DEPARTMENT OF STATE GROWTH

JUNE 2020

HOBART CITY DEAL SOUTHERN PROJECTS SUB-PROJECT 2: MACQUARIE STREET AND DAVEY STREET BUS PRIORITY

CONCEPT STAGE - ROAD SAFETY AUDIT

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Hobart City Deal
Southern Projects
Sub-Project 2: Macquarie Street and Davey Street Bus Priority
Concept Stage - Road Safety Audit

Department of State Growth

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REV	DATE	DETAILS
A	03/06/2020	Draft Preliminary Initial Issue
B	17/06/2020	Final Issue Road Safety Audit

	NAME	DATE	SIGNATURE
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Reviewed by:	s 36	17/06/2020	
Approved by:	s 36	17/06/2020	

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ABBREVIATIONS

RSA	Road Safety Audit
TGSI	Tactile Ground Surface Indicator
DDA	Disability Discrimination Act
CAR	Corrective Action Report
SSA	Safe Systems Assessment
RRPMs	Retro Reflective Pavement Markers

1 INTRODUCTION

A Concept Design Stage Road Safety Audit (RSA) of the proposed bus priority lanes and associated works on Macquarie Street and Davey Street between the Southern Outlet and Elizabeth Street, in Hobart was conducted at the request of the Department of State Growth.

1.1 AUDIT PROCESS AND TEAM DETAILS

The audit has been carried out following the procedures set out in Austroads Guide to Road Safety – Part 6: Managing Road Safety Audits and Part 6A: Implementing Road Safety Audits. The audit covers physical features of the project which may affect road user safety and it has sought to identify potential safety hazards.

However, the auditors point out that no guarantee can be made that every deficiency has been identified. Further, if all the recommendations made within this report were to be followed, this would not guarantee that the site is 'safe'; rather, adoption of the recommendations should improve the level of safety of the facility.

Members of the road safety audit team were:

- s 36 [redacted] Lead/Senior Road Safety Auditor;
- s 36 [redacted] Senior Road Safety Auditor;
- s 36 [redacted] Road Safety Auditor; and
- s 36 [redacted] Senior Road Safety Auditor.

All road safety auditors are accredited road safety auditors under the VicRoads prequalification scheme and independent of the project design team.

A day time site inspection was conducted by Ross Mannering during daylight hours on Tuesday 7th April 2020 at 8:15am, where the weather conditions were dry and clear. An evening/night time inspection was undertaken by Ross Mannering at 7:30pm on Monday 6th April 2020. Weather conditions were dry and clear. Traffic conditions were considered lower than typical during both surveys due to COVID-19 restrictions that were in place at the time. Video footage was captured during each site inspection and has been subsequently reviewed by the rest of the audit team in the preparation of this Audit.

While it may do so from time to time, the purpose of this report is not to point out compliance with standards.

1.2 CLASSIFICATIONS OF RECOMMENDATIONS

As outlined in Austroads Guide to Road Safety Part 6: Road Safety Audits and Part 6A: Implementing Road Safety Audits 2019, in order to provide guidance regarding whether or not recommendations need to be resolved, the project manager should consider the:

- Likelihood that the identified problem will result in harm;
- Severity of that harm;
- Effectiveness of a remedy in reducing the harm;
- The designers response to the audit; and
- Cost of remedying the problem (there may be several options for treatment).

Four tables (Tables 4.1-4.4) within the Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits 2019 summarise the frequency, severity, resulting risk and treatment approach. These are reproduced in the following four tables.

Table 1.1 Likelihood of crash

FREQUENCY	DESCRIPTION
Frequent	Once or more per week
Probable	Once or more per year (but less than once per week)
Occasional	Once every five to ten years
Improbable	Less often than once every ten years

Table 1.2 Likely Consequence of a Crash

SEVERITY	DESCRIPTION	EXAMPLE
Catastrophic	Likely multiple deaths	— High speed, multi vehicle crash on Freeway — Car runs into a crowded bus stop — Bus and petrol tanker collide — Collapse of a bridge or major tunnel
Serious	Likely death or serious injury	— High or medium speed vehicle/vehicle collision — High or medium speed collision with a fixed roadside object — Pedestrian or cyclist struck by car
Minor	Likely minor injury	— Some low speed vehicle collisions — Cyclists fall from a bicycle at low speed — Left turn rear end crash in a slip lane
Limited	Likely trivial injury or property damage only	— Some low speed vehicle collisions — Pedestrian walks into an object — Car reverses into a post

Table 1.3 Resulting Level of Risk

SEVERITY	FREQUENT	PROBABLE	OCCASIONAL	IMPROBABLE
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Table 1.4 Treatment Approach

RISK	SUGGESTED TREATMENT APPROACH
Intolerable	Must be corrected
High	Should be corrected or the risk significantly reduced, even if the treatment costs are high
Medium	Should be corrected or the risk significantly reduced, if the treatment costs are moderate, but not high
Low	Should be corrected or the risk reduced, if the treatment cost is low

1.3 RESPONDING TO THE AUDIT

An RSA is a formal process. The audit report documents the audit team's identified safety concerns and recommendations (if requested by the client), to improve the safety of the design. This must be responded to by the client (or the designer) with a written response to each audit finding or recommendation. The response document must be signed by a representative of the client. This response document, for example, may be a 'corrective action report' (CAR).

Audit recommendations are not mandatory. In the event of a crash, the audit documentation may be sought by representatives of an injured person. It is important that audit recommendations are given due consideration. If it is not possible to adopt a recommendation (for example, due to high cost implications), is there another effective way of partly addressing the problem or can a solution be staged over time? Reasons for not accepting findings and recommendations should be adequately documented.

1.4 IMPLEMENTING THE AGREED CHANGES

Once the Road Safety Audit – Findings and Recommendations Report (See Section 5) has been finalised, the agreed actions need to be implemented. The designer has to develop design changes that address the safety concerns. If one is at the pre-opening stage, the actions need to be implemented as soon as possible on site. Temporary warning, delineation or other treatment may be needed until the agreed solution is implemented.

Actions taken should be recorded (for example, description of work, by whom and when). This is to fully close out the road safety audit finding as well as to factually record what works were completed. Reasons for any variations from the proposed action must also be set out in writing.

2 SITE DETAILS

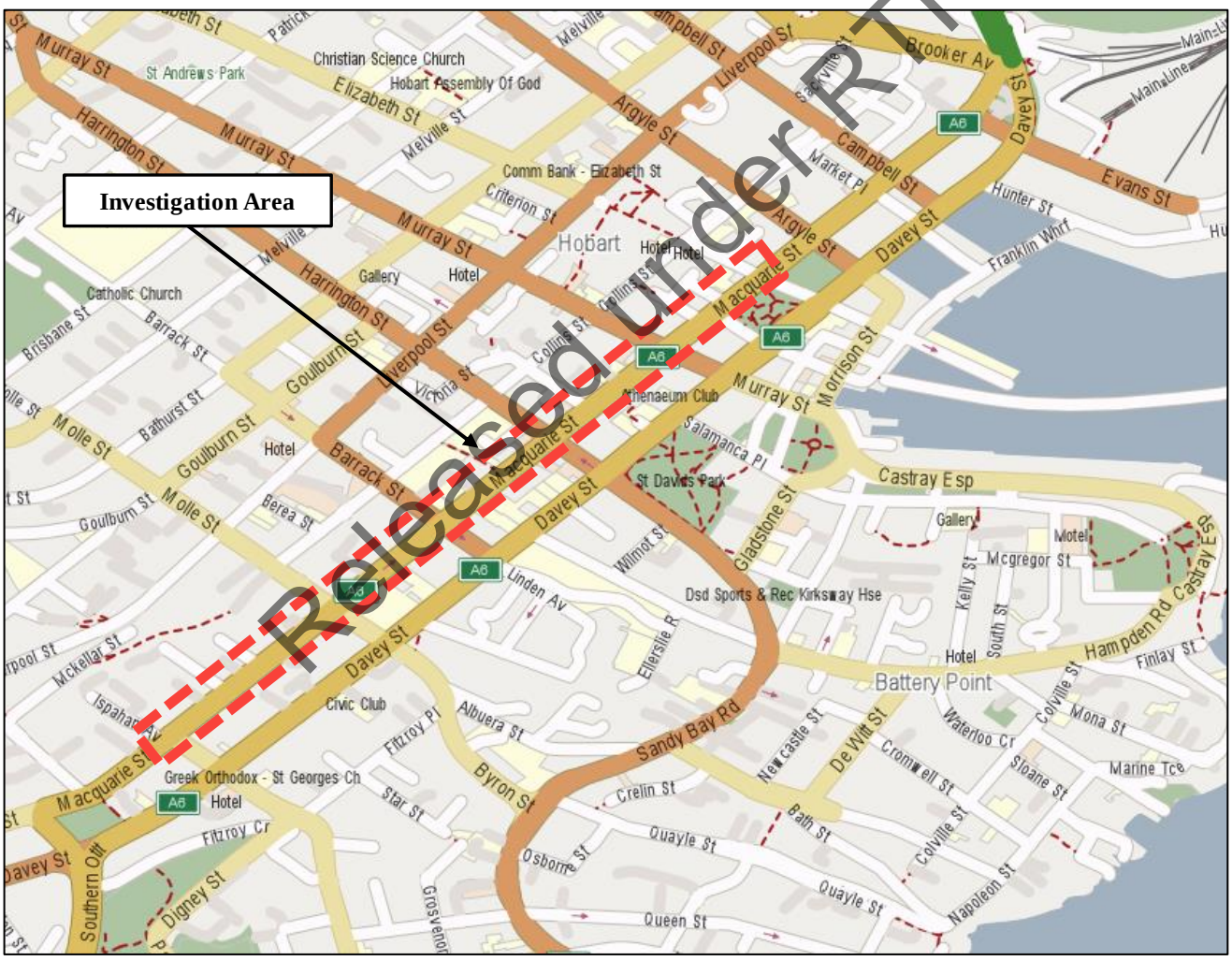
The investigation area covers both Macquarie Street and Davey Street between the Southern Outlet and Elizabeth Street in Hobart.

