

10th August 2026
Amy Kiely, Project Director
Stockland,
Level 25, 133 Castlereagh Street
Sydney, NSW, 2000

Dear Amy

Waterloo Estate (South) Concept SSDA, SSD-93222706

ptc. has been engaged by Stockland Pty Ltd to provide traffic engineering services in relation to the proposed Waterloo Estate (South) Precinct Redevelopment (SSD-93222706).

The following letter is provided in response to the traffic related comments received from City of Sydney Council (CoS), dated 2nd June 2026 and Transport for New South Wales (TfNSW), date 3rd June 2026.

1. Authority Comments and ptc. Responses

Authority	Comment	ptc. Response
CoS	George Street and McEvoy Street Intersection CoS comment – “<i>The desired future character of George Street is to be of a high street in nature. The proposed cul-de-sac design of the southern end of George Street at the McEvoy is not conducive to a local main street character and is recommended to be designed to allow for a left-in, left-out option. Further, a cul-de-sac design requires a larger turning circle, reducing the widths of footpaths and landscaping, and requires larger service vehicles including waste vehicles to complete complicated turns to return north along George Street.</i>” <i>It is acknowledged that further analysis requires to be undertaken to ensure there are no adverse safety impacts to the existing bicycle network however, appropriate traffic impact modelling should be undertaken in this application to demonstrate an acceptable impact.</i> <i>The Design Guide and accompanying documents should note the preferred option and prioritise the delivery of this design to avoid a separate approvals process in the future.</i>	The current design, as part of the CSSDA is in line with the requirements of the 2022 Design Guide, maintaining the current arrangements at the southern end of George Street. Accordingly, the proposed design is consistent with that of a high street, as envisaged by the 2022 Design Guide. The access framework also reflects the structure established in the 2022 Design Guide, with targeted refinements informed by traffic assessment and consultation with relevant authorities. The current design does not intend or allow for vehicles larger than a B99 (car) to travel along George Street South, as there are no block access driveways located on George Street South and therefore the turning circle at the southern end is designed to accommodate a B99, as per the existing arrangement. It is further noted that the City is recommending the creation of a left in and left out from George Street, to McEvoy Street. The Applicant proposes to consider this in the preparation of the Stage 1 Detailed SSDAs for Blocks 8 and 9, which includes consultation with the community in order to address any concerns that may be raised regarding this revised intersection design. In a meeting with the City in June 2026, it was discussed that TfNSW were supportive of the left in but were still reviewing the left in and left out arrangement at the subject intersection.

		As these discussions are ongoing there is no change proposed to the George Street McEvoy intersection as part of this RTS but is something that can be further considered with community input, in the Stage 1 detailed SSDAs. The Updated Design Guide maintains flexibility such that there is no restriction to provide this left turn at detailed SSDA stage if it is pursued. Noting the above, ptc. have reviewed the City of Sydney 'McEvoy St and George St proposal (dated July 2026) and have no concerns with the proposed layouts or intersection modelling outcomes and note the design could be utilised as the basis for any update to this intersection, should it require incorporation into any future submissions. (refer to Attachment 1 for the City of Sydney and George St Proposal) ptc. have not undertaken any additional assessment of the bicycle network, as the CSSDA submission is based on the 2022 Design Guide, which was approved as part of the 2022 Planning Proposal (PP-2021-3265). As outlined in Section 7.2.2 and 7.2.3 of the TIA, the development proposes to maintain and expand the City's regional bike network by, maintaining and upgrading the north-south separated, dual direction cycleway along George Street and implementing a new east-west, separated uni-directional cycle lanes along Wellington Street.
	Vehicle Access Locations There are some inconsistencies between the submitted Transport Study and the Design Guide. The Transport Study does not show a vehicle access into Block 4A from West St, while the latter does. Additionally, the Transport Study does not show access into 2A, 2B or 2E, while Design Guide shows two access points. This should be clarified in documentation. Further, the Transport Study indicates that driveways are much wider than driveway widths recommended by the City. Street design should prioritise pedestrian safety and the driveway widths should be reduced as much as possible, preferably to a maximum of 6m. This can generally be achieved by: • Two-way yield driveway: Combining into a single lane serving both entry and exit, with movements controlled via signal. Entering vehicles given priority, while exiting vehicles can wait in a waiting bay. AND/OR • Allowing entering and exiting vehicles to cross the centreline, which allows them to swing wider and enter the driveway from a more perpendicular angle. Vehicle entries should generally be designed in accordance with the relevant provisions of the SDCP 2012, including distance from other driveways and	In response to the comments raised, ptc. have reviewed and modified the block accesses as follows (refer to Attachment 2 for updated Vehicle Access Location Assessment): • Block 2B – Indicative 6m wide driveway shown • Block 2D – 9m wide driveway (due to narrowness of Cooper Street) • Block 3 – Driveway provided 6.5m wide, 8.5m offset from George St TP (min 6m allowed in accordance with AS2890.1 Figure 3.1). and 3.5m from Block 8 service vehicle driveway (set by building form) • Block 4 – Single driveway, reduced to 6.5m • Block 5 – Location determined by building form (driveway width of 9m required due to narrowness of West Street) • Block 7 – 7m wide driveway angle of Pitt St, located 6m from Kellick St TP in accordance with AS2890.1 Figure 3.1 • Block 8 – 2 basement driveways now provided (both 6m wide), 1 service vehicle driveway (6m wide). No access or egress to Cooper Place

	intersections. Additional recommendations for vehicle entry locations are as follows: <table border="1"> <thead> <tr> <th>Block</th><th>Recommendation</th><th>Notes</th></tr> </thead> <tbody> <tr> <td>Block 3</td><td>Offset from Block 8 access location</td><td>Vehicle access is not to be located opposite a busy driveway for a distance of 5m beyond the alignment of the driveway edges or within 15m of the alignment of an intersection where the proposed vehicle access is to be used by service vehicles</td></tr> <tr> <td>Block 4</td><td>Consolidate into one location OR narrow and separate driveways</td><td>Block 4 shows two access points: one for service vehicles (10m) and the other for residential parking (7m). These are both excessive and disrupt the pedestrian experience along the footpath. Update to either combine into one driveway or narrow both driveways to 5m and 6m respectively.</td></tr> <tr> <td>Block 5</td><td>Location ok, narrow width.</td><td>Careful consideration should be given as to the proximity of the entry location to Wellington Street, promoting unlawful turning. Further discussions with the City are recommended.</td></tr> <tr> <td>Block 8</td><td>Entry from John: Consolidate into one driveway and offset from Block 3 access location Exit to Cooper Place: Update Design Guide to show this</td><td>Figure 50 of Transport Study shows that Block 8 relies on vehicle exit onto Cooper Place, however Design Guide only shows vehicle access from John St. The exit onto Cooper Place may be supported but only if safe to do so and in a forward direction. Further confirmation is required.</td></tr> <tr> <td>Block 8</td><td>Entry from John: Consolidate into one driveway and offset from Block 3 access location Exit to Cooper Place: Update Design Guide to show this</td><td>Figure 50 of Transport Study shows that Block 8 relies on vehicle exit onto Cooper Place, however Design Guide only shows vehicle access from John St. The exit onto Cooper Place may be supported but only if safe to do so and in a forward direction. Further confirmation is required.</td></tr> <tr> <td>Block 10</td><td>Narrow width of driveway to 6m</td><td>Proposed width is 8m. Swept paths allow for 899 to exit and enter simultaneously, which is excessive, as given slow speeds and low volumes (~50 vph) / hr based on their trip gen rate of 0.14 trips per dwelling.</td></tr> </tbody> </table>	Block	Recommendation	Notes	Block 3	Offset from Block 8 access location	Vehicle access is not to be located opposite a busy driveway for a distance of 5m beyond the alignment of the driveway edges or within 15m of the alignment of an intersection where the proposed vehicle access is to be used by service vehicles	Block 4	Consolidate into one location OR narrow and separate driveways	Block 4 shows two access points: one for service vehicles (10m) and the other for residential parking (7m). These are both excessive and disrupt the pedestrian experience along the footpath. Update to either combine into one driveway or narrow both driveways to 5m and 6m respectively.	Block 5	Location ok, narrow width.	Careful consideration should be given as to the proximity of the entry location to Wellington Street, promoting unlawful turning. Further discussions with the City are recommended.	Block 8	Entry from John: Consolidate into one driveway and offset from Block 3 access location Exit to Cooper Place: Update Design Guide to show this	Figure 50 of Transport Study shows that Block 8 relies on vehicle exit onto Cooper Place, however Design Guide only shows vehicle access from John St. The exit onto Cooper Place may be supported but only if safe to do so and in a forward direction. Further confirmation is required.	Block 8	Entry from John: Consolidate into one driveway and offset from Block 3 access location Exit to Cooper Place: Update Design Guide to show this	Figure 50 of Transport Study shows that Block 8 relies on vehicle exit onto Cooper Place, however Design Guide only shows vehicle access from John St. The exit onto Cooper Place may be supported but only if safe to do so and in a forward direction. Further confirmation is required.	Block 10	Narrow width of driveway to 6m	Proposed width is 8m. Swept paths allow for 899 to exit and enter simultaneously, which is excessive, as given slow speeds and low volumes (~50 vph) / hr based on their trip gen rate of 0.14 trips per dwelling.	- Block 9 – Driveway widths reduced, basement driveway to 6m and service vehicle driveway to 6.5m - Block 10 – driveway reduced to 6.5m (based on service vehicle swept paths)
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TfNSW	Emergency Vehicle Access Section 9.5 in the TIA states that emergency vehicles will be permitted to access the precinct from McEvoy Street as per existing arrangements. Additional details are required on where this will occur and how access will be restricted to enable emergency vehicles only when required. TfNSW is not supportive of any general vehicle access associated with the proposed development being gained from McEvoy Street.	ptc. confirm that no changes are proposed to the existing arrangement at the southern end of George Street. The existing restrictions, permitting the emergency vehicle access only, are to remain, and general vehicle access is not proposed at this location. The current “No Right Turn” and “No Entry (Authorised Vehicles Excepted)” signage is to remain.  Existing George Street & McEvoy Street Intersection																					
	Wellington Street and Botany Street Intersection The TIA in Section 8.3 states that “any changes (turning restrictions) at the intersections of Wellington Street and Botany Road would result in redistribution of vehicular traffic into the local network, which would generally not be expected to have a profound impact. In such a way, there is found to be no requirement for further traffic modelling or assessment”. TfNSW notes that these restrictions on turning movements were not assessed as part of the current SSDA. While overall trip generation may remain consistent, due to proposed changes to road access, such as altered distributions or restricted movements, it is necessary to undertake modelling to determine whether these changes will have broader impacts on the surrounding road network, particularly at	Under the 2022 Design Guide, the access strategy included a right turn ban from Botany Road (northbound) into Wellington Street. ptc. had therefore assumed that the traffic modelling undertaken to support the PP-2021-3265 had considered the right turn ban. As part of the CSSDA, the right turn movement into Wellington St is to be allowed (as per the existing arrangements) and therefore the traffic assessment undertaken by ptc., at the CSSDA stage, allowed for right turns into Wellington Street. Following the CSSDA assessment, it has been confirmed that the modelling undertaken as part of the Planning Proposal allowed for the right turn into Wellington St.																					

	signalised intersections. TfNSW considers that detailed modelling (i.e. SIDRA) of this intersection is required. Botany Road, in the vicinity of the Wellington Street intersection, comprises only two lanes in each direction and is a key public transport corridor where additional bus priority measures are likely to be implemented in the future. In the future, northbound right turning vehicles may queue and block a through lane while waiting for a gap to access Wellington Street (noting it is a primary entry point to the precinct), which would adversely affect both the efficiency and safety of Botany Road operations and would not be acceptable. Additional comments are provided in Section 3 relating to SIDRA modelling requirements. Mitigation measures and applicable timing for its provision should be identified to address any adverse impacts on the function, safety and efficiency of the state road network as a consequence of this development.	Therefore, ptc. and the PP-2021-3265 assessments are aligned, in allowing for the right turn into Wellington St, therefore the statement regarding traffic redistribution, within Section 8.3 of the TIA, is null and void. As per the modelling assessment undertaken as part of PP-2021-3265, the forecasted traffic generated by the development, is not expected to have significant impact on the road network. Particular reference is made to the Botany St / Wellington St (Buckland St) intersection, where the level of service (LoS), is expected to increase from an LoS of A to LoS B in the AM peak and decrease from LoS B to LoS A in the PM Peak.
	Shared Zone In NSW, TfNSW is responsible for the setting and signposting of safe and appropriate speed limits in accordance with the NSW Speed Zoning Standards. The design and construction of the proposed shared zone (including but not limited to surface treatments, signage and pedestrian priority measures) shall be in accordance with the NSW Speed Zoning Standard TS 03631:2.0. Please note that TfNSW requires criteria to be met for a 10 km/h shared zone and all other proposed speed limits in accordance with the NSW Speed Zoning Standards. The proposed shared zone for Cooper Street south circulation road, shown in the cross section (Figure 48) and plan view (Figure 50), indicates that the area between John Street and the circulation road has a separated footpath to the vehicle path. Therefore, a shared zone on this section of the vehicle path is not required. Alternatively, this section of road could be redesigned in line with the NSW Speed Zoning Standards to meet the criteria for a shared zone.	The design of Cooper Street South and Cooper Place is developing with the Stage 1 DA and the design of the shared zone will be updated along with the detailed DA submission.
	Advisory Comments Car Parking The development site will benefit from the proximity to public transport. Consideration therefore should be given to adopting the lowest applicable car parking rate within the Sydney Development Control Plan 2012 to encourage and support mode shift to public and active transport modes.	Under the provisions of the Sydney LEP 2012, based on the land uses and indicative dwelling mix proposed, a maximum of 2,211 car parking spaces are permitted at the site. The reference scheme triggers the requirement for approximately 1,500 car parking spaces across all land uses, excluding on-street parking, which is below the LEP maximum. Importantly, the concept SSDA does not seek consent for a limit on the residential car parking to what is currently accommodated in the reference scheme, but rather residential car parking will be assessed and allocated within detailed applications

		in accordance with the maximum Sydney LEP 2012 rates. Retail parking is proposed to be consolidated into Block 9 as opposed to being distributed across the precinct. This is to support the delivery of a supermarket within Waterloo South. Separately, between 32-50 car parking spaces are to be provided as car share spaces, however again the exact number of car share spaces proposed within the basements of each building will be confirmed within future detailed applications.
	Advisory Comments SIDRA The provision of intersection modelling needs to consider/address the following: • Current and representative traffic counts need to be used. • The existing base models need to be calibrated with on-site observations (e.g. queue lengths, delays). • Assumptions for traffic generation should be in accordance with the Guide to Transport Impact Assessment. • Distributions to and from the development need to be justified. • Existing traffic volumes with and without the proposed development need to be modelled. • A 10 year future growth scenario needs to be modelled. • Electronic copies of all SIDRA files need to be provided to TfNSW for review.	As outlined in Section 8.3 of the TIA, the proposed CSSDA development forecasts minor variances in vehicle traffic generation, when compared to the development traffic generation approved Under PP-2021-3265 at the Planning Proposal stage. Therefore, there should be no notable variance between modelling outputs. The modelling undertaken as part of the Planning Application Proposal, included the existing traffic volumes, proposed development traffic generation, the relevant 10-year modelling horizons and was forecasted to not have any significant impact on the road network. As the development of the precinct progresses, on a block-by-block basis, the yields of each block are to be maintained in line with the yields proposed at the Planning Proposal stage and therefore are not expected to vary the approved traffic generation or distribution and therefore is not expected to vary the approved traffic assessment or warrant future modelling.

