 3000 allotments").

Walker and DIT agreed that it would be appropriate to provide an updated TIA as part of the Precinct 3B AEIS application process, given the State Government's broader investigations across the region and more inbound vehicular movements were expected (pending the opening of new local services and facilities within the Palms Village Stage 1 Retail shopping centre in mid-2026 and the school and early leaning centre in January 2027).

Walker and DIT further agreed to work collaboratively to ensure that up-to-date dwelling occupation trajectory rates and TIA investigations would inform the commencement of any future upgrades to the Port Wakefield Road/Angle Vale Road/Riverlea Boulevard intersection (acknowledging that the actual trigger is likely to align with somewhere between the clearance of 3,000 to 4,600 allotments).

In response to DIT's proposed Condition 1 – An updated *Traffic Impact Assessment (TIA)*, points (a) – (d), please note the following as of 05/02/2026:

- a. 1717 lots have been 'released' to the market
- b. 1690 lots have been 'sold'
- c. 10,283 lots have not been released (12,000 lots total)
- d. Refer to Pentalic Advisory Pty Ltd (in [Appendix D](#))

3 [Key Issues Raised](#)

Based on a detailed review of the Council's and State agencies' submissions, the main topic warranting further deliberation and clarification appeared to be associated with Walker's proposed native vegetation clearance and revegetation schemes. Additional discussion around this matter follows.

3.1 [Native Vegetation](#)

The NVC and DEW note that introducing species from different biogeographic regions may displace native species, thereby adversely impacting biodiversity.

Further, the NVC and DEW raised concern that the Precinct 3A AEIS did not reflect any attempt to investigate the potential use of native vegetation to manage the possible effects of climate change, noting that native species are more likely to resist climate change than introduced species that have acclimated to hot, dry conditions.

Walker's Response: Walker carefully selects the landscape planting species proposed and trialled for the revegetation works undertaken with open space and channel areas, with many species included within the "*Native Plant Species Lists*" produced by the Landscape Board for the Hills and Fleurieu region.

While perhaps not covered in the Precinct 3A AEIS, Walker considers the use of native vegetation species in many of its revegetation/landscaping works, primarily because they are more likely to resist the potential effects of climate change, particularly species that have acclimated to hot, dry conditions. The following lists many of the plant species (trees, shrubs & ground covers, and grasses) used in the stormwater drainage channels, noting their key features.

TREES

Summary Table of Tree species in the stormwater Drainage Channel

Species	Heat/Climate Suitability	Notes
E. camaldulensis	Moderate	Needs access to water; tolerates heat if not extreme
E. largiflorens	High	Very hardy in semi-arid conditions
C. maculata	Moderate	Prefers well-drained soils; some sensitivity to extreme inland heat
A. melanoxylon	Low-Moderate	Prefers temperate zones; may struggle in hot/dry areas
A. salicina	High	Very drought and heat-tolerant
A. victoriae	High	Extremely hardy; thrives in arid regions
E. porosa	High	Suited to semi-arid/mallee regions

Table 1 –Table of Tree species in the stormwater drainage Channel

Testing these species and reviewing their performance within stormwater drainage channels is underway, given their adaptability to a warming climate and to heat- and drought-tolerant environments. Walker, in collaboration with the Council, audits the progress of the landscaping efforts to see what is growing successfully and what is not.

Among the list, *Eucalyptus largiflorens* (Black Box), *Eucalyptus porosa* (Mallee Box), *Acacia salicina* (Willow Wattle), and *Acacia victoriae* (Elegant Wattle) are highly suitable, as they naturally thrive in semi-arid or arid regions and tolerate prolonged heat and low rainfall.

Eucalyptus camaldulensis (River Red Gum) can cope with heat if there is some soil moisture. Overall, focusing on mallee and arid-adapted species will enhance resilience to rising temperatures driven by climate change.

SHRUBS AND GROUNDCOVERS

The use of the following species for landscaping and revegetation is undergoing trialling within Riverlea's stormwater drainage channels. While not exclusively found within a specific state or region (occurring naturally across many parts of Australia), they are considered Indigenous to South Australia, regionally appropriate for SA coastal and saline systems and common in SA wetland and chenopod shrubland communities.

- *Atriplex paludosa* ssp. *cordata*
- *Banksia marginata*
- *Bolboschoenus caldwellii*
- *Disphyma crassifolium* ssp. *clavellatum*
- *Gahnia filum*
- *Maireana brevifolia*
- *Maireana aphylla*
- *Salicornia quinqueflora* ssp. *quinqueflora*
- *Tecticornia halocnemoides*
- *Wilsonia rotundifolia*



Photo 1 –Landscaping works in Stormwater Channels (including the use of felled trees)

The plants in the invert of the channel that Walker has planted include numerous Wetland/Ephemeral Basin Climate-Resilient Species (including those suited to fluctuating hydrology under climate volatility and for stormwater polishing).

- *Bolboschoenus caldwellii*
- *Cyperus gymnocaulos*
- *Juncus kraussii*
- *Ficinia nodosa*
- *Gahnia filum*
- *Mimulus repens*
- *Marsilea drummondii*

The list has been selected specifically for climate change variability, including rainfall variability, sudden inundation, extended dry periods, salinity pulses and heat resistance. The species that appears to be thriving is either *Juncus* or *Ficinia*, both excellent water purifiers and therefore valuable for WSUD principles and constructed wetland resilience.

TOUGH STRUCTURAL SHRUBS

Several species of tough structural shrubs are contemplated for trialling, given their heat tolerance and deep-rooted systems, including:

- *Acacia acinacea*
- *Acacia retinodes*
- *Banksia marginata*
- *Goodenia ovata*
- *Olearia pannosa*
- *Myoporum montanum*

The species not only has a tolerance to heat but is also a proven performer in low-rainfall regions and provides structural contribution to the urban canopy (although *Banksia marginata* tolerates heat, it is less tolerant of prolonged, extreme drought without establishment irrigation).



Photo 2 –Landscaping works in Stormwater Channels

DEEP-ROOTED GRASSES

Several species of deep-rooted grasses are also used for heat tolerance and soil stabilisation properties, including:

- Themeda triandra
- Ryttidosperma caespitosum
- Enneapogon nigricans
- Chloris truncata

These warm-season grasses have strong drought survival and good recovery after heat stress associated with dry, hot summers.

CHENOPODS & SALT BUSH (EXTREMELY HEAT AND DROUGHT-TOLERANT)

The following species are also on Walker's landscaping species list because they are among the most climate-robust genera in Australia (extremely heat- and drought-tolerant), providing habitat and serving as potential alternative corridors for fauna movement.

- Atriplex paludosa ssp. cordata
- Maireana aphylla
- Maireana brevifolia
- Rhagodia candolleana
- Rhagodia parabolica
- Rhagodia spinescens
- Suaeda australis
- Salicornia blackiana
- Salicornia quinqueflora ssp. quinqueflora
- Tecticornia halocnemoides
- Tecticornia pergranulosa
- Tecticornia sp.

The NVC states that Cottonbush open shrubland (Maireana aphylla) provides habitat for the nationally vulnerable Thick-Billed Grasswren (Amytornis modestus) and further acknowledges that retained and/or regenerated native vegetation may provide alternate corridors for movement.

Walker Response: Walker actively undertakes revegetation/landscaping works that retain and/or encourage the regeneration of native vegetation, providing potential alternative corridors for fauna movement. Over 300 tubes of Maireana aphylla are currently being pre-grown. Walker anticipates planting hundreds of this species into the existing landscape (amongst other native species) this Winter, providing habitat for the nationally vulnerable Thick-Billed Grasswren.

Accordingly, *Maireana aphylla* (among other similar Chenopods & Saltbush species) is in Walker's revegetation species trial list, specifically within segments of the drainage channel system, because they are arid-zone and/or coastal halophytes that tolerate extreme heat, poor soils, high salinity, low rainfall, and episodic flooding.

*The NVC noted that the project design requires raising ground levels to mitigate flooding risk, and Walker cannot therefore avoid clearing two River Red Gums (*E. camaldulensis* ssp. *camaldulensis*). NVC and DEW note the difficulty in offsetting the impact of removing tree hollows, as the period of natural development can exceed one hundred (100) years, but acknowledged that the presence of alternative habitats may mitigate this impact. The NVC urged the project design to accommodate the retention of felled trees on site to ensure continued habitat provision (or to install nesting boxes within the proposed open spaces).*

Walker Response: Walker has been seeking to provide alternative habitats to mitigate potential impacts to biodiversity. One means to achieve continued habitat provision is to retain and utilise felled trees on site. Walker gathers and reuses all felled trees and fallen limbs on the site, where practical. Walker also collects and stores all felled trees in an on-site stockpile for later use in its landscape planting schemes. Walker is also open to installing nesting boxes within the proposed open spaces, if feasible.



Photo 3 & 4 - Felled Trees Stockpile and Reuse in Landscaping works



Photo 5 & 6 - Felled Tree & Fallen Tree (Stage 16) - Reuse in Landscaping works

Walker uses native vegetation in many public realm planting designs, as it is easily maintained and can enhance urban amenity and create a comfortable microclimate. Additionally, the selection of native vegetation species is based on climate change-related factors, including rainfall variability, sudden inundation, extended dry periods, salinity pulses, and heat tolerance.

Further, Walker encourages the natural regeneration of native species, including *Suaeda australis*, which is thriving again in landscaped channel environments along channel edges, between landscaped rock formations, and in ephemeral wetlands directly adjacent to urban development.



Photos 7 & 8 – Landscaping works – Showing regeneration of *Suaeda australis*



4 Changes Made to the Proposal

4.1 Plan of Division

Walker amended the Precinct 3A subdivision plan to accommodate a new north-south road extension and associated roundabout at the Murdoch Drive intersection within Stage 35. The amendment led to a minor reshuffling of the allotment configurations in its vicinity and a change to the overall Allotment Mix Plan. Still, it caused no net loss of allotment numbers for the stage.

The plan changes, and the initial proposal plan for this area is shown in **Figures 8 and 9** below.



Figure 9 - Proposed Plan Change



Figure 10 – Initial Proposal Plan

Walker, at the Council's request, increased the width of Murdoch Street to 18.5m and the size of the reserve to adopt the Council's Urban Design Guidelines, given the reserve's central location.

The amended Proposal Plan and Allotment Mix Plan have been enclosed as **Appendix E** and **Appendix F**, respectively.

4.2 Affordable Housing Plan

The amendments to the proposal to accommodate the new north-south road extension and associated roundabout at the Murdoch Drive intersection resulted in a loss of four Affordable Housing products proposed at the intersection. While partially compensated with two additional Affordable Housing outcomes in the north-eastern aspects of Stage 35 (allotments 35116 & 35117), the stage and the overall Precinct result in a reduction of two Affordable Housing opportunities.

Accordingly, the Precinct 3A subdivision will now provide 141 Affordable Housing opportunities rather than 143, as initially proposed. Notwithstanding this, the affordable housing provision and the overall Affordable Housing Plan for Riverlea still provide a minimum of 15% total Affordable Housing. The amended Affordable Housing Plan is in **Appendix G**.

4.3 Updated Overall Concept Master Plan

Any authorisation issued regarding the Precinct 3A AEIS would necessitate a change and recognition of an updated overall Concept Master Plan. The updated overall Concept Master Plan should recognise the additional subdivision stages within Precinct 3A, as well as any updated modifications to existing Precincts where relevant. An updated Overall Concept Plan is in **Appendix H**.

5 Statement of Commitments

Upon reviewing the submissions, Walker understands that numerous topics will be addressed as part of the submission of technical details, plans, calculations, etc., as requested by the Council.

There are other secondary approval processes and licensing requirements from different agencies for associated works and other particular items when implementing the Precinct 3A subdivision (as mandated by other associated legislation). Walker has enclosed a Table of Commitments below, which commits to undertaking these secondary approval processes and other actions, as necessary.

TABLE OF COMMITMENTS

TOPIC	COMMITMENT
Aboriginal Heritage	The development will comply with any direction from the Minister for Aboriginal Affairs.
Aboriginal Heritage	The development will comply with the endorsed Cultural Heritage Management Plan (CHMP) prepared for the Riverlea development.
The Environment	The stormwater management system will comply with the outcomes and water quality objectives outlined in the Precinct 1, 2 and 3A Interim and Ultimate Development, Stormwater Management Plan, prepared by WGA and dated 03 October 2025.
Flora & Fauna Management	The development will comply with any reasonable conditions of an authorisation issued by the Native Vegetation Council.
Affordable Housing	Walker will deliver at least 15% 'affordable housing' of all dwellings (following the criteria determined by the Government Gazette on 8 September 2022 under regulation 4 of the <i>South Australian Housing Trust Regulations 2010</i> (or any updates)).

Table 1 - Table of Commitments

6 Secondary Approvals or Licensing Requirements

Walker acknowledges that other legislative requirements for the Precinct 3A subdivision are still relevant, including, but not limited to, compliance with the AHA and the NVA. Similarly, the subdivision will require bulk earthworks, necessitating the implementation of erosion and sediment control measures to ensure no impacts on downstream environments. Walker must ensure compliance with relevant *requirements under the Environment Protection Act 1993, including* the Environment Protection (Water Quality) Policy 2015 and applicable EPA Water Quality Guidelines.

Many subsequent construction activities (staged subdivision works, housing, buildings, bridges, ancillary playground structures and signage) will require approval under the *Planning, Development and Infrastructure Act 2016* (PDI Act) via the Council's Planning and Engineering Departments. Similarly, street naming, property numbering and works within Council road reserves will require authorisation by the Council under the *Local Government Act 1999*.

Walker has applied to the NVC (under the *Native Vegetation Regulations 2017*) to undertake the necessary vegetation clearance for the subdivision works (primarily to fill the land to make it safe from flooding). Accordingly, Walker knows its obligations under the NVA and the requirements for achieving a Significant Environmental Benefit Offset (should approval for native vegetation clearance be granted).

Whilst outside the Precinct 3A boundary area, Walker is facilitating the closure of portions of Tippets Bridge and Legoe Roads, as well as Beagle Hole Road and an unnamed road under the *Roads (Opening and Closing) Act 1991* for stormwater management (in conjunction with the Council). Some stormwater management channels also require approval under the AHA and are currently being processed by AAR.

Walker has extensively engaged with various State Government agencies regarding the Precinct 3A subdivision and is aware that numerous secondary legislative requirements and approval processes must be complied with to undertake the associated activities.

7 Conclusion

Precinct 3A will realise an additional 737 allotments and form a timely and logical expansion of the Riverlea development. The planned road network, the extension of existing services, and stormwater management systems will easily integrate into the subdivision area.

The development of Precinct 3A will contribute to the affordable housing agenda (incorporating an additional 141 Affordable Housing properties), furthering the State Government's Affordable Housing objectives.

As illustrated in the Precinct 3A AEIS Application Report, the proposal generally aligns with the relevant Zone provisions and Overlays as detailed in the Planning and Design Code – the relevant Master Planned Neighbourhood Zone provisions and the applicable Overlays.

State Government strategic documents foresee significant planned investment over the coming years in water and wastewater infrastructure in the Outer North, particularly to bring additional housing supply online quickly in Riverlea (a priority scheduled for the 2024-28 infrastructure spend), as identified in the Housing Road Map.

Further, the continued expansion of Riverlea aligns with several State Government priorities and strategic housing objectives by shortening the delivery of much-needed housing and encouraging the continued growth of northern Adelaide with a focus on the Outer North, specifically the north-western spine.

Given the limited planning issues and lead time to undertake a Precinct 3A AEIS process, the current demand for housing, and the proposals' alignment with the relevant P&D Code provisions and Overlays, it appears that enabling the expeditious expansion of Riverlea will assist in delivering the State Government's ambitious housing agenda.



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City of Playford
12 Bishopstone Road,
Davoren Park SA 5113
Attention: Mahmoud Hasaneen

3 March 2026
Project #: WGA080163
Doc. WGA080163-LT-CV-0006_A
E: mhasaneen@playford.sa.gov.au

Dear Mahmoud,

RIVERLEA PRECINCT 3A - STORMWATER MANAGEMENT PLAN

This letter has been prepared in response to Council's comments on Application: Amendment to the EIS (Precinct 3A), letter dated 2 February 2026.

1. STORMWATER AND FLOOD MANAGEMENT

Council Comment

Whilst the SMP identifies the interim arrangement (refer Figure 1), it lacks the necessary trigger points and delivery timing based on the progress of land development.

Since the approval of the Precinct 2 AEIS, the extension of drainage channels has been significantly delayed due to cultural heritage constraints. The recent technical memorandum (November 2025) from WGA does not address Council's requirement to draw down the backed-up channel water within Stage 39 stormwater infrastructure within three (3) days for a 1% AEP major storm event. WGA is still reviewing the draw-down period for the 10% AEP storm event based on rainfall probability.

Note: The TUFLOW modelling and pumping arrangement outlined in the technical memorandum does not apply to any future stages beyond the current approved stages by Engineering Services.

As the constructed drainage channels are not a free-flowing gravity system to the legal point of discharge, this presents a risk to Council if development continues without appropriate stormwater infrastructure in place.

Council refers to the marked-up plan labelled "*Pages from WGA080163-RP-CV-0034_E-Figure 1 Mark-up*", which outlines the priority list of stormwater infrastructure required and emphasises the importance of delivering Priority 1 works as soon as possible to facilitate the continued development of Riverlea, including Precinct 3A.

Walker has indicated that the lower stretch of the future drainage channel (beyond Carmelo Road) will initially be used for retention purposes prior to construction of the interim detention basin. Further clarification is required on the trigger point for provision of the interim detention basin should this approach be pursued.

Council will require Walker to enter into an Infrastructure Agreement regarding delivery of each of the associated drainage channels, to ensure works are completed prior to S138 clearance being issued for any relevant staging trigger or lot yield.

Trigger points are to be considered and agreed holistically at this assessment stage, rather than deferred to individual stage detailed design reviews.

WGA Response

In regard to the extension of the ultimate channel down to Thompson's Outfall channel, our understanding is that Walker intends to construct this as soon as the approval process will allow. We note as future development occurs, updates to Interim Modelling scenarios and outcomes will be required.

2. STORWATER QUALITY MANAGEMENT

Council Comment

The SMP identifies permanent drainage channels as being fully planted to treat stormwater runoff prior to discharge into Gulf St Vincent, in order to meet EPA minimum pollutant reduction targets for Precincts 1, 2 and 3A.

As landscaping of drainage channels typically lags behind reserve and street tree establishment, clarification is required on any interim practical measures proposed to meet EPA requirements prior to establishment of channel planting.

WGA Response

WGA supply Walker Corporation with Interim Channel Sediment and Erosion Management plans for the channel construction to provide suitable water quality improvements in the interim periods of channel construction prior to planting. The interim measures include the use of the following types of treatments in the channel system:

- Mulch buffer strips at the top of channel slopes.
- Sediment traps upstream of inline culvert structures.
- Sandbag check dams every 200m or so along the channel low flow.
- Hydromulching of the exposed channel faces to encourage interim vegetation growth until the channel is planted.

3. SEDIMENTATION BASIN

Council Comment

Council's City Operations Team requests the provision of a permanent sedimentation basin for the drainage network to facilitate consolidated and efficient maintenance. This is to be located at Channel 1 downstream of Channel 5, servicing Precincts 1, 2 and 3A.

WGA Response

WGA and Walker believe that a sedimentation basin at the proposed location is too close to houses and would impact the amenity in that area. It is likely that the detention basin proposed at the south of the site, would be a combined wetland/detention basin similar to Greenfields Wetlands in the City of Salisbury and would have almost identical operating levels, and interaction with groundwater. It is recommended that a sedimentation basin be incorporated into the design upstream of where the channel low flows would discharge to the wetland.

4. REMOVAL OF CHANNEL 8

Council Comment

Given the proximity of Channel 5 (western boundary) and Channel 7 to Precinct 3A, Council's preference is that Channel 8 be removed if possible.

Walker is to provide a bulk earthworks plan demonstrating the impacts of removal of Channel 8 for Council consideration.

WGA Response

Channel 8 has been introduced to reduce the impacts of imported fill in this area. The closer a road network can connect to an open channel drainage system, the lower the site levels in the immediate area can be. Due to the length of Riverlea Boulevard, and its distance from adjoining channels, fill levels in this precinct are significant, and the introduction of Channel 8 at the western end allows levels in this area to be dropped.

If the channel is excluded the volume of fill increases by 77,800m³.

5. TYPICAL CROSS SECTOIN OF CHANNELS 5 & 8 (REQUIRED TO INCLUDE ADJACENT ROAD RESERVE)

Council Comment

Channel 5: Demonstrate on space proofing for all paths, existing retained trees, channel's slope batter, SWL intake and outfall, etc.

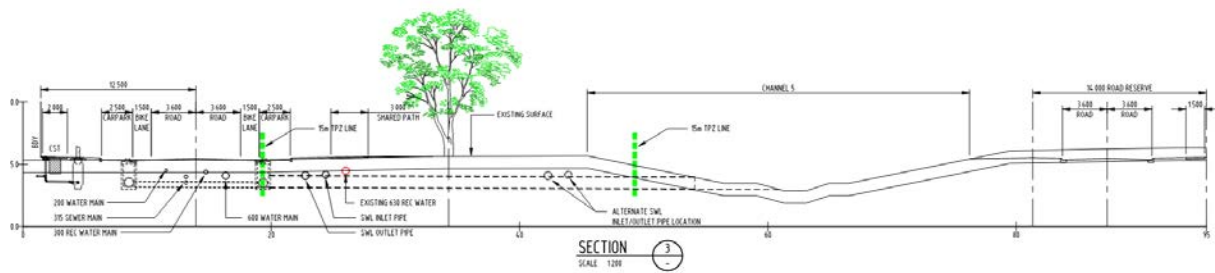
Channel 6: Demonstrate on space proofing for shared use path (north side), maintenance path, channel's slope batter, indented parking bays, street tree planting, etc. It is noted that the plan omitted the indented parking bays along the south side of Macquarie Drive. This needs to be clarified to prevent similar services constraint issues from occurring again at previous Stages 38 and 39.

WGA Response

Refer to the sketch in Appendix A that shows the location of the sections and provides details on the cross sections. Snippets from that sketch are provided below.

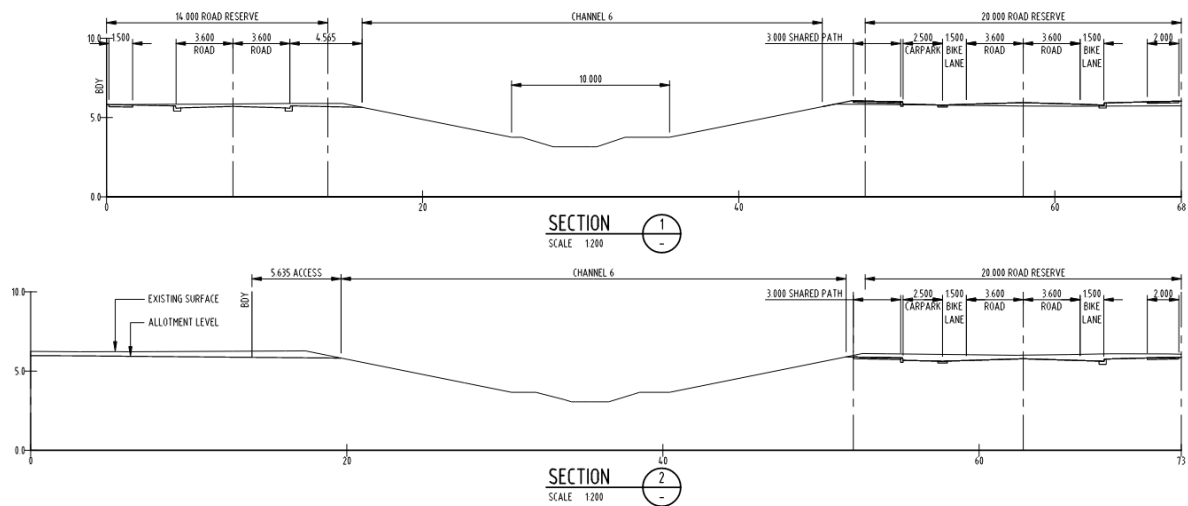
5.2 Channel 5

Sketch of Channel 5 showing existing tree corridor, collector roads and space proofing for services.



5.3 Channel 6

Sketch of sections of Channel 6 where in between road corridors either side and where adjacent lots on one side with road on opposite side.



Should you have any queries relating to this matter please contact our office.

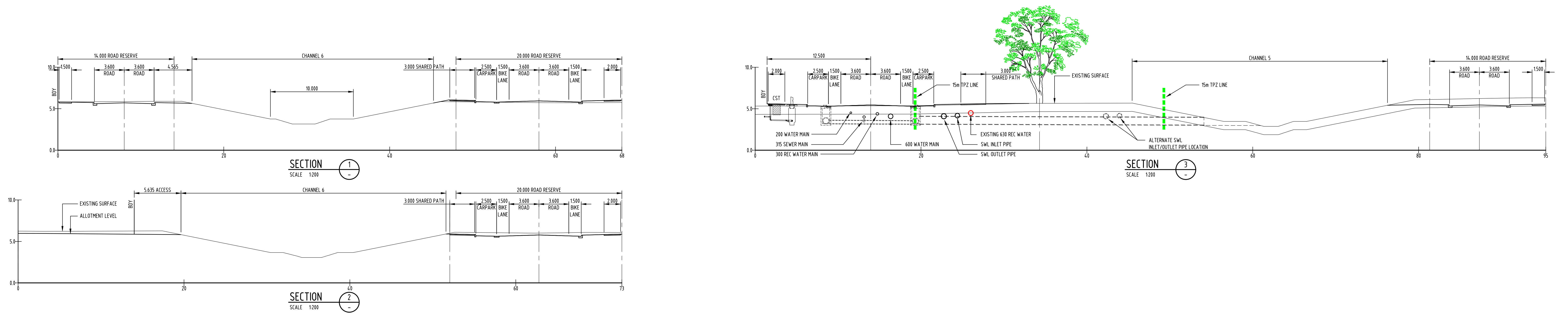
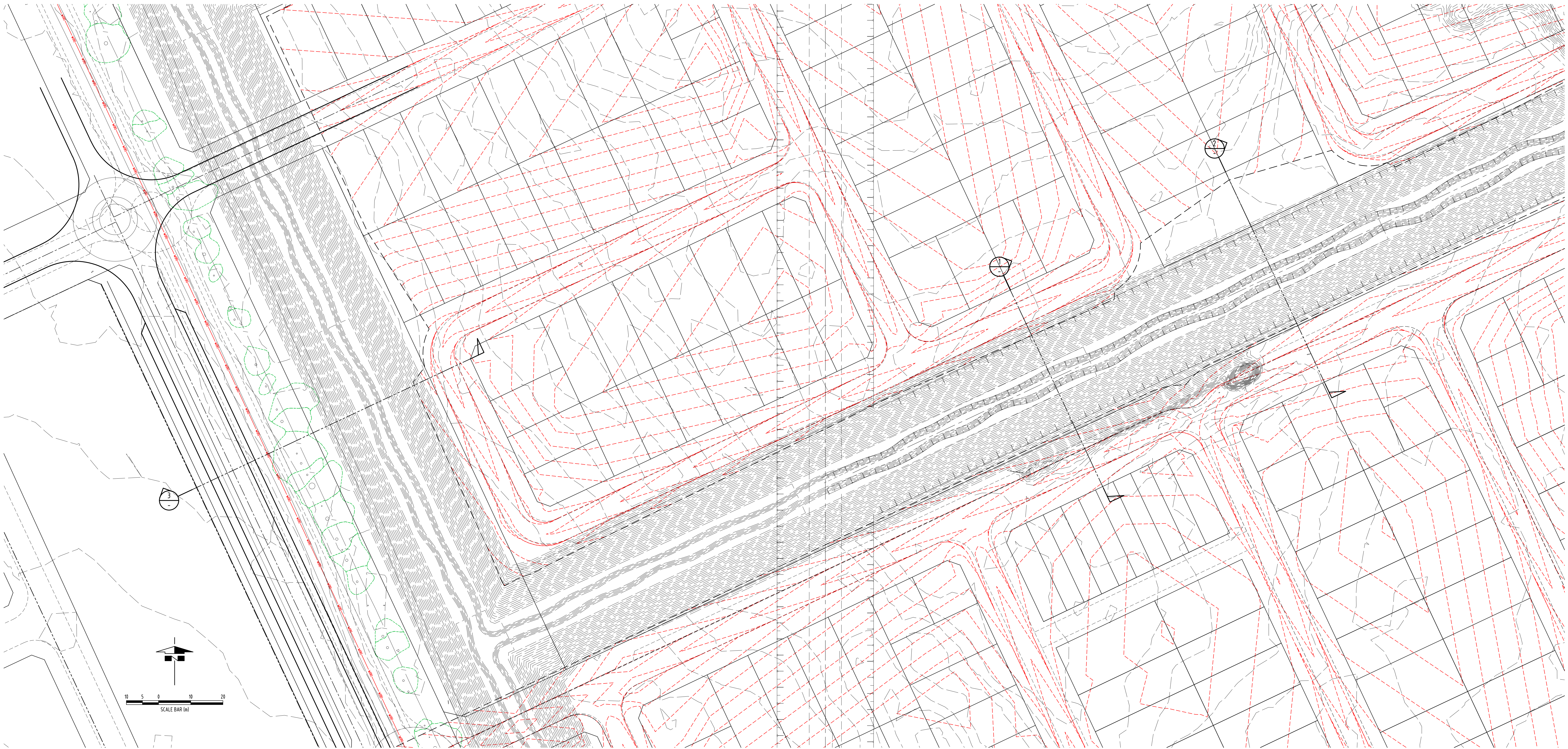
Yours sincerely,

Damien Byrne
Director
WALLBRIDGE GILBERT AZTEC

APPENDIX A CHANNEL CROSS SECTIONS

APPENDIX A

CHANNEL CROSS SECTIONS



23 February 2026

#eta1000045

Walker Corporation
9 Bonnin Crescent
Riverlea Park SA 5120
Attention: Mr. Brent Eddy

RIVERLEA PRECINCT 3A

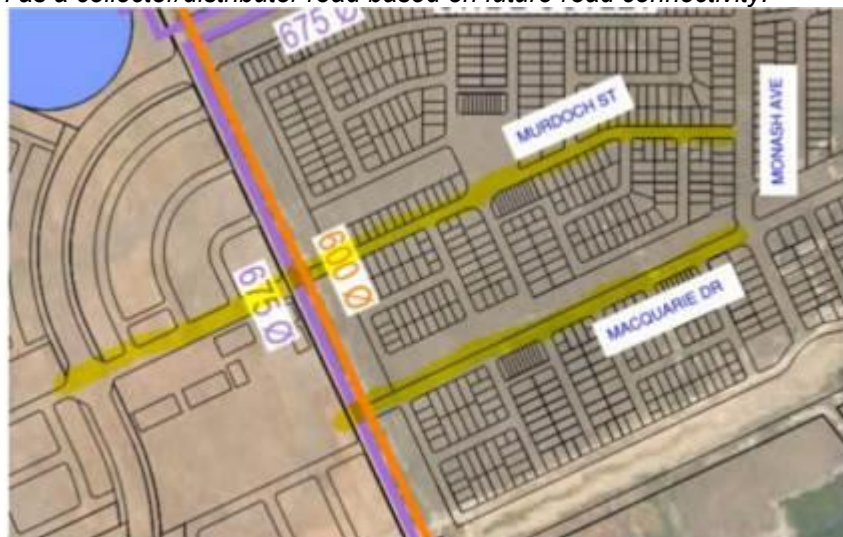
RESPONSE TO CITY OF PLAYFORD COMMENTS – TRAFFIC MATTERS

Dear Brent,

I refer to the proposed Precinct 3a development located within the Riverlea development. This letter provides a response to the comments received from the City of Playford dated 02 February 2026. This letter provides a response to the comments regarding traffic matters.

Council Comments

Murdoch Street is shown as 16m wide, which is the width of a local road. Please confirm that this will not function as a collector/distributor road based on future road connectivity.



Murdoch Street is expected to remain a local street providing access for Stages 35, 44 and 45 and Precinct 3A (as proposed) whilst there is no road connectivity to Riverlea Boulevard to the west of these stages. Once Precinct 3 is developed, there will be additional access to Riverlea Boulevard for Precinct 3A, and Stages 44 and 45 (and others), which will reduce the traffic volumes on the eastern section of Murdoch Street. Future planning will determine if the extension of Murdoch Street will be a four way

(roundabout) intersection or staggered T-junctions. Hence, Murdoch Street is not considered to be a collector road in the future given other road network options.