2.1 MACQUARIE STREET – ISPAHAN AVENUE TO ELIZABETH STREET

The first investigation area extends along Macquarie Street between Ispahan Avenue and Elizabeth Street, and covers a distance of approximately 1.25km. Macquarie Street typically comprises of a one-way, multi-lane carriageway in the northeast direction within the investigation area.

A posted speed limit of 50km/h applies along Macquarie Street within the investigation area.

The following figure shows the location of the investigation area.



Source: *www.street-directory.com.au*

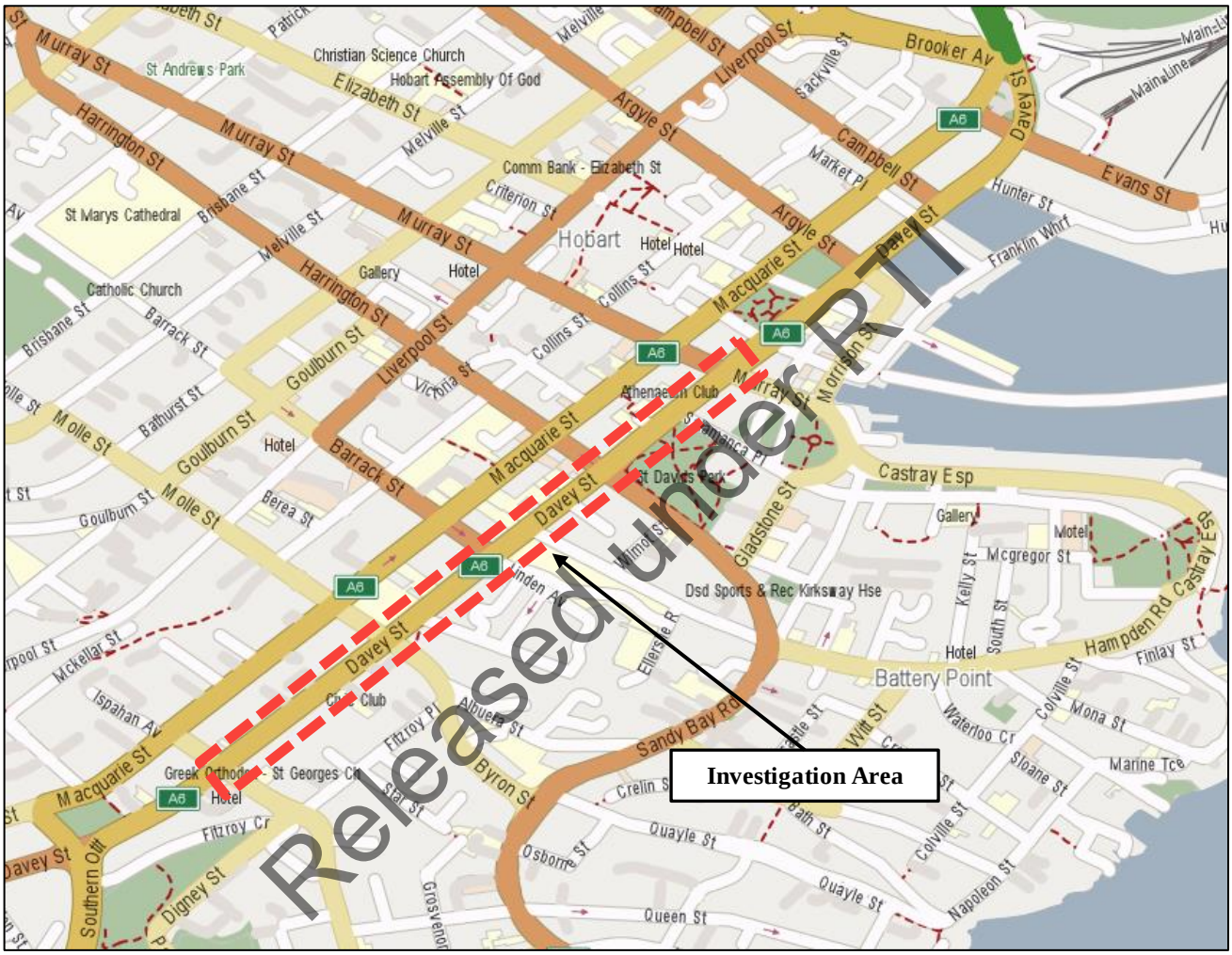
Figure 2.1 Site Investigation Area – Macquarie Street

2.2 DAVEY STREET – ANTIL STREET TO MURRAY STREET

The second investigation area extends along Davey Street between Antil Street and Murray Street, and covers a distance of approximately 1.1km. Davey Street typically comprises of a one-way, multi-lane carriageway in the southwest direction within the investigation area.

A posted speed limit of 50km/h applies along Davey Street within the investigation area.

The following figure shows the location of the investigation area.



Source: *www.street-directory.com.au*

Figure 2.2 Site Investigation Area – Davey Street

3 PROJECT INFORMATION AND SCOPE OF AUDIT

3.1 PROVIDED AND REVIEWED DOCUMENTS

The following material was supplied and referenced during the audit process:

- Macquarie Street Bus Lane Roll Plot – Sheet 1 (Drawing No HB19415-S-CIV-DRG-21101 Rev A) prepared by Pitt & Sherry dated 21/04/2020 (Draft Concept) – Received 22/04/2020
- Macquarie Street Bus Lane Roll Plot – Sheet 2 (Drawing No HB19415-S-CIV-DRG-21102 Rev C) prepared by Pitt & Sherry dated 17/03/2020 (Draft Concept) – Received 22/04/2020
- Macquarie Street Bus Lane Roll Plot – Sheet 1 (Drawing No HB19415-S-CIV-DRG-21101 Rev A) prepared by Pitt & Sherry dated 21/04/2020 (Preliminary) – Received 27/04/2020
- Macquarie Street Bus Lane Roll Plot – Sheet 2 (Drawing No HB19415-S-CIV-DRG-21102 Rev C) prepared by Pitt & Sherry dated 17/03/2020 (Preliminary) – Received 22/04/2020
- Typical Sections – Sheets 1-6 (Drawing No's. HB19415-S-CIV-DRG-20101-6 Rev A) prepared by Pitt & Sherry dated 23/04/2020
- Alignment Plan (Macquarie Street) – Sheets 17-24 (Drawing No's HB19415-S-CIV-DRG-21001-8 Rev a) prepared by Pitt & Sherry dated 23/04/2020
- Alignment Plan (Davey Street) – Sheets 26-34 (Drawing No's HB19415-S-CIV-DRG-21009-17 Rev a) prepared by Pitt & Sherry dated 23/04/2020

A copy of these plans are included within Appendix A to this audit.

3.2 PROPOSED WORKS AND SCOPE OF AUDIT

Information provided to WSP shows that it is proposed to provide bus priority measures along Macquarie Street between Ispahan Avenue and Elizabeth Street, and along Davey Street between Antil Street and Murray Street in Hobart. This includes the reconfiguration of existing traffic lanes to accommodate a bus priority lane on both Macquarie Street and Davey Street, the provision of new bus stops, and minor modifications to existing kerbing at several intersections.

In addition, dedicated on-street bicycle facilities are proposed on Davey Street between Sandy Bay Road and Molle Street.

The scope of this concept design stage road safety audit is to assess the proposed 50% concept design. Although the audit may cover light poles from a positioning/hazard perspective, it does not cover electrical/ illuminance aspects of the lighting design. Similarly, although pedestrian features may be covered, this is not a formal DDA assessment.

3.3 PROJECT DETAILS

3.3.1 MACQUARIE STREET

The proposed works along Macquarie Street include the following:

- Provision of a priority bus transit lane
- Provision of on-street bus stops
- Reconfiguration of existing traffic lanes
- Extension of left turn lane into Molle Street to Warneford Street
- Extension of right turn lane into Barrack Street
- Extension of left turn lane into Harrington Street
- Extension of right turn lane into Murray Street
- Modifications to several on-street parking spaces, including removal or change in parking restrictions
- Modifications to existing kerbing at several intersections, including kerb extensions to increase footpath widths.