If you require additional information, please do not hesitate to contact us.
Yours faithfully



Steve Wellman, Project Director

Document Control: Prepared by *SW* on *10 August 2026*. Reviewed by *JJ* on *10 August 2026*.

Attachment 1. City of Sydney – McEvoy St and George St Proposal

McEvoy St and George St proposal



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1. Purpose

This memo supports the City's formal request to allow a left-in left-out connection from George St to McEvoy St.

It summarises:

- the current status of negotiations between TfNSW and the City
- TfNSW's latest position regarding the proposed left turn from George Street into McEvoy Street
- the City's response to the concerns raised

2. Background

The Waterloo South redevelopment will deliver a significant uplift to the area of approx. 3000 dwellings along with retail and community facilities. George Street is intended to function as the primary local high street.

2.1. About the intersection

- T-intersection configuration (Figure 1)
- McEvoy St is a state road, George St is a local road
- Pedestrian crossings on all three legs. Cycle crossing runs parallel but separate to western pedestrian crossing.
- Northern leg of George St:
 - o cul-de-sac that is closed to general traffic
 - o allows emergency vehicles (Figure 2)
 - o has separated cycleway on the east side of road
- Southern leg of George St is:
 - o Southbound only
 - o Has separated cycleway on west side of the road
- Phasing
 - o Two phases running on 60 second cycle
 - o A phase – McEvoy St through movements, pedestrian crossing across George St, with EB right-turn into George St allowed as a filter turn
 - o B phase – both pedestrian crossings and cycle crossing across McEvoy St run



Figure 1 Existing configuration of intersection

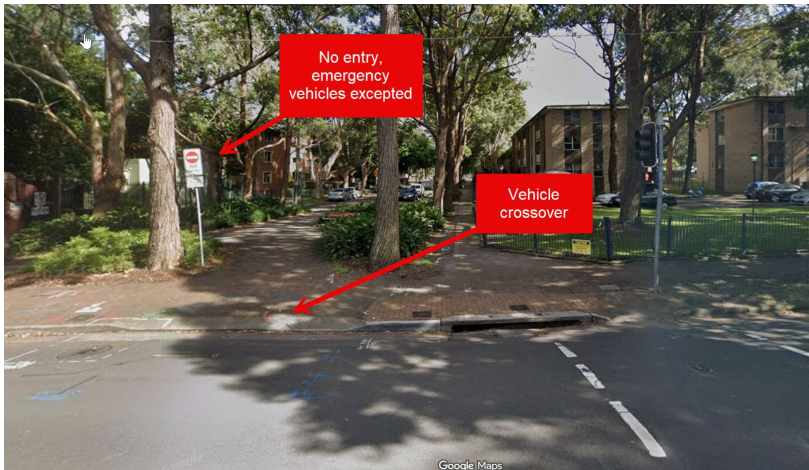


Figure 2 Emergency vehicle access from McEvoy St to George St North

2.2. City's position

Since late 2025, the City has been discussing the future operation of the George Street / McEvoy Street intersection with TfNSW to determine the most appropriate arrangement for vehicle access, servicing, waste collection, walking and cycling.

The City's preferred position has consistently been that George Street should connect to McEvoy Street via a low-volume, slow-speed left-in left-out arrangement. Key reasons are that this arrangement would:

- Be more compatible with the intended character and function of George Street as a high street compared to a cul-de-sac
- Avoid the need for Council's 10.6 metre waste vehicles to undertake three-point turns within the public domain;
- Reduce the amount of public space that would otherwise need to be dedicated to vehicle turning facilities; and

- Enable a street design that prioritises walking, cycling and place outcomes while maintaining limited vehicle access.

2.3. Concept SSDA

The Concept SSDA for Waterloo South, exhibited in May 2026, showed the existing configuration of the intersection maintained. However the exhibited design guide¹ notes in Clause 7.3(3):

“Options for the George Street and McEvoy intersection (including options for a left turn into George Street) are being investigated by the City of Sydney and Transport for NSW. Nothing in this Design Guide shall prevent the City of Sydney and TfNSW from opening this intersection to vehicular traffic in the future, should they resolve to do so.”

Stockland’s advice as part of the Public Infrastructure Working Group has been that they will continue to assume the existing arrangement and progress to detailed design with that assumption, unless the City and TfNSW can agree on an alternative.

2.4. TfNSW’s advice

The latest advice from TfNSW (email from Susan Tracey to Sarah Brickhill, dated 15 June 2026) indicates support for the left-in movement from McEvoy to George St, but raises concerns about the left-out movement noting it is not supported.

The advice is:

We raise no objection to an arrangement that permits the left turn from McEvoy Street eastbound into George Street northbound.

A left turn arrangement from George Street southbound into McEvoy Street eastbound is not supported as:

- 1. It is planned to transition the cycleway on George Street from the eastern side of George Street north of McEvoy Street to the western side of George Street south of McEvoy Street at the traffic lights. Allowing the left turn for drivers from George Street into McEvoy Street would impact on the transition for bike riders crossing McEvoy Street.*
- 2. Allowing the left turn for drivers from George Street into McEvoy Street would encourage rat running through the new precinct. Allowing the left turn movement for drivers would demand more time to be allocated to George Street to allow drivers to exit and not queue within the precinct.*
- 3. By allowing the left turn for drivers from George Street into McEvoy Street it would be difficult to physically restrict southbound drivers on George Street from crossing McEvoy Street and continue south on George Street. If the through southbound movement cannot be physically restricted, it would encourage more drivers to rat run through the precinct to access Green Square.*

¹ <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-93222706%2120260417T052312.892+GMT>

4. *The proposed left turn arrangement for drivers from George Street into McEvoy Street reallocates space and time away from pedestrians and bike riders crossing at the intersection.*

For the left turn arrangement from McEvoy Street eastbound into George Street northbound, the northern kerbside lane of McEvoy Street between Botany Road and George Street is to be signposted as 'No Stopping'.

3. City's proposal

The City has developed a proposal (Figure 1) that we believe addresses TfNSW's four concerns about the left-out movement.

A physical median forces compliance with the left-in left-out restriction, and the movements to and from the northern leg can be fitted in with minimal changes to the existing phasing, minimising impacts on the performance of the intersection.

The following section walks through how this design responds to each of TfNSW's concerns.

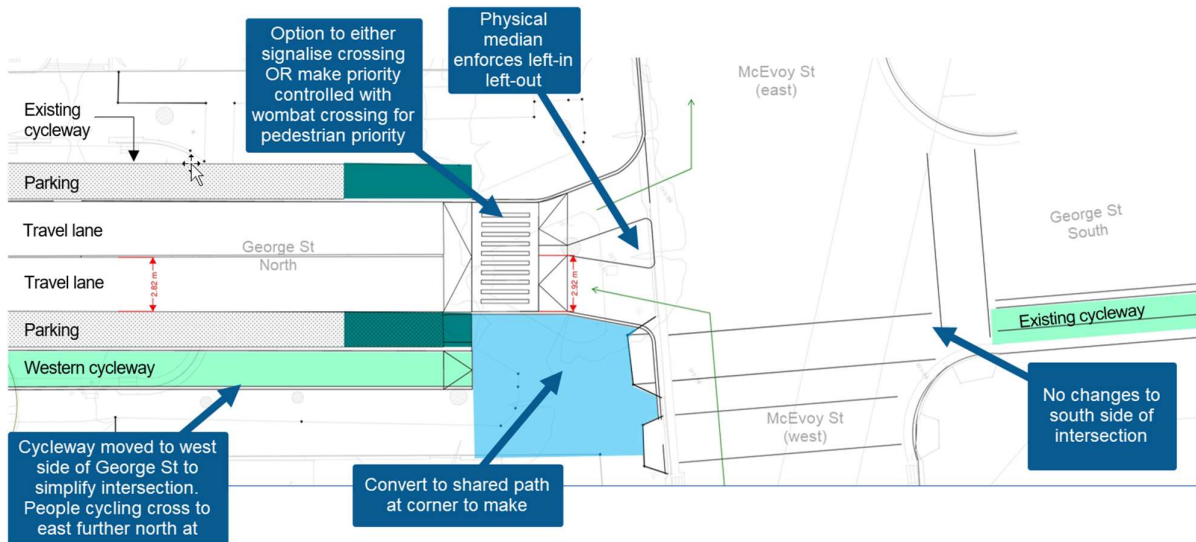


Figure 3 City's proposed configuration

4. Justification

4.1. Transition for bike riders crossing McEvoy Street

By adjusting the design of George St between John St and McEvoy St, we can keep bike riders on the west side of George St through the intersection, significantly simplifying the intersection and reducing conflict points.



Figure 4 Transition of cycleway through the intersection

The City has done some testing of this geometry and found that:

- It allows for parking to be retained on both sides of George St north, which fits with the high street character we are aiming for
- There are no changes needed to the southern side of the intersection

4.2. Traffic impacts: rat running and delay

We understand that TfNSW is concerned about the traffic impacts of this change, both to the state road network (McEvoy St, Botany St) and to the local roads within the precinct.

To quantify the level of impact expected, we obtained access to outputs from the Aimsun traffic model prepared by Jacobs to support the 2022 Waterloo South Planning Proposal. That modelling assumed largely the same uplift in the precinct, and that Pitt Street would be opened at McEvoy Street as a signalised intersection permitting all movements, while George Street remained closed.

In the analysis that follows, we assume that traffic in the Aimsun model using Pitt St would use George St instead if it were opened.

A note on the comparison between Pitt and George St volumes:

In the exhibited Concept SSDA, John St does not connect through to Pitt St, so one could argue that opening Pitt St at McEvoy St would have lower traffic volumes than opening George St as Pitt St is less connected to the rest of the precinct. However, the version of the network that Jacobs tested for the Planning Proposal (Figure 5) had also assumed that John St open at Pitt St, which means it would have similar connectivity to George and thus be a good approximation in terms of traffic volumes.



Figure 5 Network used in Jacob's 2022 Aimsun model

4.2.1. Expected turn volumes

The expected turn volumes that would use George St are below.

Table 1 Expected turn volumes

	Left in	Left out
AM (8-9am)	36	19
PM (5-6pm)	108	39

4.2.2. Rat running

The City understands that TfNSW is concerned about southbound traffic on Botany St diverting through the precinct via Wellington St and George St to avoid the intersection of Botany St and McEvoy St.

We expect the risk of rat running to be minimal due to:

- Traffic calming within the precinct (Figure 6) including 5-6 raised intersections or CFTs along the local route to make it slower than staying on Botany Rd and McEvoy St
- TfNSW's plans to upgrade McEvoy / Botany intersection will reduce delay and make it even more attractive relative to local roads through Waterloo South

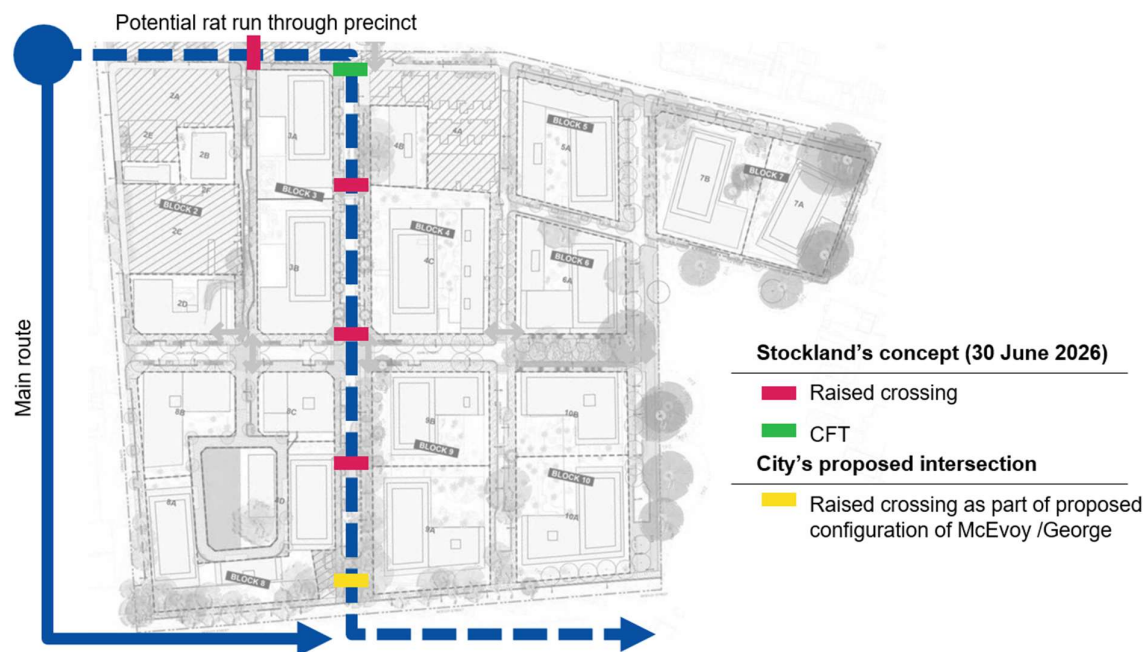


Figure 6 Traffic calming along internal route

The modelling done by Jacobs also indicates that rat running is not a major concern. Aimsun models allow traffic to choose the fastest route between set origin and destinations, and so the turn volumes above account for rat running – that is, where external traffic cuts through the precinct if it is a faster route than staying on the bordering arterial roads

These model extracts indicate that even in the PM peak, only ~150 vehicles would be using George St. We consider this a low volume of traffic and well within what is acceptable for a village high street.