Confirm whether access to Stage 35 requires any auxiliary turn treatments. This is to be assessed in accordance with AGTM Part 6, having regard to forecast traffic volumes, turning demands, and road function.

It is noted that in accordance with AGTM Part 6, once there is a single turning movement, there is a requirement for a Basic turn treatment. As discussed earlier, Murdoch Street is allocated to remain within typical residential traffic volumes based on future road network development to the west. Hence, a right turn treatment on Monash Avenue is not considered necessary. Further, the peak traffic flows associated with school traffic will not occur simultaneously with the PM peak period of Murdoch Street when most right turns would be occurring (i.e. people returning home).

SIDRA modelling for intersection 3 and 5 does not meet the performance criteria for signalised intersection as outlined in the DIT traffic modelling Guidelines: SIDRA intersection. Will be assessed in detail as part of "The Island" and Stages 18, 21 and 26 DA variation lodgement. To be reviewed and verified by DIT for signal phasing, cycle length and intergreen times.

It is noted that the modelling as part of Precinct 3a is an update to the modelling that has been completed as part of the previously approved Precinct 2 development. The traffic volumes have been updated to reflect the changes in dwellings/staging of the development.

The intersection modelling meets DIT requirements except for a LOS E at Intersection 5 in the Ultimate scenario. It is noted that the Ultimate scenarios will be subject to review based on the development of a secondary access to Riverlea.

As the extension of Riverlea Boulevard is not built as part of this stage, has the provided SIDRA modelling captured the level of service relating to Monash Avenue? Specifically, how does the road function in the interim with the level of traffic flows generating from the proposed development.

The SIDRA modelling has been undertaken with the assumption that there will be no extension of Riverlea Boulevard as part of this stage. The SIDRA modelling indicates that the Monash Avenue/Riverlea Boulevard intersection (Intersection 6) will operate effectively in the interim.

As per Paragraphs 3 & 4 – The assumptions relating to traffic/intersection capacity modelling and capacity taking into account "approx. 650 dwellings from the future Precinct 3 west", and "...the increase in Precinct 2 island yield." should be confirmed with a schedule of all approved and known increases in dwelling numbers i.e. including the full changes to the Island, Stages 18-21 +26, Stage 36, Stage 37 so that Council (and DIT) have the full understanding and the subsequent assessment required.

Please note that Condition 20 of the Precinct 2 AEIS DA approval stated that:

20. Prior to approval of a master plan for the development of any part or component of Precinct 3, an amended Traffic Impact Assessment (TIA) shall be prepared and submitted to provide the following information and achieve identified outcomes as follows:

- Analysis of secondary access to the development and associated traffic volumes supported by updated AIMSUM network and SIDRA modelling.
- Capacity of Riverlea Boulevard and the traffic volumes servicing future Precincts 4.

- **Works associated with intersection upgrades required to accommodate a minimum of 50% of occupied residential dwellings in Precinct 3 (or a minimum of 1,500 dwellings in addition to total Precinct 2 dwellings).**
- Analysis of ultimate intersection scenario supported by SIDRA re-modelling to understand final intersection footprints and consequential impacts on intersection land curtilage and acquisition requirements.

Therefore, technically, Condition 20 has been triggered as Precinct 3A is “....a part of or a component of Precinct 3.”

The highlight bullet point is relevant to consider as the threshold/trigger “....a minimum of 1,500 dwellings in addition to total Precinct 2 dwellings)” has changed as the total Precinct 2 dwelling number are incrementally increasing by virtue of increases from the Island, Stages 18-21 +26, Stage 36, Stage 37, thus reducing the 1,500 dwelling threshold as the total unassessed dwelling numbers in Precinct 2 are now proposed to be increased significantly.

Therefore, Council requires clarity on the above and Walker must provide approved and updated (projected) dwelling numbers across all of Precinct 2 and Precinct 3 overall.

As the extension of Riverlea Boulevard is not built as part of this stage, has the provided SIDRA modelling captured the level of service relating to Monash Avenue? Specifically, how does the road function in the interim with the level of traffic flows generating from the proposed development.

The Precinct 3a TIA has been prepared with the consideration to the increase in apartments/dwellings of Precinct 2. The modelling of Precinct 2 Supplement and Precinct 3a account for the lower traffic generation associated with apartments compared to typical detached dwellings.

It is noted that there has been an increase in dwellings in the Precinct 2 island, as part of the dwelling breakdown of Precinct 2 supplement report and the trip distribution of Precinct 3a (which also considered internal and external trips of the various uses within the Precinct 2 island including assuming more local trips to the commercial uses in the island for instance from Precinct 3a).

However, the intersection upgrades have been reassessed based on approximately 1,380 dwellings in Precinct 3 (738 Precinct 3a dwellings, 650 future dwellings) compared to 1,500 assumed within the original Precinct 2 TIA report (which accommodates the increase in Precinct 2 island).

Should further information be required, please contact the undersigned at your convenience.

Yours sincerely

EMPIRICAL TRAFFIC ADVISORY



Paul Morris

Director

M.TransTraff



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Department for Environment and Water
Level 8, 81-95 Waymouth Street
Adelaide SA 5000
Attention: Kym Pryde

24 February 2026
Project #: WGA080163
Doc. WGA080163-LT-CV-0005_A
E: kym.pryde@sa.gov.au

Dear Kym,

RIVERLEA PRECINCT 3A - AEIS

This letter has been prepared in response to questions raised by the Department for Environment and Water in an email to Simon Neldner of DHUD on 9 February 2026.

1. WATER RESOURCES

DEW Query

The proposal outlines (Section 8.7.32 Clearence Consideration, page 20) "In addition, much of Riverlea has high (often fluctuating) groundwater levels with elevated salinity. The Council and service authorities encourage the installation of all services (water, sewer, stormwater connections, power, etc.) above groundwater levels."

DEW understand that due to shallow depth to groundwater, there is a potential risk of groundwater contamination should for example a leakage occurs from the sewer pipes leading to a potential contaminated water to discharge into the nearby groundwater dependent ecosystems (GDEs) or discharge into the marine environment. DEW suggests the proponent consider and address this risk in the risk assessment.

The stormwater investigations to date do not sufficiently address downstream risks, and the modelling for Precinct 3a contains several inaccuracies and an inadequate assessment of detention basin performance. These issues undermine confidence in the modelling and the potential impacts of the proposed development.

Ideally, the proponent would revise the modelling to alter the downstream boundary to the point where the Smith Creek channel discharges at the western extent of the salt fields to properly understand the downstream channel capacity and address concerns of potential flooding on adjacent land.

It is noted that the stormwater hydraulic modelling prepared to support the stormwater management approach, has been prepared using three different modelling packages, with no one model providing full details. It is suggested that the proponent consider revising the modelling that:

- *includes bend loss factors, and if there are none, this should be included in the 1D and 2D models*
- *extend all modelling to include the Thompson Creek and Smith Creek channels to appropriately assess downstream flood risk.*
- *Revise existing conditions 1% and Developed Conditions 1% maps, including revision of the depth legend which does not appear to match the colours and depths in the mapping.*
- *Address inconsistencies in the associated commentary.*

WGA/Walker Response

Vacuum sewer systems have been proposed at Riverlea to keep the sewer system above groundwater levels. The mainline sewers are typically welded HDPE and therefore leakage at joint risk is unlikely. Similarly, vacuum sewers work on negative pressure, therefore any leak in a pipe would normally draw air into the system as opposed to leak outwards. Leaks in the system would identify as faults on a line, and would ultimately need repair regardless unlike a gravity system where leaks can go undetected.

In regards to the Riverlea Detention Basin and Open Channel performance, WGA and Walker have been working with WaterTech, and the consultants that prepared both the Smith Creek SMP and the Gawler River Flood study in regards to the Riverlea development.

The Smith Creek Catchment SMP does have an older version of the Riverlea Development with a large detention basin within it, so the impacts of the development on Thompson's Outfall channel are considered to some degree already.

In consultation with WaterTech this week, we have extracted data from the Smith Creek model. The critical duration storm for Thompson's Outfall Channel as it passes the Riverlea Development is the 24-hour storm with a time to peak of 38 hours. The critical duration storm from the Riverlea Development from the Riverlea specific TUFLOW model is a 6-hour storm with a time to peak of just over six hours. Therefore, the impacts of detention within the smaller Riverlea catchment do not overlap with the much larger Smith Creek catchment to create combined peak effects.

The SMP has used two hydrologic models (TUFLOW and DRAINS). DRAINS is better for assessing the pit and pipe performance at the subdivision level, whereas, TUFLOW is better for assessing overall flood capacity performance and attenuation effects of open channel systems/basins. HEC-RAS has also been used in the Unsteady State to evaluate channel designs to determine tailwater conditions for internal drainage design. The catchment parameters used between DRAINS and TUFLOW are consistent, noting though that the models operate in different manners.

In terms of extending all models to include Thompson's Outfall channel, that would effectively need to include the entire Smith Creek Catchment. Based on the fact that Riverlea is already included in the current Smith Creek SMP, and the impacts on coincident peaks has been assessed by WGA and WaterTech, WGA do not feel like this is necessary at this stage as the peaks do not coincide. Refer to the Smith Creek SMP 1%AEP Map in Appendix A which shows that an earlier version of Riverlea open channels and basin are included in the model.

If DEW consider there are inconsistencies in the information presented, please be specific, so they can be considered and addressed.

2. DETENTION BASIN

DEW Query

The emptying of the proposed 250ML detention basin is dependent on capacity and water levels in the downstream channel and the assumptions used in the associated modelling are questioned. It is considered likely that for the 9-hour duration storm most of the flows in the Smith Creek channel will come from impervious areas including glasshouses and the upstream urban development, with little contribution from the hills catchments which is contrary to what is reported. Flows from impervious areas will reach the bottom of the catchment much faster than what is assumed in the report. There are several large detention basins between the urban area and Riverlea, such as the NEXY detention basin. It is considered likely that these will flatten and extend the hydrograph meaning the peak flow down Smith Creek is likely to prevent outflows for an extended time from Riverlea.

Additionally, the location of the proposed 250ML detention basin at the south of the development area is within an area shown in the WGA stormwater report Figure 5 as an area with groundwater levels at a depth of 0-1 metres. This has potential to limit the storage volume available to mitigate peak flows, and may have significant implications for the stormwater detention strategy for the development.

Ideally, the proponent would revisit the detailed design of the proposed basin to understand whether the proposed approach is workable. If groundwater limitations mean that the proposed detention basin is not feasible alternative options should be considered.

WGA/Walker Response

Refer to discussion regarding timing of the peaks between Riverlea Basin outfall 6 hours and Smith Creek catchment, 24 hours with 38-hour time to peak.

The TUFLOW model in the report effectively models a 1m water depth for a period of 15 hours at the outlet of the Riverlea Basin. Given the technical advice from WaterTech, this seems more than reasonable given the peak flow in Thompson's Outfall Channel is 38 hours in a 4-hour storm. The impacts of concurrent flows in Thompson's Outfall channel have been considered.

In terms of groundwater, as per what occurs on site in both naturally formed channels or engineered channels, groundwater is currently intercepted by the open channel and natural drainage network within the area. The excavation of a basin which has inverts matching the Thompson's Outfall channel which is free draining, will not compromise the detention capacity of the basin as no permanent water would be stored above the free draining outlet of the proposed basin.

Should you have any queries relating to this matter please contact our office.

Yours sincerely,

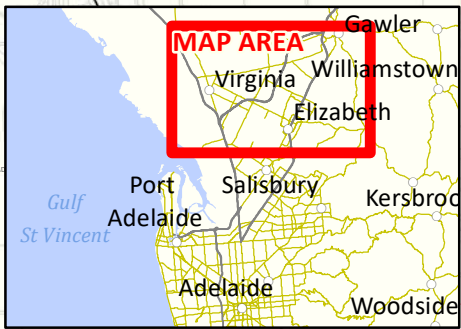
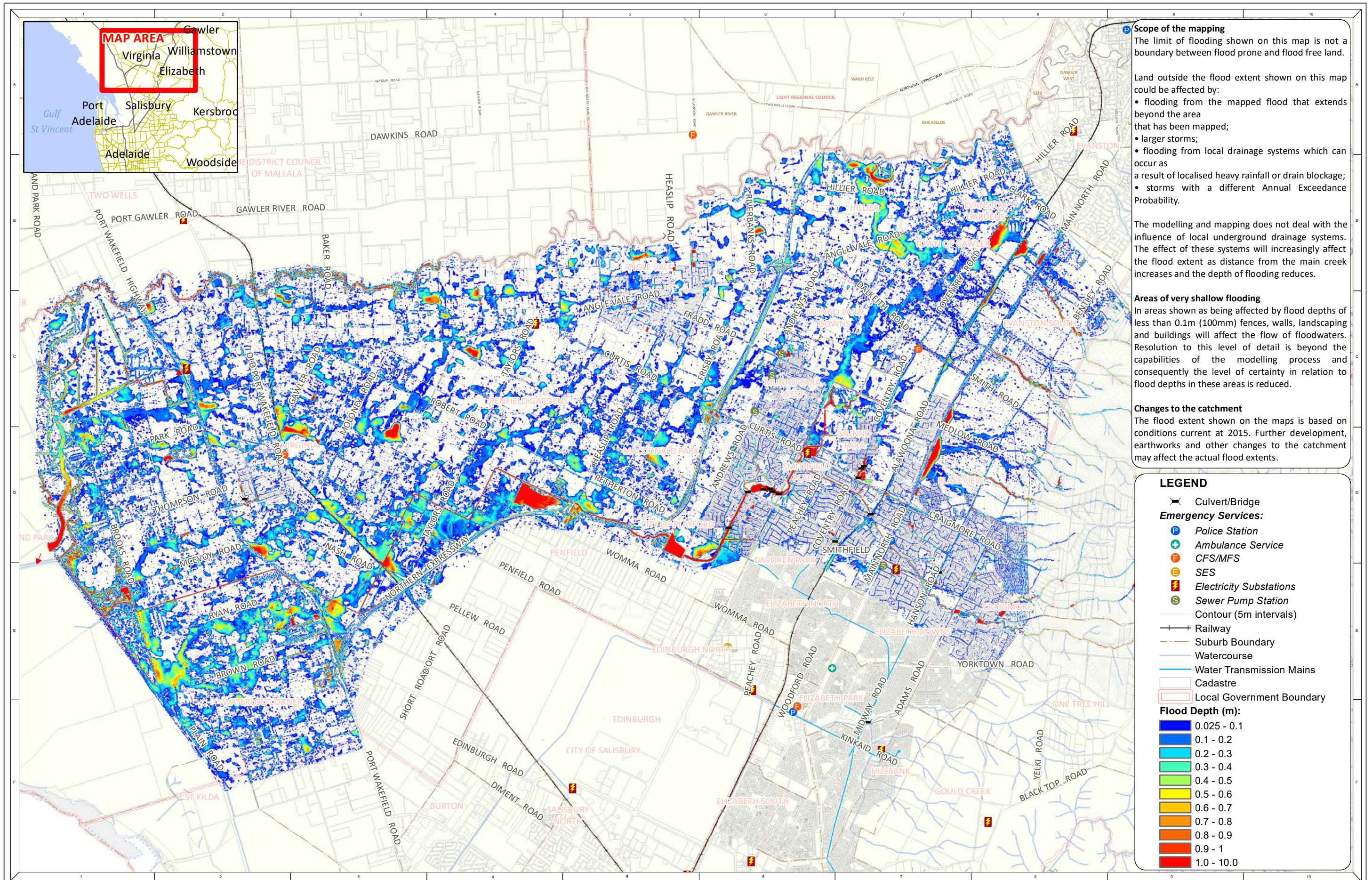


Damien Byrne
Director
WALLBRIDGE GILBERT AZTEC

APPENDIX A SMITH CREEK SMP 1%AEP

APPENDIX A

SMITH CREEK SMP 1%AEP



Scope of the mapping
The limit of flooding shown on this map is not a boundary between flood prone and flood free land.

Land outside the flood extent shown on this map could be affected by:

- flooding from the mapped flood that extends beyond the area that has been mapped;
- larger storms;
- flooding from local drainage systems which can occur as a result of localised heavy rainfall or drain blockage;
- storms with a different Annual Exceedance Probability.

The modelling and mapping does not deal with the influence of local underground drainage systems. The effect of these systems will increasingly affect the flood extent as distance from the main creek increases and the depth of flooding reduces.

Areas of very shallow flooding
In areas shown as being affected by flood depths of less than 0.1m (100mm) fences, walls, landscaping and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Changes to the catchment
The flood extent shown on the maps is based on conditions current at 2015. Further development, earthworks and other changes to the catchment may affect the actual flood extents.

LEGEND

- ✕ Culvert/Bridge
- Emergency Services:**
 - P Police Station
 - + Ambulance Service
 - F CFS/MFS
 - E SES
 - ⚡ Electricity Substations
 - S Sewer Pump Station
- Contour (5m intervals)
- Railway
- Suburb Boundary
- Watercourse
- Water Transmission Mains
- Cadastre
- Local Government Boundary

Flood Depth (m):

0.025 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
1.0 - 10.0

Data Source:
Flood data modelled by Water Technology; Roads, cadastre, culverts and bridges (within study area) supplied by City of Playford; Emergency service locations from Department for Communities and Social Inclusion; Railway alignments, local government boundaries and suburb boundaries from W Department of Planning, Transport and Infrastructure; Electricity substations from SA Power Networks; Watercourse alignment from Department of Water Land and Biodiversity Conservation; Sewer pump stations and water transmission lines from SA Water.

Disclaimer
This map is provided on the basis that those responsible for preparation and publication do not accept any responsibility for any loss or damage alleged to be suffered by anyone as a result of the publication of the map and the notations on it, or as a result of the use or misuse of the information provided herein.

0 0.5 1 2 3 4 Kilometers

Scale 1:70,000 at A3



MEMORANDUM

Subject: **Intersection Assessment: Riverlea Boulevard & Central Drive / Port Wakefield Highway**

Project: Riverlea Masterplan

Issue: Final

Prepared by: Pentelic Advisory Pty Ltd Date: 15 July 2025

To: Walker Corporation Copies to: City of Playford

1. Introduction

1.1. Background

Walker Corporation has engaged Pentelic Advisory Pty Ltd to undertake updated traffic modelling for the Riverlea Boulevard and Central Drive intersection, a key access point for the Riverlea Park planned District Centre. Riverlea Park is a master-planned community that will evolve into a vibrant hub, featuring over 12,000 homes, open spaces, schools, and public transport for approximately 33,000 residents.

Following the 2009 Buckland Park Traffic Impact Assessment, a high-level access strategy for Riverlea Park and Buckland Park was recently completed for the Department for Infrastructure and Transport (DIT). This updated assessment considers changes to the Riverlea Park Masterplan, future urban land releases in Buckland Park, and the need for efficient and safe access to Port Wakefield Highway and Riverlea Boulevard.

As part of the *Riverlea Park and Buckland Park Access Strategy Framework*, an indicative structure plan was developed by URPS, outlining proposed land uses and an integrated transport network that impacts the entire study area. This indicative structure plan provided a framework for guiding future investigation work by key stakeholder Agencies and Authorities. By establishing a clear vision for the future development of Riverlea Park and Buckland Park, the plan informed the growth of this strategic growth area as identified by the *Greater Adelaide Regional Plan* (GARP).

The *Riverlea Park and Buckland Park Indicative Structure Plan* was tested using the Tactical Adelaide Model (TAM) in close consultation with Department of Infrastructure and Transport (DIT). TAM assessed key interchanges and intersections along Port Wakefield Highway and Riverlea Boulevard. The modelling informed optimisation of Riverlea Boulevard's future function, access and intersection options. The plan guided the future spatial footprint of the Riverlea Boulevard and Central Drive/Reedy Road intersection to support the precinct's growth and connectivity.

The outputs from TAM were extracted and further analysed using SIDRA to investigate the future layout and configuration of the Riverlea Boulevard and Central Drive/Reedy Road intersection, considering growth and network-wide implications associated with the proposed structure plan.

This technical memorandum presents an assessment of the Riverlea Boulevard and Central Drive/Reedy Road intersection, focusing on staged implementation in line with development staging. The analysis determines the optimal layout and configuration for each stage, taking into account the intersection's interaction with the Port Wakefield Highway and Angle Vale Road intersection. By evaluating the intersection's performance under various staging scenarios, this memorandum provides valuable insights for informed decision-making and effective infrastructure planning.

1.2. Purpose and scope

This technical memorandum presents the findings of a traffic assessment for Riverlea Park, utilising AIMSUN and SIDRA modelling, recent traffic survey data, and growth forecasts from DIT's Tactical Adelaide Model (TAM) and the indicative structure plan. The assessment focuses on the intersections of Riverlea Boulevard and Central Drive, including the interaction with Port Wakefield Highway and Angle Vale Road, to determine the overall network implications. The assessment examines the development staging and road network staging for the intersections of Riverlea Boulevard with Central Drive and Port Wakefield Highway, considering spatial options identified in the *Riverlea Park and Buckland Park Access Strategy Framework* to ensure effective infrastructure planning.

1.3. Study area

The study area encompasses the wider Riverlea Park and Buckland Park region, but the intersection assessment specifically focuses on Riverlea Boulevard between Port Wakefield Highway and Central Drive/Reedy Road. Located within the City of Playford council area, the study area aligns with the existing Riverlea Park development and the *Greater Adelaide Regional Plan* (GARP), with potential future expansion to the south. The area is bounded by the Gawler River to the north, Port Wakefield Highway to the east, and Ryan Road to the south.

The study area, covering approximately 2,223 hectares across Riverlea, Buckland Park, and Waterloo Corner, is poised for significant development and employment growth (Figure 1). To accommodate the anticipated surge in population, employment, and travel demand, it's crucial to plan a holistic and integrated transport network and access strategy for the Port Wakefield Highway corridor and Riverlea Boulevard.

By considering the wider implications and network requirements, a more coherent and integrated approach can be achieved, minimising the need for overprovision of road infrastructure once full development potential is reached, while ensuring future travel patterns are aligned with a seamless network.

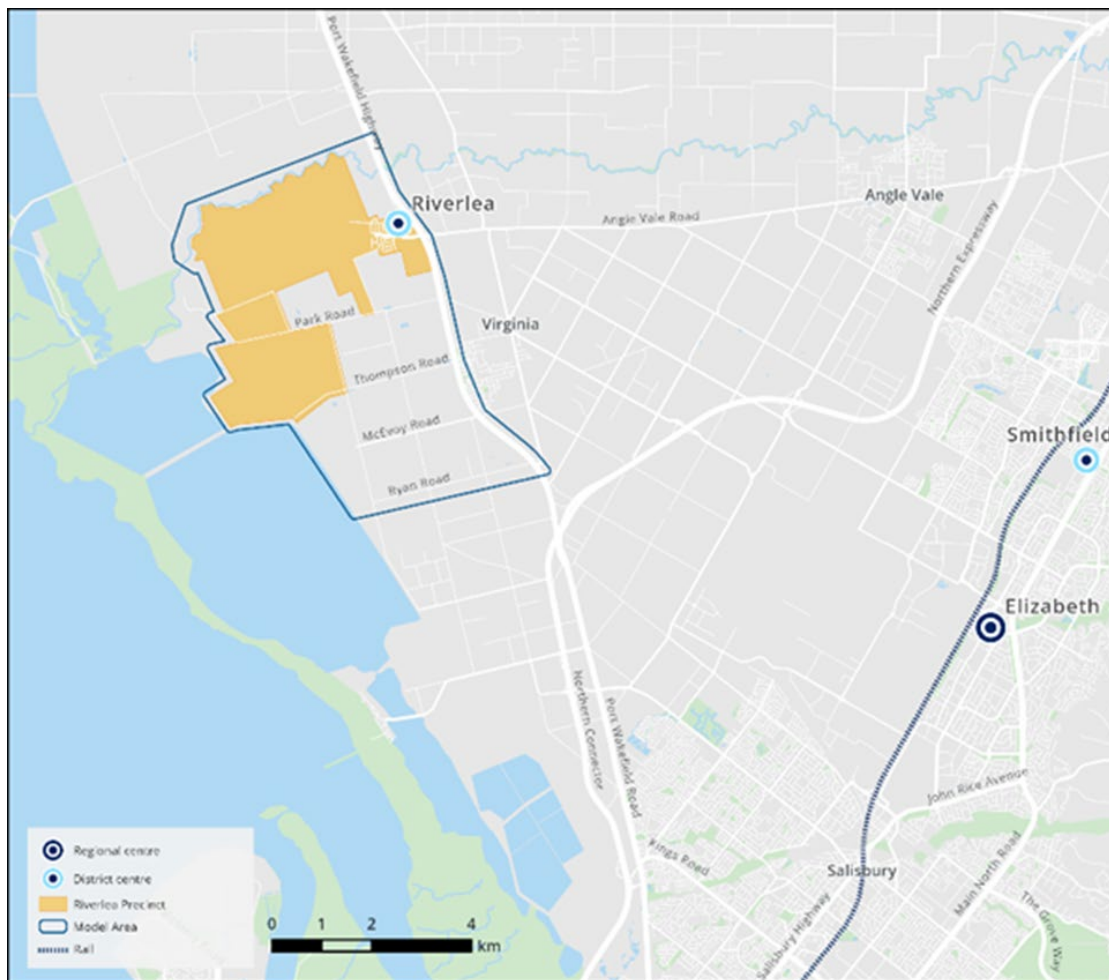


Figure 1 – Riverlea Park and Buckland Park study area

1.4. Key considerations for this assessment

Riverlea Park and Buckland Park Access Strategy Framework

This assessment has built upon the *Riverlea Park and Buckland Park Access Strategy Framework (June, 2025)*, which was informed by an Indicative Structure Plan developed by URPS for the project. The strategy aimed to assess the implications of growth and development along the Port Wakefield Highway corridor including Riverlea Boulevard and create a highly interconnected and transport-oriented urban form, accommodating a projected population of approximately 90,000-100,000 people and up to 30,000+ homes. The assessment focused on the potential role of Riverlea Park as a regional centre within the emerging transport networks and urban structure of the Northern Growth Areas.

The analysis identifies key requirements for the preferred road network (as illustrated in Figure 2), which is designed to support the ultimate development stage (2041 and beyond) for both Riverlea and Buckland Park. These requirements include:

- **Riverlea Boulevard:** 4-lane configuration (2 lanes each way) between Central Drive and Port Wakefield Highway, with localised widening at the Central Drive and Angle Vale Road intersections to accommodate 2041 traffic demand.

- **Port Wakefield Highway:** 6-lane configuration (3 lanes each way) from Riverlea Boulevard-Angle Vale Road to south of Ryan Road to accommodate 2041 forecast traffic demand. This configuration also includes a left-in access via Port Wakefield Highway between Carmelo Road and Riverlea Boulevard.
- **Port Wakefield Highway (PWH) interchanges:** Three ‘diamond’ interchanges between Riverlea Boulevard and Ryan Road, specifically at:
 - Riverlea Boulevard and Angle Vale Road (full ramp access)
 - Carmelo Road-Park Road (partial south facing ramp access only)
 - Ryan Road and Old Port Wakefield Highway (full ramp access)

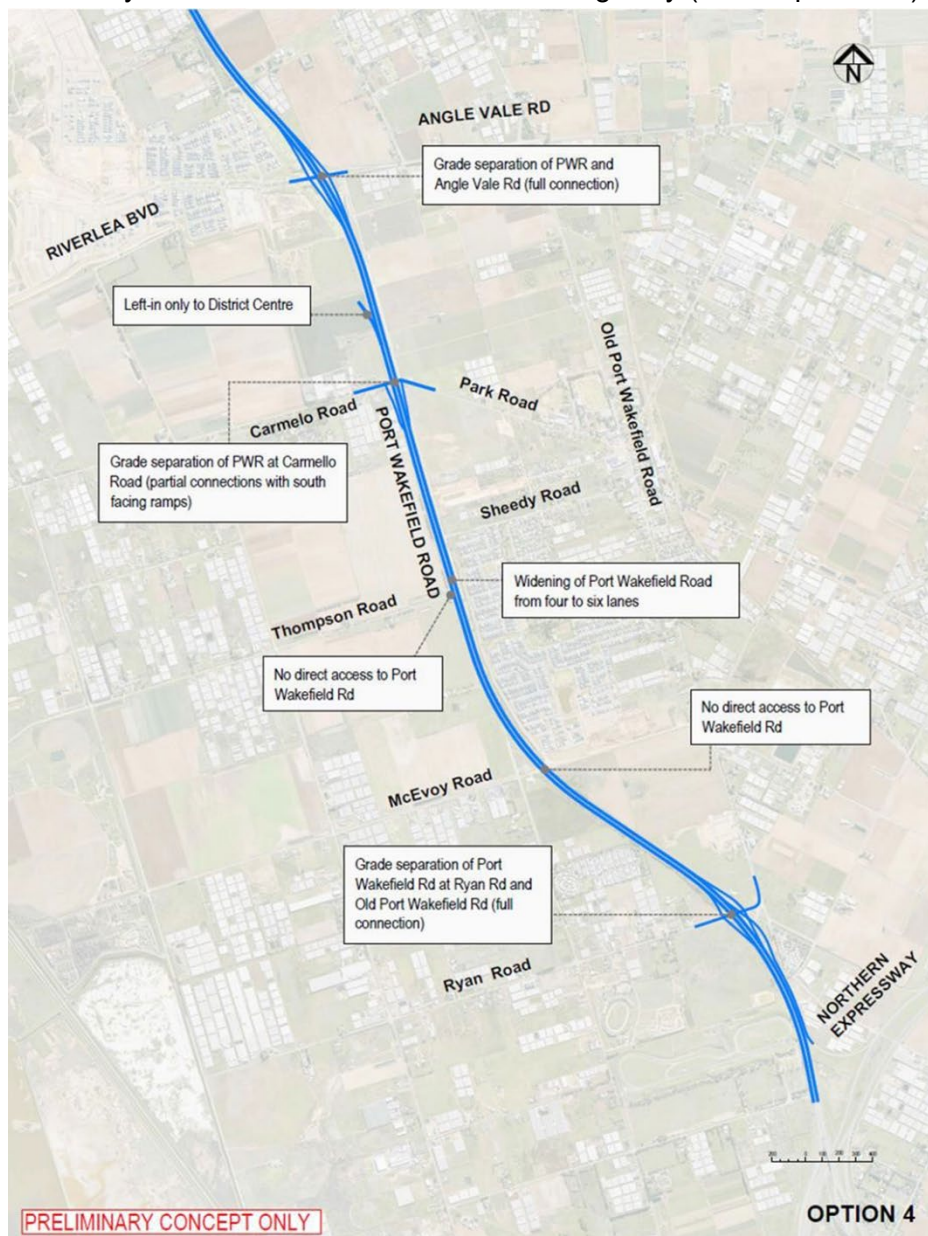


Figure 2: Indicative “preferred” interchange locations on Port Wakefield Highway

Note: Indicative interchanges are notional and indicative, and do not represent any commitment by landowners to deliver or fund the proposed network and infrastructure

Riverlea Park and Buckland Park Indicative Structure Plan

The assessment has leveraged the structure plan for Riverlea Park and Buckland Park, considering the urban structure, road network, public transport network, and land use yields, as well as their implications on Port Wakefield Highway and Riverlea Boulevard. The indicative structure plan (Figure 3) guides future investigation work, establishing a clear vision for Riverlea Park and Buckland Park's development, shaping growth, and supporting vibrant, connected, and sustainable communities. The plan promotes integrated land use and transport planning, aiming to reduce congestion and enhance liveability by concentrating higher density development around transport nodes, and creating mixed-use centres that support walkability, cycling, and public transport use. The indicative structure plan illustrates key aspects of the future development of the area, including:

- Grade-separated interchange connections to Port Wakefield Highway for enhanced accessibility and safety.
- A north-south mass transit corridor connecting Riverlea Park to Adelaide CBD, with a rail station and transport interchange at its heart.
- Mixed-use centres integrated with transport networks, supporting connected communities.
- Gradated development densities, with higher density around transport nodes and lower density near intermediate stops.
- A connected road grid including a left-in only access to the proposed Riverlea District Centre from Port Wakefield Highway (between Riverlea Boulevard and Carmelo Road-Park Road).