3.3.2 DAVEY STREET

The proposed works along Davey Street include the following:

- Provision of a priority bus transit lane
- Provision of on-street bus stops
- Reconfiguration of existing traffic lanes
- Provision of bicycle storage areas on Davey Street, at the Davey Street and Molle Street intersection
- Provision of a bicycle storage area on Davey Street, at the Davey Street and Linden Avenue intersection
- Provision of a dedicated on-street bicycle lane on Davey Street, between Harrington Street and Linden Avenue
- New signalised intersection at the Davey Street and Salamanca Place intersection
- Modifications to several on-street parking spaces, including removal or change in parking restrictions
- Modifications to existing kerbing at several intersections, including kerb extensions to increase footpath widths.

4 CRASH STATISTICS

Further to the inspection of the site, historical crash statistic data has been reviewed for the two investigation areas. This data has been sourced from the Department of State Growth Tasmania.

Crash data available from the period from 2009– 2020 has been sourced from the Department of State Growth for review and to potential identify issues and critical areas that may exist within the investigation area.

The available data showed a total of 1,129 reported crashes occurred along the two investigation areas within the above specified time period. This is shown in Figure 4.1 below with the number of crashes per year shown in Table 4.1 adjacent. Within the data tables, categories marked * indicate the occurrence of a fatal crash, whilst categories marked ** indicate the occurrence of a serious injury crash.

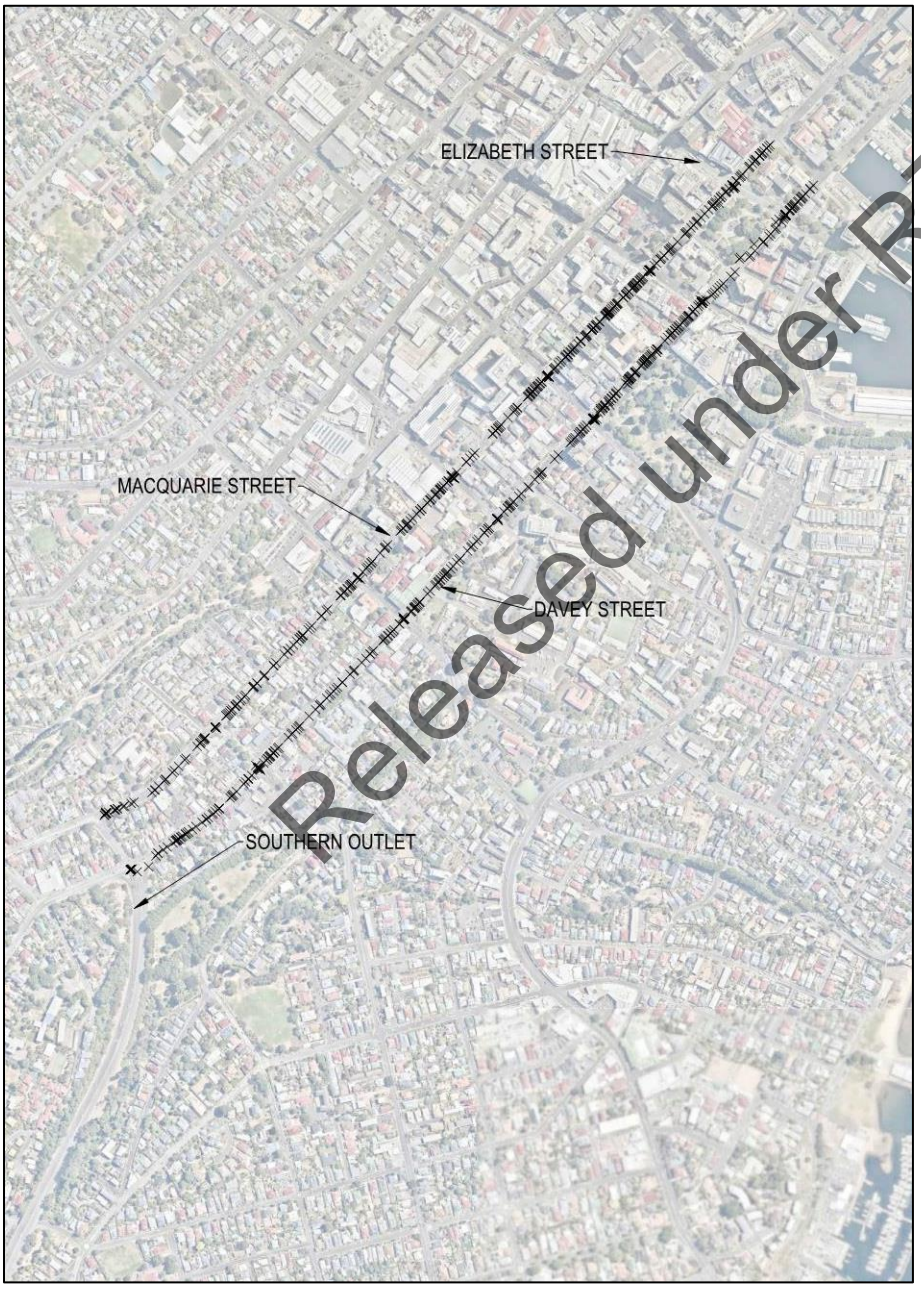


Figure 4.1 Southern Outlet Crash Locations 2009-2020

Table 4.1 Crashes Per Year

YEAR	NO. ACCIDENTS.
2009**	129
2010**	119
2011**	99
2012	89
2013**	105
2014**	106
2015	97
2016**	97
2017**	105
2018*,**	143
2019**	107
2020#	23
Total	**1,219**

#Incomplete survey year.

With regards to the preceding output crash locations, it appears that whilst in general there appears to be a fairly even distribution of crashes along the investigation area, there does appear to be some minor increase in crash numbers between Harrington Street to Elizabeth Street (35% of crashes occurring within 30% of the surveyed road length). Some minor clustering of crashes also occurs around intersections which is in line with expectations as these areas typically result in increased likelihood in vehicle speed variations, movement between lanes, or the opportunities for opposing vehicle conflicts, thereby creating greater opportunity for conflicts to occur.

In addition to the above, this data has also been reviewed to determine if there are any other factors that may be contributing to crashes along the two investigation areas that may be worth considering for treatment within the proposed concept plans. Conditions and outputs that have been investigated include:

- Crash severity;
- Crash type;
- Light conditions;
- Crash location (Intersection or Mid-block); and
- Vehicle type involved in crash.

Key statistics for each of these areas of investigation are in the following tables with key outputs and figures included within Appendix B.

Table 4.2 Accident Severity

SEVERITY	NO.	%
Fatal	1	0.1%
Serious	16	1.3%
Property Damage Only	974	79.9%
Other	228	18.7%

Table 4.3 Vehicle Type in Crash

VEHICLE TYPE	NO.	%
Light Vehicle	1092*,**	89.6%
Heavy Vehicle	90**	7.4%
Bicycle	9	0.7%
Motorcycle	20**	1.6%
Pedestrian	8*,**	0.7%

Table 4.4 Light Conditions

LIGHT CONDITIONS	NO.	%
Darkness (with street light)**	188	15.4%
Daylight*,**	970	79.6%
Dawn-Dusk	56	4.6%
Not known	5	0.4%

Table 4.5 Crash Location

CONTROL	NO.	%
Intersection	535**	43.9%
Mid-Block	684*,**	56.1%

Table 4.6 Crash Type

DCA CODE	ACCIDENT TYPE	NO.	%
0	Other/Not Stated	8	0.7%
100 – 109*,**	Pedestrian	62	5.1%
110 -119**	Vehicle from adjacent direction	175	14.4%
120 - 129	Vehicle from Opposing Direction	26	2.1%
130 – 139**	Vehicle from Same Direction	705	57.8%
140 - 149	Manoeuvring	131	10.7%
150 – 159	Overtaking	6	0.5%
160 – 169**	On Path	72	5.9%
170 – 179	Off Path On Straight	16	1.3%
180 – 189	Off Path On Curve	8	0.7%
190 - 199**	Passenger and Miscellaneous	10	0.8%

5 ROAD SAFETY AUDIT – FINDINGS AND RECOMMENDATIONS

The following table sets out the findings and recommendations of the Road Safety Audit. Any photographs relating to respective items are provided within Appendix C.