4.2.3. Impacts on level of service and delay

The City undertook SIDRA modelling of the proposed intersection layout, using turning volumes from the Jacob's model. A cycle time of 60 seconds was used in all scenarios, based on site observations.

The scenarios modelled are summarised in Table 2.

Table 2 SIDRA scenarios

Scenario	Description	Long description
0	Base	Existing 3-leg geometry. Two phase (McEvoy St phase, and George St (south) bicycle phase)
1	LILO (signalised) from George	Added left turns to and from George St (north). Adopt existing two phase TCS arrangement, with LT out of George St (north) added to the bicycle phase (phase B). Assumes left turning bicycles do so from vehicle lane
2	LILO (in signalised, out Give Way) from George	Similar to scenario 1, but with LT out of George St (north) operating as a Give Way. Some adjustments in the SIDRA model undertaken to represent this due to software limitations - namely running the outbound LT in phase A with additional priorities set up
3	All turning movements	Added north approach, permit all turning movements, south approach remains SB only (excepting cycles). Added 3rd phase for a dedicated north approach vehicle phase

The results, summarised in Table 3, show good modelling justification to support a LILO on George Street (north approach) given minimal changes in intersection performance compared to the existing geometry.

This is largely because the left-turn in can run during the main phase (McEvoy through movements), and the left-turn out can run during the existing B phase / pedestrian crossing phase (after a delay to allow pedestrians to establish themselves in the intersection).

Full SIDRA reports are in Appendix 1.

McEvoy St and George St proposal

Table 3 SIDRA results

Peak	Scenario	Description	DOS	Avg delay (s)	LOS	EB through delay (s)	WB through delay (s)	Queue west approach (m)	Queue east approach (m)
AM	0	Base	0.6	11	B	9	7	91	43
	1	LILO (signalised) from George	0.6	11	B	9	7	91	43
	2	LILO (in signalised, out Give Way) from George	0.6	11	B	9	7	91	43
	3	All turning movements	1.07	62	E	101	28	435	153
PM	0	Base	1.01	28	C	57	9	236	93
	1	LILO (signalised) from George	1.02	30	C	70	9	249	93
	2	LILO (in signalised, out Give Way) from George	1.02	30	C	70	9	249	93
	3	All turning movements	1.92	396	F	479	423	660	1087

4.3. Preventing movement between George St north and south

The proposed design includes a physical median to prevent traffic exiting the precinct to continue straight across McEvoy St to George St south.

There are precedents for including medians of this type within signalised intersections.



*Figure 1. Figure 7 Examples of medians to control traffic movements in Sydney intersections :
(a) **Morwick / The Boulevard, Strathfield**: Western approach to signals priority controlled with zebra crossing, plus restricts through movements in a signalised intersection using physical median
(b) **Johnson / Collins, Annadale**: Restricts through movements in a signalised intersection using physical median*

In the case of (a) Morwick St and The Boulevard in Strathfield, the leg with the median is actually priority controlled, while the rest of the intersection is signalised. The priority controlled leg also has a zebra crossing, giving pedestrians priority over vehicles without waiting for signals.

While unusual, this design does not appear to have had adverse safety outcomes. In the previous 10 years, there has been only one non-casualty crash at this location when in 2021 where a driver was driving on the wrong side of the Boulevard which was unrelated to the unsignalised leg.

4.4. Impact to pedestrian and cycle phases

Given the intersection can be controlled as a two-phase intersection and with minimal changes to the existing phasing arrangements, there are negligible impacts to overall cycle time and average pedestrian wait times.

In Scenario 2, where the northern leg is priority controlled, pedestrians experience zero delay crossing George St – as they do now, while in Scenario 1 where George St north is signalised, they would be able to cross during the main A phase, but experience a small delay during the B phase.

5. Conclusion

In conclusion, we believe this proposal addresses all concerns raised by TfNSW. We would like to formally request approval in principle for left-in left-out access from George St to McEvoy St so that Homes NSW and Stockland can progress their design for George St on that basis.

Table 4 Summary of City response to TfNSW concerns

TfNSW concern	How proposed design addresses
Transition for bike riders through the intersection	Keeps the cycleway on the west side of George St through the intersection, crossing midblock instead
Traffic impacts - rat running	Local route to be designed with significant traffic calming Jacob's precinct-level modelling indicates this is not the case. TfNSW has committed to upgrading Botany / McEvoy, making it even more attractive compared to internal local route We are comfortable with some amount of queuing on our local roads.
Traffic impacts – intersection performance	Both Scenarios 1 and 2 do not take any time away from A phase. The left turn out is either called at the same time as the two pedestrian crossings or priority controlled – neither which impacts timing of A phase.
Difficult to physically restrict southbound drivers on George Street	Physical median is effective, has precedent and has not caused increased crash risk.
Reallocates space and time away from pedestrians and bike riders crossing	Option 1 phases designed to have minimal impact. Option 2 increases pedestrian priority relative to signalised approach.

Appendix 1 – SIDRA reports

USER REPORT FOR SITE

Default Site User Report

 **Site: [AM1] George Street / McEvoy Street - AM (Base)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545

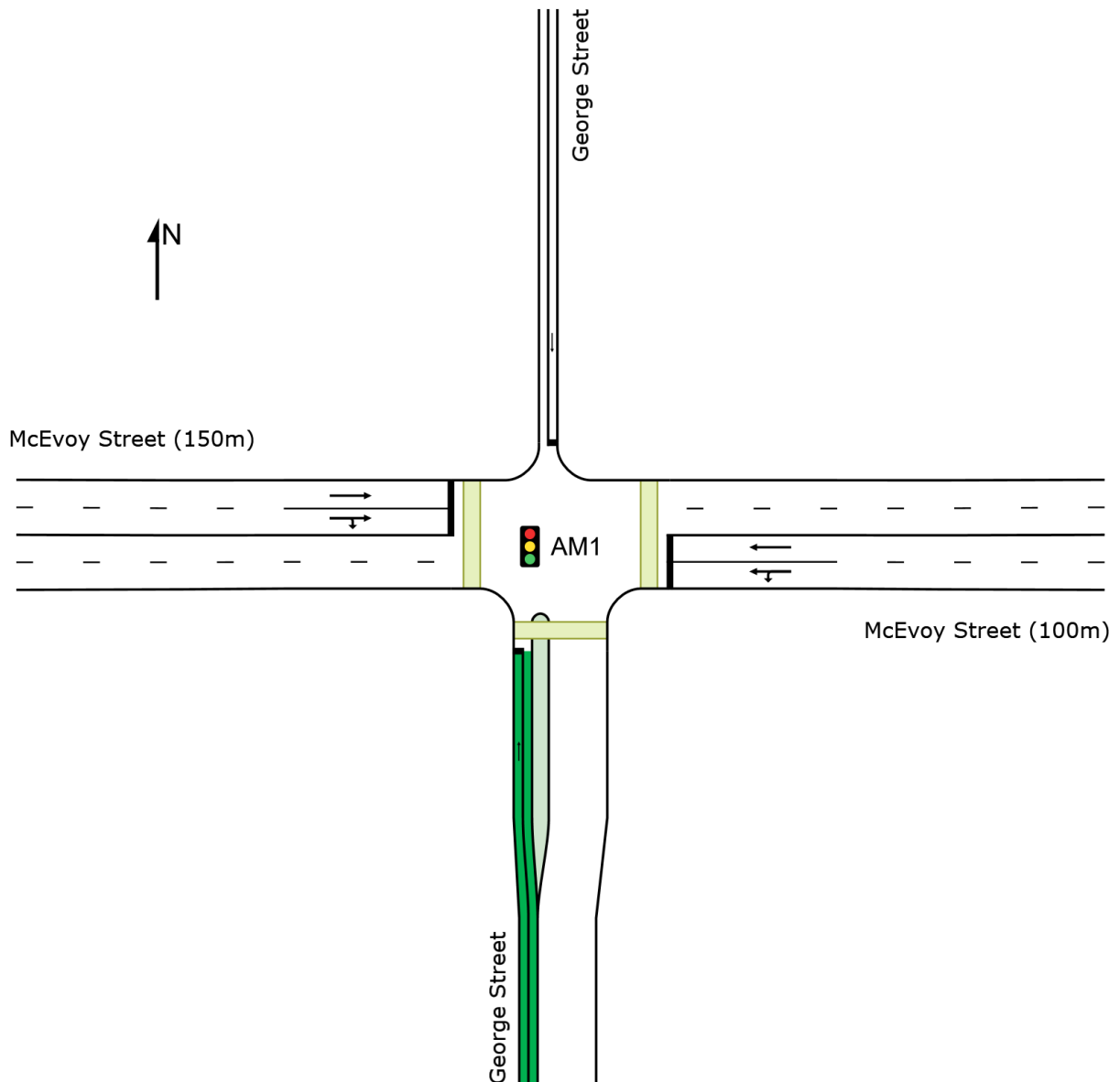
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	*0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	43	4.9	43	4.9	0.347	12.2	LOS B	6.0	42.7	0.57	0.52	0.57	43.0
5	T1	All MCs	718	5.0	718	5.0	0.347	7.4	LOS A	6.0	42.8	0.57	0.51	0.57	40.4
Approach			761	5.0	761	5.0	0.347	7.6	LOS A	6.0	42.8	0.57	0.51	0.57	40.7
North: George Street															
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
West: McEvoy Street (150m)															
11	T1	All MCs	1018	5.0	1018	5.0	0.596	9.2	LOS A	12.5	90.6	0.71	0.65	0.71	36.8
12	R2	All MCs	103	4.1	103	4.1	*0.596	20.1	LOS C	9.6	68.6	0.74	0.68	0.74	42.8
Approach			1121	4.9	1121	4.9	0.596	10.2	LOS B	12.5	90.6	0.71	0.65	0.71	37.8
All Vehicles			2303	4.0	2303	4.0	0.596	11.1	LOS B	12.5	90.6	0.69	0.60	0.69	31.9

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

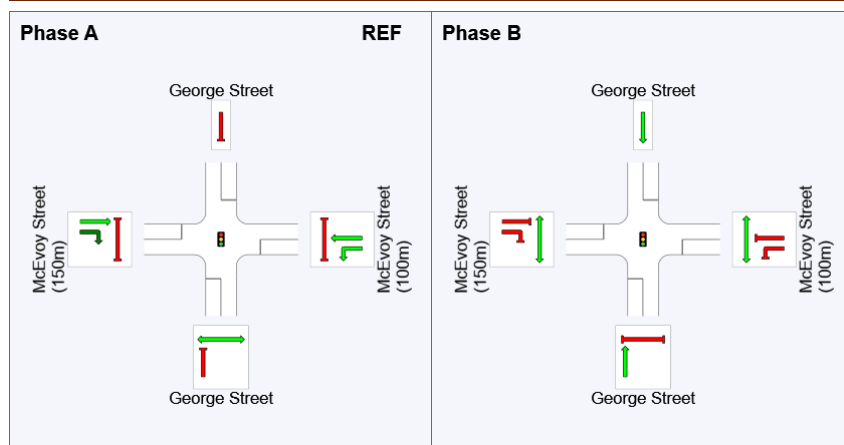
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

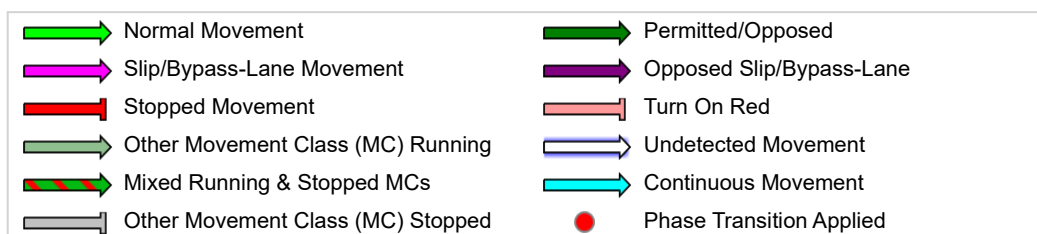
* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [AM3] George Street / McEvoy Street - AM (LILLO - signalised)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