Figure 3: Riverlea Park and Buckland Park Indicative Structure Plan

Note: Indicative structure plan is notional and indicative, and do not represent any commitment by landowners to deliver or fund the proposed network and infrastructure

Riverlea Park and Buckland Park sub-area microsimulation model

The assessment of the Riverlea Boulevard and Central Drive intersection has built upon recent traffic modelling work conducted in close collaboration with the Department of Infrastructure and Transport (DIT). As part of the *Riverlea Park and Buckland Park Access Strategy Framework* (June, 2025), a bespoke modelling framework was developed using the Tactical Adelaide Model (TAM) and a sub-area microsimulation model. This approach was endorsed by DIT through the *Riverlea Park Transport Modelling Scoping Document (TMSD)* and has undergone rigorous testing, validation, and peer review.

The AIMSUN model has been deemed "fit for purpose" after successfully passing an independent audit review by AIMSUN and further review by DIT subject matter experts. Minor adjustments were made to address feedback, ensuring the model's reliability and accuracy. With the base model meeting DIT's requirements, it provides a solid foundation for assessing the Riverlea Boulevard and Central Drive/Reedy Road intersection, informing the *Riverlea Park and Buckland Park Access Strategy Framework*, and supporting high-level assessments of future developments.

The microsimulation model area, shown in Figure 4, covers Riverlea Park and Buckland Park development growth areas within the City of Playford council area. This microsimulation area was used for the access strategy and intersection assessment, specifically for Riverlea Boulevard and Central Drive/Reedy Road, including Port Wakefield Highway and Angle Vale Road.

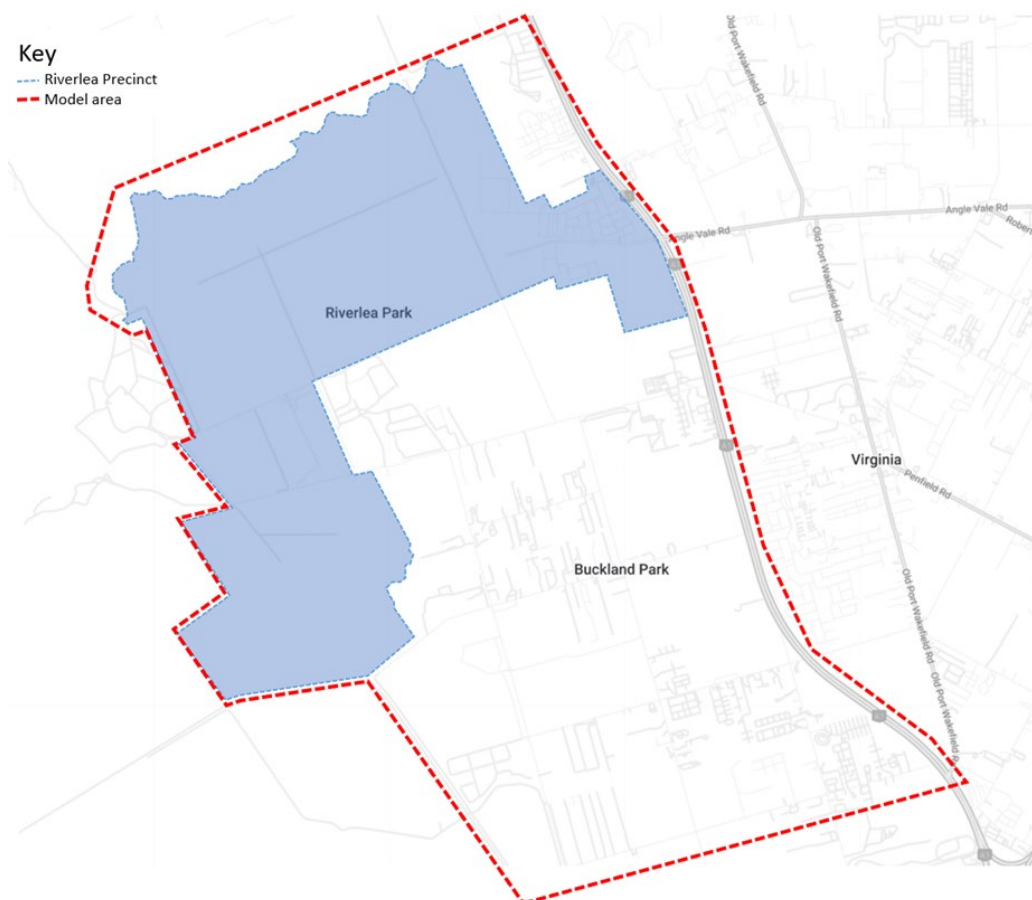


Figure 4: Microsimulation model geographical area

1.5. Assumptions and limitations

The traffic assessment presented in this technical memorandum is based on the following key assumptions and limitations, which underpin the analysis and findings:

- **AIMSUN Model:** The AIMSUN model (Version 23.0.1) was developed based on a sub-area of the Tactical Adelaide Model (TAM) provided by DIT on August 22, 2024.
- **Model Duration:** The model covers the morning peak (7AM-10AM) and evening peak (3PM-7PM), each preceded by a 30-minute warm-up period.
- **Calibration and Validation:** The model was calibrated and validated using traffic survey data, including intersection turning movement counts and floating car travel time surveys conducted between October and November 2024.
- **Assignment Methodology:** The model employs the assignment methodology outlined in the Tactical Adelaide Model Guidelines (DIT 2024), using per-hour static assignment scenarios and microscopic Stochastic Route Choice (SRC) assignments over a minimum of five seed runs.
- **Vehicle Classes:** The model includes standard DIT vehicle classes for cars, rigid trucks, and buses.
- **Travel Zoning:** The zoning system is based on the existing TAM sub-area, with additional zones created for new roads crossing the model cordon.
- **Traffic Signals:** Actuated traffic signal logic was modelled using SCATS timing data provided by DIT, with implicit consideration of pedestrian and cyclist impacts through minimum phase times and left-turn delays.
- **Signal Coordination:** Traffic signal coordination prioritises eastbound movement along Riverlea Boulevard during the morning peak and westbound movement during the evening peak.

1.6. Technical memorandum structure

This technical memorandum is comprised of the following sections:

- **Section 1: Introduction:** Outlines the assessment context, purpose, study area, and key assumptions, supported by key reference documents that underpin the analysis.
- **Section 2: Existing conditions:** Outlines the existing conditions, including traffic volumes and intersection performance at key locations: Riverlea Boulevard and Central Drive/Reedy Road, and Port Wakefield Highway and Angle Vale Road.
- **Section 3: Traffic growth and future traffic demand forecasts:** Details the approach to forecasting future traffic volumes through key locations, considering background growth, land use yields, and trip generation potential.
- **Section 4: Intersection evaluations: Riverlea Boulevard between Central Drive and Port Wakefield Highway:** Outlines the methodology, network assumptions, and infrastructure needs, providing a staging plan for road network upgrades to support the Riverlea Masterplan's growth.
- **Section 5: Conclusion:** Outlines key findings on the optimal configuration for intersections along Riverlea Boulevard between Central Drive and Port Wakefield Highway, informed by future performance assessments and aligned with the *Riverlea Park and Buckland Park Access Strategy Framework*.

2. Existing conditions

This section presents an analysis of the existing conditions at key intersections in the Riverlea Park and Buckland Park area, based on intersection turning movement counts and SIDRA analysis. The existing assessment aims to establish a baseline understanding of current intersection performance, providing a foundation for evaluating future traffic demands and infrastructure needs. The analysis will inform the development of future intersection performance along Riverlea Boulevard between Central Drive/Reedy Road and Port Wakefield Highway.

2.1. Existing traffic volumes

Table 1 provides a summary of mid-block traffic volumes on Port Wakefield Highway and Riverlea Boulevard as surveyed in October 2024.

Table 1: Existing 2024 peak hour traffic volumes on Port Wakefield Highway and Riverlea Boulevard

Road	Location	Direction	2024 Morning Peak	2024 Evening Peak
Port Wakefield Highway	North of Angle Vale Road	Southbound	626	762
Port Wakfield Road	South of Angle Vale Road	Northbound	716	750
Angle Vale Road	East of Port Wakefield Highway	Westbound	327	251
Riverlea Boulevard	West of Port Wakefield Highway	Eastbound	157	167
Riverlea Boulevard	East of Reedy Road	Westbound	202	121
Riverlea Boulevard	West of Reedy Road	Eastbound	159	167
Reedy Road	North of Riverlea Boulevard	Southbound	<10	<10

2.2. Existing intersection performance

Table 2 provides a summary of the intersection Level of Service criteria for traffic signals, roundabouts, give way and stop sign-controlled intersections. As agreed with DIT as part of the *Riverlea Park and Buckland Park Access Strategy Framework*, intersections are expected to operate at an overall Level of Service (LoS) D or better. Based on these criteria, performance has been assessed using SIDRA intersection modelling for the following intersections:

- Port Wakefield Highway, Angle Vale Road and Riverlea Boulevard
- Riverlea Boulevard and Reedy Road (southern approach for this intersection was closed to general traffic at the time traffic surveys were undertaken).

A summary of intersection performance by approach under the 2024 survey conditions is provided in Table 3 and Table 4. The intersection performance indicates that both intersections operate satisfactorily under existing traffic volumes, with overall intersection delay and Degree of Saturation meeting the performance criteria of LoS D or better and Degree of Saturation less than 0.8.

Table 2: Level of Service Criteria for intersections

Level of Service	Degree of Saturation	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	<0.8	<14	Good operation	Good operation
B	<0.8	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	<0.8	29 to 42	Satisfactory	Satisfactory, but with accident study required
D	<0.8	43 to 56	Operating near capacity	Near capacity and accident study required
E	<0.8	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control	At capacity, requires other control modes
F	>0.8	>70	Unsatisfactory	Unsatisfactory

Table 3: Existing 2024 Port Wakefield Highway and Riverlea Boulevard intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Port Wakefield Highway North	664	22.9	84.7	0.353	B	802	24.4	103.8	0.421	B
Angle Vale Road East	343	47.4	65.2	0.359	D	264	48.0	39.0	0.406	D
Port Wakefield Highway South	753	25.9	83.7	0.348	B	789	27.7	92.3	0.413	B
Riverlea Boulevard West	164	60.7	22.9	0.331	E	176	61.5	26.8	0.406	E
Overall Intersection	1927	31.7	-	0.359	C	2032	31.9	-	0.421	C

Table 4: Existing 2024 Riverlea Boulevard and Central Drive intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Reedy Road North	11	12.4	0.3	0.011	A	11	11.4	0.2	0.009	A
Riverlea Boulevard East	212	6.2	0.3	0.051	A	132	6.2	0.1	0.033	A
Riverlea Boulevard West	173	5.6	0.3	0.045	A	181	5.6	0.0	0.047	A
Overall Intersection	395	12.4	-	0.051	A	323	11.4	-	0.047	A

3. Traffic growth and future traffic demand forecasts

This section outlines the methodology and assumptions used to estimate future traffic demand for the Riverlea Park and Buckland Park area as agreed with DIT. Building on the *Riverlea Park and Buckland Park Access Strategy Framework and Indicative Structure Plan*, the assessment considers background traffic growth, land use development, trip generation potential, and trip distribution patterns to inform the planning of key road network infrastructure, including Riverlea Boulevard between Central Drive and Port Wakefield Highway.

3.1. Background traffic growth

The approach adopted for the *Riverlea Park and Buckland Park Access Strategy Framework*, as agreed with DIT, was used for this assessment. Future traffic demand was developed using a robust methodology accounting for background growth and development impacts. Background traffic demand was sourced from the Tactical Adelaide Model (TAM), with growth calculated and applied to the calibrated microsimulation model. The calculation involved factoring TAM growth to account for different base years and converting hourly growth to 15-minute intervals. The methodology involved:

- Calculating the quantum difference between future and base year demand from TAM sub-area traversals.
- Applying this quantum to the calibrated base demand of the Riverlea Park and Buckland Park microsimulation sub-area traffic model to generate the future "Do Minimum" traffic demand.

The background traffic growth calculation involved:

- Determining the TAM quantum of growth (2041 TAM - 2021 TAM).
- Factoring the TAM quantum to account for the different base year (2024) using the formula $(2041-2024)/(2041-2021) = 0.85$
- Converting the TAM quantum from hourly to 15-minute intervals using 2024 profile factors
- Adding the factored TAM quantum to the calibrated Riverlea and Buckland Park demand for each 15-minute period.

This method for calculating background traffic resulted in the following traffic growth rates (excluding traffic travelling into and out of Riverlea Boulevard):

- **Port Wakefield Highway North:** 0.9 per cent and -0.1 per cent per annum for morning and evening peak periods respectively.
- **Port Wakefield Highway South:** -0.1 per cent and 0.9 per cent per annum for morning and evening peak periods respectively.
- **Angle Vale Road South:** 4.6 per cent and -0.5 per cent per annum for morning and evening peak periods respectively.

3.2. Future land use and developable precincts

The *Riverlea Park and Buckland Park Indicative Structure Plan* integrates transport, land use, and community needs to create a vibrant and sustainable urban environment. This approach supports the Greater Adelaide Regional Plan's (GARP's) vision for Riverlea Park as a key activity centre and

transport hub. The plan was used to guide traffic modelling in this assessment, in assessing network-wide implications of potential land use demands, and provided a foundation for future planning of both Port Wakefield Highway and Riverlea Boulevard.

Riverlea Park and Buckland Park's spatial structure centres around linear mass and intermediate transit corridors, featuring frequent bus services and potential rail integration. These transport spines will be supported by mixed-use centres with concentrated development density, connecting residents to local and regional opportunities, jobs, and facilities within Greater Adelaide and beyond.

The Riverlea Park and Buckland Park Indicative Structure Plan was used to determine the traffic generation potential for the development. The plan's land use yields (Figure 5), which include up to 30,000+ homes, employment opportunities, retail centres, community facilities, and integrated transport networks, formed the basis of estimating the traffic demand generated by the development.

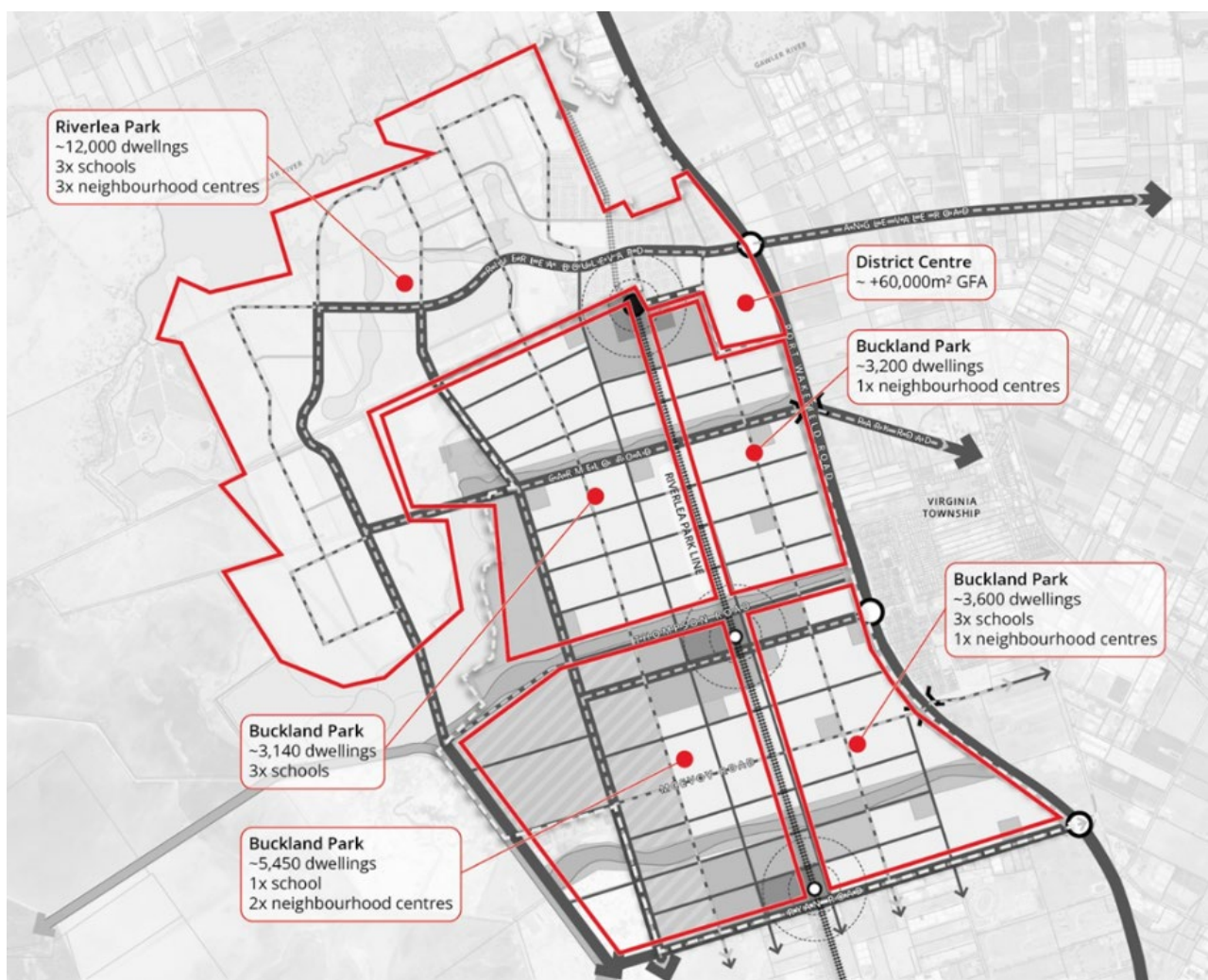


Figure 5: Indicative land use plan and forecasts

Note: Land use yields presented is notional and indicative only and subject to change

3.3. Trip generation potential

The Riverlea Park and Buckland Park transport vision aims to create a vibrant and sustainable community with a future transport network that seamlessly connects with existing and future city-serving rail and bus networks. In line with the agreed-upon vision, trip generation rates have been developed and approved by the DIT as part of the Access Strategy Framework. Specifically, most trip rates were approved through the *Transport Model Scoping Document (TMSD)* by DIT and have been updated to reflect the latest trip generation data from *Transport for NSW's Guide to Transport Impact Assessment (2024)*, ensuring a robust and evidence-based approach.

The trip generation rates and assumptions prioritise sustainability, liveability, and community well-being, with key updates including a 10-30% mode shift reduction, 7% reduction in journey-to-work trips, 40-50% trip containment, and 25% reduction in retail trips. These updates reflect a vision-led approach to building a sustainable and liveable precinct.

The adopted trip generation rates and traffic generation potential for horizon year 2041 (ultimate development) are outlined in Table 5 and Table 6, providing a framework for sustainable transportation planning. The approach aims to reduce the precinct's footprint while enhancing the quality of life for its residents, showcasing a forward-thinking approach to urban development.

Table 5: Trip generation rates for future land uses

Land Use	Metric	AM Trip Rate	PM Trip Rate
Residential Low Density	per dwelling	0.71	0.71
Residential Medium Density (near key transit nodes)	per dwelling	0.46	0.46
Residential High Density (near mass transit nodes)	per dwelling	0.20	0.20
Neighbourhood Centre Retail	Sqm GLFA	0.076	0.216
Large Shopping Centre	Sqm GLFA	0.0199	0.0383
Primary School	Number of students	0.67	0.53
Secondary School	Number of students	0.51	0.28
Commercial	Sqm GLFA	0.0099	0.0096

Table 6: Summary of traffic generation potential for Riverlea and Buckland Park (2041 ultimate)

Land Use	Metric	Quantum	AM Rate	PM Rate	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
Residential Low Density	per dwelling	15,354	0.71	0.71	2,180	8,721	8,721	2,180
Residential Medium Density	per dwelling	7,001	0.46	0.46	644	2,576	2,576	644
Residential High Density	per dwelling	7,001	0.2	0.2	202	808	808	202
Neighbourhood Centre Retail	Sqm GLFA	61,919	0.076	0.216	1,765	1,765	3,464	3,464
Large Shopping Centre	Sqm GLFA	58,093	0.0199	0.0383	434	434	834	834
Primary School	Number of students	11,400	0.67	0.53	3,819	3,819	3,021	3,021
Secondary School	Number of students	5,400	0.51	0.28	1,377	1,377	756	756
Commercial	Sqm GLFA	6,081	0.0099	0.0096	48	12	12	47

3.4. Trip distribution

An integrated trip distribution approach was developed for the *Riverlea Precinct and Buckland Park Access Strategy Framework*, guided by key principles. The approach generates and attracts local trips within the precincts proportionally to the number of dwellings, while distributing excess trips to external zones using the Strategic Adelaide Model (SAM) sub-area distribution. Aiming for trip containment, the approach targets around 50% of total trips to be internal for the ultimate development potential.

Adjustments were made to reflect planned changes to the future road network. Notably, 50% of trips to and from Angle Vale Road (east) were redistributed to Park Road (east), and 30% of trips heading to Port Wakefield Highway (south) were rerouted through new local roads as outlined in the *Riverlea Park and Buckland Park Indicative Structure Plan*. These adjustments provide valuable insights into estimated future traffic patterns and trip generation within the precincts, based on the ultimate road network envisioned in the structure plan. The trip distribution patterns between Riverlea Precinct, Buckland Park, and external travel zones are illustrated in Figure 6 and Figure 7.



Figure 6: 2041 morning peak distribution of internal-external trips



Figure 7: 2041 evening peak distribution of internal-external trips

3.5. Future traffic demand (2041 ultimate)

Figure 8 summarises the total traffic demand for base and future years (2041), providing an overview of expected traffic demand for Riverlea Park and Buckland Park development precincts. This informed the decision-making and planning for the *Riverlea Park and Buckland Park Access Strategy Framework*, and has been used to inform the spatial intersection footprints and layouts of Riverlea Boulevard and Central Drive and Riverlea Boulevard and Port Wakefield Highway.

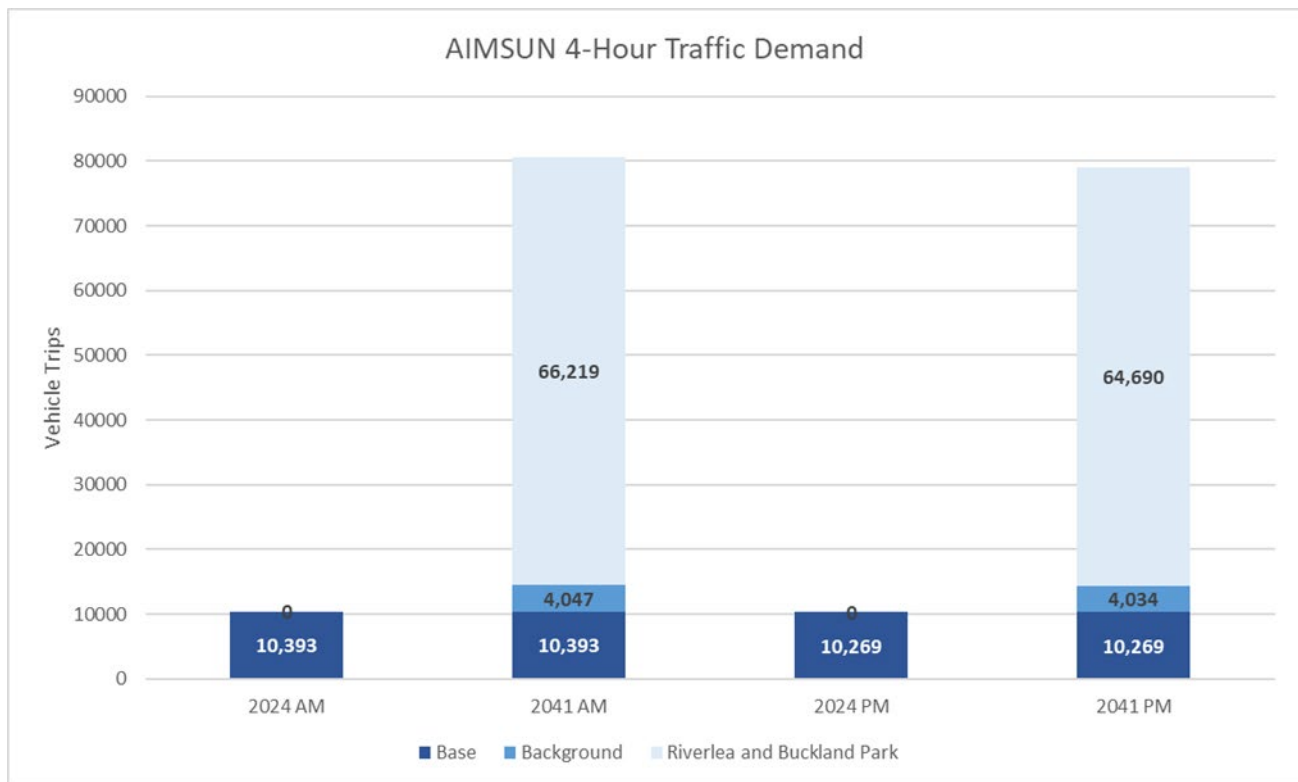


Figure 8: Summary of peak hour traffic demand for Riverlea Park and Buckland Park (2041 ultimate)

4. Intersection evaluations: Riverlea Boulevard between Central Drive and Port Wakefield Highway

This section outlines the methodology and findings of the traffic assessment for the Riverlea Park and Buckland Park area, as per the Indicative Structure Plan. With a focus on staging, the assessment evaluates the future transportation infrastructure needs and performance of Riverlea Boulevard between Central Drive and Port Wakefield Highway, in line with the proposed development staging. The analysis encompasses network assumptions, road network performance measures, future traffic volumes, network congestion, and intersection performance, with a particular emphasis on staging requirements. Proposed intersection layouts and upgrades are presented, tailored to each development stage and informed by traffic modelling.

4.1. Overall approach to assessment

To ensure the efficient delivery of the Riverlea Masterplan, a multi-decade project comprising approximately 12,000 new homes, an indicative road staging plan has been developed. This plan strategically stages the road network to meet short-term, medium-term, and long-term needs, aligning with the Masterplan's transport objectives. Notably, the ultimate development and network were used to stress-test various development stages, examining the network's performance prior to full build-out and confirming that grade separation of Port Wakefield Highway is not required. Detailed operational traffic modelling using AIMSUN and SIDRA has been undertaken to refine the road network, enabling the development of more detailed network staging and ensuring sufficient capacity to support the proposed development yield throughout its phased delivery.

The traffic assessment built upon the *Riverlea Park and Buckland Park Access Strategy Framework*, utilising a bespoke microsimulation model based on the Tactical Adelaide Model (TAM). Specifically, the AIMSUN model reflected the planned road network as per the *Riverlea Park and Buckland Park Indicative Structure Plan*, enabling accurate traffic volume forecasts. In collaboration with the Department of Infrastructure and Transport (DIT), traffic volume outputs for each development staging horizon year were extracted from the AIMSUN model and used as inputs for SIDRA intersection models at key locations (Figure 9), including:

- #1 Riverlea Boulevard and Port Wakefield Highway/Angle Vale Road
- #2 Riverlea Boulevard and Central Drive/Reedy Road

SIDRA Intersection (version 9) was used to analyse the weekday peak periods, adopting a network-based approach that grouped intersections with continuous traffic flows. The assessment evaluated intersection capacities, queue lengths, and delays using SIDRA modelling, in accordance with *DIT's Traffic Modelling Guidelines*. Key intersections were assessed using SIDRA Intersection (Version 9.1.6), with the methodology for integrating SIDRA intersection analysis outlined in Figure 10.

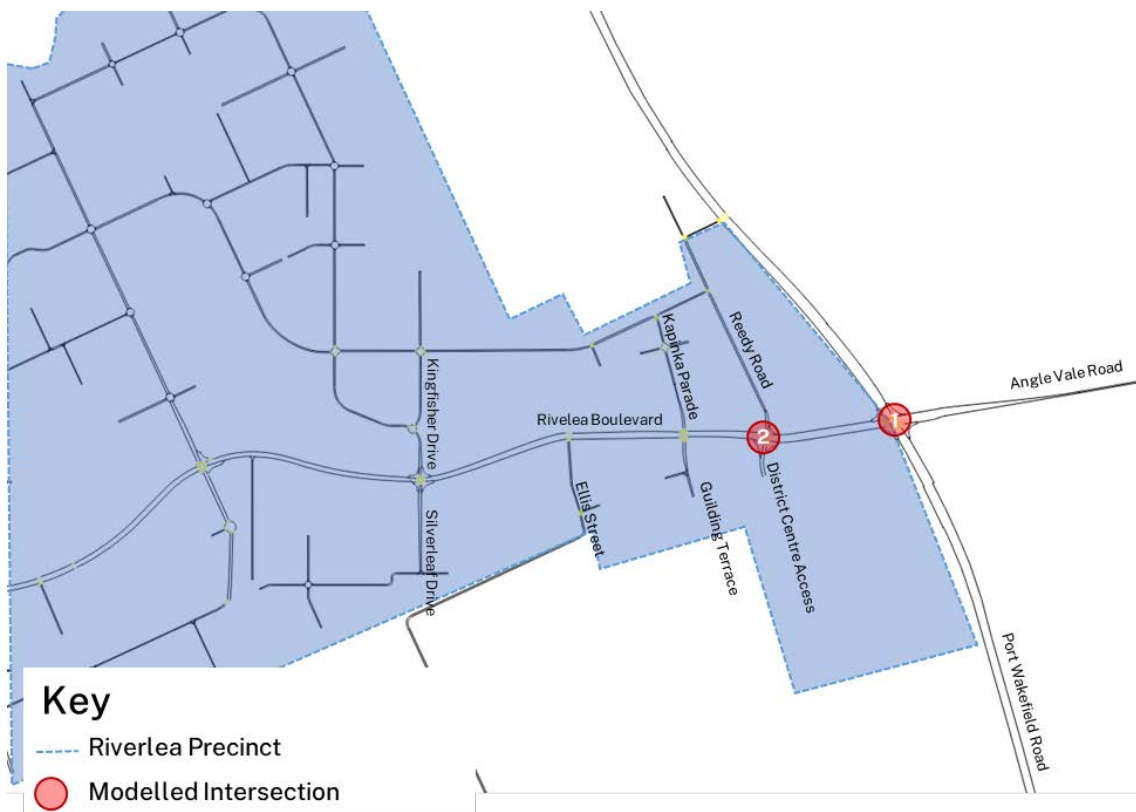


Figure 9: Intersections modelled in SIDRA

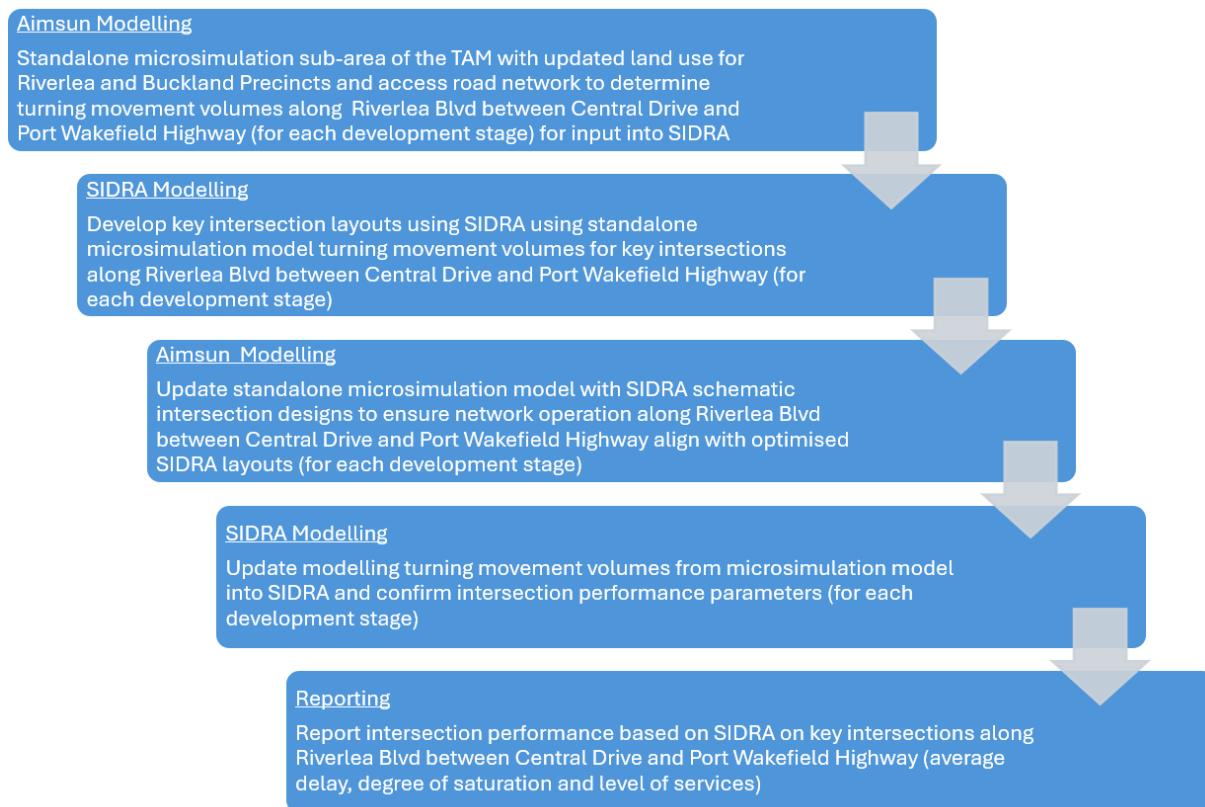


Figure 10: Intersection modelling and evaluation process

4.2. Development and network staging methodology

Determining development yield and triggers

An iterative process was employed to determine the development yield that could be supported by each stage of the Riverlea Masterplan, with a focus on identifying trigger points for interim development staging. This process was designed to optimise the road network without requiring upgrades to Port Wakefield Highway and Riverlea Boulevard as a grade-separated interchange. The steps involved:

1. **Step 1:** Modelling the full development yield (12,000 dwellings) and district centre (58,000 sqm of retail) using the Riverlea Park and Buckland Park AIMSUN model to determine preliminary intersection performance.
2. **Step 2:** Gradually reducing the development yield according to proposed staging until intersections achieved a satisfactory Level of Service, as indicated by AIMSUN outputs.
3. **Step 3:** Using traffic volumes from Step 2, modelling intersection performance in SIDRA to determine detailed operational characteristics.
4. **Step 4:** Iterating Steps 2 and 3 for preceding development stages to refine the staging plan and identify key trigger points for infrastructure upgrades.