Table 5.1 Audit Findings

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
1.	**Crash Data Findings**						
1.1.	Over 50% of accidents involve vehicles travelling in the same direction (rear end). This may be a result of several contributing factors such as: — The current speed limit along both investigation areas could be too high and influencing these crashes. — Existing road grades may be influencing the ability of vehicles to adequately stop. It is noted that a speed reduction has previously been implemented along the investigation sections of road, and that this reduction was undertaken midway through the crash data survey period. Review of the crash data outputs indicates that the number of same direction crashes was generally the same across both the first half of the survey period (2009-Mid 2014) and the second half (Mid 2014 – 2020).	Consideration could be given to further reducing speed limits along the identified sections of the two investigation areas. Sightlines to be reviewed at all intersections within the investigation areas.	-	-	To Note		High numbers of rear-end crashes are a common pattern for signalised intersections. While numerous, they are often low-speed with low consequence. Of itself, this is not a reason to reduce the speed limit. However, lower speed limits could reduce the incidence and severity. Include comment in design report recommending Department consider 40kph speed limit east of Barrack St where activity is higher

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
1.2.	Approximately 14% of crashes involve vehicles from adjacent directions. This may indicate that the current give way arrangements at minor streets approaching either Macquarie Street or Davey Street is not adequate or that vehicles are running red lights.	To address vehicles running red lights, ensure that red lights for traffic signals are appropriately visible and free of obstruction. Consideration could also be given to providing red light and speed cameras at signalised intersections. For vehicles joining the main traffic flow from minor streets, consideration to be given to upgrading any 'Give Way' treatments to 'Stop' arrangement' to enforce vehicle stopping at these locations.	-	-	To Note		

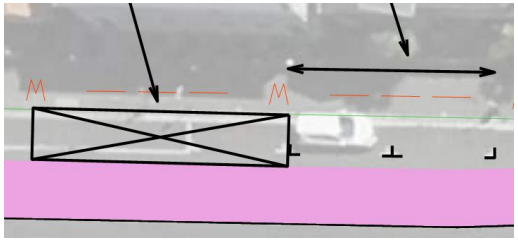
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
2.	**Existing Conditions – Macquarie Street**						
2.1.	There is a power pole on the left-hand side at the intersection of the Southern Outlet and Macquarie Street which is located within the deflection zone of the safety barrier. This may intensify the outcomes of a crash in this location.	Consider providing a different crash barrier to protect the pole, or alternatively consider relocating the electricity services underground.	Occasional	Serious	High		Existing hazards within the clearzone are listed as a departure in the Design Report. Relocation/undergrounding of power poles is outside Scope of this project.DSG to confirm if this upgrade is to be included in this project.
2.2.	The line marking between the two right most lanes on the turn from the Southern Outlet to Macquarie Street has been worn. This may result in side swipe collisions due to the lack of lane definition.	It is recommended that the line marking be reinstated with long lasting thermoplastic line marking.	-	-	To Note		Agreed, note in concept design report / costing design advice.
2.3.	There is a streetlight luminaire which is not functioning just north of Gore Street.	It is recommended that the streetlight luminaire be replaced.	-	-	To Note		Noted. To be resolved in future stages of design.
2.4.	There is a streetlight luminaire which is not functioning just south of Ispahan Avenue	It is recommended that the streetlight luminaire be replaced.	-	-	To Note		Noted. To be resolved in future stages of design.
2.5.	Trees obscure the street lighting between Harrington Street and Murray Street.	Consider trimming or removing trees so that the street lighting is less obstructed.	-	-	To Note		Noted. To be resolved in future stages of design.

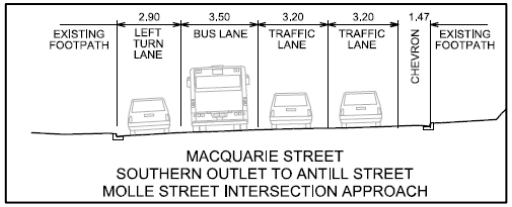
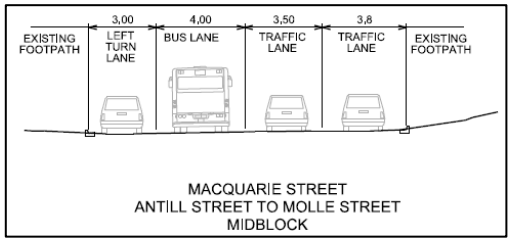
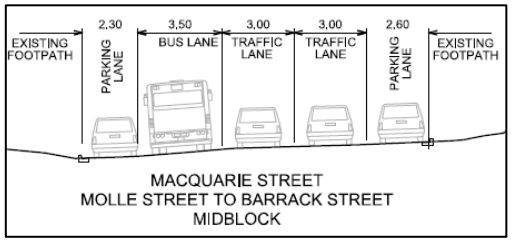
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
3.	**Existing Conditions – Davey Street**						
3.1.	Streetlight partially obscured by tree north of Evans Street. This may result in a driver having a collision with an object on the road due to poor illuminance.	Trees to be trimmed or removed so that the street lighting is less obstructed.	-	-	To Note		Noted. To be resolved in future stages of design.
3.2.	Trees on both sides of the road south of Evans Street encroach into the lane which may result in a crash for large vehicles.	Trees to be trimmed or removed to reduce impacts between the trees and large vehicles.	-	-	To Note		Noted. To be resolved in future stages of design.
3.3.	The safety barrier in the median south of Elizabeth Street is considered a spearing hazard for errant vehicles as it has a horizontal rail.	Replace the safety barrier with a conventional safety barrier and provide the appropriate terminal.	Occasional	Serious	High		Outside of project area. Included note in concept design.
3.4.	The safety barrier on the right-hand side south of Elizabeth Street (where Davey Street is split level) is considered a spearing hazard for errant vehicles as it has a horizontal rail.	Replace the safety barrier with a conventional safety barrier and provide the appropriate terminal.	Occasional	Serious	High		Outside of project area. Included note in concept design.
3.5.	The lane line between the two right hand lanes between Elizabeth Street and Murray Street where Davey Street is split level is in poor condition. This may result in a side swipe crash in poor light or weather.	It is recommended that the line marking be reinstated with long lasting thermoplastic line marking.	-	-	To Note		Outside of project area. Included note in concept design.

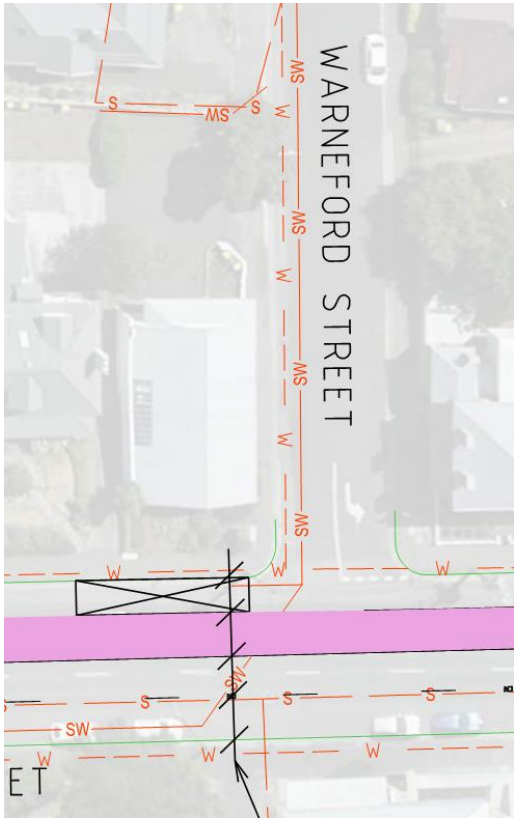
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
3.6.	Street lighting between Salamanca Place and Sandy Bay Road on the left-hand side is partially obscured by trees. This may result in a driver having a collision with an object on the road due to poor illuminance.	Trees to be trimmed or removed so that the street lighting is less obstructed.	-	-	To Note		Noted. To be resolved in future stages of design.
3.7.	The pavement in the vicinity of Sandy Bay Road is rutted and corrugated which may result in a vehicle losing control or a pedestrian tripping.	It is recommended that the pavement be reinstated as part of the proposed road modifications.	Occasional	Limited	Low		Agreed, include resurfacing in scope. Note in concept design report / costing design advice.
3.8.	Street lighting is poor on the left-hand side between Sandy Bay Road and Barrack Street. This may result in a driver having a collision with an object on the road and may also result in a pedestrian on the footpath tripping.	Consider undertaking a detailed street lighting investigation to determine if additional street lighting is required.	-	-	To Note		Note in concept design report
3.9.	Streetlight partially obscured by tree north of Barrack Street which may result in a driver having a collision with an object on the road due to poor illuminance.	Trees to be trimmed or removed so that the street lighting is less obstructed.	-	-	To Note		Noted. To be resolved in future stages of design.
3.10.	Street lighting is poor on the left-hand side between Barrack Street and Molle Street. This may result in a driver having a collision with an object on the road and may also result in a pedestrian on the footpath tripping.	Consider undertaking a detailed street lighting investigation to determine if additional street lighting is required.	-	-	To Note		Note in concept design report

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
3.11.	Street lighting is poor on the left-hand side between Molle Street and Antil Street. This may result in a driver having a collision with an object on the road and may also result in a pedestrian on the footpath tripping.	Consider undertaking a detailed street lighting investigation to determine if additional street lighting is required.	-	-	To Note		Note in concept design report
3.12.	The University of Tasmania advanced direction sign north of Antil Street is partially obscured by vegetation. This may result in sudden lane changes from drivers, resulting in a collision.	Vegetation to be trimmed so that the sign is less obstructed.	Occasional	Limited	Low		Noted. To be resolved in future stages of design.
3.13.	The pavement between Molle Street and Antil Street is rutted and corrugated. This may result in a vehicle losing control or a pedestrian tripping.	It is recommended that the pavement be reinstated.	Occasional	Limited	Low		Agreed, include resurfacing in scope. Note in concept design report / costing design advice.
3.14.	The pavement between Molle Street and Antil Street has excessive cross fall on the right-hand side. This may increase the propensity for vehicles to drive out of their lane.	Consider reducing the cross fall grades if the road pavement is being reconfigured.	Occasional	Minor	Medium		Note in concept design report
3.15.	The advanced direction sign on the approach to the Southern Outlet is partially obscured by vegetation. This may result in sudden lane changes from drivers, resulting in a collision.	Vegetation to be trimmed so that the sign is less obstructed.	Occasional	Limited	Low		Noted. To be resolved in future stages of design.
3.16.	The traffic light on the left hand side of the approach to the Southern Outlet pedestrian crossing is obscured by vegetation. This may result in a driver not seeing the red signal and colliding with a pedestrian.	Trees to be trimmed or removed so that the traffic light is less obstructed.	Occasional	Serious	High		Noted. To be resolved in future stages of design.