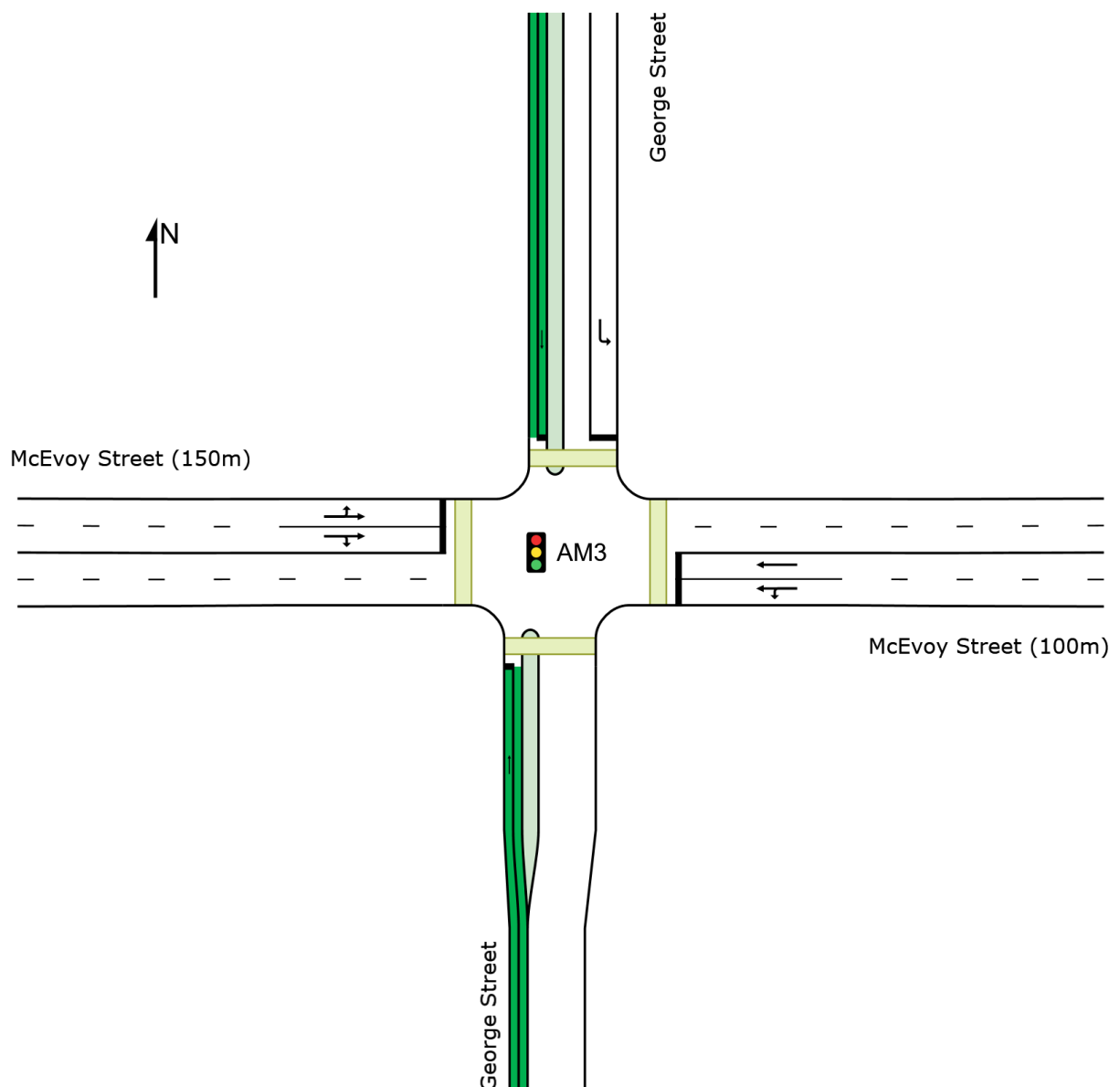
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	* 0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	43	4.9	43	4.9	0.348	13.2	LOS B	6.0	42.8	0.57	0.52	0.57	43.0
5	T1	All MCs	718	5.0	718	5.0	0.348	7.4	LOS A	6.0	43.0	0.57	0.51	0.57	40.3
Approach			761	5.0	761	5.0	0.348	7.7	LOS A	6.0	43.0	0.57	0.51	0.57	40.6
North: George Street															
7	L2	All MCs	31	3.4	31	3.4	0.064	25.8	LOS C	0.7	4.2	0.84	0.69	0.84	30.6
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			241	0.4	241	0.4	0.150	20.4	LOS C	4.9	13.1	0.84	0.66	0.84	26.2
West: McEvoy Street (150m)															
10	L2	All MCs	48	4.3	48	4.3	0.600	15.1	LOS B	12.7	91.3	0.70	0.64	0.70	43.1
11	T1	All MCs	980	4.9	980	4.9	0.600	9.2	LOS A	12.7	91.3	0.72	0.66	0.72	36.2
12	R2	All MCs	103	4.1	103	4.1	* 0.600	20.3	LOS C	9.7	69.4	0.74	0.69	0.74	42.7
Approach			1132	4.8	1132	4.8	0.600	10.5	LOS B	12.7	91.3	0.72	0.66	0.72	37.8
All Vehicles			2344	4.0	2344	4.0	0.600	11.4	LOS B	12.7	91.3	0.69	0.61	0.69	32.0

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

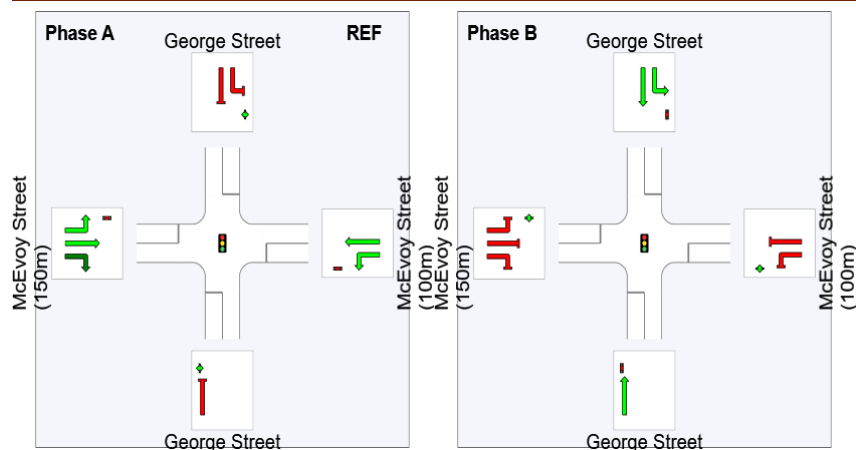
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [AM4] George Street / McEvoy Street - AM (LILO - LT out Give Way)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

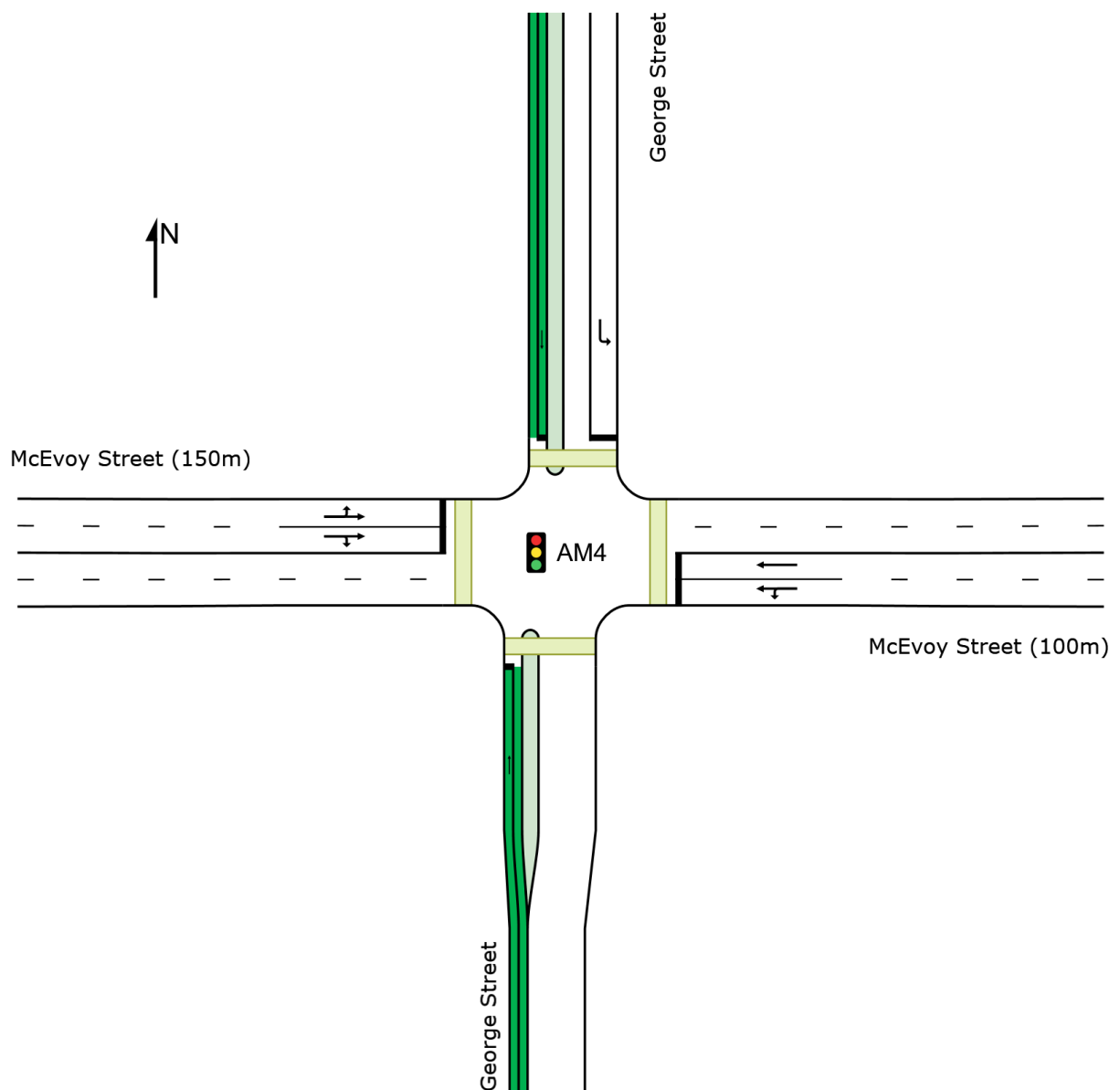
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	* 0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	43	4.9	43	4.9	0.348	13.2	LOS B	6.0	42.8	0.57	0.52	0.57	43.0
5	T1	All MCs	718	5.0	718	5.0	0.348	7.4	LOS A	6.0	43.0	0.57	0.51	0.57	40.3
Approach			761	5.0	761	5.0	0.348	7.7	LOS A	6.0	43.0	0.57	0.51	0.57	40.6
North: George Street															
7	L2	All MCs	31	3.4	31	3.4	0.036	8.2	LOS A	0.3	1.6	0.46	0.93	0.46	29.8
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			241	0.4	241	0.4	0.150	18.2	LOS B	4.9	13.1	0.79	0.69	0.79	26.1
West: McEvoy Street (150m)															
10	L2	All MCs	48	4.3	48	4.3	0.600	15.1	LOS B	12.7	91.3	0.70	0.64	0.70	43.1
11	T1	All MCs	980	4.9	980	4.9	0.600	9.2	LOS A	12.7	91.3	0.72	0.66	0.72	36.2
12	R2	All MCs	103	4.1	103	4.1	* 0.600	20.3	LOS C	9.7	69.4	0.74	0.69	0.74	42.7
Approach			1132	4.8	1132	4.8	0.600	10.5	LOS B	12.7	91.3	0.72	0.66	0.72	37.8
All Vehicles			2344	4.0	2344	4.0	0.600	11.2	LOS B	12.7	91.3	0.69	0.61	0.69	32.0

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

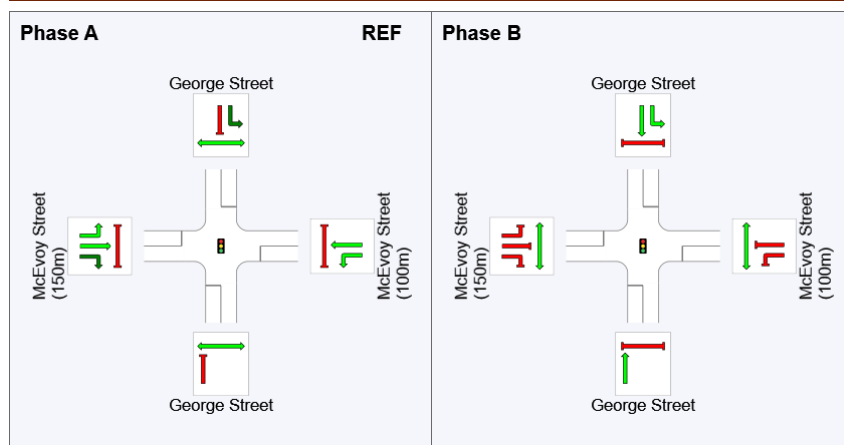
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

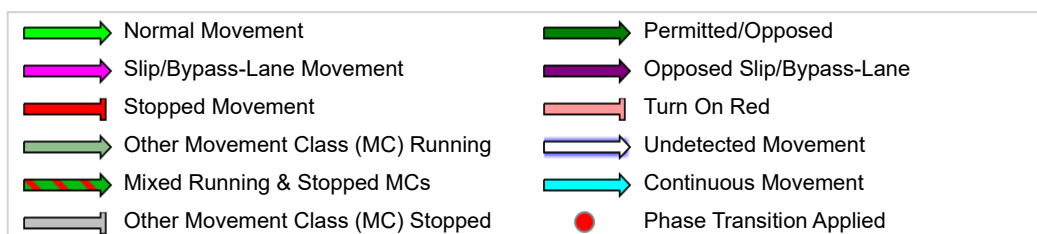
* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [AM2] George Street / McEvoy Street - AM** (All turning movements)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