This process enabled the development of a staged approach to infrastructure delivery, aligning with Riverlea Masterplan's growth trajectory while ensuring efficient network performance.

Network staging assumptions

The network staging modelling was also conducted based on several key assumptions that informed the development staging and trigger point analysis. Specifically, the modelling assumed that:

- The Buckland Park development (to the south of Riverlea Masterplan) and its associated network would be excluded, with all access to Riverlea provided via Riverlea Boulevard.
- Port Wakefield Highway would retain its existing 4-lane configuration, without upgrades to a grade-separated interchange.
- Approximately 50% of residential and non-residential trips would be contained within the Riverlea Masterplan and District Centre.
- Background traffic growth along Port Wakefield Highway and Angle Vale Road would be fixed at 2041 levels, providing a consistent basis for evaluating network staging.

Staging the development and road network

The proposed development stages are outlined in Table 7, which details each stage, the corresponding external road network upgrades, and key considerations to support a nominal upper limit of development yield, comprising residential growth (measured by the number of occupied dwellings) and commercial development, including retail and district centre components. The intersection layouts corresponding to each development stage are illustrated in Figure 11 and Figure 12.

Table 7: Staged development yield and road network requirements

Development stage	Road network staging	Development yields support by each stage
Stage 1	- Construction of a new signalised intersection at Riverlea Boulevard and Central Drive - Existing signalised intersection at Riverlea Boulevard, Angle Vale Road and Port Wakefield Highway	Up to 4,600 dwellings and 12,000m ² of retail space (including a tavern) in the Retail Centre
Stage 2	- Realignment of the eastbound carriageway on Riverlea Boulevard to create dedicated left-turn and through lanes on the kerb side. - Duplication of the right-turn lane on Port Wakefield Highway northbound, with a minimum storage length of 70m. - Duplication of the left-turn lane on Port Wakefield Highway southbound, with a minimum storage length of 140m. - Construction of a dedicated left-turn lane from Port Wakefield Highway northbound (between Carmelo Road and Riverlea Boulevard) into the District Centre	Up to 5,600 dwellings and 50,000m ² of retail space in the District Centre

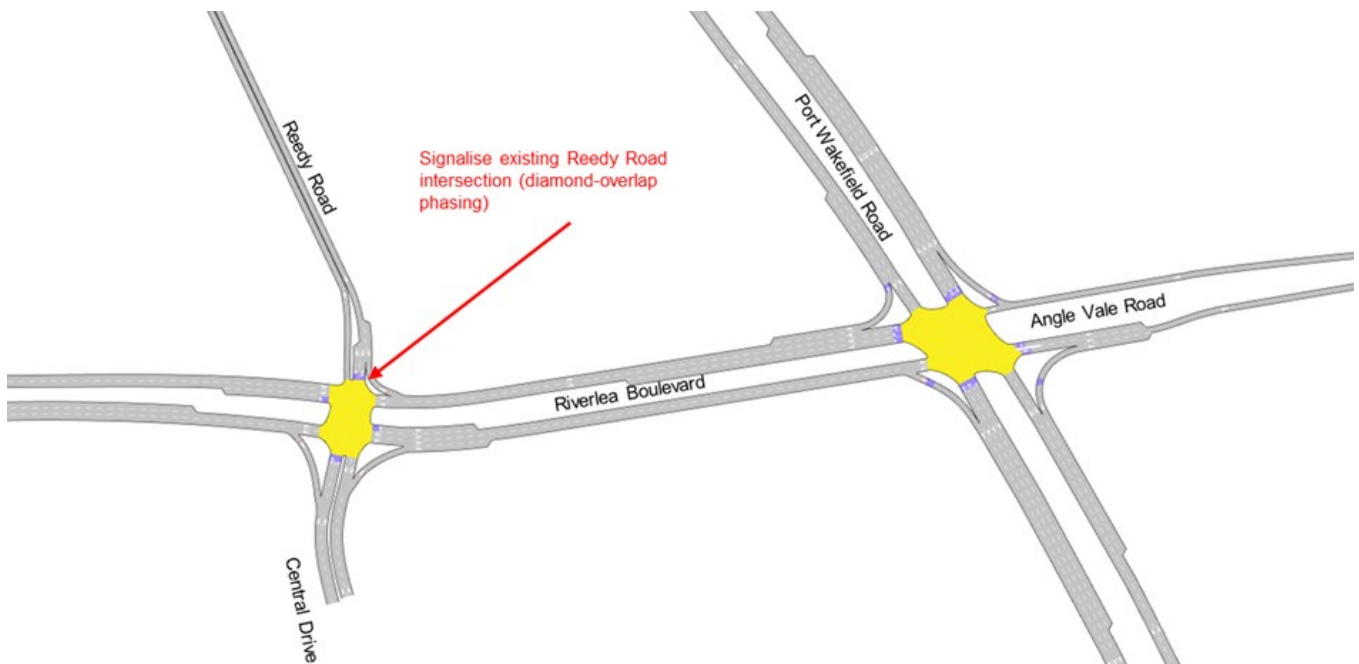


Figure 11: Development Stage 1 Road network (support 4,600 dwellings + 12,000m² retail)

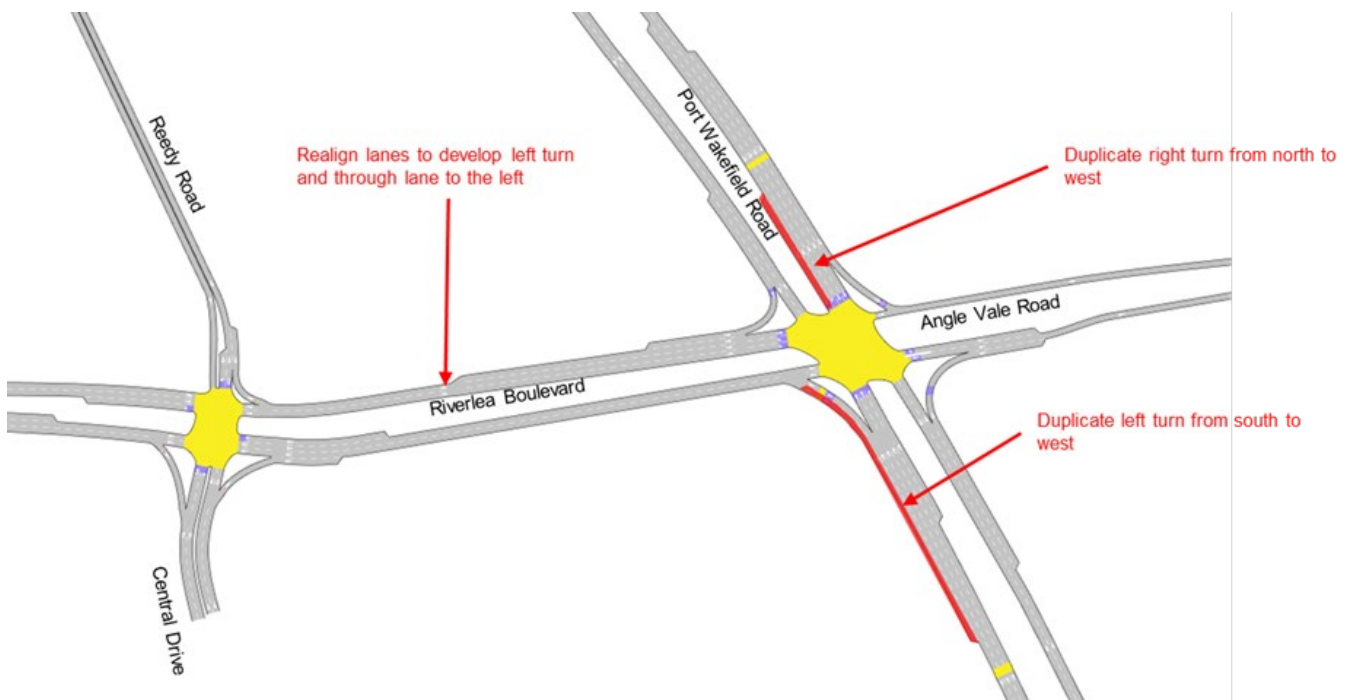


Figure 12: Development Stage 2 Road network (support 5,600 dwellings + 50,000m² retail)

4.3. Trip generation potential (Stages 1 and 2)

The development staging and total traffic generation potential for the Riverlea Masterplan are presented in Table 8 and Table 9, which are informed by Stages 1 and 2 network staging and trigger point analysis.

Table 8: Summary of traffic generation potential for Riverlea Masterplan (Stage 1)

Land Use	Metric	Quantum	AM Rate	PM Rate	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
Residential Low Density	per dwelling	3,273	0.71	0.71	465	1,859	1,859	465
Residential Medium Density	per dwelling	680	0.46	0.46	63	250	250	63
Residential High Density	per dwelling	680	0.2	0.2	23	91	91	23
Neighbourhood Centre Retail	Sqm GLFA	7,161	0.076	0.216	204	204	358	358
Large Shopping Centre	Sqm GLFA	12,000	0.0199	0.0383	90	90	172	172
Primary School	Number of students	0	0.67	0.53	0	0	0	0
Secondary School	Number of students	2,400	0.51	0.28	612	612	336	336
Commercial	Sqm GLFA	839	0.0099	0.0096	7	2	2	6
Total					1,462	3,107	3,068	1,423

Table 9: Summary traffic generation potential Riverlea Masterplan (Stage 2)

Land Use	Metric	Quantum	AM Rate	PM Rate	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
Residential Low Density	per dwelling	3,980	0.71	0.71	565	2,261	2,261	565
Residential Medium Density	per dwelling	830	0.46	0.46	76	305	305	76
Residential High Density	per dwelling	830	0.2	0.2	28	112	112	28
Neighbourhood Centre Retail	Sqm GLFA	7,161	0.076	0.216	204	204	358	358
Large Shopping Centre	Sqm GLFA	50,000	0.0199	0.0383	373	373	718	718
Primary School	Number of students	0	0.67	0.53	0	0	0	0
Secondary School	Number of students	2,400	0.51	0.28	612	612	336	336
Commercial	Sqm GLFA	839	0.0099	0.0096	7	2	2	6
Total					1,865	3,869	4,092	2,089

4.4. Road network performance measures

The traffic assessment is based on performance criteria agreed with DIT as part of the *Riverlea Park and Buckland Park Access Strategy Framework*. These criteria, outlined in Table 10, were developed for high-level planning and preliminary concept purposes, providing a foundation for assessing the indicative structure plan's road network performance for the Riverlea Masterplan.

Table 10: Desired standards of service for road network performance

Network component	Performance measure	Target standard of service
Motorway mainline	Multi-lane highway density (Highway Capacity Manual)	<22.5 pcu/km/lane
Motorway interchange	Intersection performance	Level of Service D or better for the AM and PM peak periods
	Queue lengths on ramps	Does not propagate back to mainline (exit ramp) or arterial road (entry ramp)
Arterial Roads and sub-arterial roads	New intersection performance	Level of Service D or better for the AM and PM peak periods
	Existing (unmodified) intersection performance	Not significantly worse than existing conditions
	Degree of saturation	Not exceeding 0.8 for priority junctions, 0.85 for roundabouts and 0.9 for traffic signals under existing cycle times
	Queue lengths in turning bays	95 th percentile back-of-queue to be fully contained within turning bays, not to extend to any adjacent signalised intersection, pedestrian crossing, level crossing or upstream lane merge, diverge or weaving manoeuvre

4.5. Proposed intersection layouts

The SIDRA schematic layouts, developed based on the traffic modelling work, are presented below. Corresponding 5% concept designs from WGA are included in Appendix C for reference. The proposed key intersections and upgrades include:

- **Riverlea Boulevard/Angle Vale Road and Port Wakefield Highway:** Interim upgrade to the existing intersection with additional lanes on the southern, northern and western approaches (Figure 13).
- **Riverlea Boulevard/Central Drive/Reedy Road:** new 4-way signalised intersection with double-diamond overlap phasing and left-turn slip lanes on the north, east, and south approaches (Figure 14).

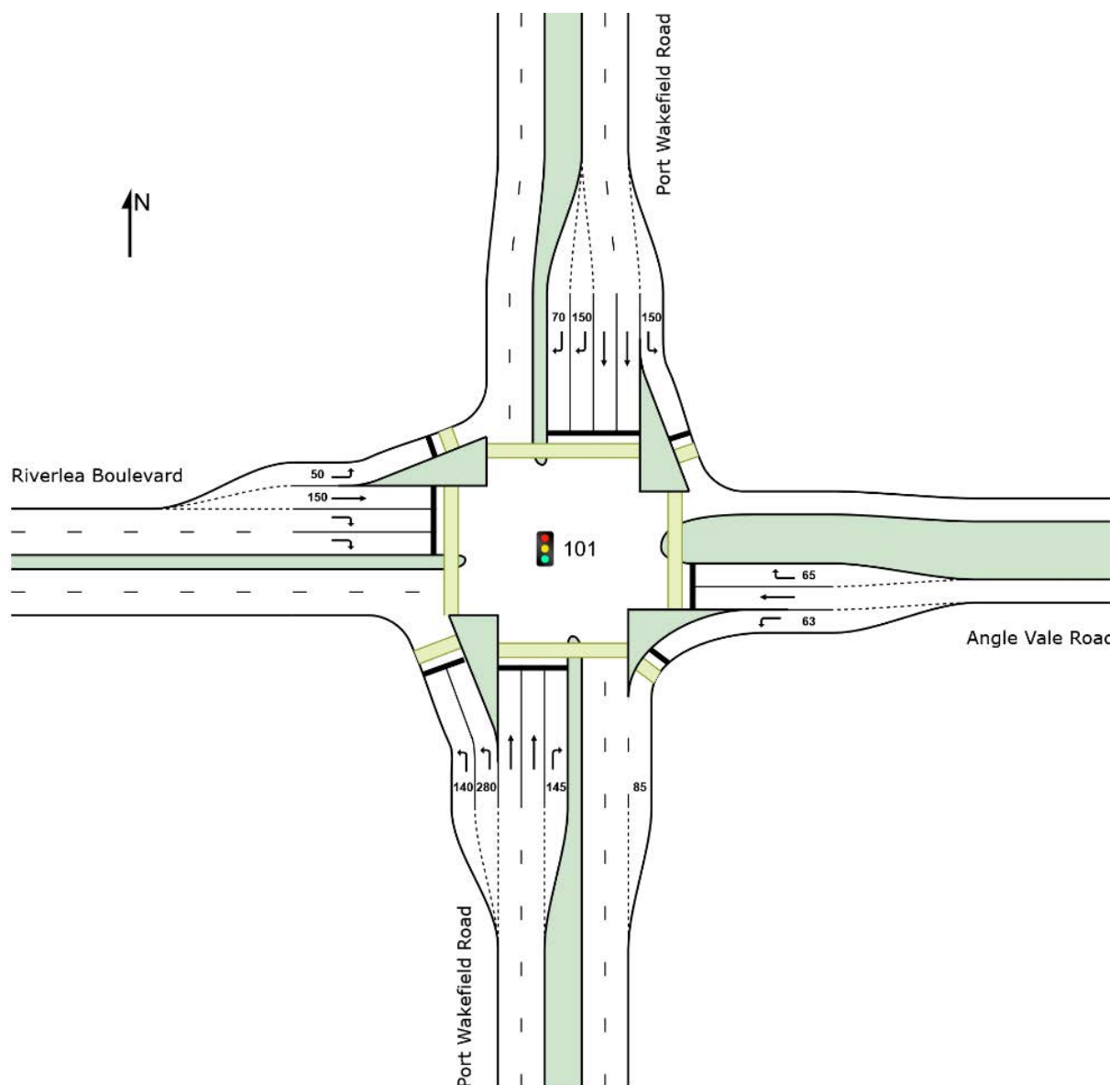


Figure 13: Proposed intersection upgrade layout for Port Wakefield Highway and Riverlea Boulevard

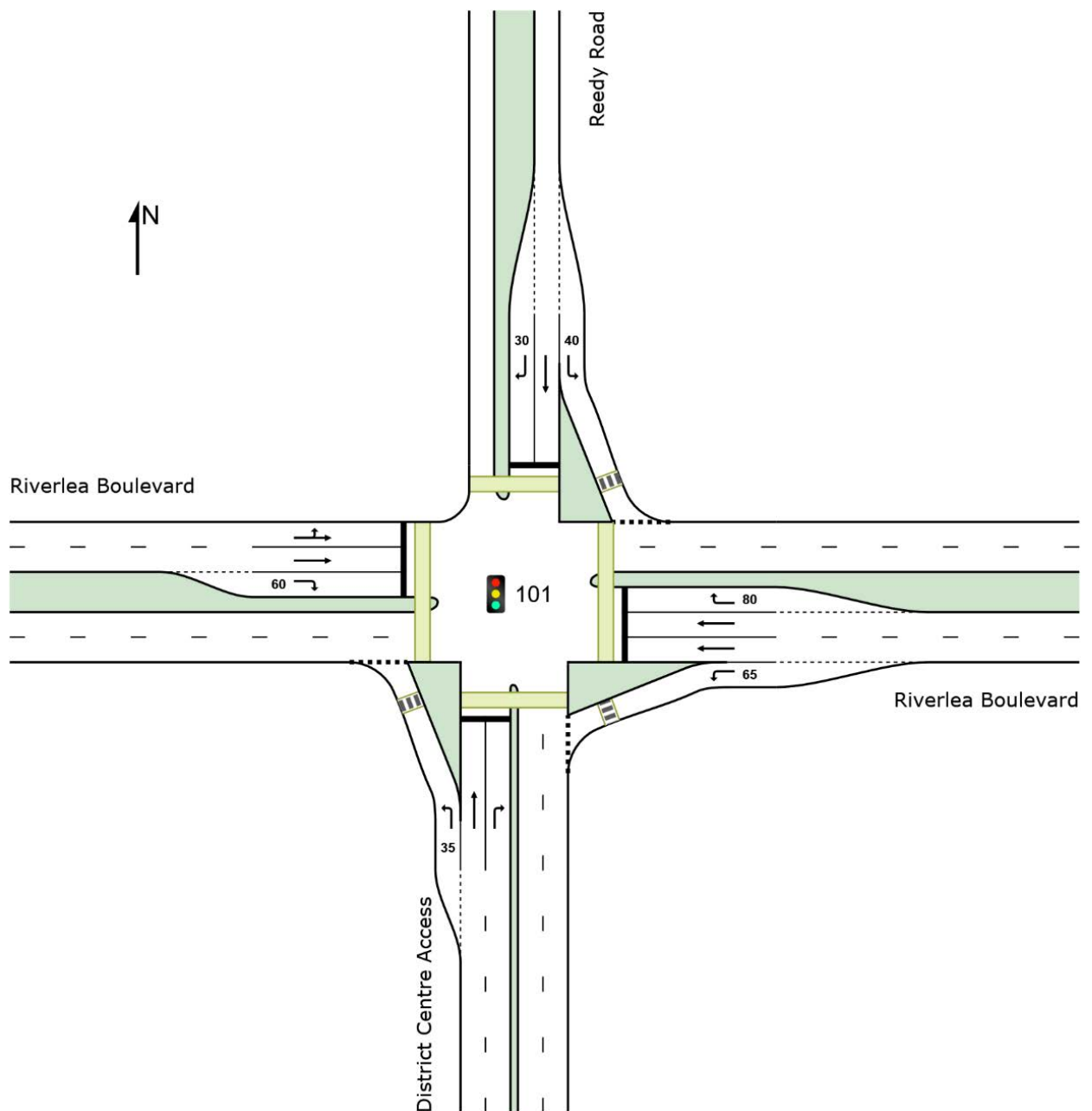


Figure 14: Proposed new signalised intersection layout for Riverlea Boulevard and Central Drive

4.6. Future road network performance

Traffic volumes for Stages 1 and 2 were extracted from the AIMSUN model and analysed using SIDRA intersection models. The results are presented in Table 11 to Table 14, with detailed lane summary data in Appendix B. Key findings include:

- **Stage 1 (4,600 dwellings and 12,000m² retail):** Both intersections operate effectively, with the Port Wakefield Highway, Angle Vale Road, and Riverlea Boulevard intersection approaching capacity but with manageable impacts. This intersection is a key consideration for Stage 1's development yield.
- **Stage 2 (5,600 dwellings and 50,000m² retail):** The Port Wakefield Highway, Angle Vale Road, and Riverlea Boulevard intersection approaches capacity, while the Riverlea Boulevard and Central Drive intersection experiences increased delays but remains manageable.

SIDRA modelling indicates that Riverlea Boulevard's intersections operate near capacity during both stages, but impacts are considered manageable. The analysis suggests that:

- **Stage 1 (4,600 dwellings and 12,000m² retail) and Stage 2 (5,600 dwellings and 50,000m² retail)** can be supported by the proposed infrastructure, with some intersections approaching capacity but operating within acceptable limits.

Table 11: Riverlea Stage 1 Port Wakefield Highway and Riverlea Boulevard intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Port Wakefield Highway North	783	43.9	85.5	0.857	D	996	31.0	66.9	0.798	C
Angle Vale Road East	489	54.2	88.8	0.889	D	291	73.3	33.5	0.801	F
Port Wakefield Highway South	643	36.8	58.0	0.687	C	1954	42.2	305.8	0.928	C
Riverlea Boulevard West	1276	15.4	72.0	0.879	B	58	63.5	4.9	0.108	E
<i>Overall Intersection</i>	3192	32.6	-	0.889	C	3298	41.9	-	0.928	C

Table 12: Riverlea Stage 1 Riverlea Boulevard and Central Drive intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Reedy Road North	240	15.0	15.4	0.235	B	16	50.0	1.7	0.071	D
Riverlea Boulevard East	77	13.5	4.7	0.046	A	1263	17.4	96	0.529	B
Central Drive South	99	24.0	6.9	0.291	B	78	23.7	4.1	0.114	B
Riverlea Boulevard West	1117	27.9	83.5	0.688	B	174	54.5	35.2	0.500	D
<i>Overall Intersection</i>	1533	24.9	83.5	0.688	B	1531	22.3	-	0.529	B

Table 13: Riverlea Stage 2 Port Wakefield Highway and Riverlea Boulevard intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Port Wakefield Highway North	769	59.9	115.7	0.890	E	1089	30.2	57.5	0.546	C
Angle Vale Road East	486	83.3	117.0	0.905	F	308	40.9	22.1	0.650	C
Port Wakefield Highway South	642	49.4	79.3	0.725	D	1916	32.8	79.5	0.731	C
Riverlea Boulevard West	1583	25.6	145.9	0.898	B	35	38.3	2.1	0.054	C
<i>Overall Intersection</i>	3481	45.6	-	0.905	D	3348	32.8	-	0.731	C

Table 14: Riverlea Stage 2 Riverlea Boulevard and Central Drive intersection performance

Approach	Morning Peak					Evening Peak				
	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS	2024 Demand (veh/h)	Delay per vehicle (s)	Queue Length (m)	DoS	LoS
Reedy Road North	415	30.0	43.6	0.373	C	16	28.7	1.0	0.043	C
Riverlea Boulevard East	37	12.9	1.4	0.021	A	1298	41.1	135.1	1.001	C
Central Drive South	392	35.6	48.5	0.864	C	732	67.9	102.1	1.058	E
Riverlea Boulevard West	1374	58.1	158.9	0.876	E	328	112.3	100.2	1.053	F
<i>Overall Intersection</i>	2217	48.1	-	0.876	D	2374	59.1	-	1.058	E

Future network volumes

Figure 15 to Figure 18 show the modelled network volumes for Stages 1 and 2. The analysis reveals:

- Peak hour traffic patterns are consistent across both stages, with dominant flows towards Adelaide in the morning and from Adelaide in the evening
- Port Wakefield Highway and Riverlea Boulevard carry the highest volumes, consistent with their roles as key higher order roads.
- Stage 2 sees a notable increase in traffic around the District Centre, driven by the expanded development footprint.
- The modelled volumes are within acceptable limits for each road type, aligning with the road hierarchy and functional classifications.

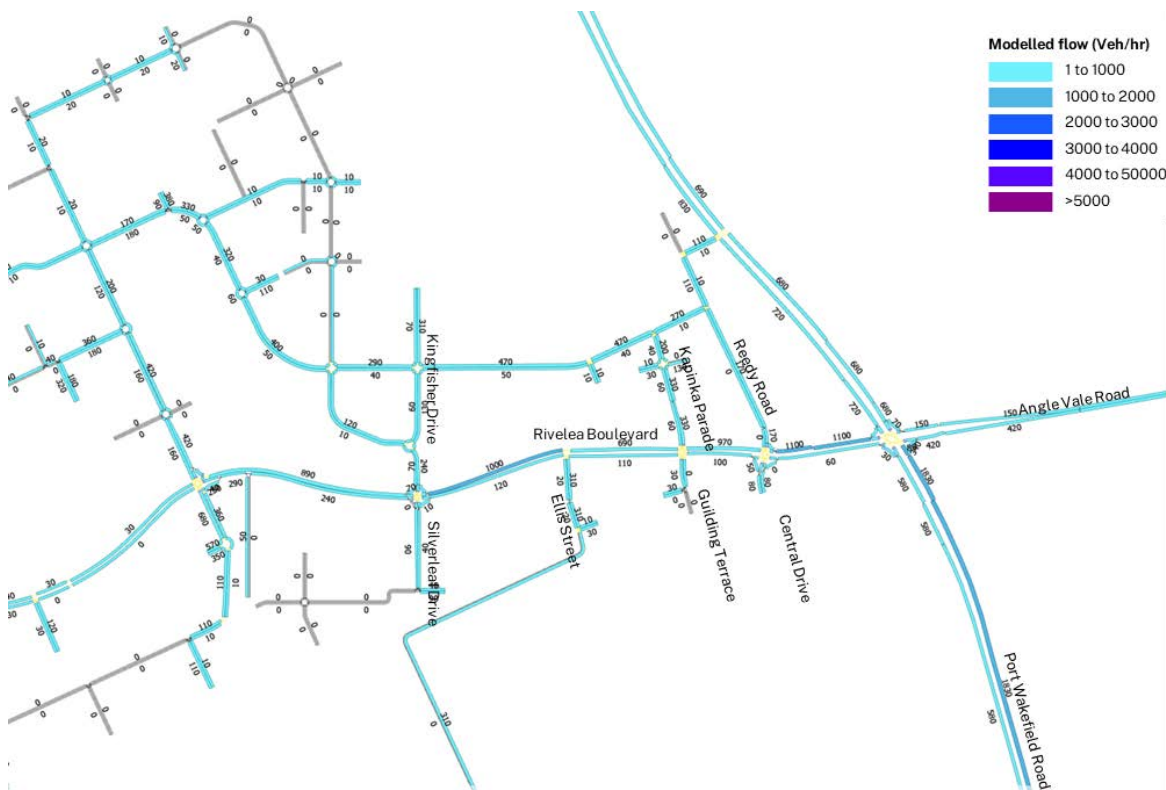


Figure 15: Stage 1 morning peak hour modelled network volumes



Figure 16: Stage 1 evening peak hour modelled network volumes

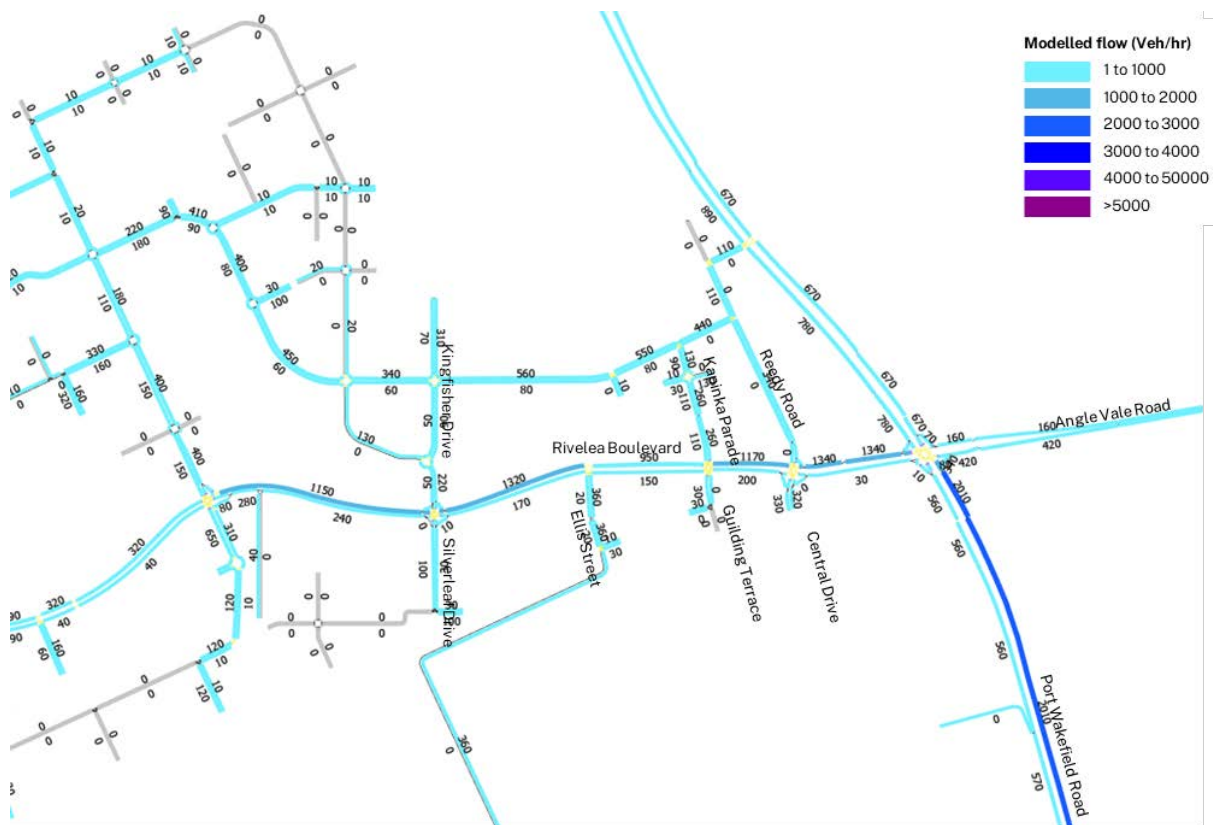


Figure 17: Stage 2 morning peak hour modelled network volumes

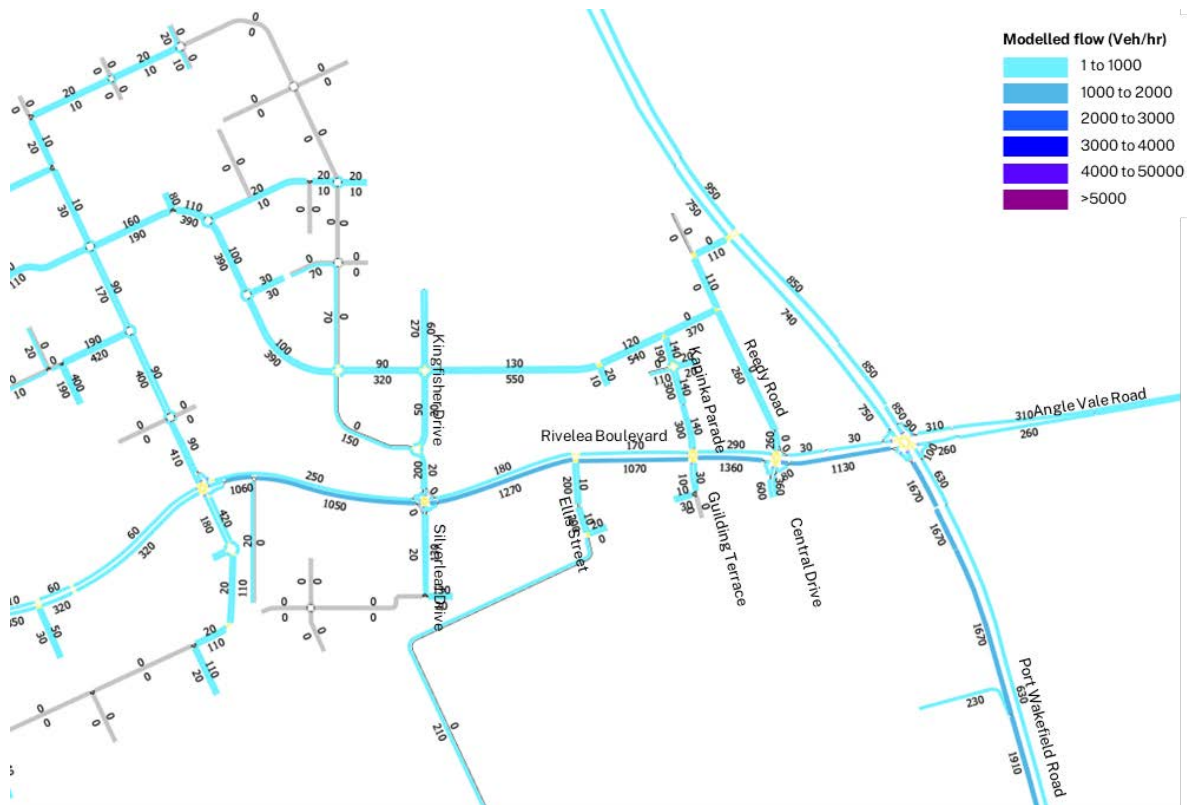


Figure 18: Stage 2 evening peak hour modelled network volumes

Future network congestion and density

Modelled network density plots (Figure 19 to Figure 22) indicate localised congestion during peak hours at specific intersections. In the morning peak, minor congestion occurs on Riverlea Boulevard approaching Port Wakefield Highway, while in the evening peak, congestion is expected on Port Wakefield Highway approaching Riverlea Boulevard and on Riverlea Boulevard approaching Central Drive.