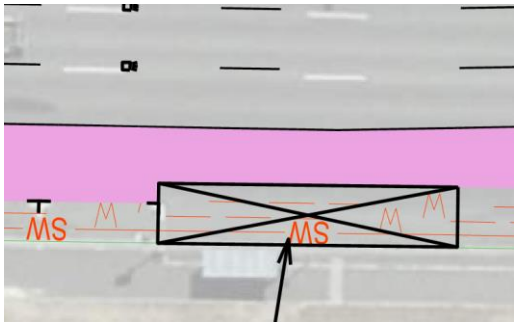
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
4.	**Concept Design – Macquarie Street**						
4.1.	Drivers turning left into Ispahan Avenue, Warneford Street & Denison Lane are required to turn across the bus lane in the AM peak. This may result in side swipe or rear end crashes.	Allow left turning vehicles to drive within bus lane on approach to side roads.	Occasional	Minor	Medium		Add broken line on approach to left-turns (see line marking details for bus lanes). Can also stop red pavement at minor intersection - example of Parramatta Road @ Missenden in Sydney.
4.2.	The lateral shift on the northern side of the Macquarie Street / Antil Street intersection may result in side swipe crashes.	Ensure the proposed alignment is suitable for the design speed and that the rate of lateral shift is appropriate.	Occasional	Minor	Medium		Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
4.3.	The lateral shift on the northern side of the Macquarie Street / Molle Street intersection may result in side swipe crashes.	Ensure the proposed alignment is suitable for the design speed and that the rate of lateral shift is appropriate.	Occasional	Minor	Medium		Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
4.4.	The lateral shift on the northern side of the Macquarie Street / Barrack Street intersection may result in side swipe crashes.	Ensure the proposed alignment is suitable for the design speed and that the rate of lateral shift is appropriate.	Occasional	Minor	Medium		Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
4.5.	In cases where the bus lane is positioned adjacent to the kerb and gutter, there is a potential for vehicles to travel close to roadside hazards such as overhead electricity poles and signs, which increases the potential for collisions.	Consider providing safety barriers to protect signs and electricity poles, or alternatively consider relocating the electricity services underground, and relocate signs away from the edge of the kerb	Improbable	Serious	Medium		No bus lane proposed adjacent kerb except at bus boarder locations.

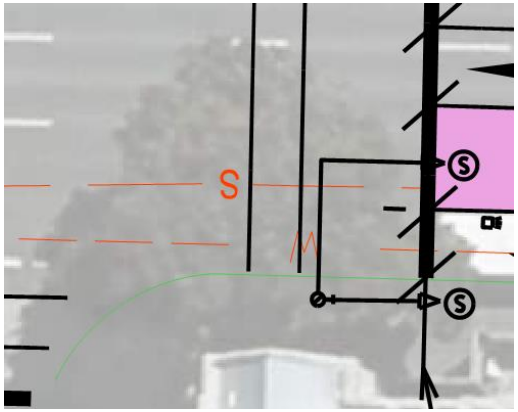
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
4.6.	In cases where the bus lane is positioned adjacent to the kerb and gutter, there is a potential for vehicles to travel close to pedestrians, which increases the potential for pedestrian/vehicle crashes.	It is recommended to maximise separation between bus lane and footpaths where possible, and also consider providing safety barriers to protect pedestrians.	Occasional	Serious	High		No bus lane proposed adjacent kerb except at bus boarder locations.
4.7.	Garbage collections will be required from the bus lane creating the potential for garbage trucks to be involved in rear end collisions.	Ensure garbage collections are undertaken outside peak hours, during periods of low traffic movements.	Occasional	Serious	High		Noted. Fewer vehicles will be travelling in the bus lane compared to current moving lane - proposed design reduces this risk. In Sydney, this required communication from TfNSW to City of Sydney to not empty the street bins in the middle of the PM peak
4.8.	Positioning of the bus lane adjacent to on-street car parking spaces may result in buses swerving into adjacent traffic lanes to avoid inattentive drivers opening car doors.	Consideration should be given to providing a buffer zone between the bus lane and on-street car spaces.	Probable	Minor	High		Buses already travel in this lane in existing conditions. Proposed bus lanes are generally wider than existing lanes, mitigating this risk.
4.9.	In some cases, bus stops have been provided directly behind on-street car spaces. Due to this, it is unclear if buses can exit the bus stop area without impacting the vehicle parked in front, or having to make a reverse manoeuvre. Refer image below: 	Swept path diagrams will need to be prepared showing a bus can exit the bus stop area without impacting the vehicle parked in front. Confirmation is also required that the set out and provision of bus stops is in line with local policy and Austroads guidelines.	Occasional	Limited	Low		No Reverse manoeuvre - Bus Zone needs to be long enough

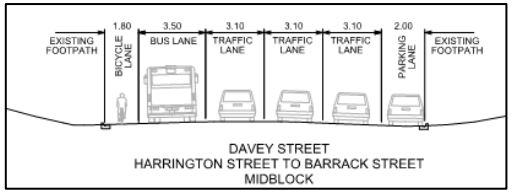
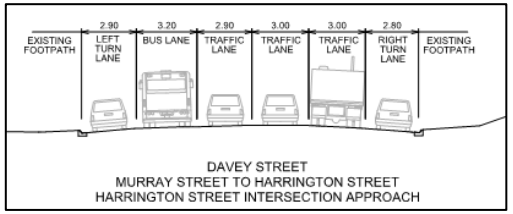
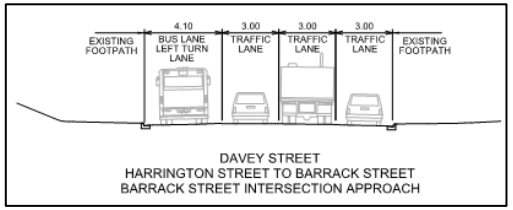
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
4.10.	Provided cross sections indicate variations in the lane width for both the bus lane and standard vehicle lanes as shown below:  MACQUARIE STREET SOUTHERN OUTLET TO ANTILL STREET MOLLE STREET INTERSECTION APPROACH  MACQUARIE STREET ANTILL STREET TO MOLLE STREET MIDBLOCK  MACQUARIE STREET MOLLE STREET TO BARRACK STREET MIDBLOCK These variations in lane widths may lead to inattentive drivers veering across lane lanes at points where the lanes narrow. This may lead to side swipe accidents with vehicles in the adjacent lanes.	Look to provide consistent lane width across entire extent of Macquarie Street.	Occasional	Limited	Low		Road space optimised following hierarchy defined in the Design Report. Departures listed in design report.

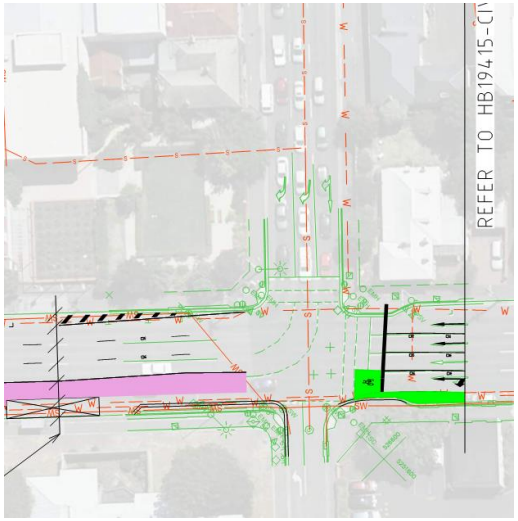
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
4.11.	If a bus was to park in the bus stop to the west of Warneford Street, then this may impede sight lines for a vehicle turning onto Macquarie Street and could potentially lead to a vehicle collision. 	Consider relocating the bus bay to the downstream side of the intersection. If it is not possible to relocate the bus stop, ensure the bus stop is set back adequately such that appropriate sightlines are provided for vehicles turning onto Macquarie Street. Confirmation is also required that the set out and provision of bus stops is in line with local policy and Austroads guidelines.	Occasional	Serious	High		Bus stop removed.