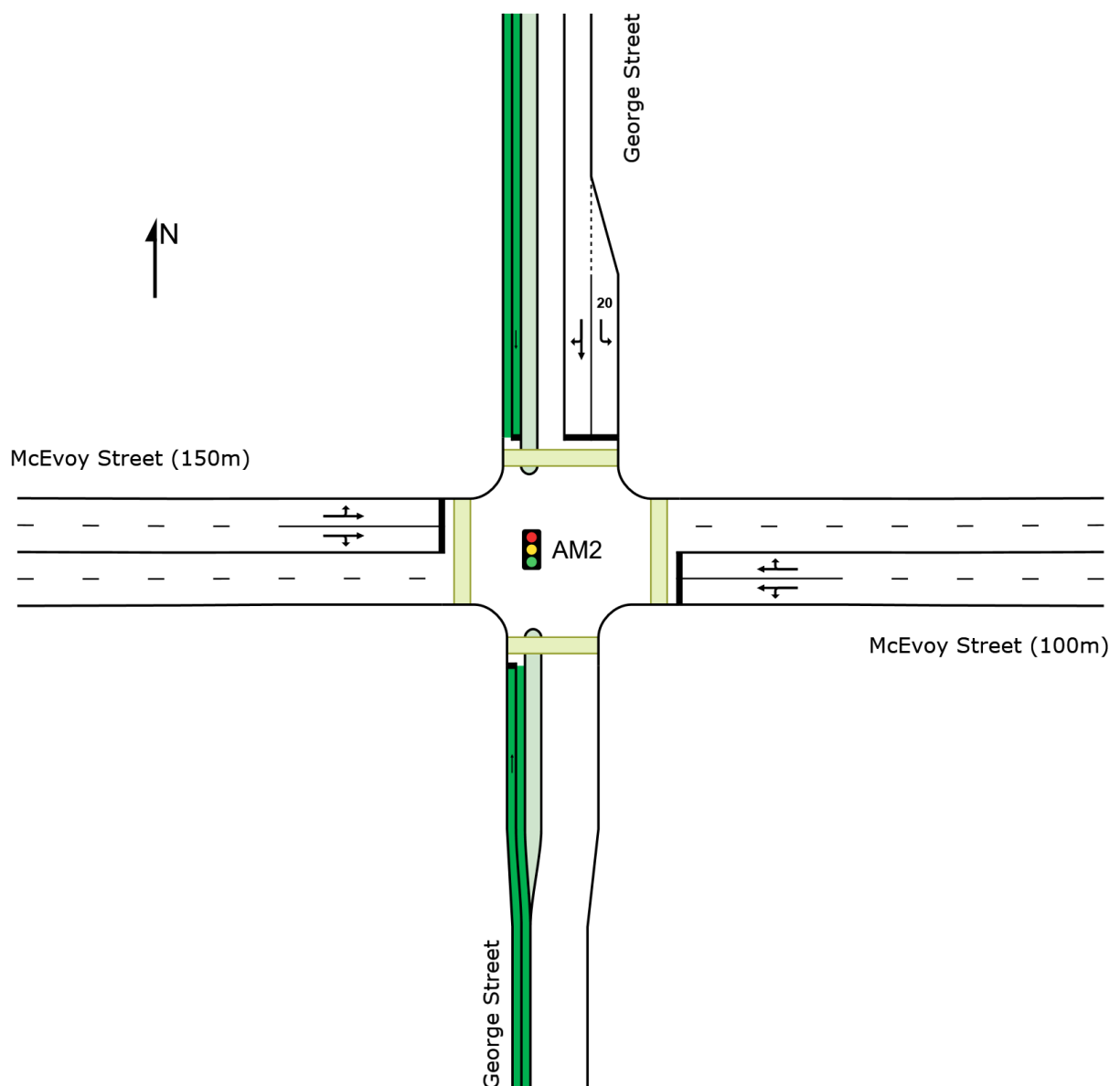
Input Phase Sequence: A, B, C

Output Phase Sequence: A, B, C

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	*0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	43	4.9	43	4.9	0.874	34.7	LOS C	21.4	152.8	1.00	1.07	1.29	30.8
5	T1	All MCs	592	5.0	592	5.0	0.874	27.9	LOS C	21.4	152.8	1.00	1.07	1.29	21.5
6	R2	All MCs	105	4.0	105	4.0	0.874	44.8	LOS D	4.1	26.3	1.00	0.99	1.61	26.1
Approach			740	4.8	740	4.8	0.874	30.7	LOS C	21.4	152.8	1.00	1.06	1.34	23.3
North: George Street															
7	L2	All MCs	31	3.4	31	3.4	0.129	32.4	LOS C	0.9	4.9	0.94	0.70	0.94	28.0
8	T1	All MCs	212	0.0	212	0.0	*0.710	19.7	LOS B	4.9	29.7	0.84	0.66	0.84	25.9
9	R2	All MCs	126	5.0	126	5.0	0.710	37.7	LOS D	4.1	29.7	1.00	0.88	1.22	29.7
Approach			368	2.0	368	2.0	0.710	26.9	LOS C	4.9	29.7	0.90	0.74	0.98	26.9
West: McEvoy Street (150m)															
10	L2	All MCs	48	4.3	48	4.3	1.068	98.1	LOS F	60.4	435.2	1.00	1.86	2.41	12.8
11	T1	All MCs	980	4.9	980	4.9	*1.068	100.6	LOS F	60.4	435.2	1.00	1.85	2.42	6.2
12	R2	All MCs	103	4.1	103	4.1	1.068	117.7	LOS F	8.7	60.1	1.00	1.40	2.82	15.7
Approach			1132	4.8	1132	4.8	1.068	102.1	LOS F	60.4	435.2	1.00	1.81	2.46	7.4
All Vehicles			2451	4.0	2451	4.0	1.068	62.1	LOS E	60.4	435.2	0.97	1.32	1.76	14.3

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

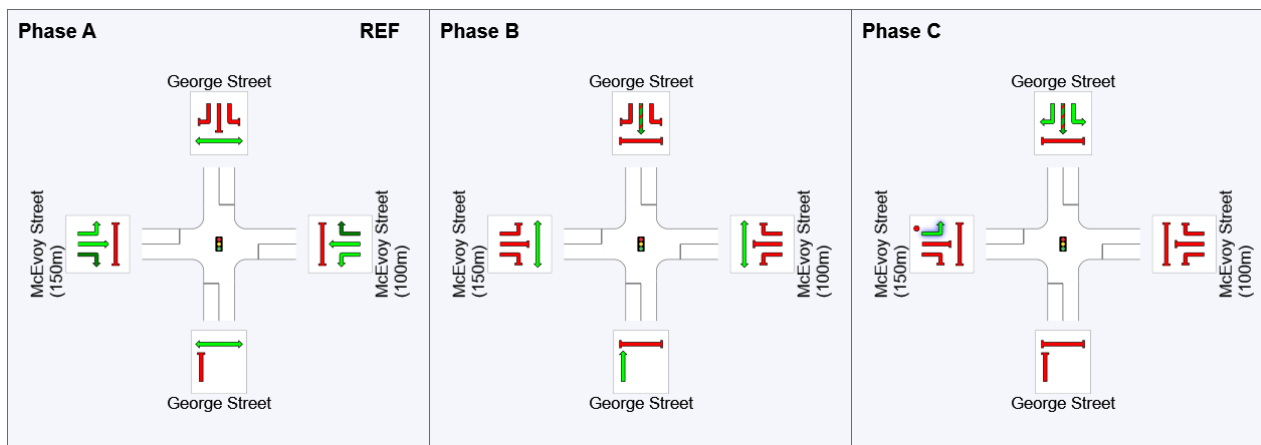
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

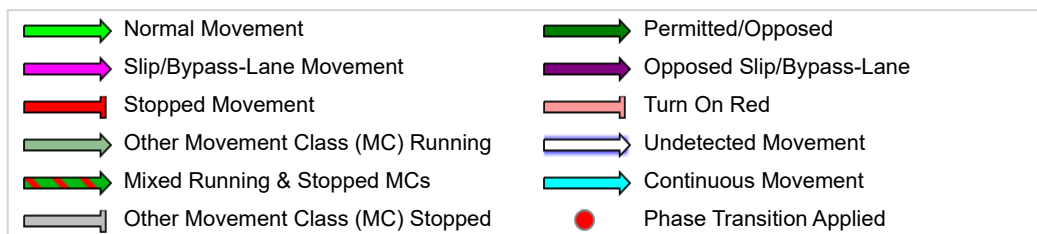
* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0.0	28.4	48.0
Green Time (sec)	22.4	13.6	6.0
Phase Time (sec)	28.4	19.6	12.0
Phase Split	47%	33%	20%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [PM1] George Street / McEvoy Street - PM (Base)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545

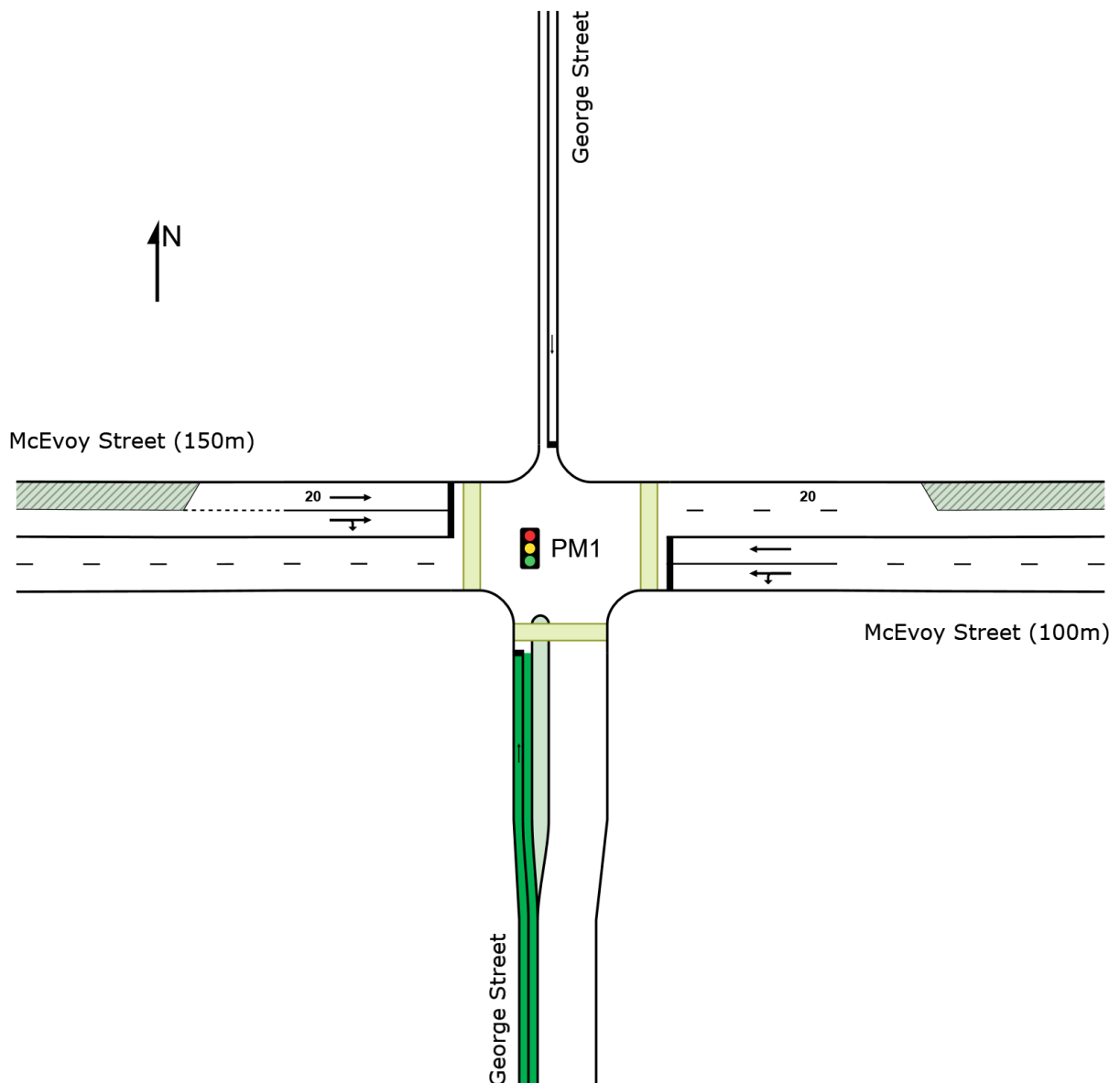
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	* 0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	64	4.9	64	4.9	0.609	14.2	LOS B	12.8	92.3	0.70	0.65	0.70	42.8
5	T1	All MCs	1259	4.9	1259	4.9	0.609	9.1	LOS A	12.8	92.6	0.70	0.64	0.70	37.8
Approach			1323	4.9	1323	4.9	0.609	9.3	LOS A	12.8	92.6	0.70	0.64	0.70	38.2
North: George Street															
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
West: McEvoy Street (150m)															
11	T1	All MCs	741	5.0	741	5.0	* 1.008	57.2	LOS E	33.0	236.4	0.83	1.18	1.50	14.7
12	R2	All MCs	93	4.5	93	4.5	1.008	104.9	LOS F	33.0	236.4	1.00	1.60	2.04	20.5
Approach			834	4.9	834	4.9	1.008	62.5	LOS E	33.0	236.4	0.85	1.23	1.56	13.7
All Vehicles			2578	4.1	2578	4.1	1.008	28.2	LOS C	33.0	236.4	0.77	0.83	1.00	23.5

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

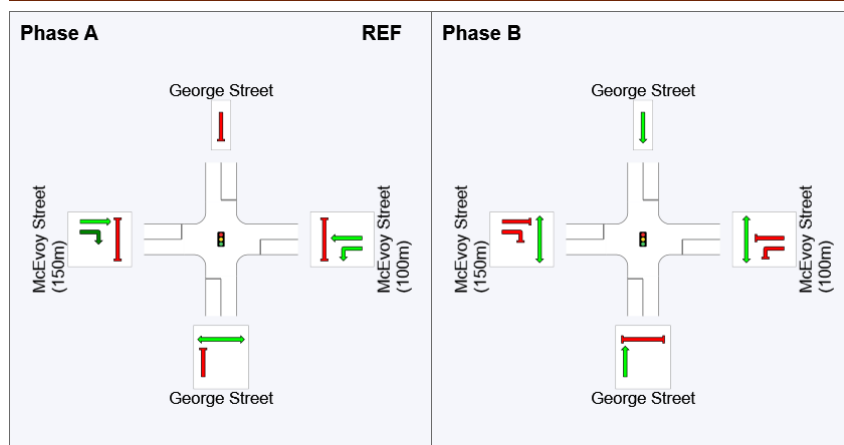
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

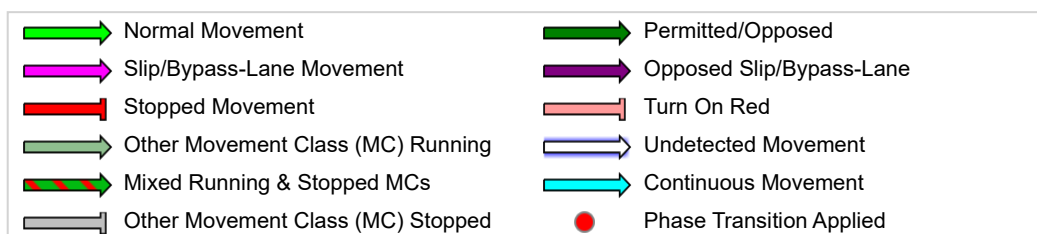
* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [PM3] George Street / McEvoy Street - PM (LILO - signalised)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