Figure 19: Stage 1 morning peak hour modelled density



Figure 20: Stage 1 evening peak hour modelled density



Figure 21: Stage 2 morning peak hour modelled density



Figure 22: Stage 2 evening peak hour modelled density

4.7. Riverlea development rollout and infrastructure planning

The Riverlea development is progressing steadily, with 681 dwellings occupied as of July 14, 2025, and a projected annual uptake of 360 dwellings, driven by a consistent monthly average of 30 dwellings over the past 12-18 months. As illustrated in Table 15, this growth trajectory suggests that Stage 1 capacity will be reached by mid-2035, and Stage 2 capacity by mid-2038.

The proposed new signalised intersection at Riverlea Boulevard and Central Drive/Reedy Road, detailed in Section 4.5 (Figure 14), is designed to accommodate this growth. The spatial layout of the new signals will support future development until 2038, based on current occupancy rates. This provides a significant window of opportunity for the State Government to implement integrated infrastructure planning and rezoning, unlocking the Riverlea Park growth area. With the new signals expected to operate within capacity limits for over a decade, there is time to strategically plan and deliver the necessary infrastructure to support the Riverlea development continued growth.

Table 15: Riverlea development and staging roll out timelines

Year	per/year	Accumulative dwellings
2025 @ 14/07	681	681
2025 remaining	150	831
2026	360	1,191
2027	360	1,551
2028	360	1,911
2029	360	2,271
2030	360	2,631
2031	360	2,991
2032	360	3,351
2033	360	3,711
2034	360	4,071
2035	360	4,431
2036	360	4,791
2037	360	5,151
2038	360	5,511
2039	360	5,871

5. Conclusion

Detailed intersection modelling has been conducted for Riverlea Boulevard's key intersections with Port Wakefield Highway and Central Drive using a combination of the Riverlea AIMSUN model and SIDRA modelling. This analysis aims to assess intersection performance, inform planned upgrades, and determine the carrying capacity of existing intersections under various development stages, including intermediate stages and the full development scenario (nominally 2041), to facilitate future development of the Riverlea Masterplan.

5.1. Summary of findings

The analysis indicates that the proposed development staging and intersection upgrades can support the anticipated traffic demand and yield. Key findings include:

- **Stage 1:** Existing intersection at Port Wakefield Highway and proposed traffic signals at Central Drive can accommodate up to 4,600 dwellings and 12,000m² retail of development, with intersections operating at acceptable delay levels, albeit near capacity at Port Wakefield Highway.
- **Stage 2:** Upgraded intersection at Port Wakefield Highway and proposed intersection at Central Drive can support up to 5,600 dwellings and 50,000m² retail of development, with acceptable delay levels but operating near capacity, particularly at Riverlea Boulevard and Central Drive due to conflicting traffic movements.
- **Future capacity:** The new signalised intersection at Riverlea Boulevard and Central Drive has been dimensioned to accommodate the ultimate Riverlea Masterplan development of 12,000 dwellings in conjunction with the proposed grade-separated interchange at Port Wakefield Highway and Riverlea Boulevard, supporting the long-term vision of 30,000 dwellings as outlined in the *Riverlea Park and Buckland Park Access Strategy Framework*.

Overall, the findings suggest that the proposed intersection upgrades and staging can accommodate the planned development yield, with some intersections operating near capacity under peak conditions. Further growth beyond the proposed thresholds would require additional interventions to maintain acceptable performance.

5.2. Key conclusions

The detailed intersection modelling along Riverlea Boulevard between Central Drive and Port Wakefield Highway yields the following key conclusions:

- The Riverlea development's steady growth is expected to be supported by the proposed signalised intersection at Riverlea Boulevard and Central Drive/Reedy Road, which is designed to accommodate development until 2038, allowing the State Government sufficient time to implement integrated infrastructure planning to unlock the Riverlea Park growth area.
- The existing intersection at Port Wakefield Highway and proposed intersection at Central Drive can support Stage 1 development (4,600 dwellings, 12,000m² of retail) with acceptable performance, operating effectively at Port Wakefield Highway intersection, which is expected to approach practical capacity but remain manageable.

- Interim upgrades at Port Wakefield Highway and Riverlea Boulevard intersection can accommodate Stage 2 development (5,600 dwellings, 50,000m² of retail) with sufficient capacity.
- The proposed signalised intersection at Riverlea Boulevard and Central Drive is expected to operate effectively, with impacts remaining manageable within acceptable limits, supporting the planned development yield.

Appendix A

2024 SIDRA outputs for:

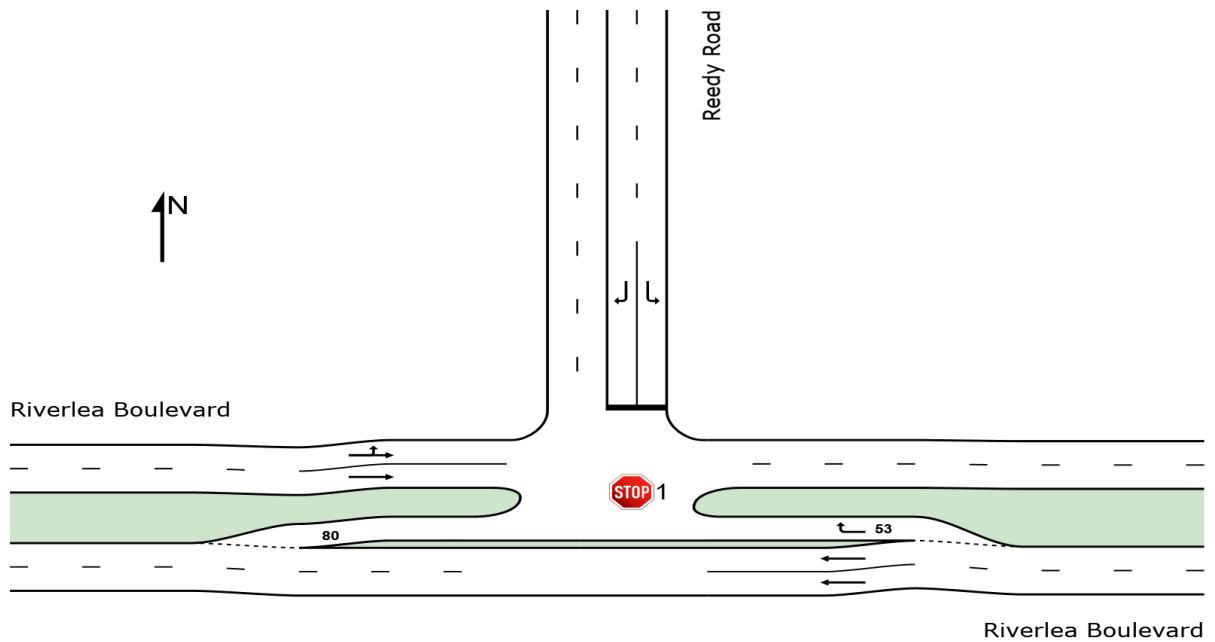
- Riverlea Boulevard and Central Drive/Reedy Road
- Riverlea Boulevard and Port Wakefield Highway

SITE LAYOUT

 **Site: 1 [1. 2024 Base Riverlea District Centre AM (Site Folder: At-grade intersection)]**

Three-way intersection with 5-lane major road (Stop control)
Site Category: (None)
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\Users\iwans\Documents\Viae Consulting\01 - Projects\VC050_Riverlea Modelling Peer Review\Technical\SIDRA\20250701_Riverlea 2041.sip9

LANE SUMMARY

 **Site: 1 [1. 2024 Base RiverleaDistrict Centre PM (Site Folder: At-grade intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Three-way intersection with 5-lane major road (Stop control)

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%											
East: Riverlea Boulevard															
Lane 1	63	1.0	63	1.0	1937	0.033	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	63	1.0	63	1.0	1937	0.033	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	5	1.0	5	1.0	1205	0.004	100	6.2	LOS A	0.0	0.1	Short	53	0.0	NA
Approach	132	1.0	132	1.0		0.033		0.3	NA	0.0	0.1				
North: Reedy Road															
Lane 1	5	1.0	5	1.0	1095	0.005	100	8.4	LOS A	0.0	0.1	Full	500	0.0	0.0
Lane 2	5	1.0	5	1.0	559	0.009	100	11.4	LOS A	0.0	0.2	Full	500	0.0	0.0
Approach	11	1.0	11	1.0		0.009		9.9	LOS A	0.0	0.2				
West: Riverlea Boulevard															
Lane 1	90	1.0	90	1.0	1932	0.047	100	0.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	91	1.0	91	1.0	1937	0.047	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	181	1.0	181	1.0		0.047		0.2	NA	0.0	0.0				
All Vehicles	323	1.0	323	1.0		0.047		0.5	NA	0.0	0.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
East: Riverlea Boulevard										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit:	W	N								
Lane 1	63	-	63	1.0	1937	0.033	100	NA	NA	
Lane 2	63	-	63	1.0	1937	0.033	100	NA	NA	
Lane 3	-	5	5	1.0	1205	0.004	100	0.0	2	
Approach	126	5	132	1.0		0.033				
North: Reedy Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From N To Exit:	E	W								
Lane 1	5	-	5	1.0	1095	0.005	100	NA	NA	

Lane 2	-	5	5	1.0	559	0.009	100	NA	NA
Approach	5	5	11	1.0	0.009				
West: Riverlea Boulevard									
Mov.	L2	T1	Total	%HV		Deg.	Lane	Prob.	Ov.
From W					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E			veh/h	v/c	%	%	No.
Lane 1	5	85	90	1.0	1932	0.047	100	NA	NA
Lane 2	-	91	91	1.0	1937	0.047	100	NA	NA
Approach	5	176	181	1.0	0.047				
Total %HV Deg.Satn (v/c)									
All Vehicles	323	1.0		0.047					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis													
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
West Exit: Riverlea Boulevard													
Merge Type: Priority													
Exit Short Lane	3	80	0.0	63	63	3.02	2.01	5	1727	0.003	0.1	0.1	
Merge Lane	2	-	100.0	Merge Lane is not Opposed				63	1800	0.035	0.0	0.0	

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
East: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

 **Site: 1 [1. 2024 Base RiverleaDistrict Centre AM (Site Folder: At-grade intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Three-way intersection with 5-lane major road (Stop control)

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%											
East: Riverlea Boulevard															
Lane 1	99	1.0	99	1.0	1937	0.051	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	99	1.0	99	1.0	1937	0.051	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	14	1.0	14	1.0	1215	0.011	100	6.2	LOS A	0.0	0.3	Short	53	0.0	NA
Approach	212	1.0	212	1.0		0.051		0.4	NA	0.0	0.3				
North: Reedy Road															
Lane 1	5	1.0	5	1.0	1100	0.005	100	8.4	LOS A	0.0	0.1	Full	500	0.0	0.0
Lane 2	5	1.0	5	1.0	500	0.011	100	12.4	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	11	1.0	11	1.0		0.011		10.4	LOS A	0.0	0.3				
West: Riverlea Boulevard															
Lane 1	86	1.0	86	1.0	1931	0.045	100	0.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	86	1.0	86	1.0	1937	0.045	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	173	1.0	173	1.0		0.045		0.2	NA	0.0	0.0				
All Vehicles	395	1.0	395	1.0		0.051		0.6	NA	0.0	0.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
East: Riverlea Boulevard										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit:	W	N								
Lane 1	99	-	99	1.0	1937	0.051	100	NA	NA	
Lane 2	99	-	99	1.0	1937	0.051	100	NA	NA	
Lane 3	-	14	14	1.0	1215	0.011	100	0.0	2	
Approach	198	14	212	1.0		0.051				
North: Reedy Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From N To Exit:	E	W								
Lane 1	5	-	5	1.0	1100	0.005	100	NA	NA	

Lane 2	-	5	5	1.0	500	0.011	100	NA	NA
Approach	5	5	11	1.0		0.011			
West: Riverlea Boulevard									
Mov.	L2	T1	Total	%HV		Deg.	Lane	Prob.	Ov.
From W					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E			veh/h	v/c	%	%	No.
Lane 1	5	81	86	1.0	1931	0.045	100	NA	NA
Lane 2	-	86	86	1.0	1937	0.045	100	NA	NA
Approach	5	167	173	1.0		0.045			
Total %HV Deg.Satn (v/c)									
All Vehicles	395	1.0		0.051					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis													
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
West Exit: Riverlea Boulevard													
Merge Type: Priority													
Exit Short Lane	3	80	0.0	99	99	3.02	2.01	5	1691	0.003	0.1	0.1	
Merge Lane	2	-	100.0	Merge Lane is not Opposed				99	1800	0.055	0.0	0.0	

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
East: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

SITE LAYOUT

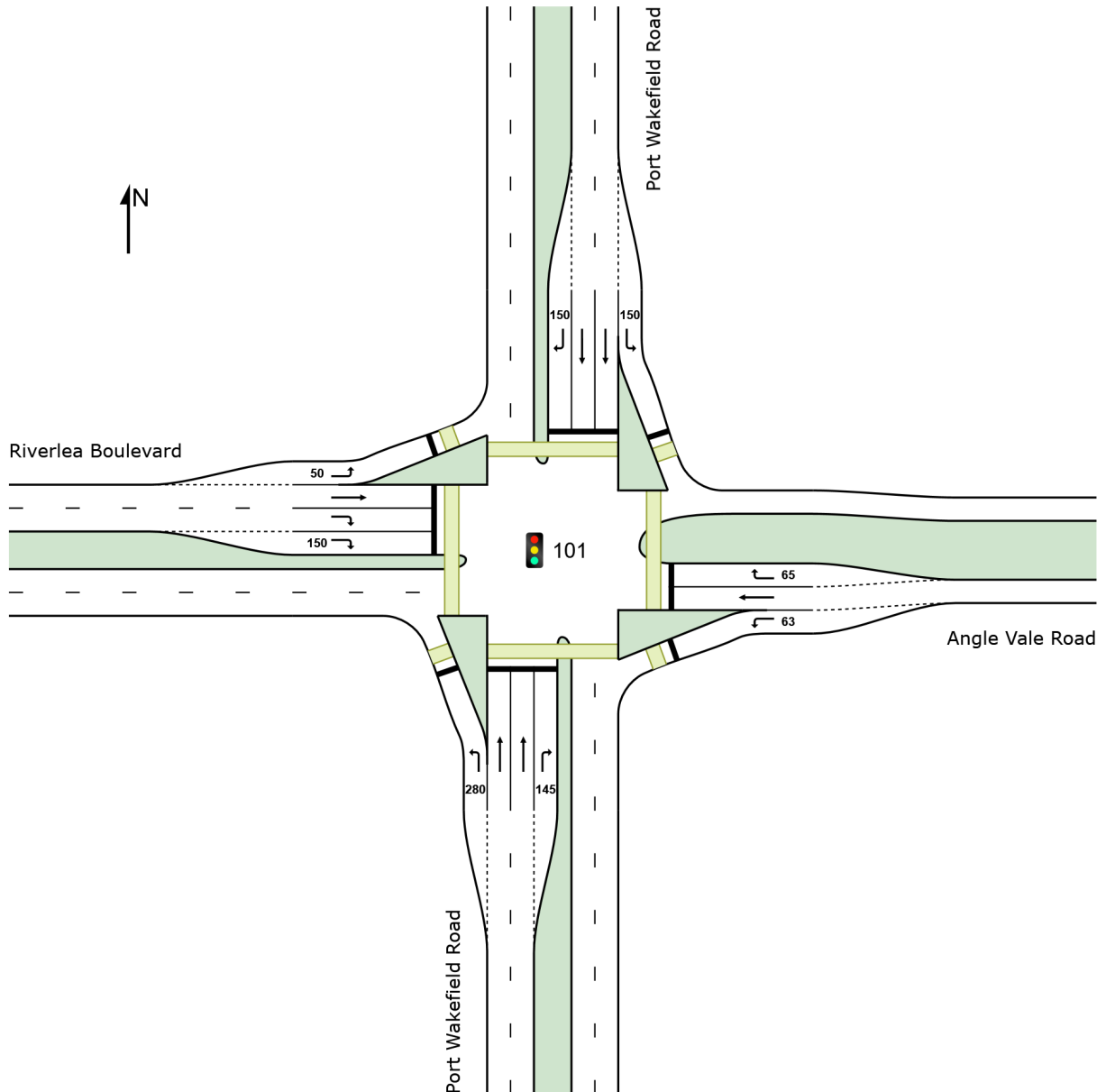
 Site: 101 [2. 2024 Base PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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LANE SUMMARY

Site: 101 [2. 2024 Base PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						Queue					
	veh/h	%	veh/h	%						[Veh	Dist]				
					veh/h	v/c	%	sec			m		m	%	%
South: Port Wakefield Road															
Lane 1	135	16.4	135	16.4	762	0.177	100	26.1	LOS B	4.6	36.6	Short	280	0.0	NA
Lane 2	280	16.9	280	16.9	805	0.348	100	22.3	LOS B	10.4	83.7	Full	500	0.0	0.0
Lane 3	280	16.9	280	16.9	805	0.348	100	22.3	LOS B	10.4	83.7	Full	500	0.0	0.0
Lane 4	58	23.6	58	23.6	185	0.312	100	60.1	LOS E	3.2	27.1	Short	145	0.0	NA
Approach	753	17.3	753	17.3		0.348		25.9	LOS B	10.4	83.7				
East: Angle Vale Road															
Lane 1	187	9.6	187	9.6	522	0.359	100	41.2	LOS C	8.6	65.2	Short	63	0.0	NA
Lane 2	77	2.7	77	2.7	255	0.301	100	51.6	LOS D	4.1	29.7	Full	500	0.0	0.0
Lane 3	79	12.0	79	12.0	228	0.346	100	58.0	LOS E	4.3	33.3	Short	65	0.0	NA
Approach	343	8.6	343	8.6		0.359		47.4	LOS D	8.6	65.2				
North: Port Wakefield Road															
Lane 1	77	5.5	77	5.5	819	0.094	100	25.1	LOS B	2.5	18.3	Short	150	0.0	NA
Lane 2	291	13.0	291	13.0	824	0.353	100	22.3	LOS B	10.9	84.7	Full	500	0.0	0.0
Lane 3	291	13.0	291	13.0	824	0.353	100	22.3	LOS B	10.9	84.7	Full	500	0.0	0.0
Lane 4	5	0.0	5	0.0	217	0.024	100	56.4	LOS D	0.3	1.9	Short	150	0.0	NA
Approach	664	12.0	664	12.0		0.353		22.9	LOS B	10.9	84.7				
West: Riverlea Boulevard															
Lane 1	1	0.0	1	0.0	387	0.003	100	29.3	LOS C	0.0	0.2	Short	50	0.0	NA
Lane 2	56	3.8	56	3.8	174	0.320	100	56.9	LOS E	3.2	22.9	Full	500	0.0	0.0
Lane 3	54	6.9	54	6.9	162	0.331	100	62.9	LOS E	3.1	22.7	Full	500	0.0	0.0
Lane 4	54	6.9	54	6.9	162	0.331	100	62.9	LOS E	3.1	22.7	Short	150	0.0	NA
Approach	164	5.8	164	5.8		0.331		60.7	LOS E	3.2	22.9				
All Vehicles	1924	13.0	1924	13.0		0.359		31.7	LOS C	10.9	84.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)											
South: Port Wakefield Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	135	-	-	135	16.4	762	0.177	100	0.0	2	

Lane 2	-	280	-	280	16.9	805	0.348	100	NA	NA
Lane 3	-	280	-	280	16.9	805	0.348	100	NA	NA
Lane 4	-	-	58	58	23.6	185	0.312	100	0.0	3
Approach	135	560	58	753	17.3		0.348			
East: Angle Vale Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E						Cap.	Satn	Util.	SL	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	187	-	-	187	9.6	522	0.359	100	8.1	2
Lane 2	-	77	-	77	2.7	255	0.301	100	NA	NA
Lane 3	-	-	79	79	12.0	228	0.346	100	0.0	2
Approach	187	77	79	343	8.6		0.359			
North: Port Wakefield Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	77	-	-	77	5.5	819	0.094	100	0.0	2
Lane 2	-	291	-	291	13.0	824	0.353	100	NA	NA
Lane 3	-	291	-	291	13.0	824	0.353	100	NA	NA
Lane 4	-	-	5	5	0.0	217	0.024	100	0.0	3
Approach	77	582	5	664	12.0		0.353			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	1	-	-	1	0.0	387	0.003	100	0.0	2
Lane 2	-	56	-	56	3.8	174	0.320	100	NA	NA
Lane 3	-	-	54	54	6.9	162	0.331	100	NA	NA
Lane 4	-	-	54	54	6.9	162	0.331	100	0.0	3
Approach	1	56	107	164	5.8		0.331			
Total %HV Deg.Satn (v/c)										
All Vehicles	1924	13.0		0.359						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec		
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

 Site: 101 [2. 2024 Base PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

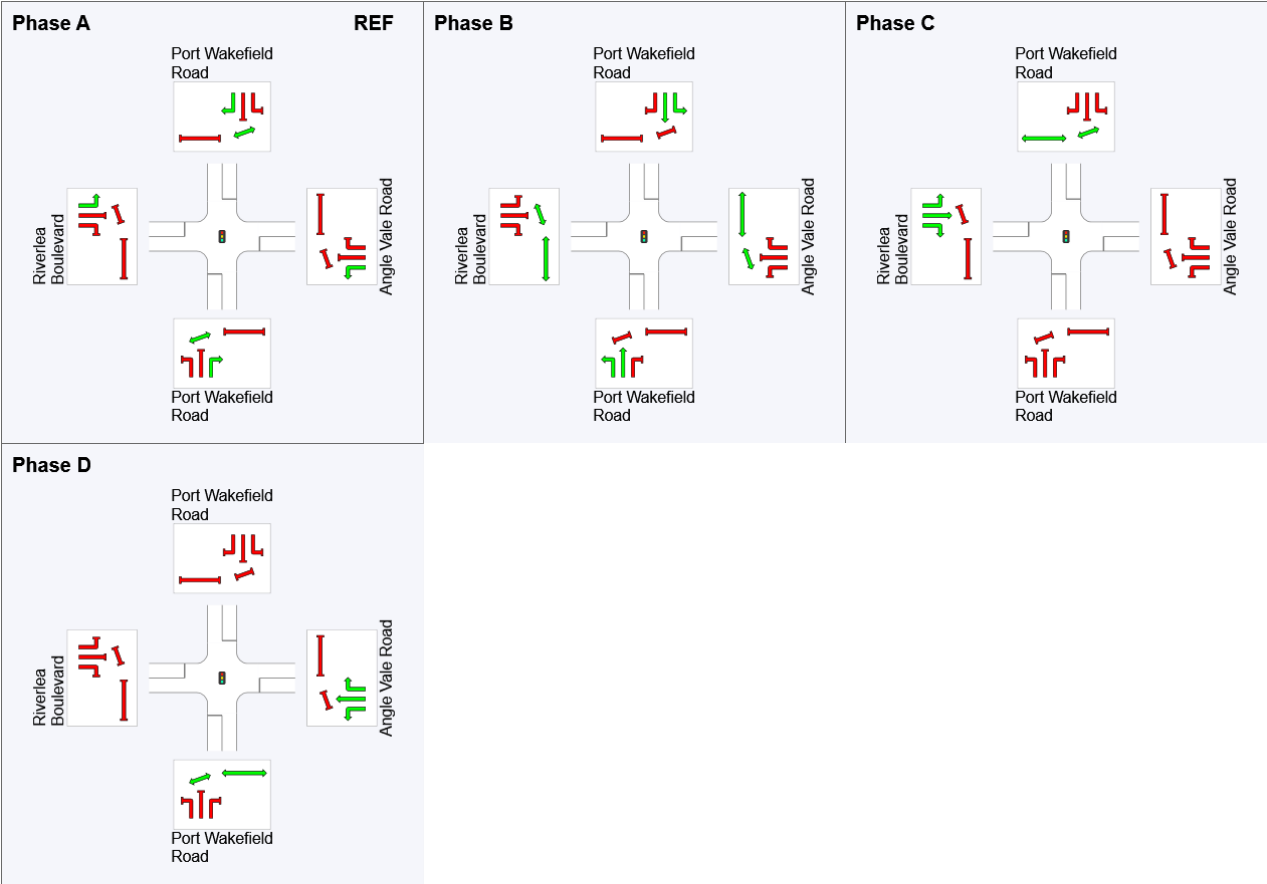
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	20	81	98
Green Time (sec)	14	55	11	16
Phase Time (sec)	20	61	17	22
Phase Split	17%	51%	14%	18%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

LANE SUMMARY

Site: 101 [2. 2024 Base PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%											
South: Port Wakefield Road															
Lane 1	72	0.0	72	0.0	836	0.086	100	25.5	LOS B	2.3	16.4	Short	280	0.0	NA
Lane 2	313	11.3	313	11.3	818	0.382	100	23.3	LOS B	12.0	92.3	Full	500	0.0	0.0
Lane 3	313	11.3	313	11.3	818	0.382	100	23.3	LOS B	12.0	92.3	Full	500	0.0	0.0
Lane 4	93	14.8	93	14.8	224	0.413	100	58.7	LOS E	5.1	40.4	Short	145	0.0	NA
Approach	789	10.7	789	10.7		0.413		27.7	LOS B	12.0	92.3				
East: Angle Vale Road															
Lane 1	116	14.5	116	14.5	533	0.217	100	38.0	LOS C	5.0	39.0	Short	63	0.0	NA
Lane 2	49	2.1	49	2.1	256	0.193	100	50.6	LOS D	2.6	18.7	Full	500	0.0	0.0
Lane 3	99	2.1	99	2.1	244	0.406	100	58.3	LOS E	5.4	38.8	Short	65	0.0	NA
Approach	264	7.6	264	7.6		0.406		48.0	LOS D	5.4	39.0				
North: Port Wakefield Road															
Lane 1	105	6.0	105	6.0	801	0.131	100	26.1	LOS B	3.5	26.1	Short	150	0.0	NA
Lane 2	345	10.8	345	10.8	820	0.421	100	23.8	LOS B	13.6	103.8	Full	500	0.0	0.0
Lane 3	345	10.8	345	10.8	820	0.421	100	23.8	LOS B	13.6	103.8	Full	500	0.0	0.0
Lane 4	6	0.0	6	0.0	248	0.026	100	54.4	LOS D	0.3	2.3	Short	150	0.0	NA
Approach	802	10.1	802	10.1		0.421		24.4	LOS B	13.6	103.8				
West: Riverlea Boulevard															
Lane 1	3	0.0	3	0.0	402	0.008	100	29.0	LOS C	0.1	0.7	Short	50	0.0	NA
Lane 2	65	1.6	65	1.6	161	0.406	100	58.6	LOS E	3.8	26.8	Full	500	0.0	0.0
Lane 3	54	6.9	54	6.9	148	0.364	100	64.3	LOS E	3.1	23.1	Full	500	0.0	0.0
Lane 4	54	6.9	54	6.9	148	0.364	100	64.3	LOS E	3.1	23.1	Short	150	0.0	NA
Approach	176	4.8	176	4.8		0.406		61.5	LOS E	3.8	26.8				
All Vehicles	2032	9.5	2032	9.5		0.421		31.9	LOS C	13.6	103.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)											
South: Port Wakefield Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	72	-	-	72	0.0	836	0.086	100	0.0	2	

Lane 2	-	313	-	313	11.3	818	0.382	100	NA	NA
Lane 3	-	313	-	313	11.3	818	0.382	100	NA	NA
Lane 4	-	-	93	93	14.8	224	0.413	100	0.0	3
Approach	72	625	93	789	10.7		0.413			
East: Angle Vale Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E						Cap.	Satn	Util.	SL	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	116	-	-	116	14.5	533	0.217	100	0.0	2
Lane 2	-	49	-	49	2.1	256	0.193	100	NA	NA
Lane 3	-	-	99	99	2.1	244	0.406	100	0.0	2
Approach	116	49	99	264	7.6		0.406			
North: Port Wakefield Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	105	-	-	105	6.0	801	0.131	100	0.0	2
Lane 2	-	345	-	345	10.8	820	0.421	100	NA	NA
Lane 3	-	345	-	345	10.8	820	0.421	100	NA	NA
Lane 4	-	-	6	6	0.0	248	0.026	100	0.0	3
Approach	105	691	6	802	10.1		0.421			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	3	-	-	3	0.0	402	0.008	100	0.0	2
Lane 2	-	65	-	65	1.6	161	0.406	100	NA	NA
Lane 3	-	-	54	54	6.9	148	0.364	100	NA	NA
Lane 4	-	-	54	54	6.9	148	0.364	100	0.0	3
Approach	3	65	107	176	4.8		0.406			
Total %HV Deg.Satn (v/c)										
All Vehicles	2032	9.5		0.421						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