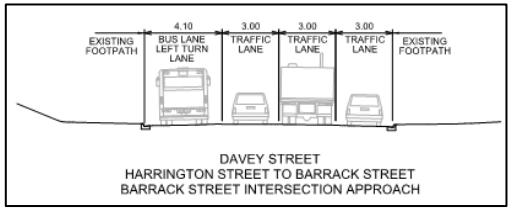
ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
5.	**Concept Design – Davey Street**						
5.1.	The lanes are not aligned between the approach and departure sides of the Davey Street and Barrack Street intersection. This may result in side swipe collisions.	Adjust the proposed alignment so that there is no diversion through the intersection or install line marking guidance.	Occasional	Minor	Medium		This is an existing issue which would result in significant works outside scope of this proejct. Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
5.2.	The lateral shift on the southern side of the Davey Street / Molle Street intersection may result in side swipe crashes	Ensure the proposed alignment is suitable for the design speed and that the rate of lateral shift is appropriate.	Occasional	Minor	Medium		Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
5.3.	The lateral shift north of the Davey Street / Antil Street intersection may result in side swipe crashes	Ensure the proposed alignment is suitable for the design speed and that the rate of lateral shift is appropriate.	Occasional	Minor	Medium		Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
5.4.	The lanes are not aligned between the approach and departure sides of the Davey Street and Antil Street intersection. This may result in side swipe collisions	Adjust the proposed alignment so that there is no diversion through the intersection or install line marking guidance.	Occasional	Minor	Medium		Lanes are aligned through intersection with lateral shift occuring after. Rate of lateral shift of 1.0m/s is adopted as per diverge taper in Austroads. To be reviewed in future stages of design.
5.5.	Garbage collections will be required from the bus lane creating the potential for garbage trucks to be involved in rear end collisions.	Ensure garbage collections are undertaken outside peak hours, during periods of low traffic movements.	Occasional	Serious	High		Noted. Fewer vehicles will be travelling in the bus lane compared to current moving lane - proposed design reduces this risk.

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
5.6.	Positioning of the bus lane adjacent to on-street car parking spaces may result in buses swerving into adjacent traffic lanes to avoid possible inattentive drivers opening their car door into the bus lane.	Consideration should be given to providing a buffer zone between the bus lane and on-street car spaces.	Probable	Minor	High		Buses already travel in this lane in existing conditions. Proposed bus lanes are generally wider than existing lanes, mitigating this risk.
5.7.	In some cases, bus stops have been provided directly behind on-street car spaces. Due to this, it is unclear if buses can exit the bus stop area without impacting the vehicle parked in front, or having to make a reverse manoeuvre. Refer image below: 	Swept path diagrams will need to be prepared showing a bus can exit the bus stop area without impacting the vehicle parked in front. Confirmation is also required that the set out and provision of bus stops is in line with local policy and Austroads guidelines.	Occasional	Limited	Low		Standard situation. Bus Zone needs to be long enough.

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
5.8.	The proposed pedestrian crossing at the proposed signalised Davey Street / Salamanca Place intersection leads pedestrians directly into an existing tree. This may cause pedestrians, especially those who are visually impaired to collide with the tree. Refer image below: 	Consideration should be given to realigning or relocating the pedestrian crossing. Further consideration may be given to relocating the tree.	Occasional	Limited	Low		Align pedestrian crossing to kerb corner - avoids the tree
5.9.	At the north-western end of the proposed signalised Davey Street / Salamanca Place intersection, the pedestrian crossing starts behind the proposed traffic light post. In the event where the pedestrian has been given the signal to 'go', the traffic light post may block the view of a vehicle running a red light through the intersection, thus colliding with the pedestrian.	Consideration should be given to widening the kerb outstand so that the pedestrian crossing starts in front of the traffic light post.	Occasional	Serious	Low		Agreed - if the kerb widening is to be put in, it needs to continue approximately 12 metres back from the stop line

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
5.10.	Provided cross sections indicate variations in the lane width for both the bus lane and standard vehicle lanes as shown below:    These variations in lane widths may lead to inattentive drivers veering across lane lanes at points where the lanes narrow. This may lead to side swipe accidents with vehicles in the adjacent lanes.	Look to provide consistent lane width across entire extent of Davey Street.	Occasional	Limited	Low		Road space optimised following hierarchy defined in the Design Report. Departures listed in design report.

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
5.11.	At the intersection of Barrack Street and Davey Street, the addition of the bus lane has resulted in a shift of alignment of all subsequent lanes, thereby reducing the operational width of the northernmost lane.  This may impact the ability of larger vehicles to navigate the right turn from Barrack Street, with vehicles encroaching into the adjacent lane and side swiping vehicles.	Undertake swept path diagrams to confirm any impact on existing vehicle turn movements.	Occasional	Limited	Low		Swept path analysis completed - noted on the drawings and in the Design Report.

ITEM	AUDIT FINDINGS	AUDIT RECOMMENDATIONS	FREQUENCY	SEVERITY	RISK	CLIENT RESPONSE	
						ACCEPT YES/NO	REASONS/COMMENTS
6.	**General Findings**						
6.1.	It is unclear if the existing pedestrian refuge on Salamanca Place will be retained.	Confirm if existing pedestrian refuge will be retained or removed due to the proposed pedestrian crossing.	-	-	To Note.		Add to concept design
6.2.	Plans show the provision of Retro Reflective Pavement Markers (RRPMs).	Ensure RRPMs are shown in accordance with local design guidelines and/or other relevant references such as the Australian Standards or Austroads Guidelines.	-	-	To Note.		Agree however exceeds level of detail required for Concept Design.
6.3.	Plans do not provide a legend.	Consideration should be given to providing a legend on each plan so that there is clarity between line marking, kerbing, and other features.	-	-	To Note.		Plans part of larger package were legend is provided
6.4.	Provided cross sections only show lane and carriageway widths. As per the below: 	Cross sections should show the entire road reserve width from title boundary to title boundary.	-	-	To Note.		Design has adopted footpath like-for-like or betterment.Typical cross section be resolved in future stages of design

6 CONCLUSION

This Road Safety Audit report has been conducted in accordance with the audit process specified within Austroads Guide to Road Safety Part 6: Road Safety Audit (2019). The site has been inspected and the audit has been carried out for the purposes of identifying any features which could be altered or removed to improve the safety of the proposal works across the two investigation areas.

The identified issues have been noted in this report and these findings and recommendations are put forward for consideration by the Client and any authorities.

Auditors:

s 36 [redacted]

Lead/Senior Road Safety Auditor

s 36 [redacted]

Senior Road Safety Auditor

s 36 [redacted]

Road Safety Auditor

s 36 [redacted]

Senior Road Safety Auditor

7 LIMITATION STATEMENT

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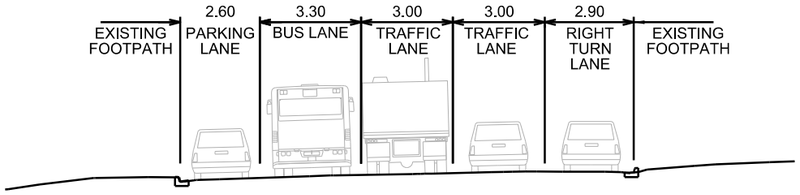
APPENDIX A

REVIEWED CONCEPT PLANS



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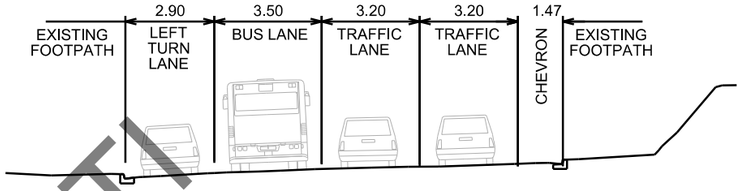
ANTILL STREET INTERSECTION APPROACH



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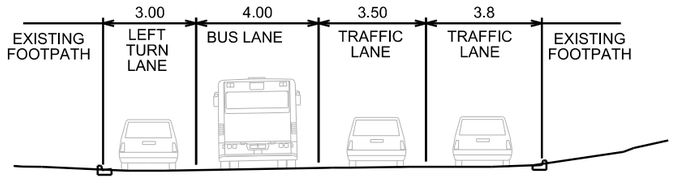
MOLLE STREET INTERSECTION APPROACH



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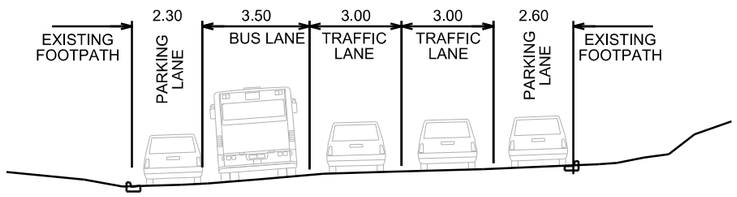
MIDBLOCK



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MOLLE STREET TO BARRACK STREET
MIDBLOCK

FILE NAME:

DATE:

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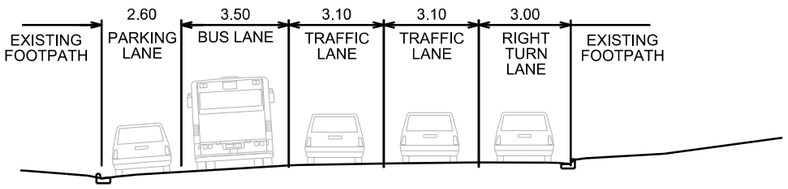