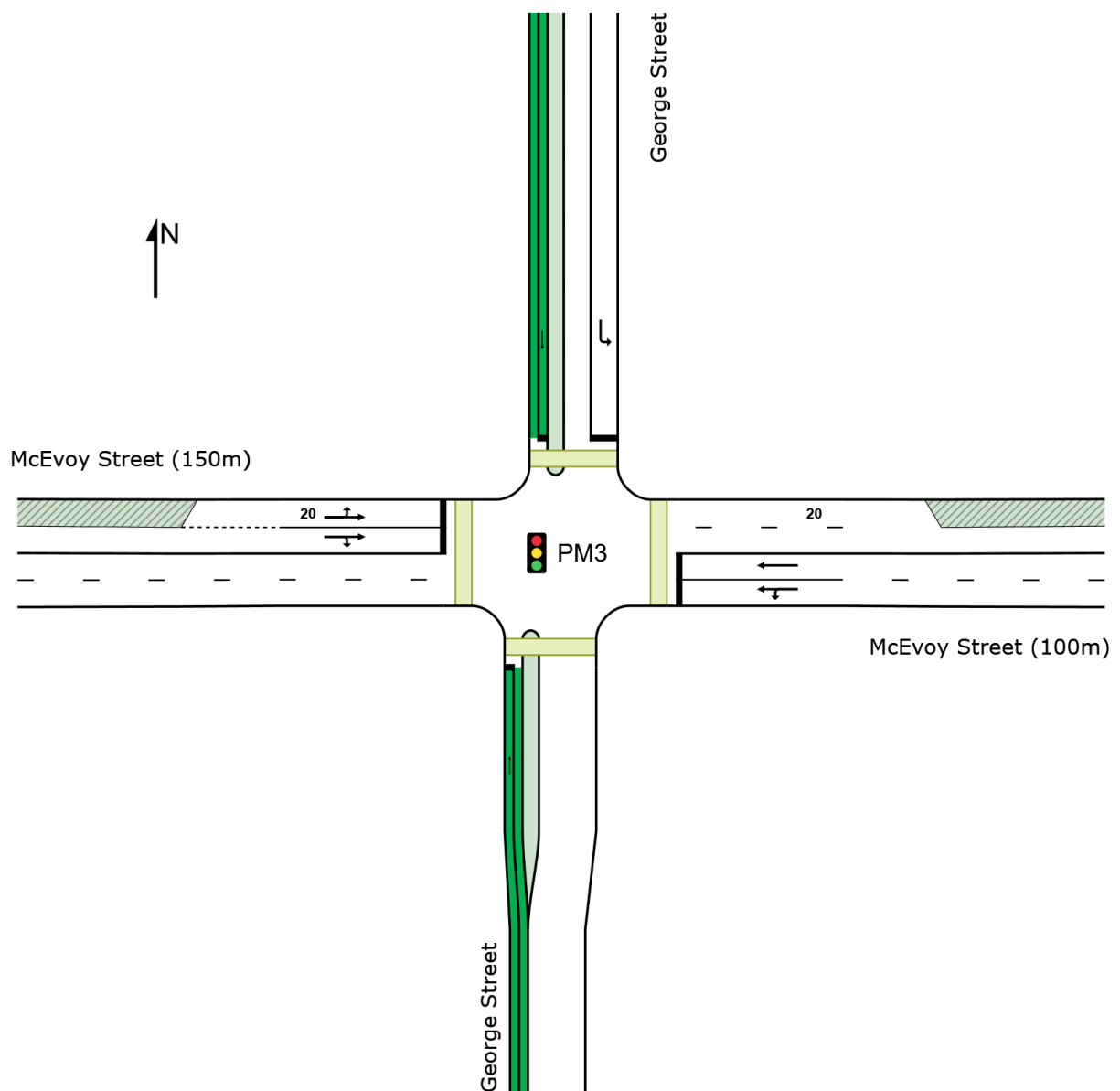
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	* 0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	64	4.9	64	4.9	0.610	15.3	LOS B	12.9	92.5	0.71	0.65	0.71	42.7
5	T1	All MCs	1259	4.9	1259	4.9	0.610	9.1	LOS A	12.9	92.9	0.71	0.64	0.71	37.7
Approach			1323	4.9	1323	4.9	0.610	9.4	LOS A	12.9	92.9	0.71	0.64	0.71	38.2
North: George Street															
7	L2	All MCs	52	4.1	52	4.1	0.123	26.9	LOS C	1.3	8.1	0.85	0.72	0.85	31.6
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			262	0.8	262	0.8	0.150	21.1	LOS C	4.9	13.1	0.84	0.67	0.84	26.5
West: McEvoy Street (150m)															
10	L2	All MCs	124	4.2	124	4.2	0.222	23.8	LOS C	3.8	27.2	0.53	0.58	0.53	44.6
11	T1	All MCs	627	4.9	627	4.9	* 1.018	70.0	LOS E	34.8	248.6	0.90	1.41	1.77	12.1
12	R2	All MCs	93	4.5	93	4.5	1.018	110.8	LOS F	34.8	248.6	1.00	1.65	2.12	19.6
Approach			844	4.7	844	4.7	1.018	67.7	LOS E	34.8	248.6	0.85	1.32	1.62	14.6
All Vehicles			2640	4.1	2640	4.1	1.018	30.0	LOS C	34.8	248.6	0.78	0.86	1.02	23.5

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

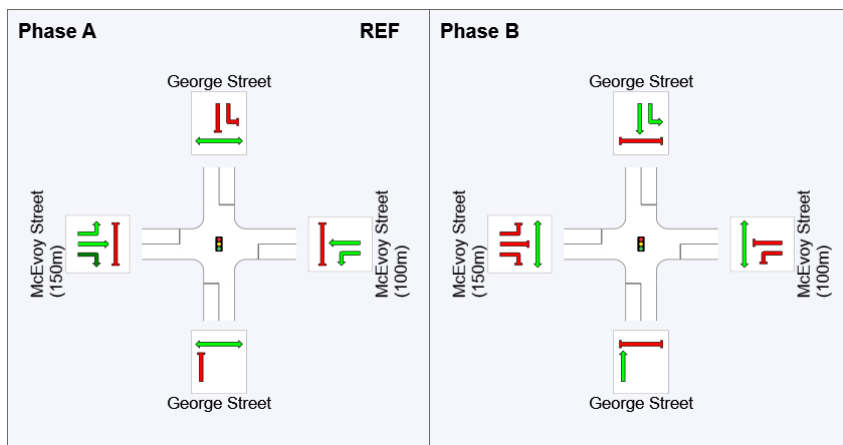
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [PM4] George Street / McEvoy Street - PM (LILO - LT out Give Way)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

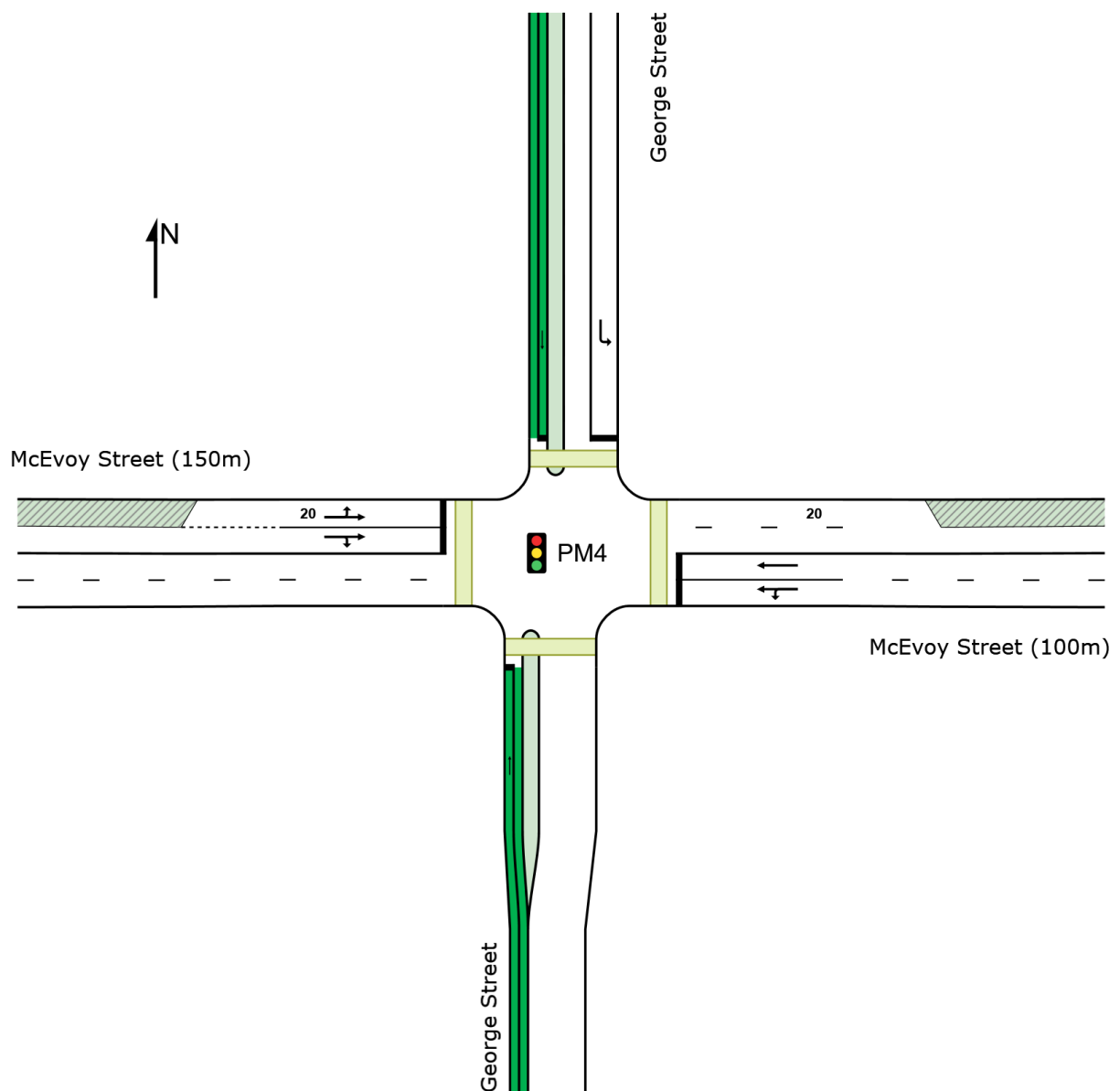
Input Phase Sequence: A, B

Output Phase Sequence: A, B

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				km/h
South: George Street															
2	T1	All MCs	211	0.0	211	0.0	* 0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
East: McEvoy Street (100m)															
4	L2	All MCs	64	4.9	64	4.9	0.610	15.3	LOS B	12.9	92.5	0.71	0.65	0.71	42.7
5	T1	All MCs	1259	4.9	1259	4.9	0.610	9.1	LOS A	12.9	92.9	0.71	0.64	0.71	37.7
Approach			1323	4.9	1323	4.9	0.610	9.4	LOS A	12.9	92.9	0.71	0.64	0.71	38.2
North: George Street															
7	L2	All MCs	52	4.1	52	4.1	0.069	12.6	LOS B	0.7	4.5	0.63	1.05	0.63	28.6
8	T1	All MCs	211	0.0	211	0.0	0.150	19.7	LOS B	4.9	13.1	0.84	0.66	0.84	25.8
Approach			262	0.8	262	0.8	0.150	18.3	LOS B	4.9	13.1	0.80	0.73	0.80	26.2
West: McEvoy Street (150m)															
10	L2	All MCs	124	4.2	124	4.2	0.222	23.8	LOS C	3.8	27.2	0.53	0.58	0.53	44.6
11	T1	All MCs	627	4.9	627	4.9	* 1.018	70.1	LOS E	34.8	248.7	0.90	1.41	1.77	12.1
12	R2	All MCs	93	4.5	93	4.5	1.018	110.9	LOS F	34.8	248.7	1.00	1.65	2.12	19.6
Approach			844	4.7	844	4.7	1.018	67.7	LOS E	34.8	248.7	0.85	1.32	1.62	14.6
All Vehicles			2640	4.1	2640	4.1	1.018	29.8	LOS C	34.8	248.7	0.77	0.87	1.02	23.5

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

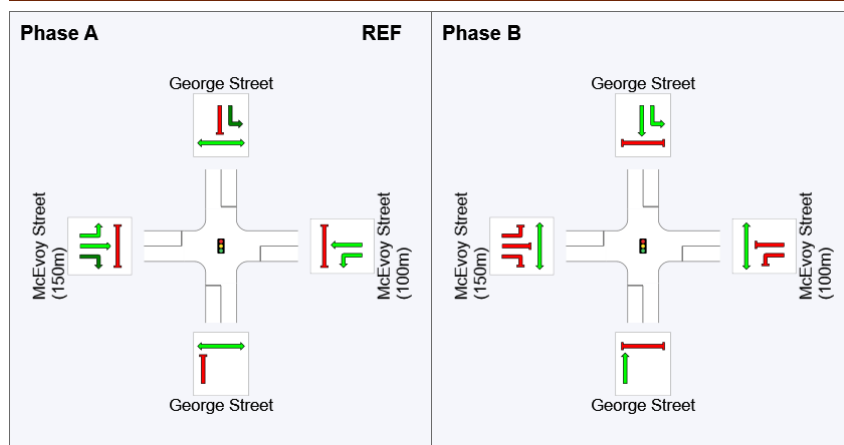
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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.

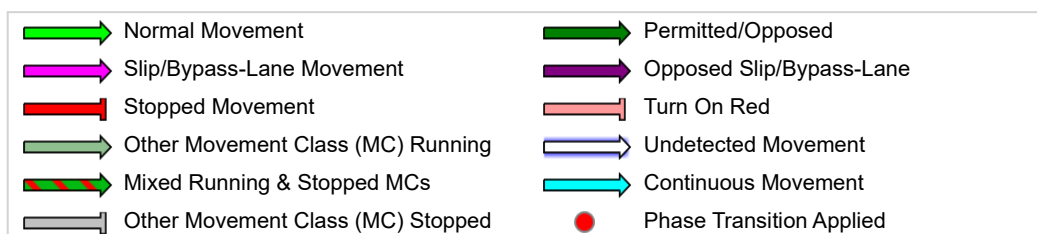
* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0.0	40.4
Green Time (sec)	34.4	13.6
Phase Time (sec)	40.4	19.6
Phase Split	67%	33%
Phase Frequency (%)	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%.