 Site: 101 [2. 2024 Base PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

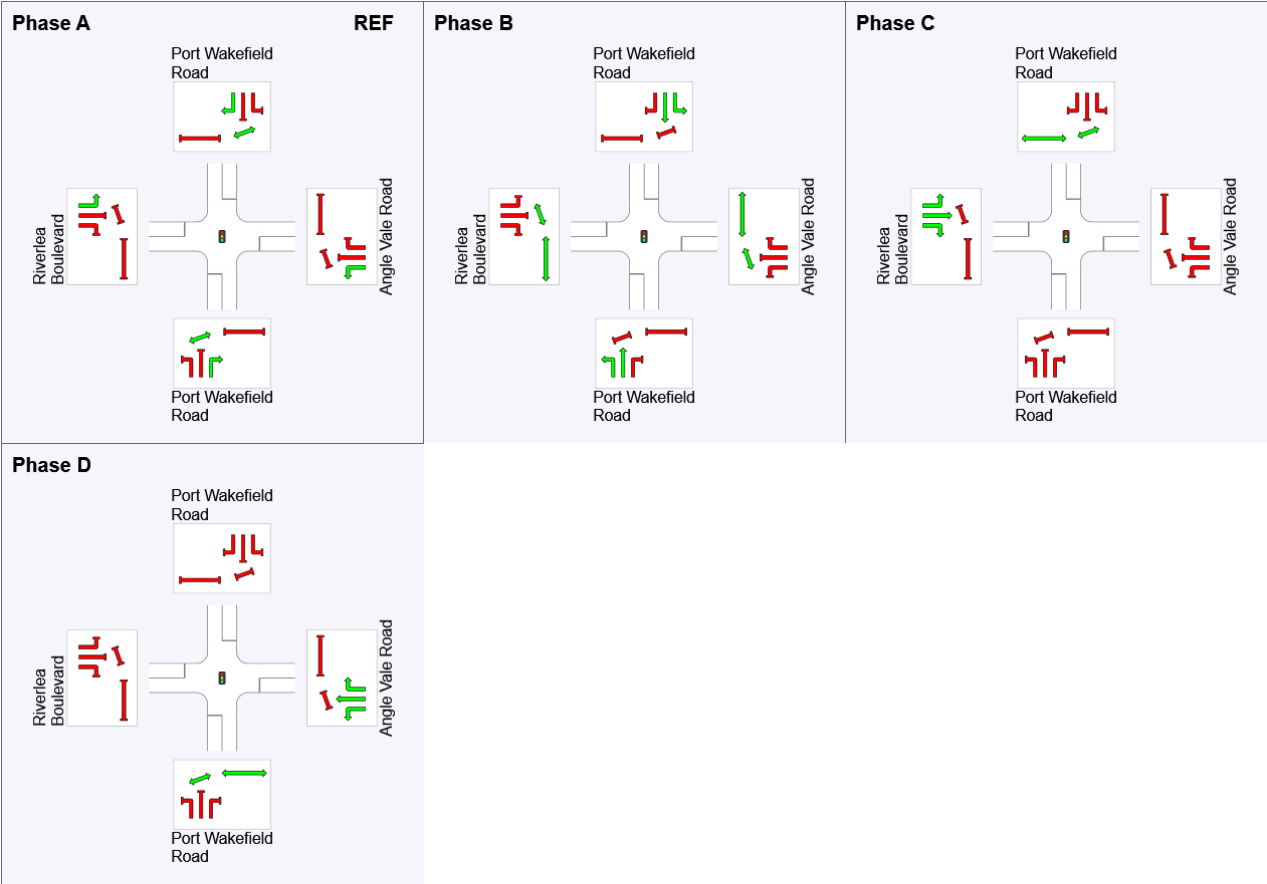
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	22	82	98
Green Time (sec)	16	54	10	16
Phase Time (sec)	22	60	16	22
Phase Split	18%	50%	13%	18%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

Appendix B

SIDRA outputs for Stages 1 and 2:

- Riverlea Boulevard and Central Drive/Reedy Road
- Riverlea Boulevard and Port Wakefield Highway

SITE LAYOUT

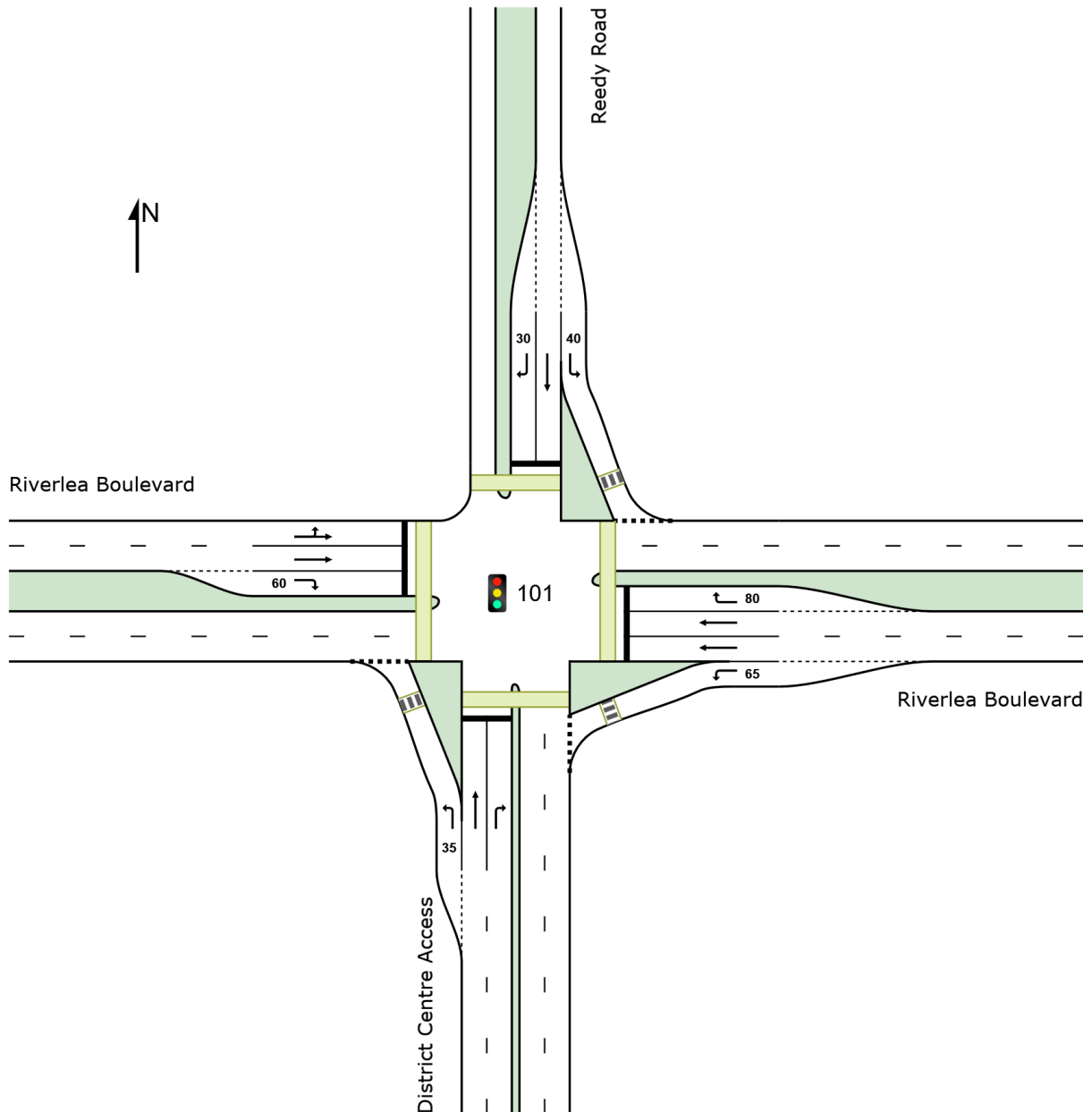
 **Site: 101 [1. 2041 Interim Riverlea District Centre AM (Site Folder: At-grade intersection)]**

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\Users\iwans\Documents\Viae Consulting\01 - Projects\VC050_Riverlea Modelling Peer Review\Technical\SIDRA\20250701_Riverlea 2041.sip9

LANE SUMMARY

 Site: 101 [1. 2041 Existing Riverlea District Centre AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 Network: N101 [Existing AM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: District Centre Access															
Lane 1	58	1.0	58	1.0	1377	0.042	100	6.2	LOS A	0.1	0.9	Short	35	0.0	NA
Lane 2	5	1.0	5	1.0	387	0.014	100	30.9	LOS C	0.1	0.8	Full	500	0.0	0.0
Lane 3	36	1.0	36	1.0	123	0.291	100	51.7	LOS D	1.0	6.9	Full	500	0.0	0.0
Approach	99	1.0	99	1.0		0.291		24.0	LOS B	1.0	6.9				
East: Riverlea Boulevard															
Lane 1	4	1.0	4	1.0	1219	0.003	100	6.4	LOS A	0.0	0.1	Short	65	0.0	NA
Lane 2	35	1.0	35	1.0	775	0.046	100	20.3	LOS B	0.7	4.7	Full	500	0.0	0.0
Lane 3	35	1.0	35	1.0	775	0.046	100	5.4	LOS A	0.2	1.3	Full	500	0.0	0.0
Lane 4	2	1.0	2	1.0	123	0.017	100	51.6	LOS D	0.1	0.4	Short	80	0.0	NA
Approach	77	1.0	77	1.0		0.046		13.5	LOS A	0.7	4.7				
North: Reedy Road															
Lane 1	206	1.0	206	1.0	879	0.235	100	11.9	LOS A	2.2	15.4	Short	40	0.0	NA
Lane 2	28	1.0	28	1.0	387	0.073	100	31.7	LOS C	0.6	4.4	Full	500	0.0	0.0
Lane 3	5	1.0	5	1.0	123	0.043	100	49.9	LOS D	0.1	1.0	Short	30	0.0	NA
Approach	240	1.0	240	1.0		0.235		15.0	LOS B	2.2	15.4				
West: Riverlea Boulevard															
Lane 1	533	1.0	533	1.0	775	0.688	100	23.6	LOS B	11.8	83.5	Full	500	0.0	0.0
Lane 2	521	1.0	521	1.0	757 ¹	0.688	100	28.7	LOS C	11.6	82.1	Full	500	0.0	0.0
Lane 3	63	1.0	63	1.0	123	0.514	100	57.4	LOS E	1.8	12.5	Short	60	0.0	NA
Approach	1117	1.0	1117	1.0		0.688		27.9	LOS B	11.8	83.5				
All Vehicles	1533	1.0	1533	1.0		0.688		24.9	LOS B	11.8	83.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)											
South: District Centre Access											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:						veh/h	Satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	

	W	N	E							
Lane 1	58	-	-	58	1.0	1377	0.042	100	0.0	2
Lane 2	-	5	-	5	1.0	387	0.014	100	NA	NA
Lane 3	-	-	36	36	1.0	123	0.291	100	NA	NA
Approach	58	5	36	99	1.0		0.291			
East: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From E						Cap.	Deg.	Util.	SL	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	4	-	-	4	1.0	1219	0.003	100	0.0	2
Lane 2	-	35	-	35	1.0	775	0.046	100	NA	NA
Lane 3	-	35	-	35	1.0	775	0.046	100	NA	NA
Lane 4	-	-	2	2	1.0	123	0.017	100	0.0	3
Approach	4	71	2	77	1.0		0.046			
North: Reedy Road										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From N						Cap.	Deg.	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	206	-	-	206	1.0	879	0.235	100	0.0	2
Lane 2	-	28	-	28	1.0	387	0.073	100	NA	NA
Lane 3	-	-	5	5	1.0	123	0.043	100	0.0	2
Approach	206	28	5	240	1.0		0.235			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From W						Cap.	Deg.	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	5	528	-	533	1.0	775	0.688	100	NA	NA
Lane 2	-	521	-	521	1.0	757 ¹	0.688	100	NA	NA
Lane 3	-	-	63	63	1.0	123	0.514	100	0.0	2
Approach	5	1048	63	1117	1.0		0.688			
Total %HV Deg.Satn (v/c)										
All Vehicles	1533	1.0		0.688						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: District Centre Access				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: Riverlea Boulevard				

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [1. 2041 Existing RiverleaDistrictCentre AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing AM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: D, C, A, B
Output Phase Sequence: D, C, A, B
Reference Phase: Phase A
Offset: 49 seconds (Program)

Phase Timing Summary

Phase	D	C	A	B
Phase Change Time (sec)	85	7	49	61
Green Time (sec)	6	36	6	18
Phase Time (sec)	12	42	12	24
Phase Split	13%	47%	13%	27%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

LANE SUMMARY

 Site: 101 [1. 2041 Existing Riverlea District Centre PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 Network: N101 [Existing PM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%						veh/h	v/c				%
South: District Centre Access															
Lane 1	60	1.0	60	1.0	970	0.062	100	9.4	LOS A	0.6	4.1	Short	35	0.0	NA
Lane 2	9	1.0	9	1.0	258	0.037	100	60.7	LOS E	0.4	2.6	Full	500	0.0	0.0
Lane 3	8	1.0	8	1.0	74	0.114	100	84.3	LOS F	0.4	2.7	Full	500	0.0	0.0
Approach	78	1.0	78	1.0		0.114		23.7	LOS B	0.6	4.1				
East: Riverlea Boulevard															
Lane 1	47	1.0	47	1.0	1272	0.037	100	6.3	LOS A	0.1	0.8	Short	65	0.0	NA
Lane 2	554	1.0	554	1.0	1046	0.529	100	4.8	LOS A	5.3	37.3	Full	500	0.0	0.0
Lane 3	540	1.0	540	1.0	1020 ¹	0.529	100	21.3	LOS B	13.6	96.0	Full	500	0.0	0.0
Lane 4	122	1.0	122	1.0	234	0.523	100	62.1	LOS E	4.7	33.0	Short	80	0.0	NA
Approach	1263	1.0	1263	1.0		0.529		17.4	LOS B	13.6	96.0				
North: Reedy Road															
Lane 1	5	1.0	5	1.0	1394	0.004	100	6.0	LOS A	0.0	0.1	Short	40	0.0	NA
Lane 2	5	1.0	5	1.0	258	0.020	100	60.3	LOS E	0.2	1.4	Full	500	0.0	0.0
Lane 3	5	1.0	5	1.0	74	0.071	100	83.7	LOS F	0.2	1.7	Short	30	0.0	NA
Approach	16	1.0	16	1.0		0.071		50.0	LOS D	0.2	1.7				
West: Riverlea Boulevard															
Lane 1	28	1.0	28	1.0	1036	0.027	100	17.8	LOS B	0.6	4.0	Full	500	0.0	0.0
Lane 2	29	1.0	29	1.0	1046	0.027	100	16.7	LOS B	0.6	4.1	Full	500	0.0	0.0
Lane 3	117	1.0	117	1.0	234	0.500	100	72.6	LOS F	5.0	35.2	Short	60	0.0	NA
Approach	174	1.0	174	1.0		0.500		54.5	LOS D	5.0	35.2				
All Vehicles	1531	1.0	1531	1.0		0.529		22.3	LOS B	13.6	96.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: District Centre Access										
Mov.	L2	T1	R2	Total	%HV					
From S						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:						veh/h	Satn	Util.	SL Ov.	Lane
							v/c	%	%	No.

	W	N	E							
Lane 1	60	-	-	60	1.0	970	0.062	100	0.0	2
Lane 2	-	9	-	9	1.0	258	0.037	100	NA	NA
Lane 3	-	-	8	8	1.0	74	0.114	100	NA	NA
Approach	60	9	8	78	1.0		0.114			
East: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From E						Cap.	Deg.	Util.	SL	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	47	-	-	47	1.0	1272	0.037	100	0.0	2
Lane 2	-	554	-	554	1.0	1046	0.529	100	NA	NA
Lane 3	-	540	-	540	1.0	1020 ¹	0.529	100	NA	NA
Lane 4	-	-	122	122	1.0	234	0.523	100	0.0	3
Approach	47	1094	122	1263	1.0		0.529			
North: Reedy Road										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From N						Cap.	Deg.	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	5	-	-	5	1.0	1394	0.004	100	0.0	2
Lane 2	-	5	-	5	1.0	258	0.020	100	NA	NA
Lane 3	-	-	5	5	1.0	74	0.071	100	0.0	2
Approach	5	5	5	16	1.0		0.071			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV			Lane	Prob.	Ov.
From W						Cap.	Deg.	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	5	23	-	28	1.0	1036	0.027	100	NA	NA
Lane 2	-	29	-	29	1.0	1046	0.027	100	NA	NA
Lane 3	-	-	117	117	1.0	234	0.500	100	1.0	2
Approach	5	52	117	174	1.0		0.500			
Total %HV Deg.Satn (v/c)										
All Vehicles	1531	1.0		0.529						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: District Centre Access				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: Riverlea Boulevard				

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [1. 2041 Existing RiverleaDistrictCentre PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing PM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: D, C, A, B
Output Phase Sequence: D, C, A, B
Reference Phase: Phase A
Offset: 148 seconds (Program)

Phase Timing Summary

Phase	D	C	A	B
Phase Change Time (sec)	36	61	148	10
Green Time (sec)	19	81	6	20
Phase Time (sec)	25	87	12	26
Phase Split	17%	58%	8%	17%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

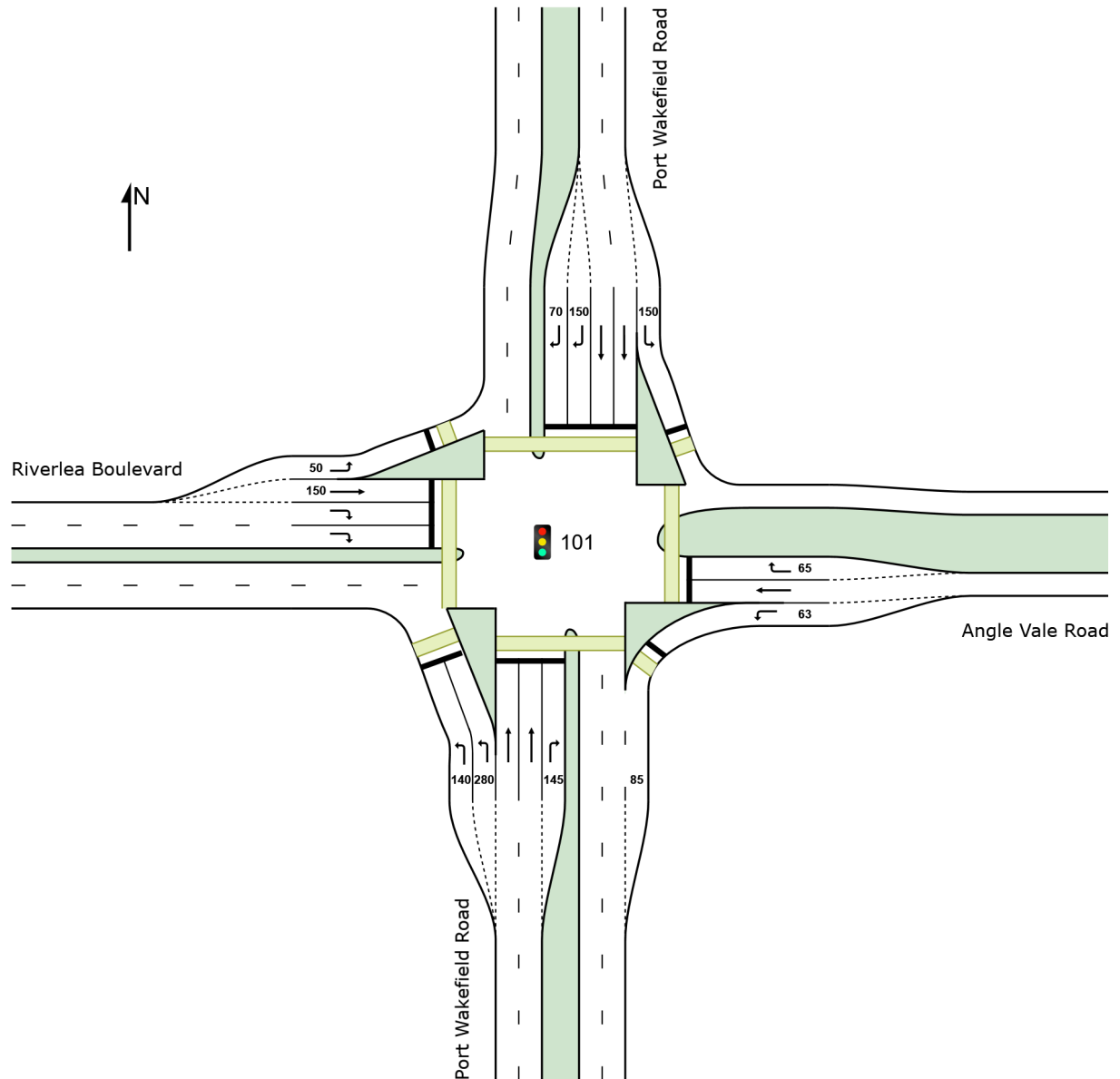
 Site: 101 [2. 2041 Interim PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Approach Lane Flows (veh/h)	
South: Port Wakefield Road	

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	35	-	-	35	0.0	433	0.080	100	0.0	2
Lane 2	-	278	-	278	19.1	405	0.687	100	NA	NA
Lane 3	-	278	-	278	19.1	405	0.687	100	NA	NA
Lane 4	-	-	53	53	22.0	125	0.422	100	0.0	3
Approach	35	556	53	643	18.3		0.687			
East: Angle Vale Road										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	391	-	-	391	4.3	439 ¹	0.889	100	83.0	2
Lane 2	-	16	-	16	6.7	187	0.084	100	NA	NA
Lane 3	-	-	83	83	12.7	170	0.488	100	0.0	2
Approach	391	16	83	489	5.8		0.889			
North: Port Wakefield Road										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	-	-	81	11.7	400	0.203	100	0.0	2
Lane 2	-	337	-	337	23.9	394	0.857	100	NA	NA
Lane 3	-	337	-	337	23.9	394	0.857	100	NA	NA
Lane 4	-	-	27	27	0.0	144	0.189	100	0.0	3
Approach	81	675	27	783	21.8		0.857			
West: Riverlea Boulevard										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	199	-	-	199	0.0	743	0.268	100	0.0	2
Lane 2	-	25	-	25	0.0	628	0.040	100	NA	NA
Lane 3	-	-	526	526	0.0	598	0.879	100	NA	NA
Lane 4	-	-	526	526	0.0	598	0.879	100	0.0	3
Approach	199	25	1052	1276	0.0		0.879			
Total %HV Deg.Satn (v/c)										
All Vehicles	3192	9.9			0.889					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Port Wakefield Road				

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [2. 2041 Existing PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing AM (Network Folder: Signalised Diamond Interchange (SDI))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

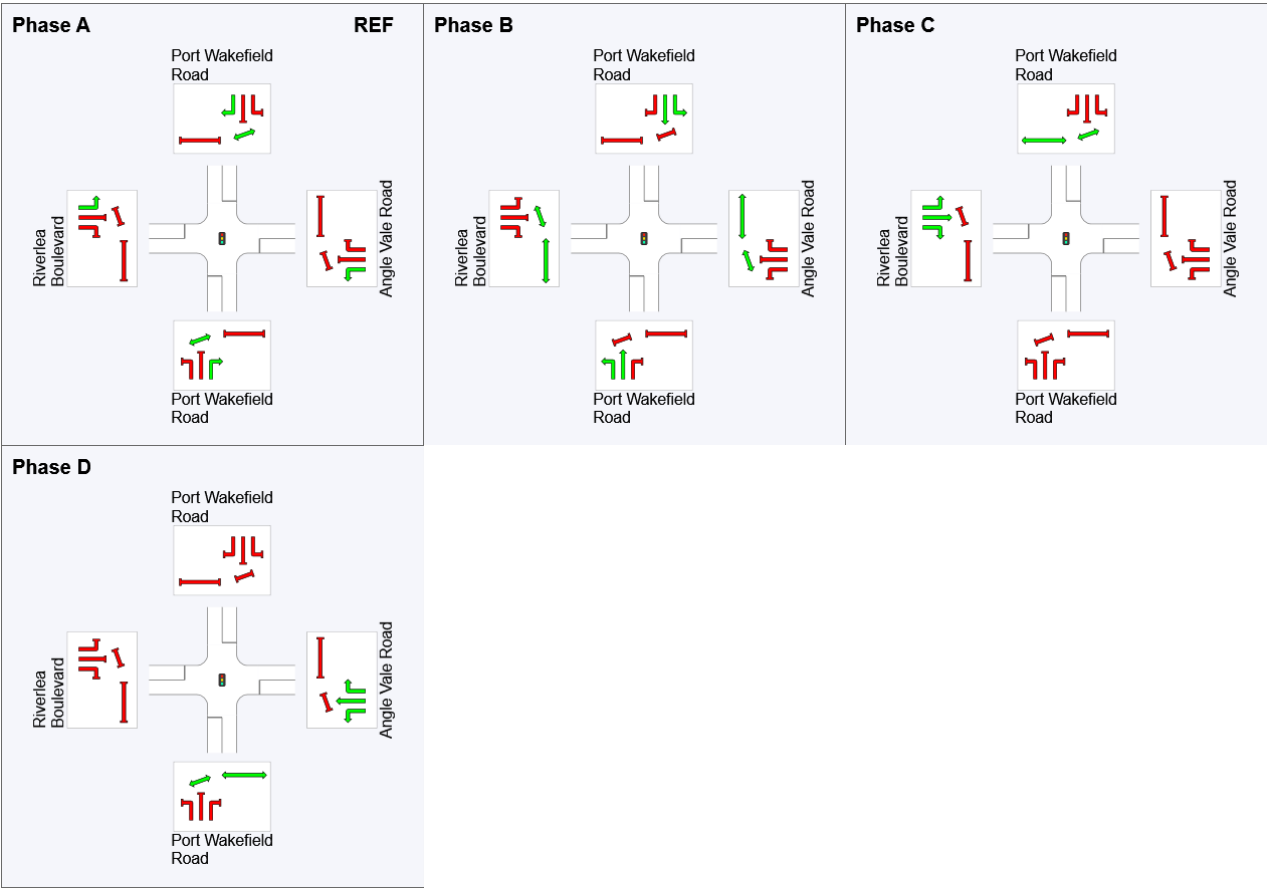
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A
Offset: 0 seconds (Program)

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	13	40	75
Green Time (sec)	7	21	29	9
Phase Time (sec)	13	27	35	15
Phase Split	14%	30%	39%	17%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

LANE SUMMARY

 Site: 101 [2. 2041 Existing PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 Network: N101 [Existing PM (Network Folder: Signalised Diamond Interchange (SDI))]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Port Wakefield Road															
Lane 1	972	0.0	972	0.0	1052	0.923	100	47.9	LOS D	43.7	305.8	Short	280	0.0	NA
Lane 2	375	18.9	375	18.9	984	0.381	100	18.9	LOS B	9.1	74.1	Full	500	0.0	4.8 ⁸
Lane 3	375	18.9	375	18.9	984	0.381	100	18.9	LOS B	9.1	74.1	Full	500	0.0	0.0
Lane 4	232	5.9	232	5.9	249	0.928	100	93.5	LOS F	12.1	89.0	Short	145	0.0	NA
Approach	1954	8.0	1954	8.0		0.928		42.2	LOS C	43.7	305.8				
East: Angle Vale Road															
Lane 1	115	16.5	115	16.5	399	0.288	100	55.8	LOS D	4.2	33.5	Short	63	0.0	NA
Lane 2	94	0.0	94	0.0	117	0.801	100	82.2	LOS F	4.5	31.5	Full	500	0.0	0.0
Lane 3	82	6.4	82	6.4	107	0.771	100	87.4	LOS F	3.9	29.1	Short	65	0.0	NA
Approach	291	8.3	291	8.3		0.801		73.3	LOS F	4.5	33.5				
North: Port Wakefield Road															
Lane 1	115	8.3	115	8.3	994	0.115	100	21.5	LOS B	2.3	17.4	Short	150	0.0	NA
Lane 2	337	12.3	337	12.3	1023	0.329	100	18.2	LOS B	7.9	60.9	Full	500	0.0	0.0
Lane 3	337	12.3	337	12.3	1023	0.329	100	18.2	LOS B	7.9	60.9	Full	500	0.0	0.0
Lane 4	207	0.0	207	0.0	260	0.798	100	77.8	LOS F	9.6	66.9	Short	150	0.0	NA
Approach	996	9.3	996	9.3		0.798		31.0	LOS C	9.6	66.9				
West: Riverlea Boulevard															
Lane 1	23	0.0	23	0.0	396	0.058	100	42.7	LOS D	0.7	4.9	Short	50	0.0	NA
Lane 2	5	0.0	5	0.0	143	0.037	100	70.6	LOS F	0.2	1.6	Full	500	0.0	0.0
Lane 3	15	0.0	15	0.0	136	0.108	100	78.5	LOS F	0.6	4.5	Full	500	0.0	0.0
Lane 4	15	0.0	15	0.0	136	0.108	100	78.5	LOS F	0.6	4.5	Short	150	0.0	NA
Approach	58	0.0	58	0.0		0.108		63.5	LOS E	0.7	4.9				
All Vehicles	3298	8.3	3298	8.3		0.928		41.9	LOS C	43.7	305.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁸ Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)										
South: Port Wakefield Road										
Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.	