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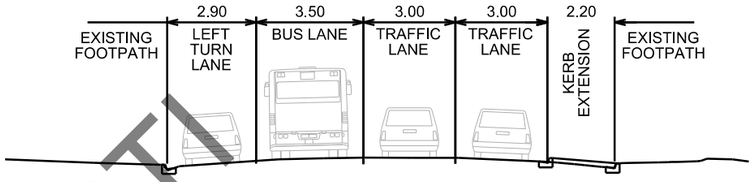

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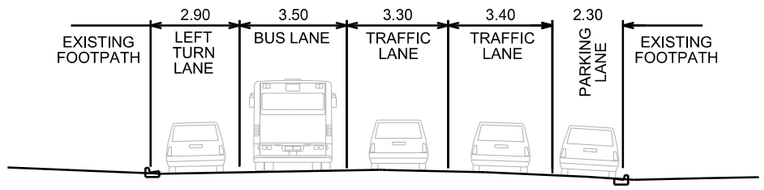

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MACQUARIE STREET
HARRINGTON STREET TO MURRAY STREET
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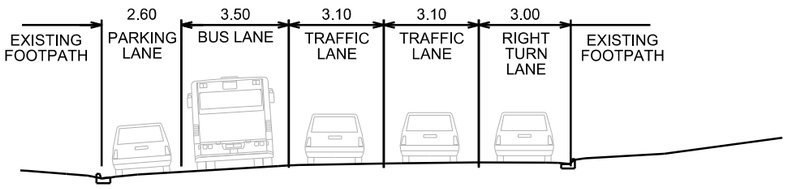

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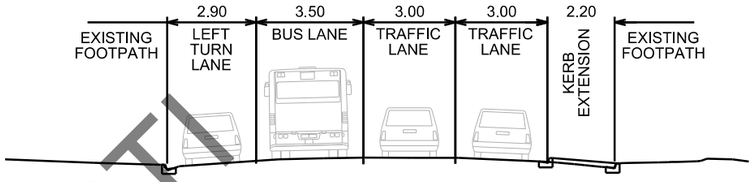
MOLLE STREET TO BARRACK STREET
BARRACK STREET INTERSECTION APPROACH



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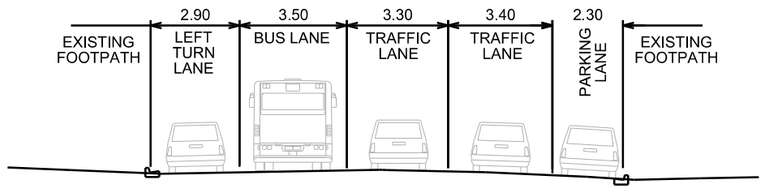

MACQUARIE STREET
BARRACK STREET TO HARRINGTON STREET
MIDBLOCK

MACQUARIE STREET
HARRINGTON STREET TO MURRAY STREET
MIDBLOCK

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TYPICAL SECTIONS - SHEET 3

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DRAWING No.
HB19415-S-CIV-DRG-20103

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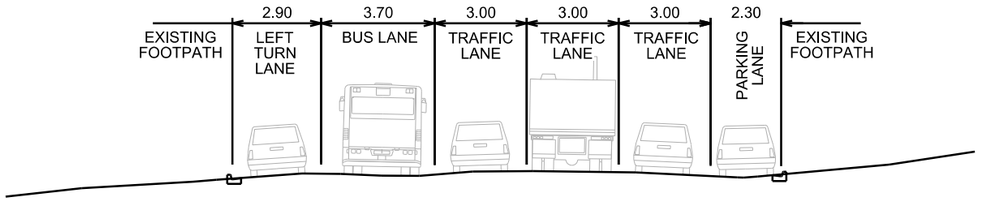

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MURRAY STREET TO HARRINGTON STREET
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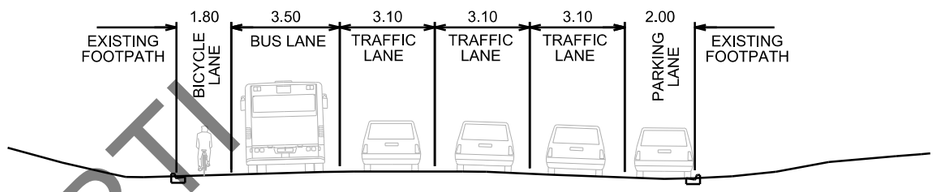

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MIDBLOCK

DAVEY STREET
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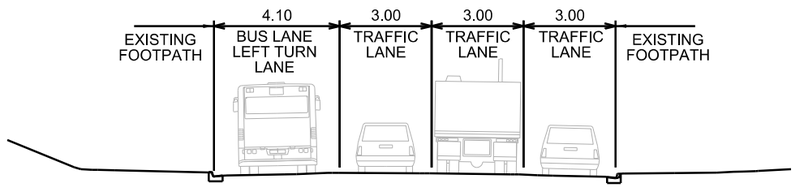

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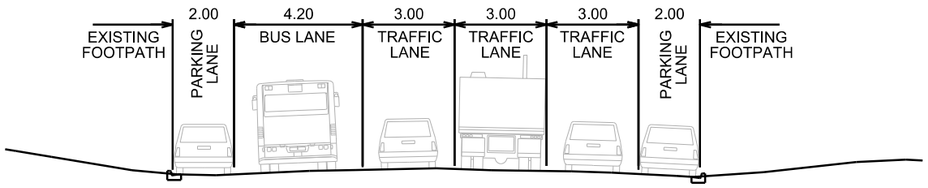
TYPICAL SECTIONS - SHEET 4

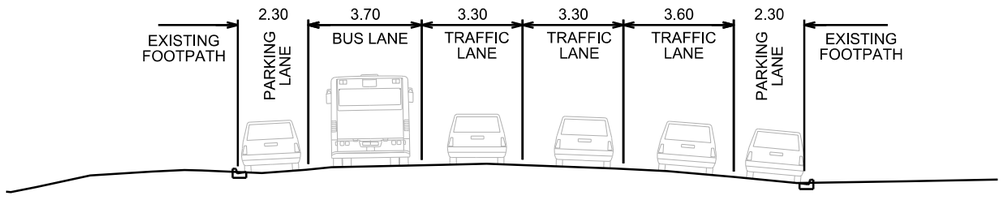
SHEET
04

DRAWING No.
HB19415-S-CIV-DRG-20104

REV
A



DAVEY STREET
BARRACK STREET TO MOLLE STREET
MIDBLOCK



DAVEY STREET
MOLLE STREET TO ANTILL STREET
MIDBLOCK

DAVEY STREET
BARRACK STREET TO MOLLE STREET
MOLLE STREET INTERSECTION APPROACH

DAVEY STREET
MOLLE STREET TO ANTILL STREET
ANTILL STREET INTERSECTION APPROACH

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]	[redacted]			23/04/20

SCALE AT A3 1:200

2 0 2 4 6 8

pitt&sherry

pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

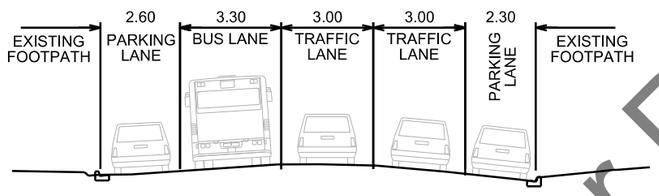
STATUS
PRELIMINARY

DRAWING TITLE
MACQUARIE STREET
TYPICAL SECTIONS - SHEET 5

SHEET
05

DRAWING No.
HB19415-S-CIV-DRG-20105

REV
A



DAVEY STREET
ANTILL STREET TO SOUTHERN OUTLET
MIDBLOCK

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]	[redacted]			23/04/20

SCALE AT A3 1:200

2 0 2 4 6 8

pitt&sherry

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CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
DAVEY STREET
TYPICAL SECTIONS - SHEET 6

SHEET
06

DRAWING No.
HB19415-S-CIV-DRG-20106

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT WSP

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PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 17