Default Site User Report

 **Site: [PM2] George Street / McEvoy Street - PM** (All turning movements)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site User-Given Cycle Time)

Site Scenario: 1 | Local Volumes

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS4545 - amended

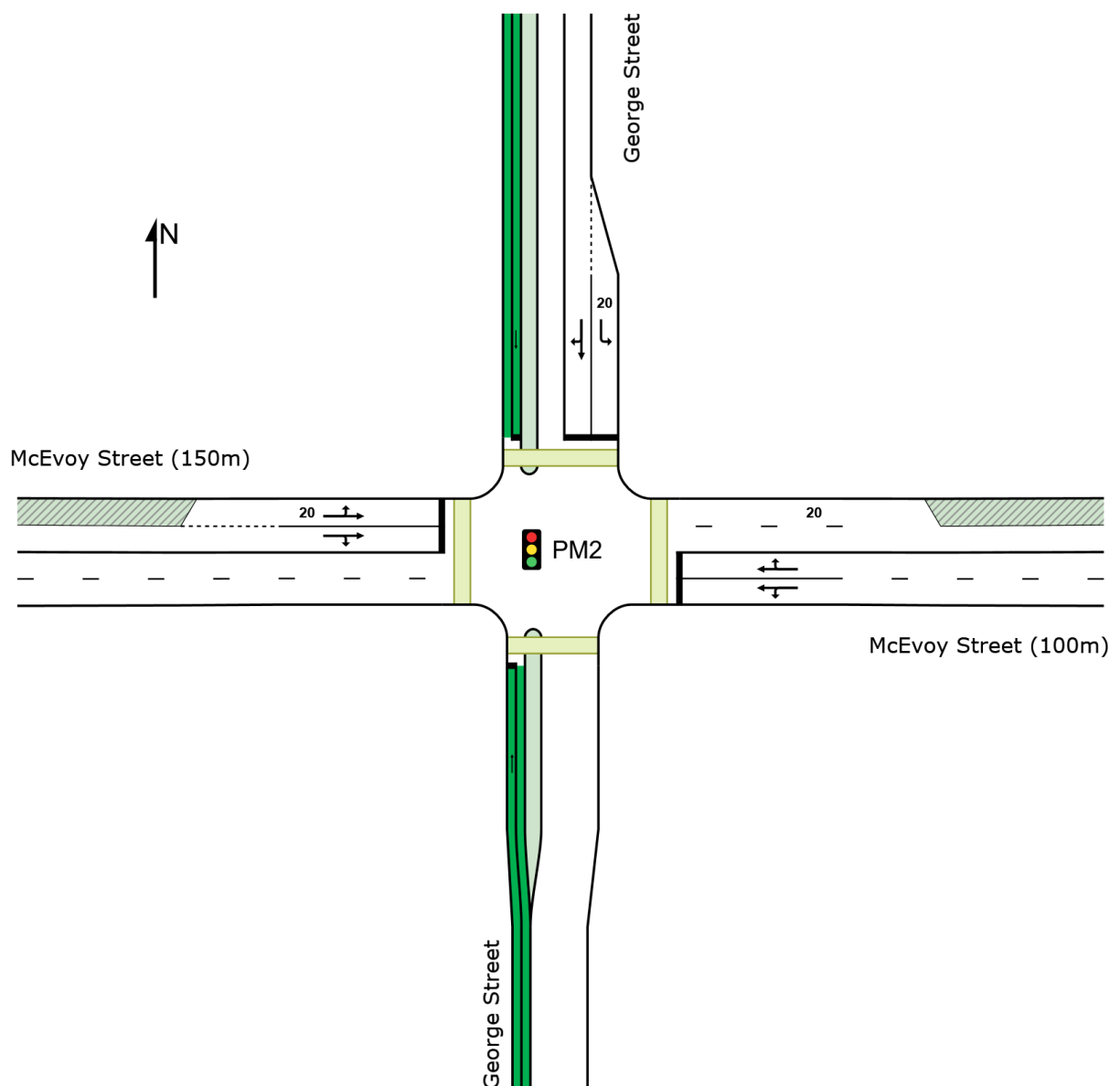
Input Phase Sequence: A, B, C

Output Phase Sequence: A, B, C

Reference Phase: Phase A

Site Layout

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



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: George Street															
2	T1	All MCs	21	0.0	21	0.0	0.015	18.8	LOS B	0.5	1.3	0.80	0.55	0.80	26.0
Approach			21	0.0	21	0.0	0.015	18.8	LOS B	0.5	1.3	0.80	0.55	0.80	26.0
East: McEvoy Street (100m)															
4	L2	All MCs	75	4.2	75	4.2	1.442	429.6	LOS F	152.5	1087.1	1.00	4.09	5.69	6.1
5	T1	All MCs	1108	4.9	1108	4.9	1.442	422.8	LOS F	152.5	1087.1	1.00	3.89	5.70	2.9
6	R2	All MCs	104	4.0	104	4.0	1.442	453.5	LOS F	38.2	262.8	1.00	2.64	5.77	6.1
Approach			1287	4.8	1287	4.8	1.442	425.7	LOS F	152.5	1087.1	1.00	3.80	5.71	3.4
North: George Street															
7	L2	All MCs	62	3.4	62	3.4	0.263	33.1	LOS C	1.8	10.2	0.96	0.73	0.96	27.9
8	T1	All MCs	22	0.0	22	0.0	* 0.905	19.9	LOS B	6.0	43.6	0.81	0.57	0.84	26.3
9	R2	All MCs	161	5.2	161	5.2	0.905	45.8	LOS D	6.0	43.6	1.00	1.09	1.70	27.0
Approach			245	4.3	245	4.3	0.905	40.2	LOS D	6.0	43.6	0.97	0.95	1.44	27.1
West: McEvoy Street (150m)															
10	L2	All MCs	135	3.9	135	3.9	0.435	27.0	LOS C	6.7	46.5	0.72	1.08	0.72	37.8
11	T1	All MCs	638	4.8	638	4.8	* 1.919	479.4	LOS F	94.7	659.7	0.87	2.60	4.77	3.4
12	R2	All MCs	103	4.1	103	4.1	1.919	904.1	LOS F	94.7	659.7	1.00	3.91	8.25	4.6
Approach			876	4.6	876	4.6	1.919	459.8	LOS F	94.7	659.7	0.86	2.52	4.55	4.6
All Vehicles			2429	4.6	2429	4.6	1.919	395.6	LOS F	152.5	1087.1	0.95	3.02	4.82	4.6

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

Vehicle movement LOS values are based on average delay per movement.

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

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.

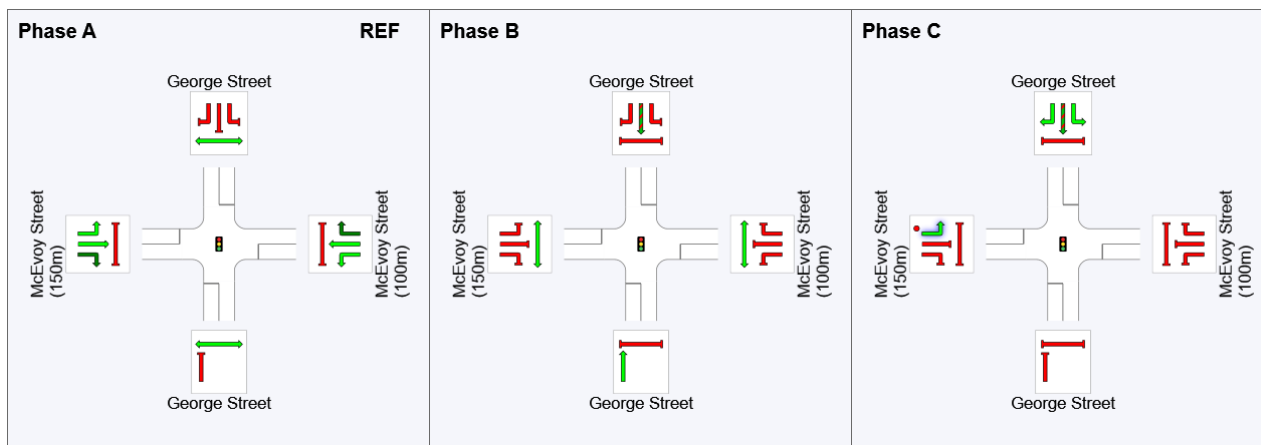
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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

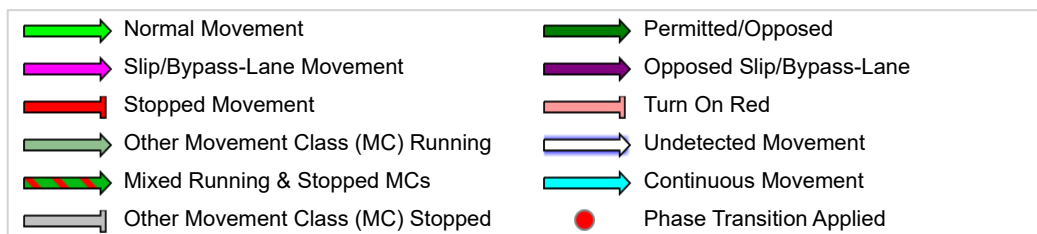
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0.0	28.4	48.0
Green Time (sec)	22.4	13.6	6.0
Phase Time (sec)	28.4	19.6	12.0
Phase Split	47%	33%	20%
Phase Frequency (%)	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%.

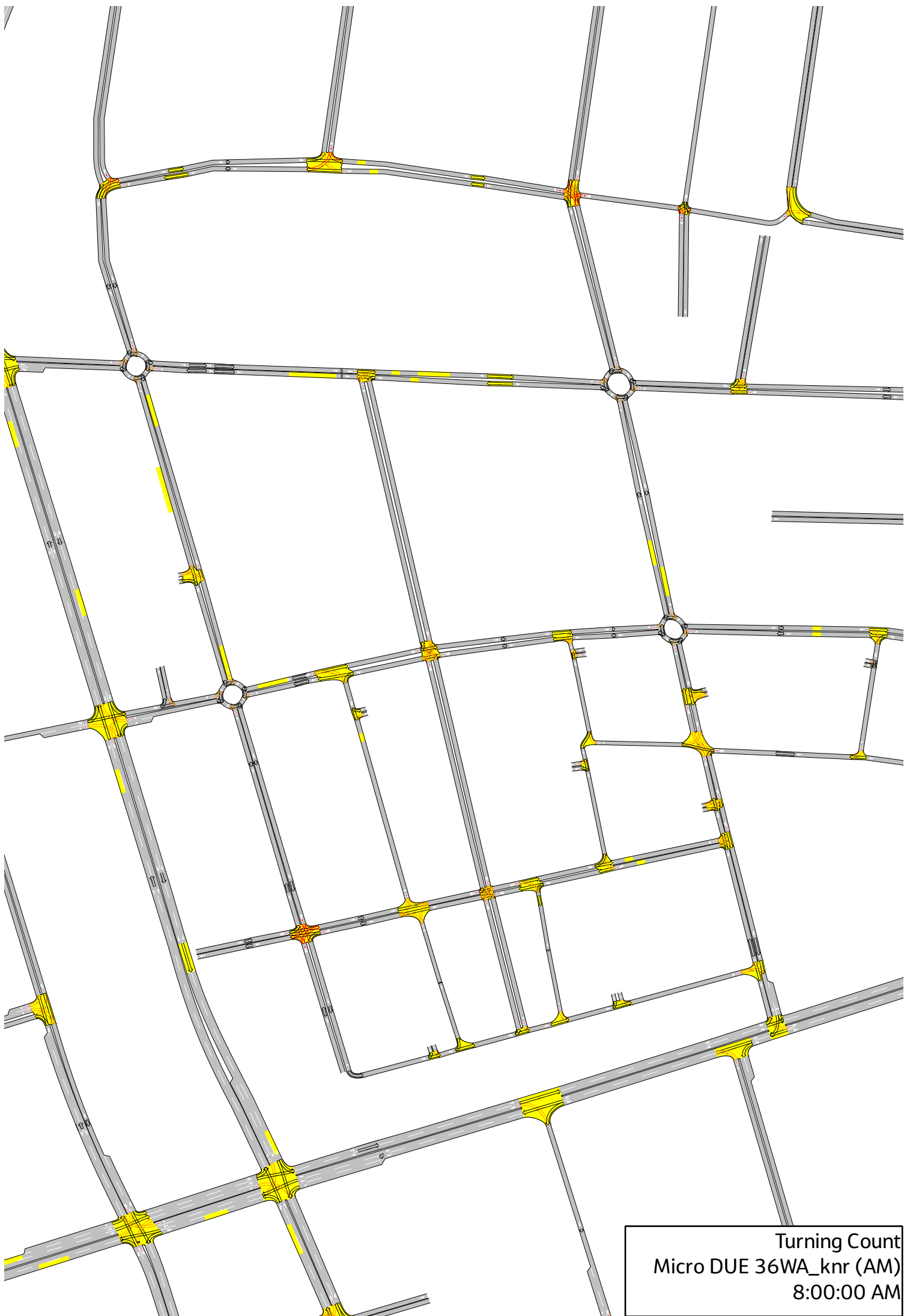
Appendix 2 – Jacob's modelling outputs from 2022 planning proposal



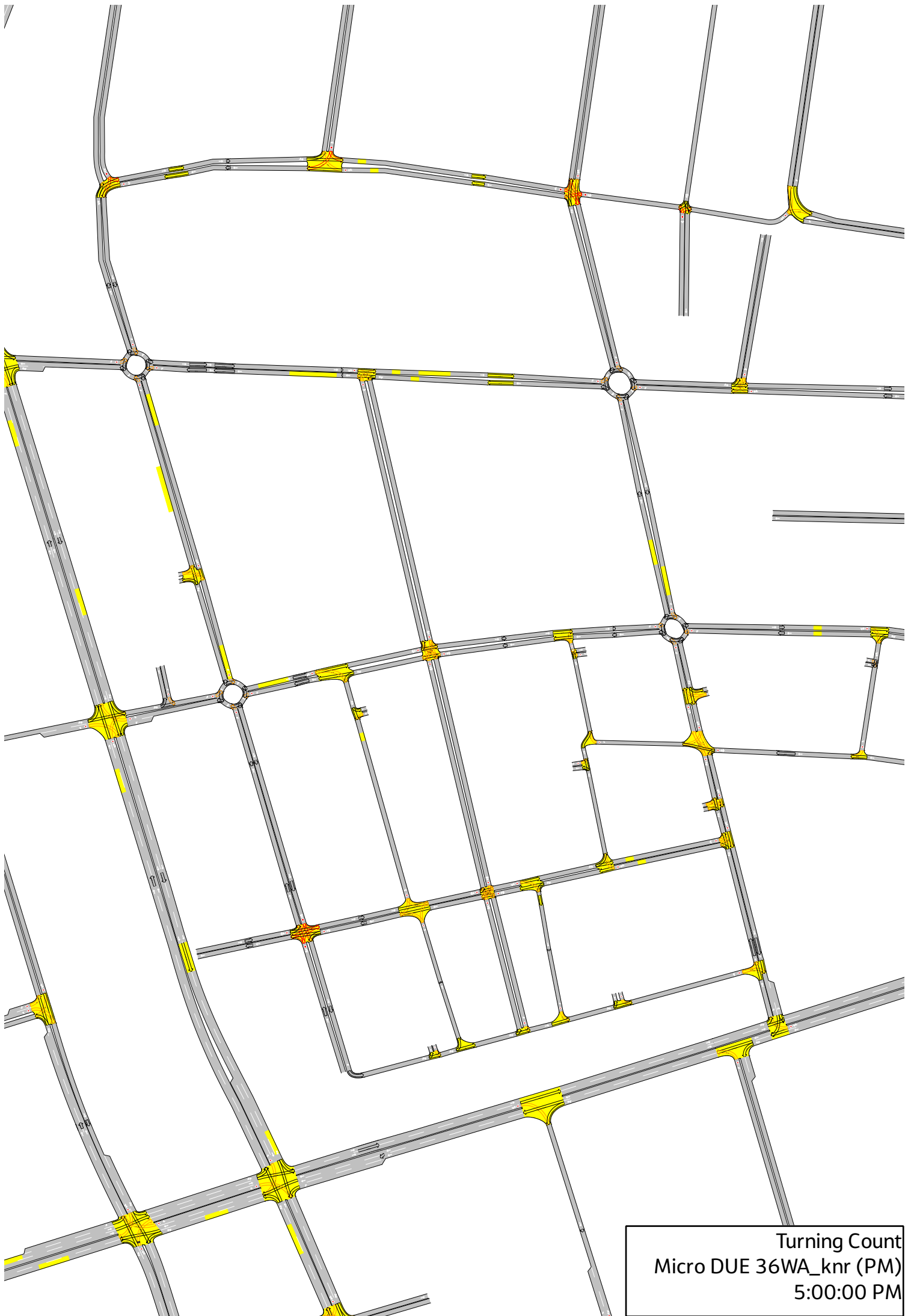
Link Counts
Micro DUE 36WA_knr (AM)
8:00:00 AM