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	972	-	-	972	0.0	1052	0.923	100	58.3	2
Lane 2	-	375	-	375	18.9	984	0.381	100	NA	NA
Lane 3	-	375	-	375	18.9	984	0.381	100	NA	NA
Lane 4	-	-	232	232	5.9	249	0.928	100	5.1	3
Approach	972	751	232	1954	8.0		0.928			
East: Angle Vale Road										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	115	-	-	115	16.5	399	0.288	100	0.0	2
Lane 2	-	94	-	94	0.0	117	0.801	100	NA	NA
Lane 3	-	-	82	82	6.4	107	0.771	100	0.0	2
Approach	115	94	82	291	8.3		0.801			
North: Port Wakefield Road										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	115	-	-	115	8.3	994	0.115	100	0.0	2
Lane 2	-	337	-	337	12.3	1023	0.329	100	NA	NA
Lane 3	-	337	-	337	12.3	1023	0.329	100	NA	NA
Lane 4	-	-	207	207	0.0	260	0.798	100	0.0	3
Approach	115	674	207	996	9.3		0.798			
West: Riverlea Boulevard										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	-	-	23	0.0	396	0.058	100	0.0	2
Lane 2	-	5	-	5	0.0	143	0.037	100	NA	NA
Lane 3	-	-	15	15	0.0	136	0.108	100	NA	NA
Lane 4	-	-	15	15	0.0	136	0.108	100	0.0	3
Approach	23	5	29	58	0.0		0.108			
Total %HV Deg.Satn (v/c)										
All Vehicles	3298	8.3			0.928					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [2. 2041 Existing PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing PM (Network Folder: Signalised Diamond Interchange (SDI))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Optimum Cycle Time - Minimum Delay)

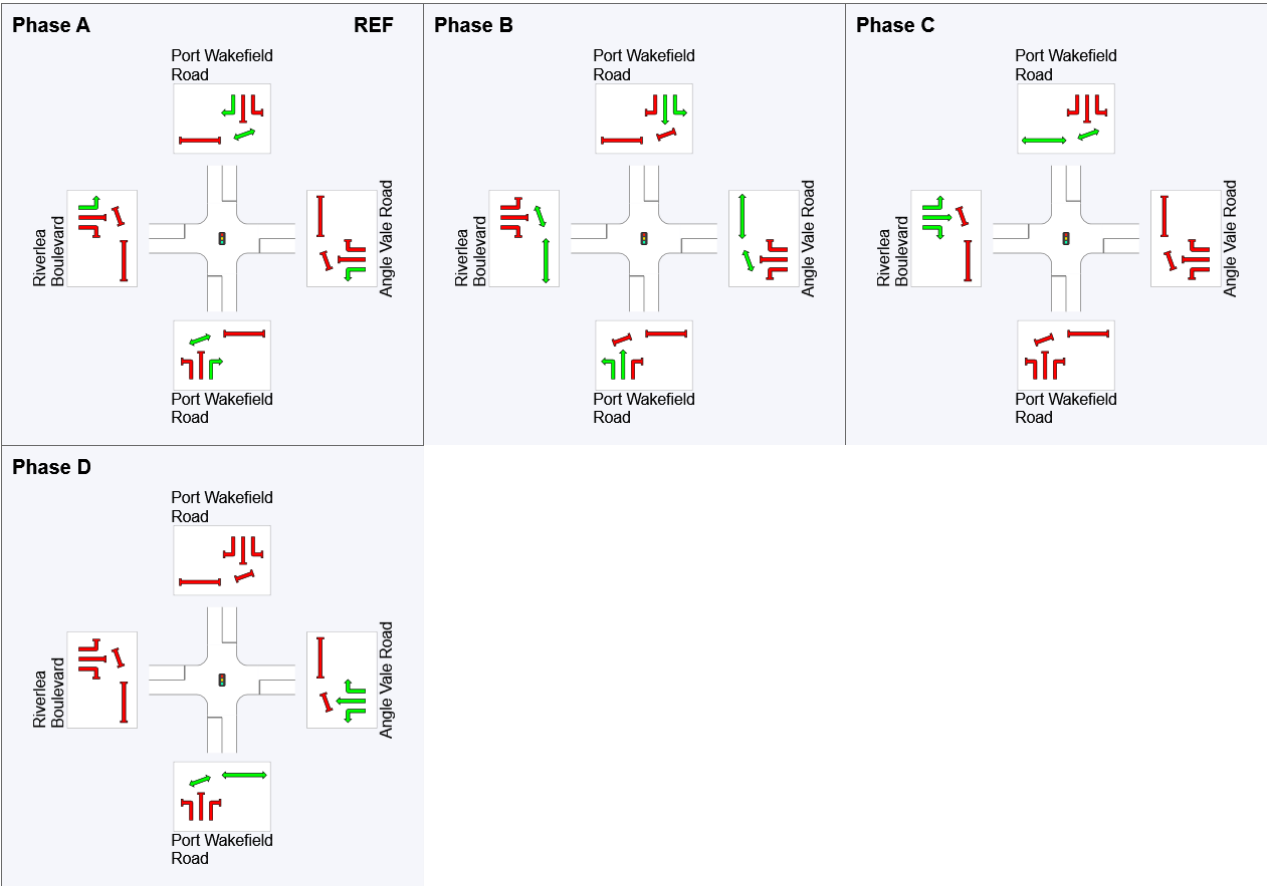
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A
Offset: 0 seconds (Program)

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	27	118	135
Green Time (sec)	21	85	11	9
Phase Time (sec)	27	91	17	15
Phase Split	18%	61%	11%	10%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

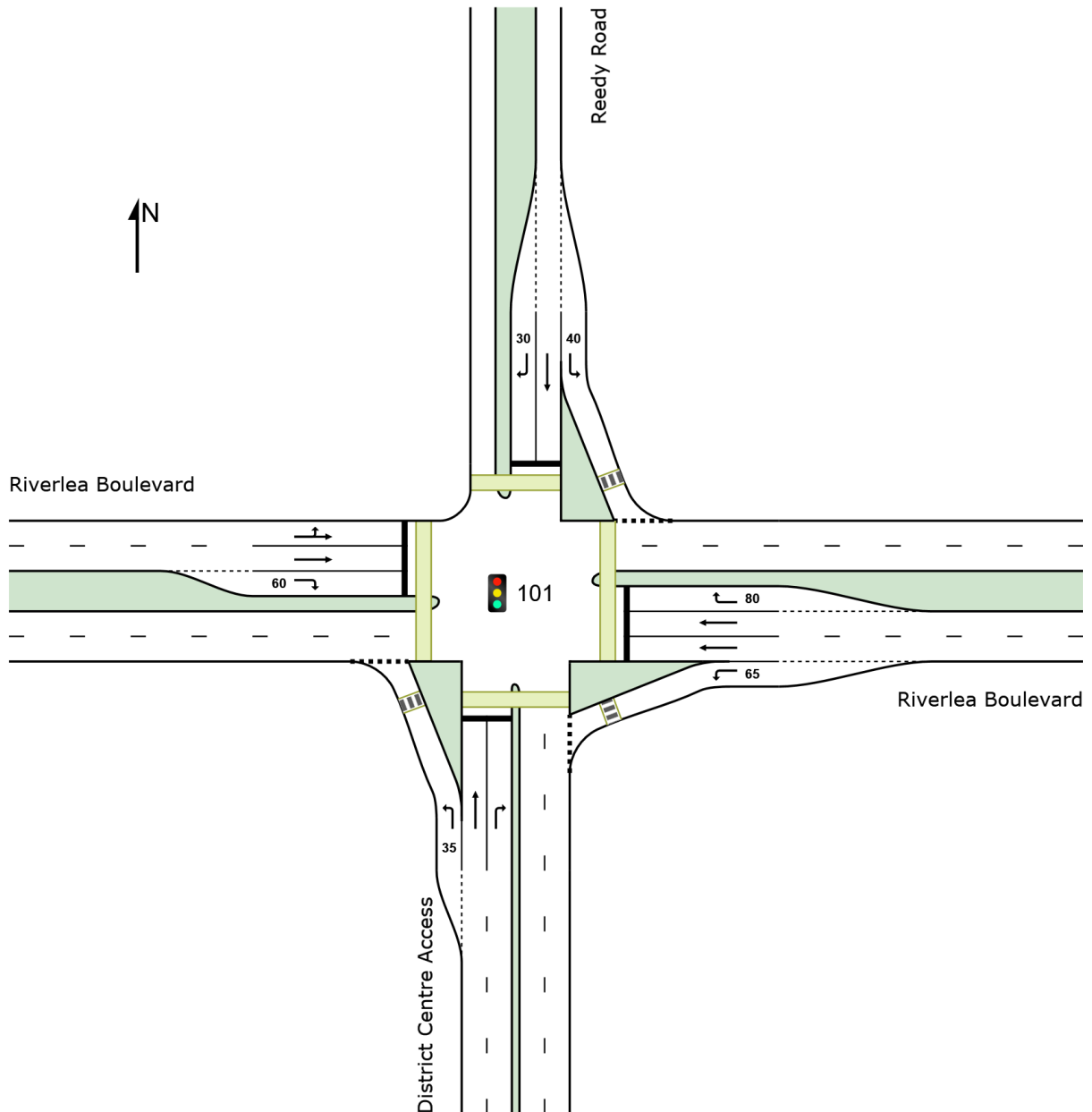
 **Site: 101 [1. 2041 Interim Riverlea District Centre AM (Site Folder: At-grade intersection)]**

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\Users\iwans\Documents\Viae Consulting\01 - Projects\VC050_Riverlea Modelling Peer Review\Technical\SIDRA\20250701_Riverlea 2041.sip9

LANE SUMMARY

 Site: 101 [1. 2041 Interim Riverlea District Centre AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 Network: N101 [Interim AM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %						[Veh m]	Dist m				
South: District Centre Access															
Lane 1	214	1.0	214	1.0	1424	0.150	100	6.1	LOS A	0.4	3.1	Short	35	0.0	NA
Lane 2	5	1.0	5	1.0	323	0.016	100	44.6	LOS D	0.2	1.1	Full	500	0.0	0.0
Lane 3	173	1.0	173	1.0	200	0.864	100	71.9	LOS F	6.9	48.5	Full	500	0.0	0.0
Approach	392	1.0	392	1.0		0.864		35.6	LOS C	6.9	48.5				
East: Riverlea Boulevard															
Lane 1	4	1.0	4	1.0	1041	0.004	100	10.7	LOS A	0.0	0.3	Short	65	0.0	NA
Lane 2	15	1.0	15	1.0	710	0.021	100	14.6	LOS B	0.2	1.4	Full	500	0.0	0.0
Lane 3	15	1.0	15	1.0	710	0.021	100	5.4	LOS A	0.1	0.5	Full	500	0.0	0.0
Lane 4	2	1.0	2	1.0	292	0.007	100	58.4	LOS E	0.1	0.5	Short	80	0.0	NA
Approach	37	1.0	37	1.0		0.021		12.9	LOS A	0.2	1.4				
North: Reedy Road															
Lane 1	294	1.0	294	1.0	786	0.373	100	22.3	LOS B	6.2	43.6	Short	40	0.0	NA
Lane 2	120	1.0	120	1.0	323	0.372	100	48.5	LOS D	3.9	27.4	Full	500	0.0	0.0
Lane 3	1	1.0	1	1.0	200	0.005	100	56.8	LOS E	0.0	0.2	Short	30	0.0	NA
Approach	415	1.0	415	1.0		0.373		30.0	LOS C	6.2	43.6				
West: Riverlea Boulevard															
Lane 1	615	1.0	615	1.0	710	0.866	100	44.9	LOS D	22.5	158.9	Full	500	0.0	0.0
Lane 2	503	1.0	503	1.0	581 ¹	0.866	100	61.3	LOS E	18.8	133.0	Full	500	0.0	0.0
Lane 3	256	1.0	256	1.0	292	0.876	100	83.6	LOS F	10.2	72.1	Short	60	0.0	NA
Approach	1374	1.0	1374	1.0		0.876		58.1	LOS E	22.5	158.9				
All Vehicles	2217	1.0	2217	1.0		0.876		48.1	LOS D	22.5	158.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: District Centre Access										
Mov.	L2	T1	R2	Total	%HV					
From S						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:						veh/h	Satn	Util.	SL Ov.	Lane
							v/c	%	%	No.

	W	N	E							
Lane 1	214	-	-	214	1.0	1424	0.150	100	0.0	2
Lane 2	-	5	-	5	1.0	323	0.016	100	NA	NA
Lane 3	-	-	173	173	1.0	200	0.864	100	NA	NA
Approach	214	5	173	392	1.0		0.864			
East: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E						Cap.	Satn	Util.	SL	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	4	-	-	4	1.0	1041	0.004	100	0.0	2
Lane 2	-	15	-	15	1.0	710	0.021	100	NA	NA
Lane 3	-	15	-	15	1.0	710	0.021	100	NA	NA
Lane 4	-	-	2	2	1.0	292	0.007	100	0.0	3
Approach	4	31	2	37	1.0		0.021			
North: Reedy Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	294	-	-	294	1.0	786	0.373	100	58.2	2
Lane 2	-	120	-	120	1.0	323	0.372	100	NA	NA
Lane 3	-	-	1	1	1.0	200	0.005	100	0.0	2
Approach	294	120	1	415	1.0		0.373			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	5	610	-	615	1.0	710	0.866	100	NA	NA
Lane 2	-	503	-	503	1.0	581 ¹	0.866	100	NA	NA
Lane 3	-	-	256	256	1.0	292	0.876	100	67.4	2
Approach	5	1113	256	1374	1.0		0.876			
Total %HV Deg.Satn (v/c)										
All Vehicles	2217	1.0		0.876						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: District Centre Access				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: Riverlea Boulevard				

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [1. 2041 Interim Riverlea District Centre AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Interim AM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

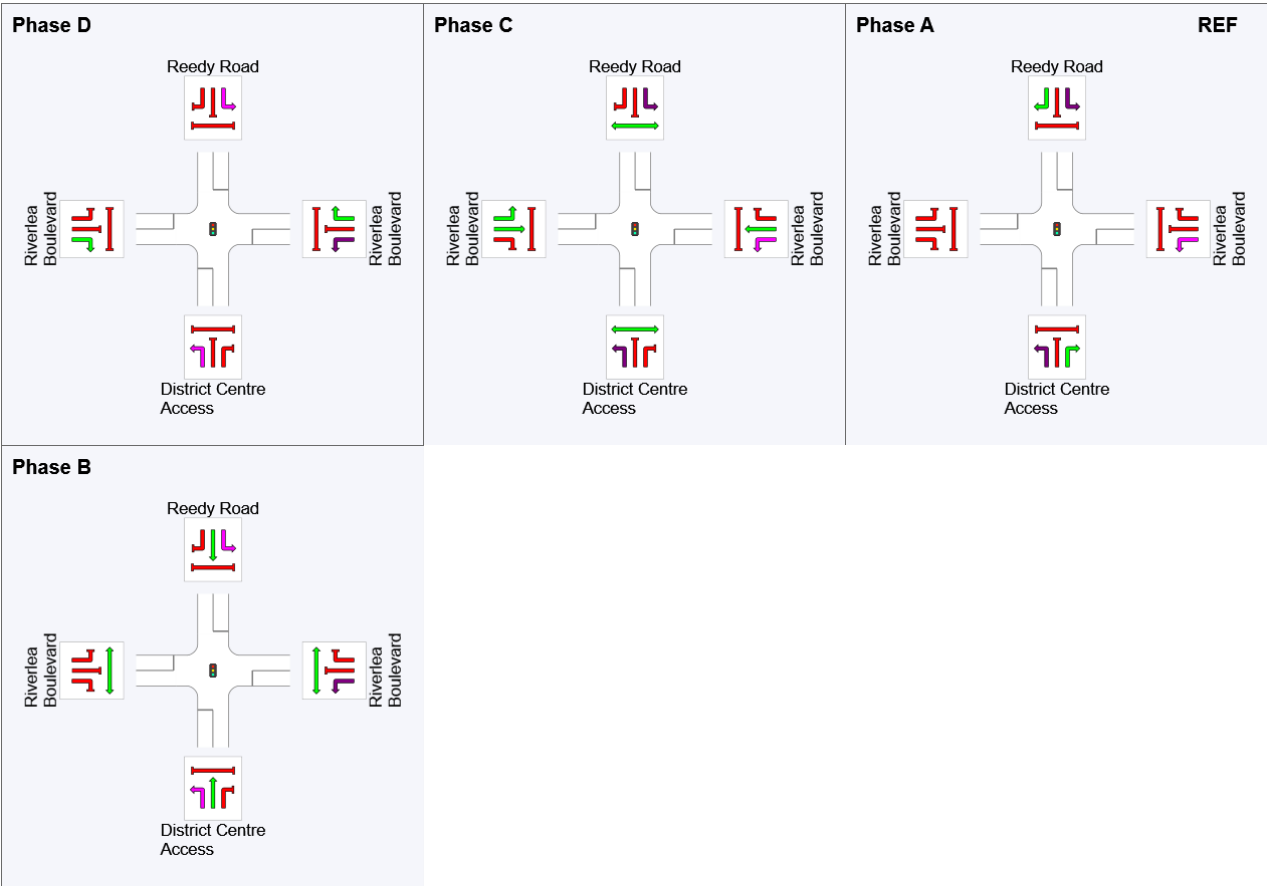
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: D, C, A, B
Output Phase Sequence: D, C, A, B
Reference Phase: Phase A
Offset: 68 seconds (Program)

Phase Timing Summary

Phase	D	C	A	B
Phase Change Time (sec)	113	18	68	87
Green Time (sec)	19	44	13	20
Phase Time (sec)	25	50	19	26
Phase Split	21%	42%	16%	22%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

LANE SUMMARY

 Site: 101 [1. 2041 Interim Riverlea District Centre PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 Network: N101 [Interim PM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh m]	[Dist m]				
South: District Centre Access															
Lane 1	421	1.0	421	1.0	921 ¹	0.457	100	25.2	LOS B	5.9	41.6	Short	35	0.0	NA
Lane 2	296	1.0	296	1.0	280 ¹	1.058	100	129.7	LOS F	14.5	102.1	Full	500	0.0	0.0
Lane 3	15	1.0	15	1.0	123	0.120	100	50.7	LOS D	0.4	2.8	Full	500	0.0	0.0
Approach	732	1.0	732	1.0		1.058		67.9	LOS E	14.5	102.1				
East: Riverlea Boulevard															
Lane 1	97	1.0	97	1.0	1057	0.092	100	12.9	LOS A	0.4	2.6	Short	65	0.0	NA
Lane 2	544	1.0	544	1.0	544 ¹	1.001	100	47.2	LOS D	18.1	127.8	Full	500	0.0	0.0
Lane 3	567	1.0	567	1.0	567 ¹	1.001	100	39.5	LOS C	19.1	135.1	Full	500	0.0	0.0
Lane 4	89	1.0	89	1.0	287	0.312	100	44.6	LOS D	2.2	15.3	Short	80	0.0	NA
Approach	1298	1.0	1298	1.0		1.001		41.1	LOS C	19.1	135.1				
North: Reedy Road															
Lane 1	5	1.0	5	1.0	1387	0.004	100	6.1	LOS A	0.0	0.1	Short	40	0.0	NA
Lane 2	5	1.0	5	1.0	409	0.013	100	30.0	LOS C	0.1	0.8	Full	500	0.0	0.0
Lane 3	5	1.0	5	1.0	123	0.043	100	49.9	LOS D	0.1	1.0	Short	30	0.0	NA
Approach	16	1.0	16	1.0		0.043		28.7	LOS C	0.1	1.0				
West: Riverlea Boulevard															
Lane 1	13	1.0	13	1.0	570	0.023	100	25.9	LOS B	0.2	1.7	Full	500	0.0	0.0
Lane 2	13	1.0	13	1.0	581	0.023	100	23.6	LOS B	0.2	1.8	Full	500	0.0	0.0
Lane 3	302	1.0	302	1.0	287	1.053	100	119.9	LOS F	14.2	100.2	Short	60	0.0	NA
Approach	328	1.0	328	1.0		1.053		112.3	LOS F	14.2	100.2				
All Vehicles	2374	1.0	2374	1.0		1.058		59.1	LOS E	19.1	135.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: District Centre Access										
Mov.	L2	T1	R2	Total	%HV					
From S						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:						veh/h	Satn	Util.	SL Ov.	Lane
							v/c	%	%	No.

	W	N	E							
Lane 1	421	-	-	421	1.0	921 ¹	0.457	100	66.4	2
Lane 2	-	296	-	296	1.0	280 ¹	1.058	100	NA	NA
Lane 3	-	-	15	15	1.0	123	0.120	100	NA	NA
Approach	421	296	15	732	1.0		1.058			
East: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	97	-	-	97	1.0	1057	0.092	100	0.0	2
Lane 2	-	544	-	544	1.0	544 ¹	1.001	100	NA	NA
Lane 3	-	567	-	567	1.0	567 ¹	1.001	100	NA	NA
Lane 4	-	-	89	89	1.0	287	0.312	100	0.0	3
Approach	97	1112	89	1298	1.0		1.001			
North: Reedy Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	5	-	-	5	1.0	1387	0.004	100	0.0	2
Lane 2	-	5	-	5	1.0	409	0.013	100	NA	NA
Lane 3	-	-	5	5	1.0	123	0.043	100	0.0	2
Approach	5	5	5	16	1.0		0.043			
West: Riverlea Boulevard										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	5	8	-	13	1.0	570	0.023	100	NA	NA
Lane 2	-	13	-	13	1.0	581	0.023	100	NA	NA
Lane 3	-	-	302	302	1.0	287	1.053	100	99.9	2
Approach	5	21	302	328	1.0		1.053			
Total %HV Deg.Satn (v/c)										
All Vehicles	2374	1.0		1.058						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: District Centre Access				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	8.1	103.7	NA
Lane 3	0.0	0.0	0.0	0.0
East: Riverlea Boulevard				

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.2	1.2	NA
Lane 3	0.0	0.2	1.2	NA
Lane 4	0.0	0.0	0.0	0.0
North: Reedy Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	7.6	95.8	NA

PHASING SUMMARY

Site: 101 [1. 2041 Interim RiverleaDistrictCentre PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Interim PM (Network Folder: Signalised Diamond Interchange (SDI))]

Reedy Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

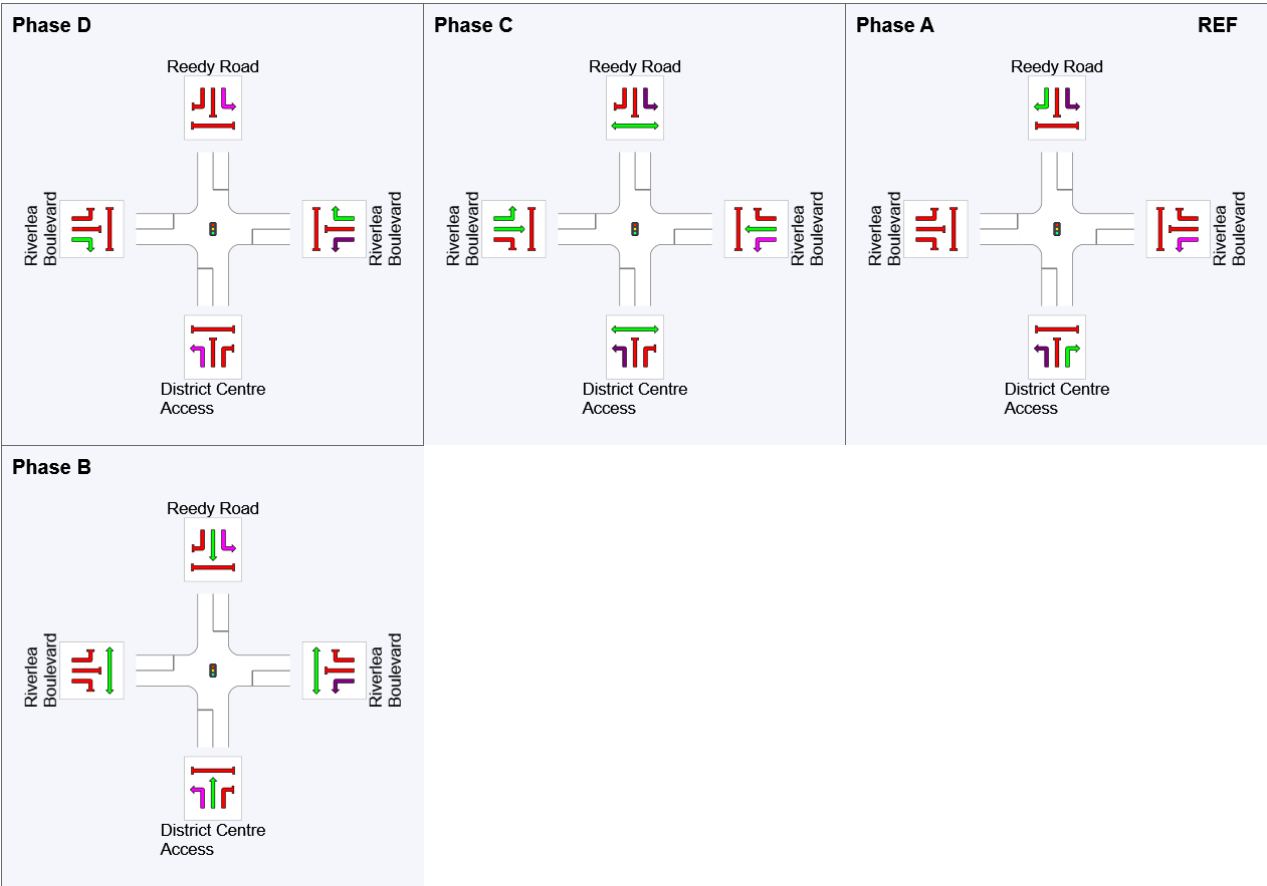
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: D, C, A, B
Output Phase Sequence: D, C, A, B
Reference Phase: Phase A
Offset: 0 seconds (Program)

Phase Timing Summary

Phase	D	C	A	B
Phase Change Time (sec)	37	57	0	12
Green Time (sec)	14	27	6	19
Phase Time (sec)	20	33	12	25
Phase Split	22%	37%	13%	28%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

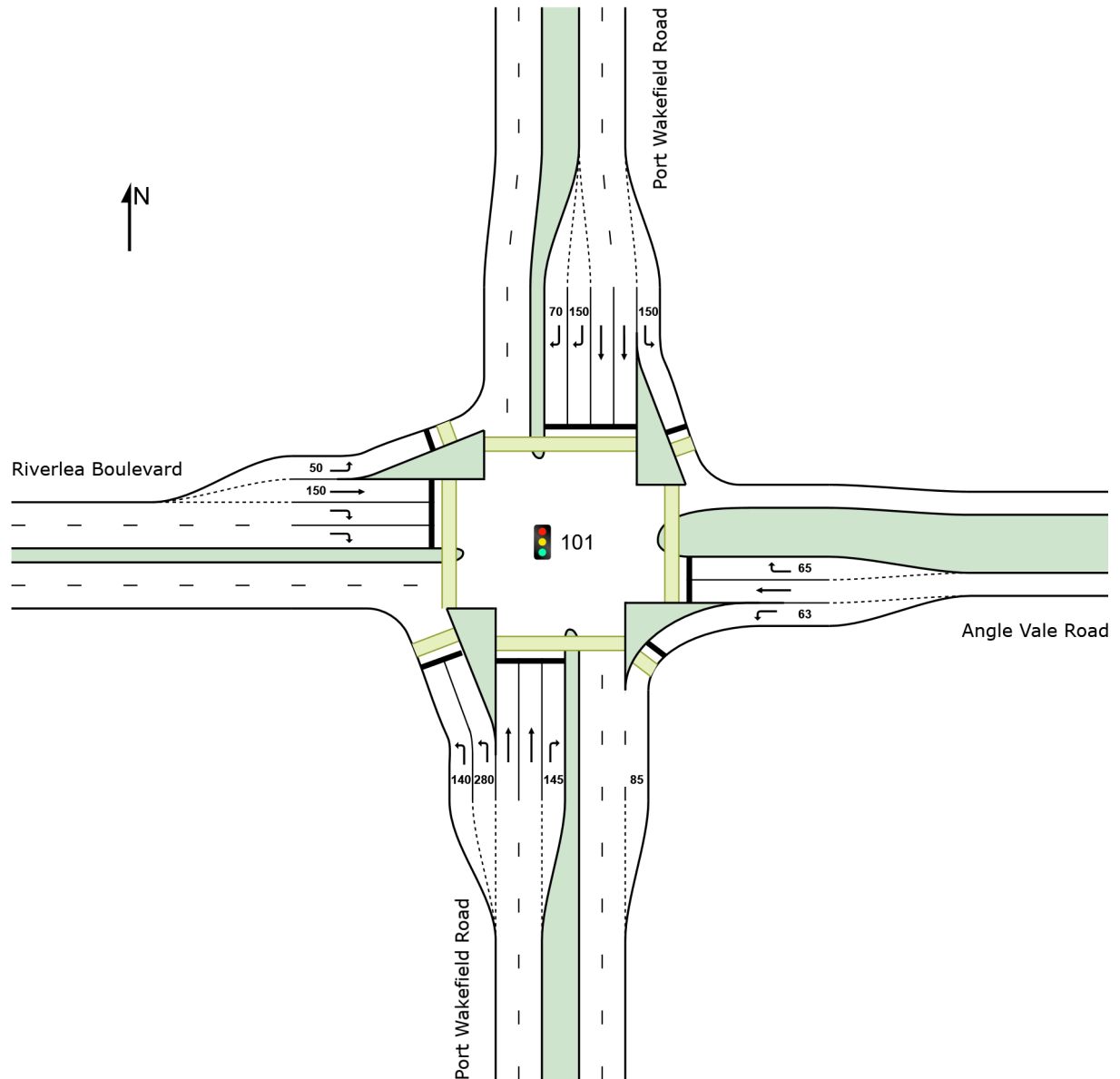
 Site: 101 [2. 2041 Interim PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\Users\iwans\Documents\Viae Consulting\01 - Projects\VC050_Riverlea Modelling Peer Review\Technical\SIDRA\20250701_Riverlea 2041.sip9

LANE SUMMARY

 **Site: 101 [2. 2041 Interim PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

 **Network: N101 [Interim AM (Network Folder: Signalised Diamond Interchange (SDI))]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%											
South: Port Wakefield Road															
Lane 1	8	0.0	8	0.0	418	0.020	100	44.1	LOS D	0.2	1.6	Short	140	0.0	NA
Lane 2	8	0.0	8	0.0	418	0.020	100	44.1	LOS D	0.2	1.6	Short	280	0.0	NA
Lane 3	283	19.4	283	19.4	390	0.725	100	48.2	LOS D	9.7	79.3	Full	500	0.0	0.0
Lane 4	283	19.4	283	19.4	390	0.725	100	48.2	LOS D	9.7	79.3	Full	500	0.0	0.0
Lane 5	60	21.1	60	21.1	161	0.372	100	62.6	LOS E	2.1	17.4	Short	145	0.0	NA
Approach	642	19.0	642	19.0		0.725		49.4	LOS D	9.7	79.3				
East: Angle Vale Road															
Lane 1	392	4.3	392	4.3	433 ¹	0.905	100	87.7	LOS F	16.1	117.0	Short	63	0.0	NA
Lane 2	8	12.5	8	12.5	165	0.051	100	68.5	LOS E	0.3	2.2	Full	500	0.0	0.0
Lane 3	86	12.2	86	12.2	157	0.551	100	64.7	LOS E	3.1	24.0	Short	65	0.0	NA
Approach	486	5.8	486	5.8		0.905		83.3	LOS F	16.1	117.0				
North: Port Wakefield Road															
Lane 1	81	11.7	81	11.7	386	0.210	100	46.7	LOS D	2.4	18.3	Short	150	0.0	NA
Lane 2	338	24.0	338	24.0	380	0.890	100	61.5	LOS E	13.7	115.7	Full	500	0.0	0.0
Lane 3	338	24.0	338	24.0	380	0.890	100	61.5	LOS E	13.7	115.7	Full	500	0.0	0.0
Lane 4	6	0.0	6	0.0	186	0.034	100	58.8	LOS E	0.2	1.5	Short	150	0.0	NA
Lane 5	6	0.0	6	0.0	186	0.034	100	58.8	LOS E	0.2	1.5	Short	70	0.0	NA
Approach	769	22.3	769	22.3		0.890		59.9	LOS E	13.7	115.7				
West: Riverlea Boulevard															
Lane 1	265	0.0	265	0.0	898	0.296	100	11.1	LOS A	2.1	14.7	Short	50	0.0	NA
Lane 2	39	0.0	39	0.0	748	0.052	100	12.8	LOS A	0.5	3.2	Short	150	0.0	NA
Lane 3	639	0.0	639	0.0	712	0.898	100	31.0	LOS C	20.8	145.9	Full	500	0.0	0.0
Lane 4	639	0.0	639	0.0	712	0.898	100	27.0	LOS B	19.7	138.0	Full	500	0.0	0.0
Approach	1583	0.0	1583	0.0		0.898		25.6	LOS B	20.8	145.9				
All Vehicles	3481	9.3	3481	9.3		0.905		45.6	LOS D	20.8	145.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)											
South: Port Wakefield Road											
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	8	-	-	8	0.0	418	0.020	100	0.0	2	
Lane 2	8	-	-	8	0.0	418	0.020	100	0.0	3	
Lane 3	-	283	-	283	19.4	390	0.725	100	NA	NA	
Lane 4	-	283	-	283	19.4	390	0.725	100	NA	NA	
Lane 5	-	-	60	60	21.1	161	0.372	100	0.0	4	
Approach	17	565	60	642	19.0		0.725				
East: Angle Vale Road											
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	392	-	-	392	4.3	433 ¹	0.905	100	100.0	2	
Lane 2	-	8	-	8	12.5	165	0.051	100	NA	NA	
Lane 3	-	-	86	86	12.2	157	0.551	100	0.0	2	
Approach	392	8	86	486	5.8		0.905				
North: Port Wakefield Road											
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	81	-	-	81	11.7	386	0.210	100	0.0	2	
Lane 2	-	338	-	338	24.0	380	0.890	100	NA	NA	
Lane 3	-	338	-	338	24.0	380	0.890	100	NA	NA	
Lane 4	-	-	6	6	0.0	186	0.034	100	0.0	3	
Lane 5	-	-	6	6	0.0	186	0.034	100	0.0	4	
Approach	81	676	13	769	22.3		0.890				
West: Riverlea Boulevard											
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	265	-	-	265	0.0	898	0.296	100	0.0	2	
Lane 2	-	39	-	39	0.0	748	0.052	100	0.0	3	
Lane 3	-	-	639	639	0.0	712	0.898	100	NA	NA	
Lane 4	-	-	639	639	0.0	712	0.898	100	NA	NA	
Approach	265	39	1279	1583	0.0		0.898				
Total %HV Deg.Satn (v/c)											
All Vehicles	3481	9.3			0.905						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Port Wakefield Road												
Merge Type: Priority												
Exit Short Lane	1	85	0.0	977	1018	3.06	2.04	392	688	0.569	3.0	6.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				977	1800	0.543	0.0	0.0

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [2. 2041 Interim PortWakefieldAngleVale AM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Interim AM (Network Folder: Signalised Diamond Interchange (SDI))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