Link Counts
Micro DUE 36WA_knr (PM)
5:00:00 PM



Turning Count
Micro DUE 36WA_knr (AM)
8:00:00 AM



Turning Count
Micro DUE 36WA_knr (PM)
5:00:00 PM

Attachment 2. Revised Vehicle Access Location Assessments



LEGEND

- TRAFFIC FLOW
- CAR ACCESS / EGRESS
- SERVICE VEHICLE ACCESS / EGRESS

NOTES:

NOT FOR CONSTRUCTION
These drawings have been prepared for information only and are not issue for construction

SWEPT PATHS
The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

899 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

10.6m CoS Refuse Vehicle

Overall Length	10.604m
Overall Width	2.600m
Overall Body Height	3.800m
Min Body Ground Clearance	0.394m
Track Width	2.500m
Lock-to-lock time	2.277m
Curb to Curb Turning Radius	10.500m

Large Articulated Vehicle

Overall Length	15.400m
Overall Width	3.500m
Overall Body Height	3.052m
Min Body Ground Clearance	0.406m
Max Track Width	2.277m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	6.616m

REV	DATE	DESCRIPTION	DRAWN	REVIEWED
X	X	X	X	X
X	X	X	X	X
X	X	X	X	X
4	06/07/26	RTS RESPONSE	SW	SW
3	15/04/26	REVISED GEORGE ST ACCESS	SW	SW
2	10/04/26	UPDATED BLOCK 8 & 9	SW	SW
1	27/03/26	10.6M WASTE VEHICLE	SW	SW

PROJECT
WATERLOO PRECINCT

DRAWING TITLE
PUBLIC DOMAIN ASSESSMENT
Precinct South West

10.6m Waste Vehicle

Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

CLIENT STOCKLANDS

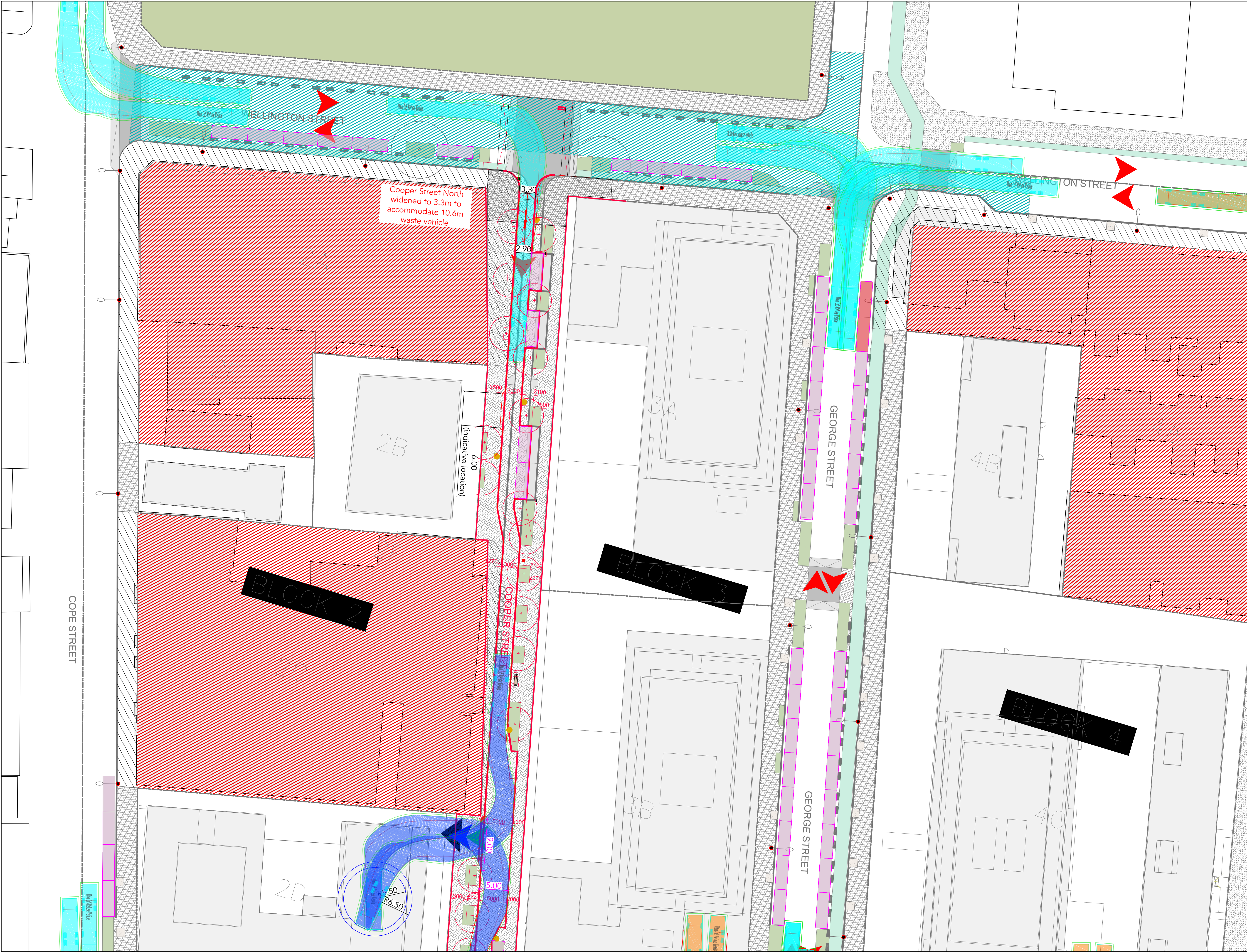
DRAWING # pteT_DWG_SK31.1

PROJECT # 25-1221

SCALE
1 : 300 @ A1
1 : 600 @ A3

RTS RESPONSE

REV 4



LEGEND

TRAFFIC FLOW

CAR ACCESS / EGRESS

SERVICE VEHICLE ACCESS / EGRESS

NOTES:

NOT FOR CONSTRUCTION

These drawings have been prepared for information only and are not issue for construction

SWEPT PATHS

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

10.6m CoS Refuse Vehicle

Overall Length	10.604m
Overall Width	2.600m
Overall Body Height	3.800m
Min Body Ground Clearance	0.394m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	10.500m

Large Articulated Vehicle

Overall Length	15.400m
Overall Width	2.500m
Overall Body Height	3.052m
Min Body Ground Clearance	0.406m
Max Track Width	2.277m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	6.616m

X	X	X		x	x
X	X	X		x	x
X	X	X		x	x
4	06/07/26	RTS RESPONSE	SW	SW	
3	15/04/26	REVISED GEORGE ST ACCESS	SW	SW	
2	10/04/26	UPDATED BLOCK 3 & 4	SW	SW	
1	27/03/26	10.6M WASTE VEHICLE	SW	SW	
REV	DATE	DESCRIPTION	DRAWN	REVIEWED	

PROJECT

WATERLOO PRECINCT

DRAWING TITLE

PUBLIC DOMAIN ASSESSMENT
Precinct North West

10.6m Waste Vehicle

Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

CLIENT

STOCKLANDS

DRAWING #

ptsT_DWG_SK31.2

PROJECT #

25-1221

SCALE

1 : 300 @ A1
1 : 600 @ A3

RTS RESPONSE

REV 4



LEGEND

TRAFFIC FLOW

CAR ACCESS / EGRESS

SERVICE VEHICLE ACCESS / EGRESS

NOTES:

NOT FOR CONSTRUCTION

These drawings have been prepared for information only and are not issue for construction

SWEPT PATHS

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

10.6m CoS Refuse Vehicle

Overall Length	10.604m
Overall Width	2.600m
Overall Body Height	2.880m
Min Body Ground Clearance	0.394m
Track Width	2.500m
Lock-to-lock time	2.500s
Curb to Curb Turning Radius	10.500m

Large Articulated Vehicle

Overall Length	15.400m
Overall Width	2.580m
Overall Body Height	3.052m
Min Body Ground Clearance	0.406m
Max Track Width	2.277m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	6.616m

X	X	X		x	x
X	X	X		x	x
X	X	X		x	x
4	06/07/26	RTS RESPONSE	SW	SW	
3	15/04/26	REVISED GEORGE ST ACCESS	SW	SW	
2	10/04/26	UPDATED BLOCK 9 & 10	SW	SW	
1	27/03/26	10.6M WASTE VEHICLE	SW	SW	
REV	DATE	DESCRIPTION	DRAWN	REVIEWED	

PROJECT

WATERLOO PRECINCT

DRAWING TITLE

PUBLIC DOMAIN ASSESSMENT
Precinct South East

10.6m Waste Vehicle

Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

CLIENT

STOCKLANDS

DRAWING #

ptcT_DWG_SK31.3

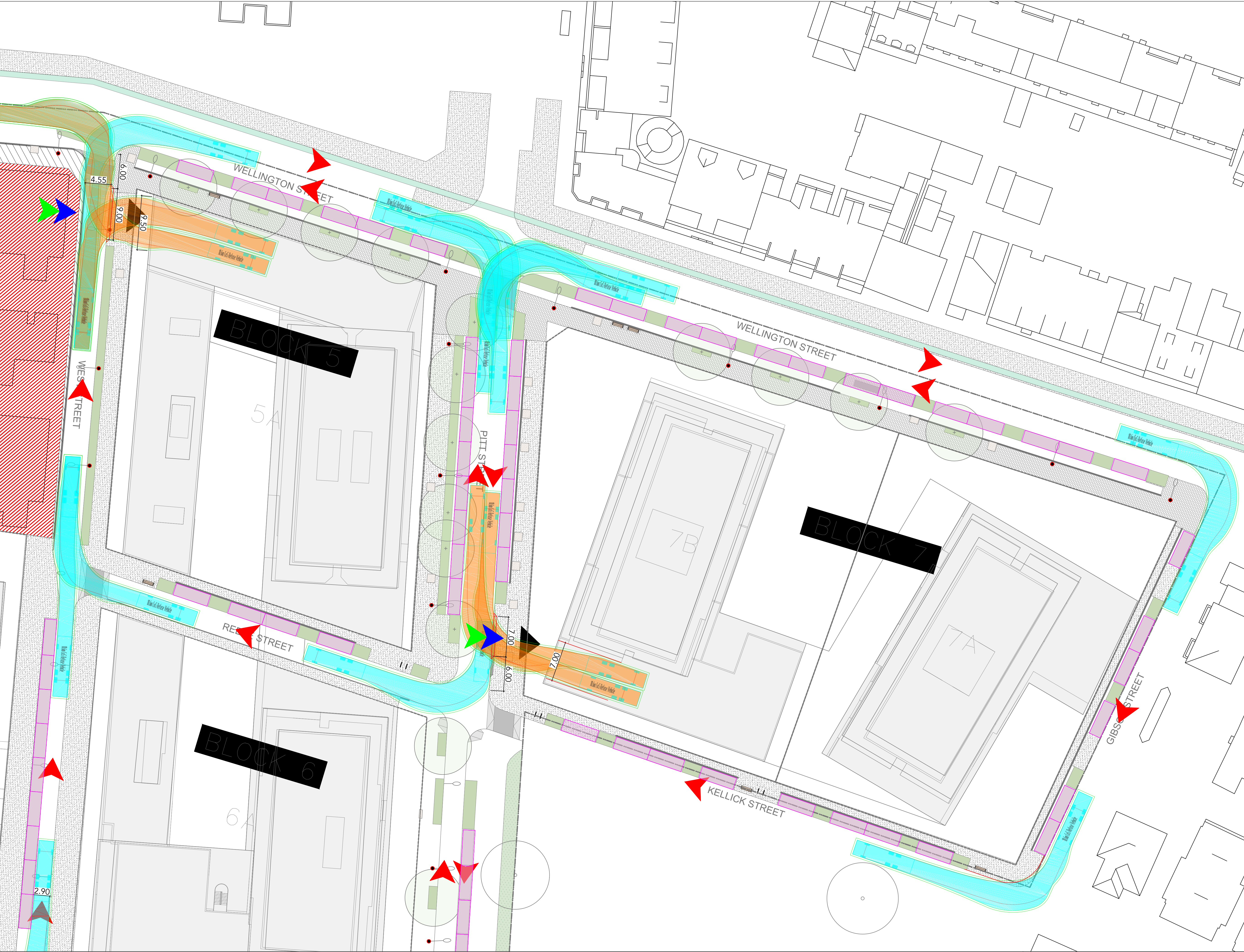
PROJECT #

25-1221

SCALE

1 : 300 @ A1
1 : 600 @ A3

RTS RESPONSE



LEGEND

TRAFFIC FLOW

CAR ACCESS / EGRESS

SERVICE VEHICLE ACCESS / EGRESS

NOTES:

NOT FOR CONSTRUCTION

These drawings have been prepared for information only and are not issue for construction

SWEPT PATHS

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

10.6m CoS Refuse Vehicle

Overall Length	10.604m
Overall Width	2.600m
Overall Body Height	3.800m
Min Body Ground Clearance	0.394m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.500m

Large Articulated Vehicle

Overall Length	15.400m
Overall Width	2.500m
Overall Body Height	3.852m
Min Body Ground Clearance	0.406m
Max Track Width	2.277m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	6.616m

X	X	X		X	X
X	X	X		X	X
X	X	X		X	X
4	06/07/26	RTS RESPONSE	SW	SW	
3	15/04/26	REVISED GEORGE ST ACCEN	SW	SW	
2	10/04/26	UPDATED BLOCK 8 & 9	SW	SW	
1	27/03/26	10.6M WASTE VEHICLE	SW	SW	
REV	DATE	DESCRIPTION	DRAWN	REVIEWED	

PROJECT

WATERLOO PRECINCT

DRAWING TITLE

PUBLIC DOMAIN ASSESSMENT
Precinct - North East

10.6m Waste Vehicle

Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

CLIENT

STOCKLANDS

DRAWING #

ptcT_DWG_SK31.4

PROJECT #

25-1221

SCALE

1 : 300 @ A1
1 : 600 @ A3

RTS RESPONSE

REV 4