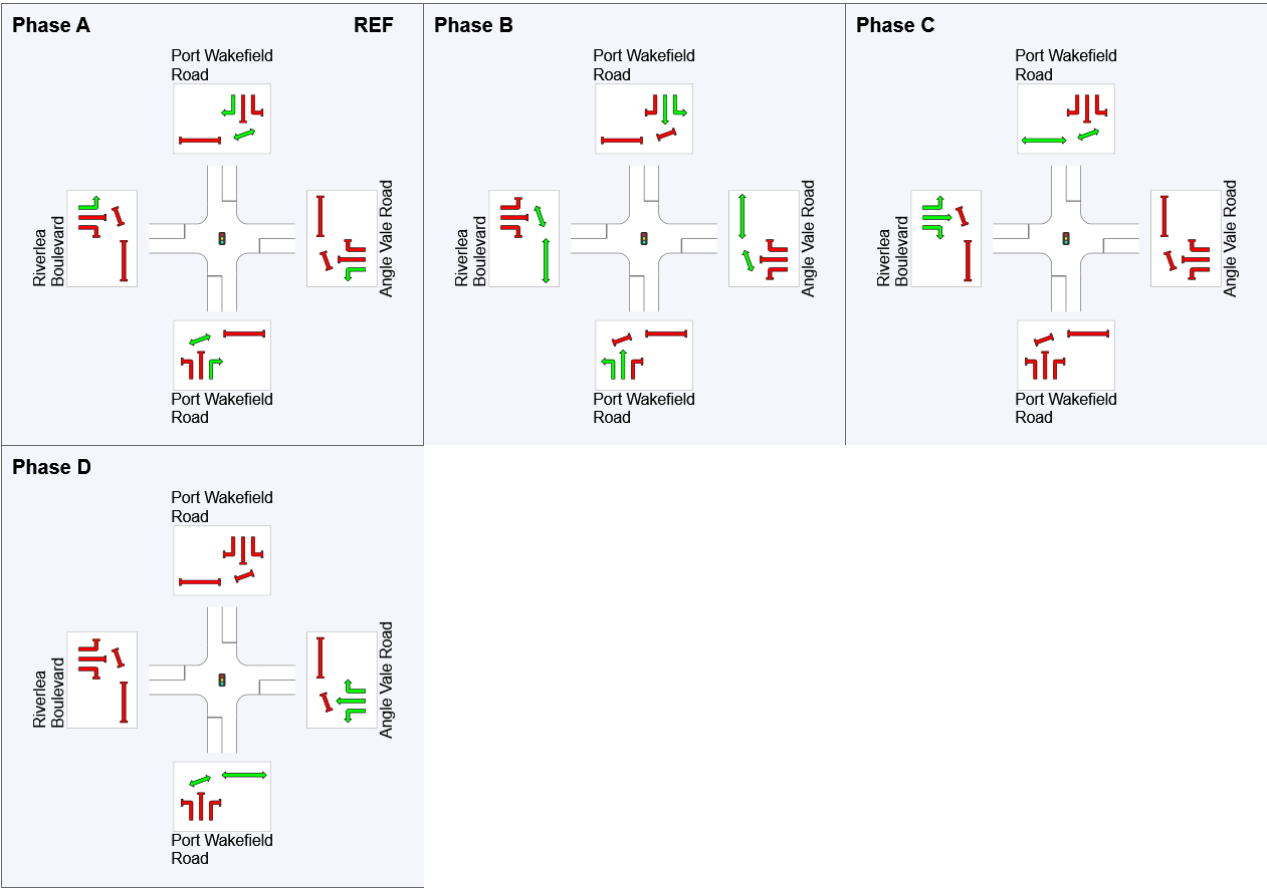
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A
Offset: 0 seconds (Program)

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	18	51	103
Green Time (sec)	12	27	46	11
Phase Time (sec)	18	33	52	17
Phase Split	15%	28%	43%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

LANE SUMMARY

Site: 101 [2. 2041 Interim PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■ ■ Network: N101 [Interim PM
(Network Folder: Signalled
Diamond Interchange (SDI))]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	Aver. Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h	HV] %	[Total veh/h	HV] %						[Veh]	Dist] m					
South: Port Wakefield Road																
Lane 1	468	0.0	468	0.0	640	0.731	100	34.5	LOS C	11.4	79.5	Short	140	0.0	NA	
Lane 2	468	0.0	468	0.0	640	0.731	100	34.5	LOS C	11.4	79.5	Short	280	0.0	NA	
Lane 3	373	19.1	373	19.1	598	0.624	100	26.8	LOS B	8.5	69.0	Full	500	0.0	0.0	
Lane 4	373	19.1	373	19.1	598	0.624	100	26.8	LOS B	8.5	69.0	Full	500	0.0	0.0	
Lane 5	235	6.3	235	6.3	336	0.699	100	44.7	LOS D	6.2	46.0	Short	145	0.0	NA	
Approach	1916	8.2	1916	8.2		0.731		32.8	LOS C	11.4	79.5					
East: Angle Vale Road																
Lane 1	115	16.5	115	16.5	572	0.200	100	29.1	LOS C	2.2	17.4	Short	63	0.0	NA	
Lane 2	113	0.0	113	0.0	173	0.650	100	46.0	LOS D	3.2	22.1	Full	500	0.0	0.0	
Lane 3	81	6.5	81	6.5	158	0.514	100	50.6	LOS D	2.2	16.4	Short	65	0.0	NA	
Approach	308	7.8	308	7.8		0.650		40.9	LOS C	3.2	22.1					
North: Port Wakefield Road																
Lane 1	115	8.3	115	8.3	604	0.190	100	28.0	LOS B	2.2	16.3	Short	150	0.0	NA	
Lane 2	339	12.2	339	12.2	622	0.546	100	25.9	LOS B	7.4	57.5	Full	500	0.0	0.0	
Lane 3	339	12.2	339	12.2	622	0.546	100	25.9	LOS B	7.4	57.5	Full	500	0.0	0.0	
Lane 4	148	0.0	148	0.0	351	0.422	100	41.1	LOS C	3.6	25.2	Short	150	0.0	NA	
Lane 5	148	0.0	148	0.0	351	0.422	100	41.1	LOS C	3.6	25.2	Short	70	0.0	NA	
Approach	1089	8.5	1089	8.5		0.546		30.2	LOS C	7.4	57.5					
West: Riverlea Boulevard																
Lane 1	11	0.0	11	0.0	557	0.019	100	14.7	LOS B	0.1	0.6	Short	50	0.0	NA	
Lane 2	2	0.0	2	0.0	217	0.010	100	42.6	LOS D	0.1	0.4	Short	150	0.0	NA	
Lane 3	11	0.0	11	0.0	206	0.054	100	49.2	LOS D	0.3	2.1	Full	500	0.0	0.0	
Lane 4	11	0.0	11	0.0	206	0.054	100	49.2	LOS D	0.3	2.1	Full	500	0.0	0.0	
Approach	35	0.0	35	0.0		0.054		38.3	LOS C	0.3	2.1					
All Vehicles	3348	8.2	3348	8.2		0.731		32.8	LOS C	11.4	79.5					

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)	
South: Port Wakefield Road	

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	468	-	-	468	0.0	640	0.731	100	0.0	2
Lane 2	468	-	-	468	0.0	640	0.731	100	0.0	3
Lane 3	-	373	-	373	19.1	598	0.624	100	NA	NA
Lane 4	-	373	-	373	19.1	598	0.624	100	NA	NA
Lane 5	-	-	235	235	6.3	336	0.699	100	0.0	4
Approach	936	745	235	1916	8.2		0.731			
East: Angle Vale Road										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	115	-	-	115	16.5	572	0.200	100	0.0	2
Lane 2	-	113	-	113	0.0	173	0.650	100	NA	NA
Lane 3	-	-	81	81	6.5	158	0.514	100	0.0	2
Approach	115	113	81	308	7.8		0.650			
North: Port Wakefield Road										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	115	-	-	115	8.3	604	0.190	100	0.0	2
Lane 2	-	339	-	339	12.2	622	0.546	100	NA	NA
Lane 3	-	339	-	339	12.2	622	0.546	100	NA	NA
Lane 4	-	-	148	148	0.0	351	0.422	100	0.0	3
Lane 5	-	-	148	148	0.0	351	0.422	100	0.0	4
Approach	115	679	296	1089	8.5		0.546			
West: Riverlea Boulevard										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	-	-	11	0.0	557	0.019	100	0.0	2
Lane 2	-	2	-	2	0.0	217	0.010	100	0.0	3
Lane 3	-	-	11	11	0.0	206	0.054	100	NA	NA
Lane 4	-	-	11	11	0.0	206	0.054	100	NA	NA
Approach	11	2	22	35	0.0		0.054			
Total %HV Deg.Satn (v/c)										
All Vehicles	3348	8.2		0.731						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Port Wakefield Road Merge Type: Priority												
Exit Short Lane	1	85	0.0	351	371	3.25	2.17	115	1273	0.090	0.7	0.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed				351	1800	0.195	0.0	0.0

Variable Demand Analysis			
Initial Queued	Residual Queued	Time for Residual	Duration of

	Demand veh	Demand veh	Demand to Clear sec	Oversatn sec
South: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
East: Angle Vale Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Port Wakefield Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
Lane 5	0.0	0.0	0.0	0.0
West: Riverlea Boulevard				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101 [2. 2041 Interim PortWakefieldAngleVale PM (Site Folder: At-grade intersection)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Interim PM (Network Folder: Signalised Diamond Interchange (SDI))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

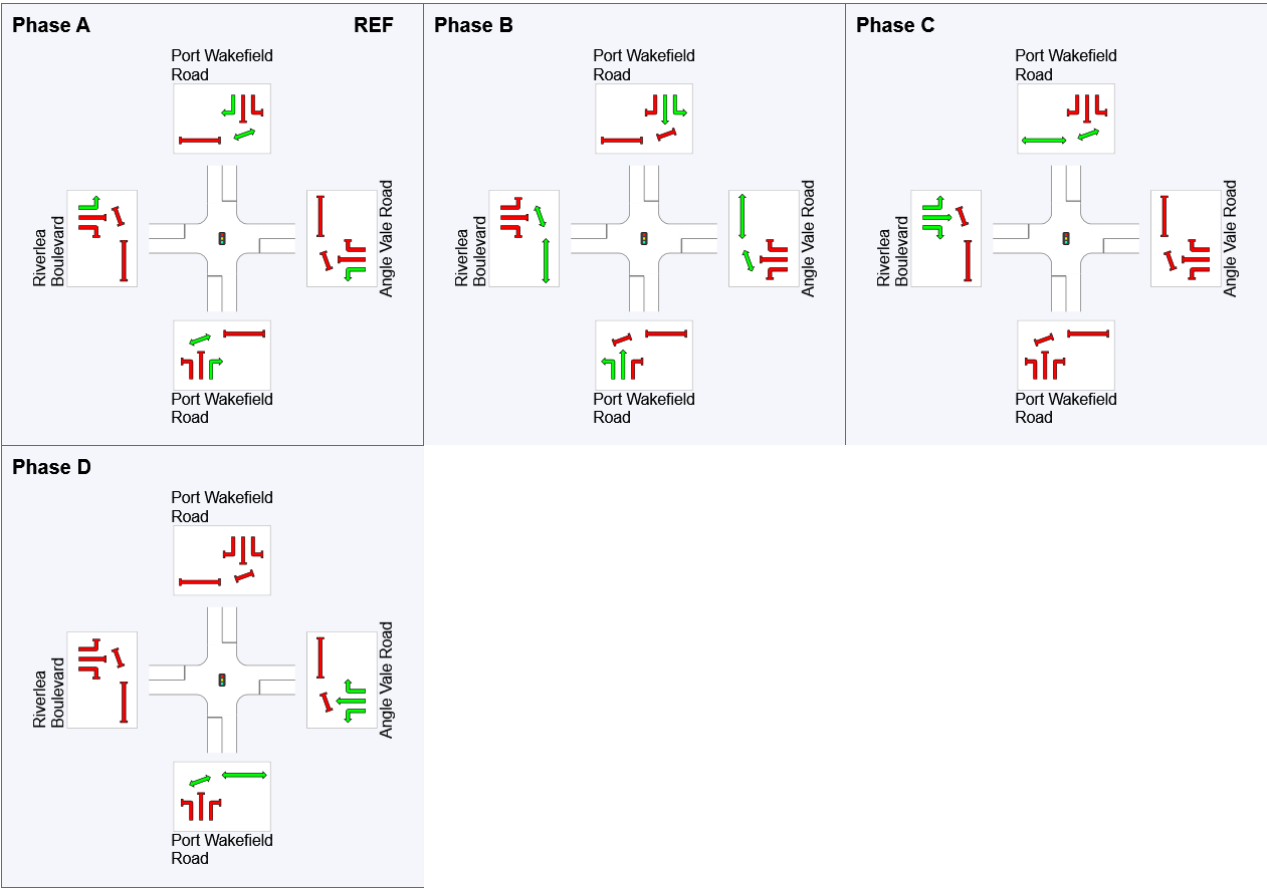
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Four-Phase Split Phasing
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase A
Offset: 0 seconds (Program)

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	23	60	76
Green Time (sec)	17	31	10	8
Phase Time (sec)	23	37	16	14
Phase Split	26%	41%	18%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

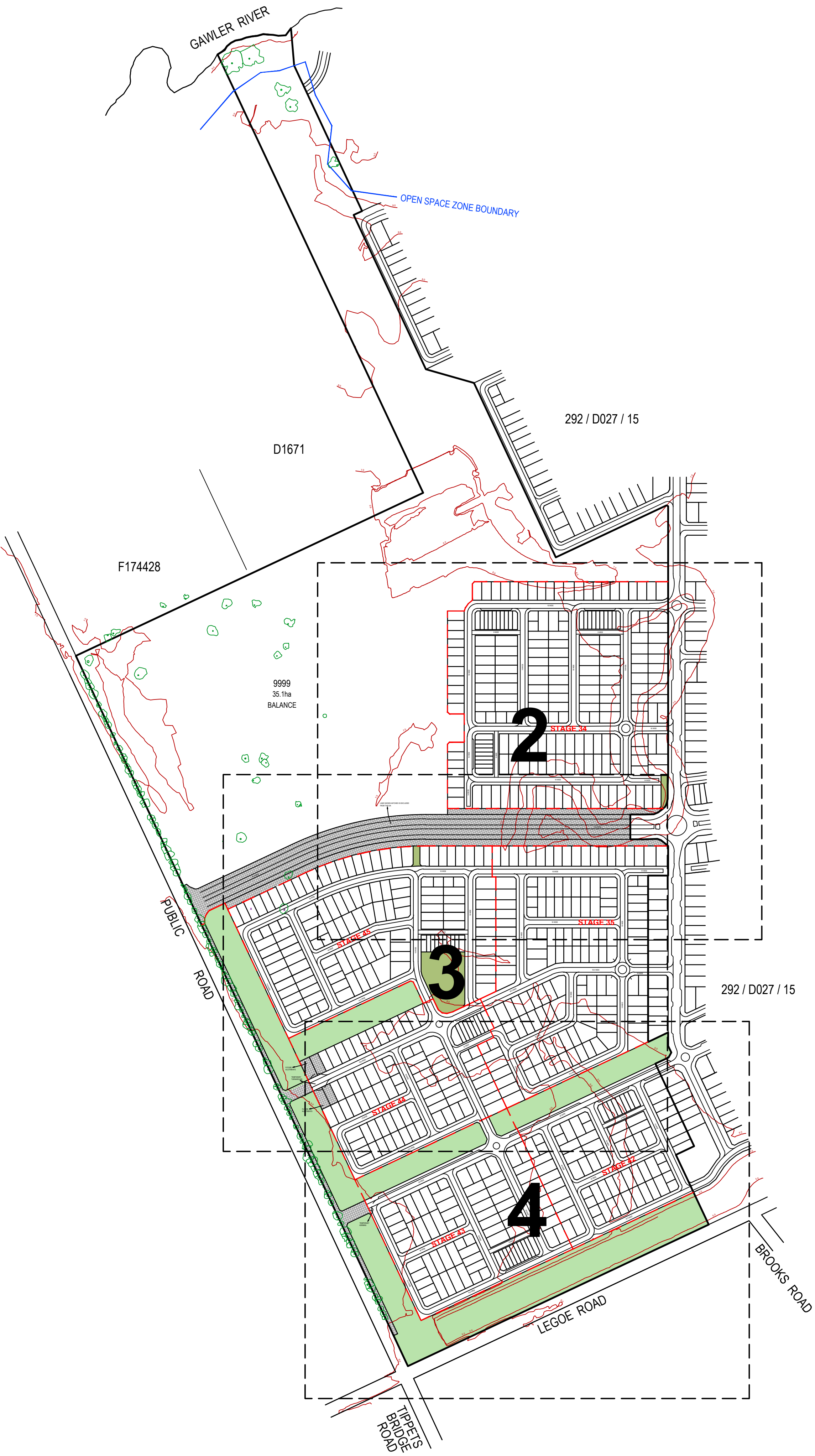
Appendix C

5% concept design for:

- Riverlea Boulevard and Central Drive/Reedy Road



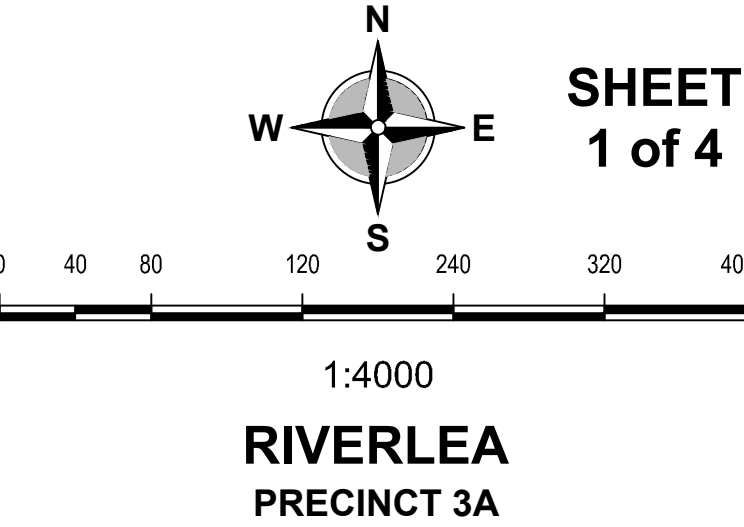
SHEET INDEX



Plan SA
Development No. / /
City of Playford

Proposed Plan of Division
Allotment 8888 in Dev. No. 292 / D027 / 15
Hundred of Port Adelaide
in the area named
RIVERLEA PARK

PT CT's 5868/771, 5868/775, 6288/349, 6288/351,
6317/911, 6317/912
REGISTERED OWNER(S) :
WALKER PASTORAL PTY LTD





Client

Walker Corporation Pty Ltd
ABN 95 001 176 263
G.P.O. Box 4073
Sydney NSW 2001
Level 21, Governor Macquarie Tower
1 Farrer Place Sydney NSW 2000
Telephone (02) 8273 9600
Facsimile (02) 9252 7400
Web walkercorp.com.au

E	MURDOCH STREET WIDENED TO 18.5	DEL	GIH	03.07.2026
D	WALKWAYS IN STAGES 35 & 45 REMOVED	DEL	GIH	28.05.2026
C	ALLOTMENTS 45058-45076			
B	MURDOCH STREET ROUNDABOUT ADDED	DEL	GIH	4.03.2026
A	COUNCIL COMMENTS	RHF	GIH	25.11.2025
	1ST ISSUE	RHF	GIH	23.09.2025

Issue	Description	Drwn	Ckd.	Appd.	Date
-------	-------------	------	------	-------	------

No. of proposed allotments	737
Total area	84.47ha
Developable area (less 9999)	49.37ha
Reserves)	5721m²
Drainage Reserves	7.544ha
Total Reserve area	8.116ha
Contributed Reserve (8.8%)	4.344ha
(total reserve less 50% of Drainage Reserves)	
Length of new roads	8325m
 Tree to be removed	
Contour interval 1m. Datum AHD.	
Road pavements shown are indicative only.	
Dimensions and areas are subject to survey.	

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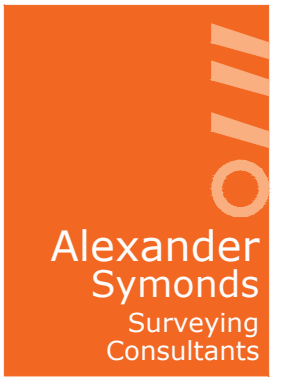
Glenn Ian Hordacre
LICENSED SURVEYOR

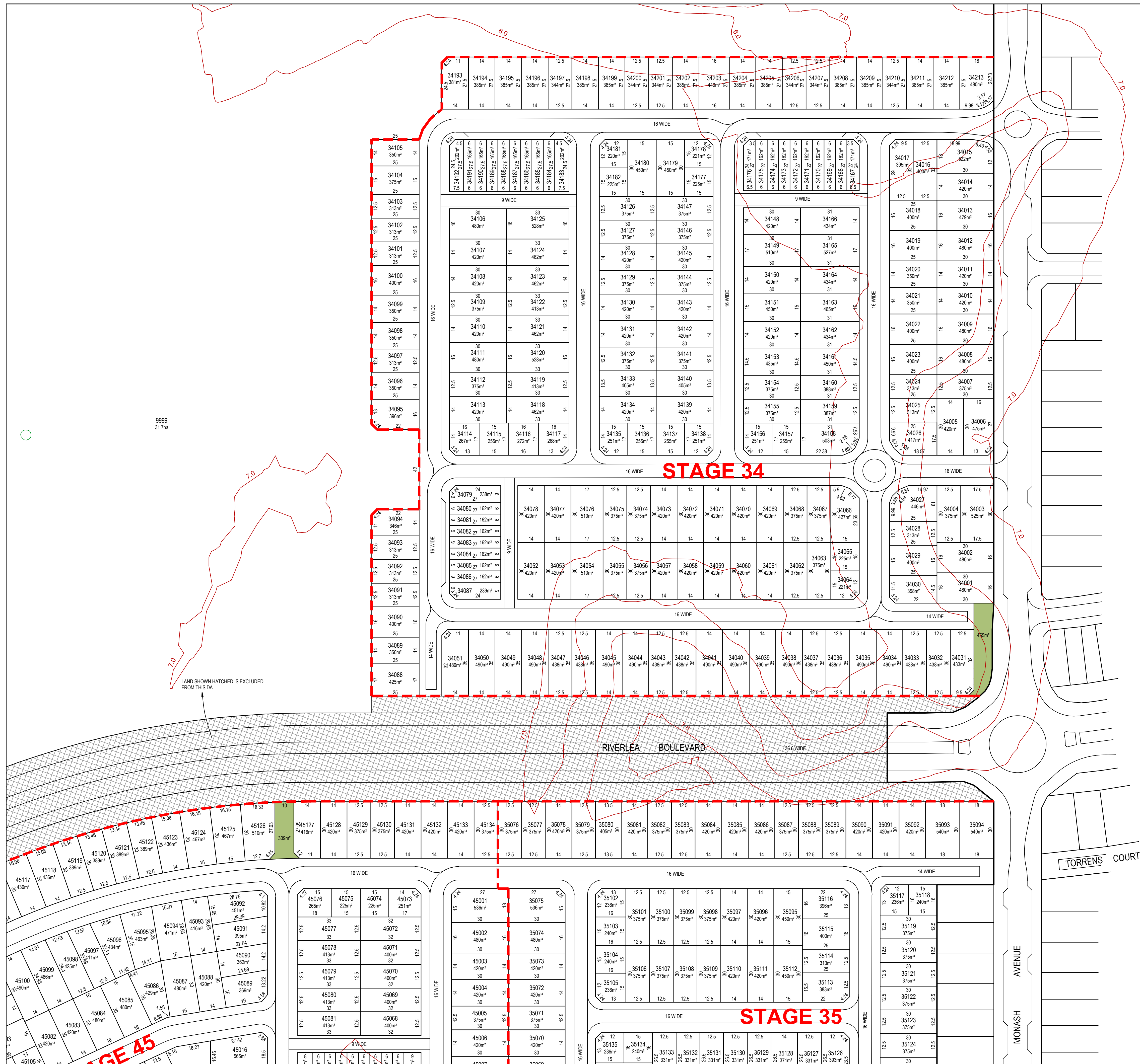
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DWG NO.: 23A1275PROP(E)	
REVISION: E	
DEL 03.07.2026	

Alexander & Symonds Pty Ltd
Kaurna Country
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South Australia 5067
ABN 93007 753 988

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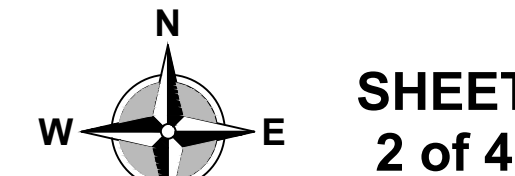




Plan SA
Development No. / /
City of Playford

Proposed Plan of Division
Allotment 8888 in Dev. No. 292 / D027 / 15
Hundred of Port Adelaide
in the area named
RIVERLEA PARK

PT CT's 5868/771, 5868/775, 6288/349, 6288/351,
6317/911, 6317/912
REGISTERED OWNER(S):
WALKER PASTORAL PTY LTD



1:1000
**RIVERLEA
PRECINCT 3A**

Client



Walker Corporation Pty Ltd
ABN 95 001 176 263
G.P.O. Box 4073
Sydney NSW 2001
Level 21, Governor Macquarie Tower
1 Farrer Place Sydney NSW 2000
Telephone (02) 8273 9600
Facsimile (02) 9252 7400
Web walkercorp.com.au

E	MURDOCH STREET WIDENED TO 18.5	DEL	GIH	03.07.2026
D	WALKWAYS IN STAGES 35 & 45 REMOVED	DEL	GIH	28.05.2026
C	ALLOTMENTS 45058-45076	RHF	GIH	4.03.2026
B	MURDOCH STREET ROUNDABOUT ADDED	RHF	GIH	25.11.2025
A	COUNCIL COMMENTS	RHF	GIH	23.09.2025
A	1ST ISSUE			

Issue	Description	Drwn	Ckd	Appd	Date
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No. of proposed allotments 737

Total area 84.47ha
Developable area (less 9999) 49.37ha

Reserves) 5721m²
Drainage Reserves 7.544ha
Total Reserve area 8.116ha
Contributed Reserve (8.8%) 4.344ha
(total reserve less 50% of Drainage Reserves)

Length of new roads 8325m

Tree to be removed

Contour interval 1m. Datum AHD.
Road pavements shown are indicative only.
Dimensions and areas are subject to survey.

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Glenn Ian Hordacre
LICENSED SURVEYOR

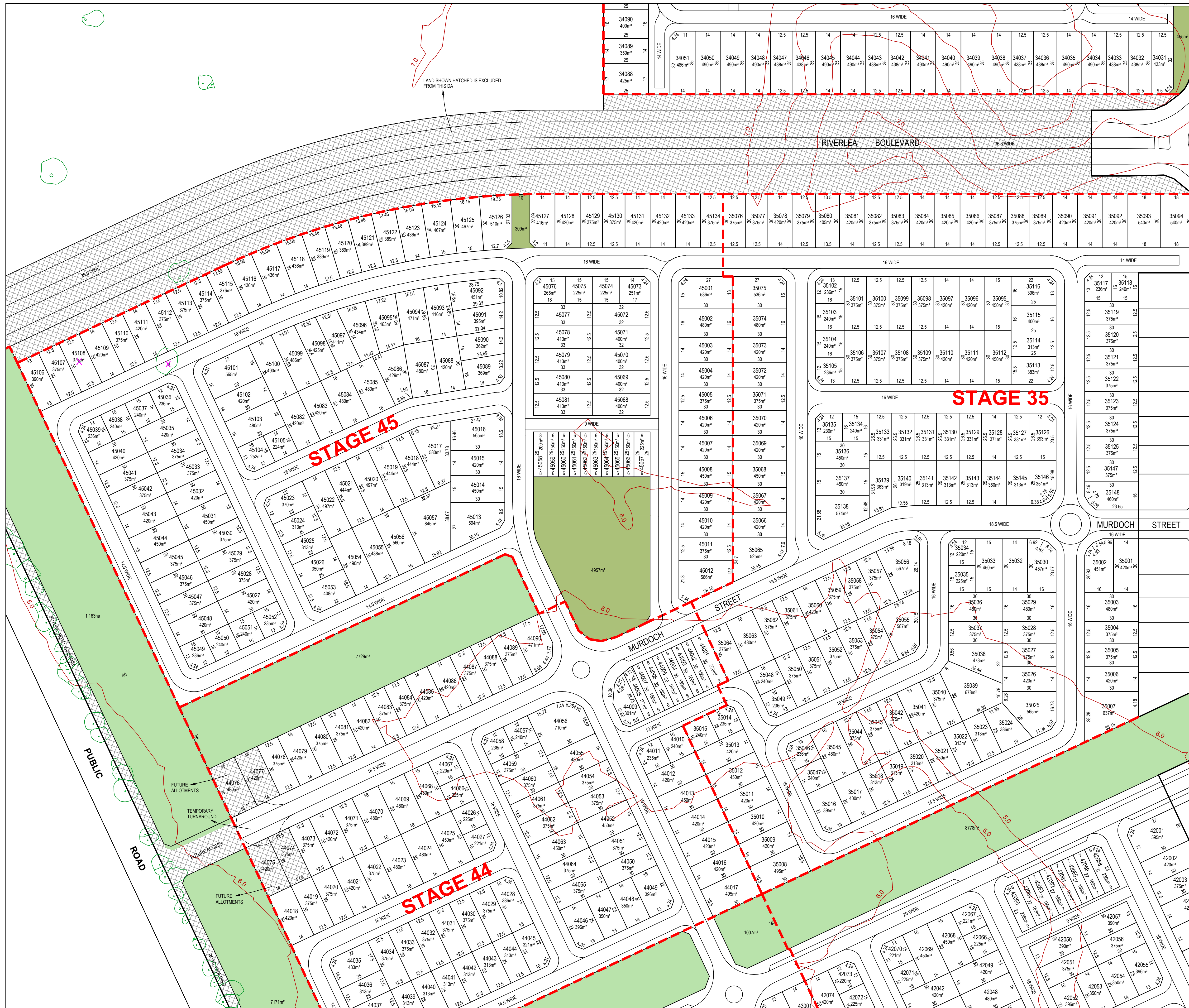
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DWG NO.: 23A1275PROP(E)	
REVISION: E	
DEL 03.07.2026	

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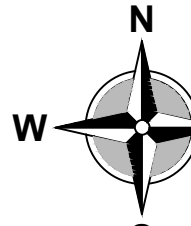




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SHEET
3 of 4



1:1000

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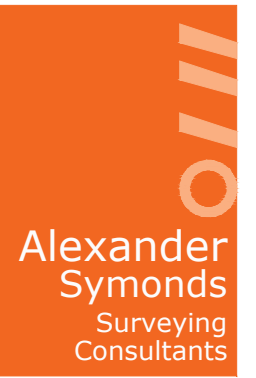
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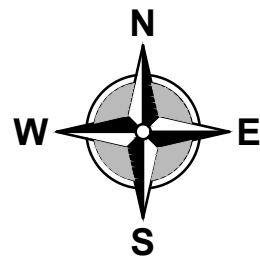
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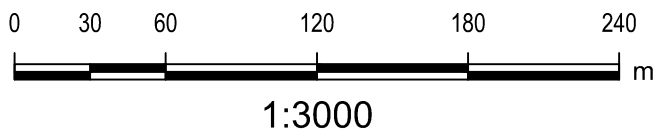
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LEGEND

Allotment Type	Width	Depth	Area m²	Total	Total%
Terrace	7-9	25-30	150-250	65	8.8%
Cottage	15	15	225	76	10.3%
Small Courtyard	12.5	25	312	41	5.6%
Courtyard	14	25	350	43	5.8%
Villa	12.5	30	375	178	22.4%
Medium Courtyard	16	25	400	24	3.3%
Entry Traditional	14	30	420	167	24.2%
Large Villa	12.5	35	438	22	3.0%
Large Courtyard	18	25	450	10	1.4%
Small Traditional	16	30	480	63	8.7%
Entry Estate	14	35	490	25	3.4%
Grand Courtyard	20	25	500		
Medium Traditional	18	30	540	14	1.9%
Small Estate	16	35	560	2	0.3%
Large Traditional	20	30	600	6	0.8%
Medium Estate	18	35	630	1	0.1%
Large Estate	20	35	700		
Grand Estate			800+		
MD Site					
Other					
Total				737	100%



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Title

**PRECINCT 3A
Residential Allotment Mix
Modification**

Project

RIVERLEA

Project Code

23A1275

Drawing No.

23A1275LM

Rev

D

Revision Date

27 July 2026

Surveyor
Alexander & Symonds Pty Ltd
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