DRAWING No.
HB19415-S-CIV-DRG-21001

SHEET
17

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 18

SHEET
18

DRAWING No.
HB19415-S-CIV-DRG-21002

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT: WSP

PROJECT: HOBART SOUTHERNS PROJECTS SP02

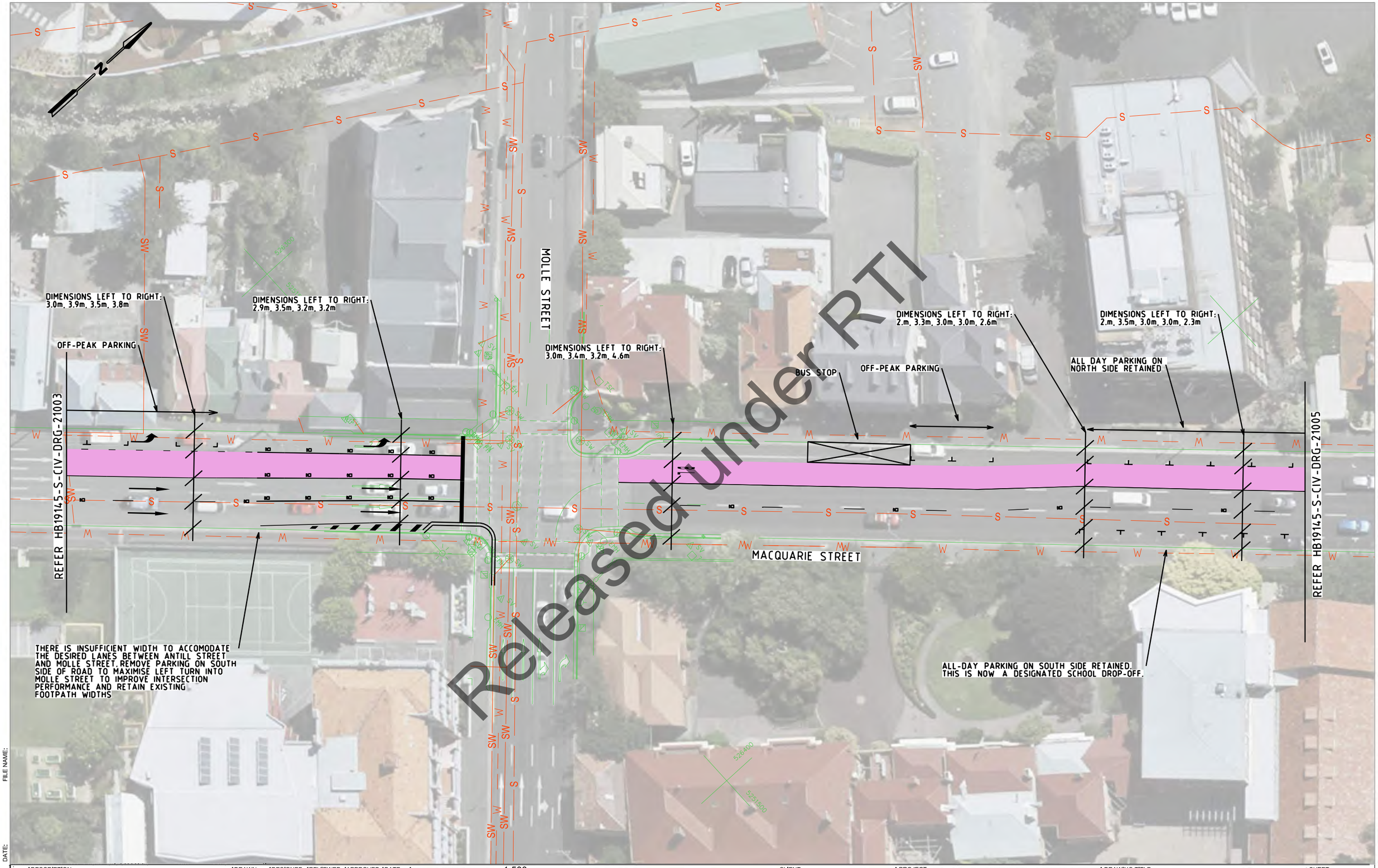
STATUS: PRELIMINARY

DRAWING TITLE: ALIGNMENT PLAN SHEET 19

SHEET: 19

DRAWING No.: HB19415-S-CIV-DRG-21003

REV: A



FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

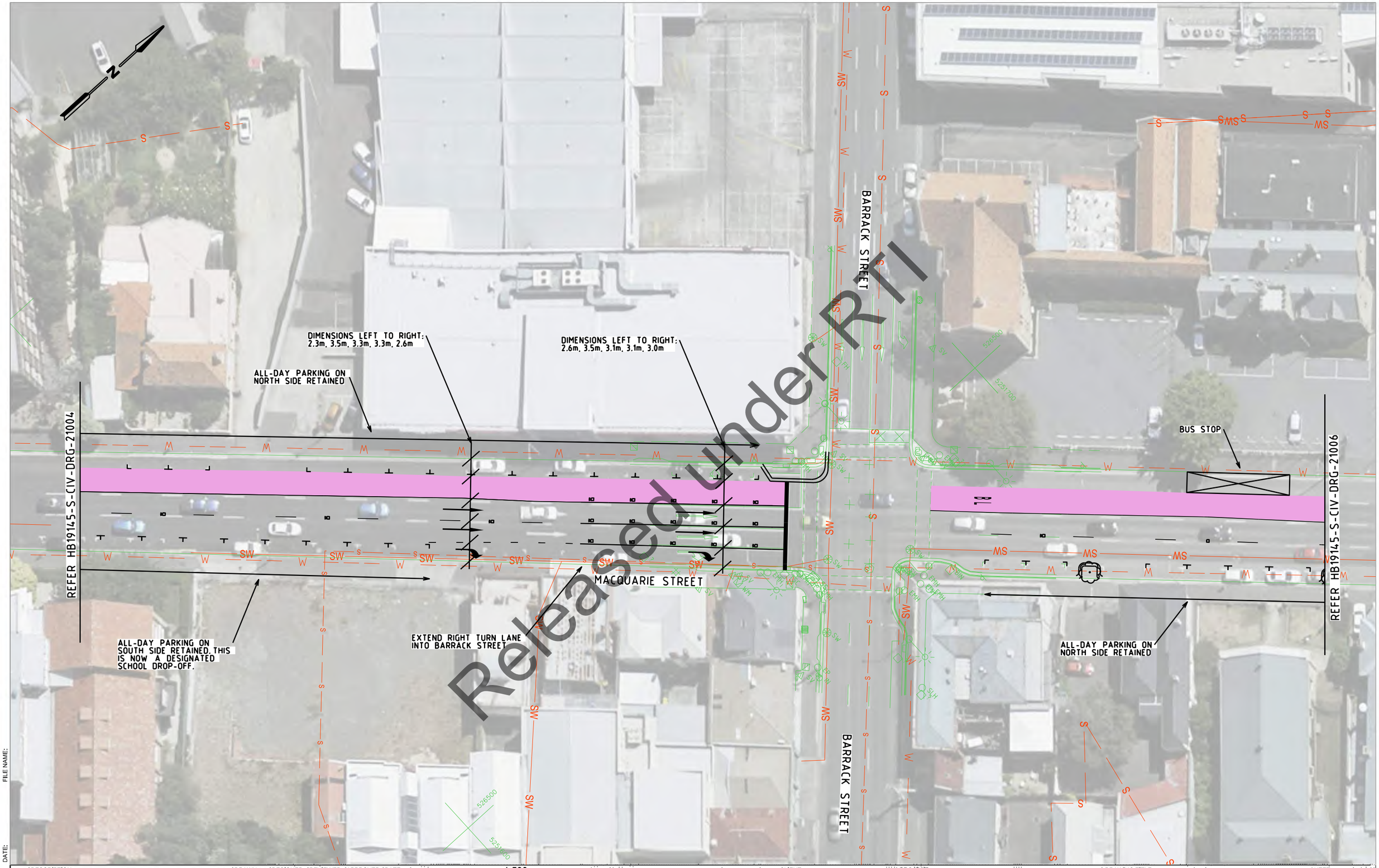
STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 20

SHEET
20

DRAWING No.
HB19415-S-CIV-DRG-21004

REV
A



FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

CLIENT WSP

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PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
SHEET 21
ALIGNMENT PLAN

SHEET
21

DRAWING No.
HB19415-S-CIV-DRG-21005

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 22

SHEET
22

DRAWING No.
HB19415-S-CIV-DRG-21006

REV
A

DIMENSIONS LEFT TO RIGHT:
2.6m, 3.5m, 3.0m, 3.3m, 2.3m

ALL-DAY PARKING ON
NORTH SIDE RETAINED

VICTORIA STREET

DIMENSIONS LEFT TO RIGHT:
2.6m, 3.6m, 3.1m, 3.1m, 2.3m

DIMENSIONS LEFT TO RIGHT:
2.6m, 3.3m, 3.0m, 3.0m, 2.8m

ALL-DAY PARKING ON
NORTH SIDE RETAINED

REFER HB19145-S-CIV-DRG-21006

REFER HB19145-S-CIV-DRG-21008

MACQUARIE STREET

ALL-DAY PARKING ON
SOUTH SIDE RETAINED

EXTEND RIGHT TURN
LANE INTO MURRAY
STREET. MAY BE
EXTENDED FURTHER
(REMOVING SOME PARKING
ON SOUTH SIDE) PENDING
TRAFFIC MODELLING
OUTCOMES

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 25 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 23

SHEET
23

DRAWING No.
HB19415-S-CIV-DRG-21007

REV
A

POTENTIAL TO EXTEND KERB EXTENSION TO WIDEN FOOTPATH

DIMENSIONS LEFT TO RIGHT:
2.5m, 3.3m, 3.0m, 3.0m, 2.9m

ALL DAY PARKING RETAINED ON NORTH SIDE

MURRAY STREET

DIMENSIONS LEFT TO RIGHT:
2.6m, 3.5m, 3.0m, 3.6m
RETAIN EXISTING WESTBOUND LEFT TURN LANE WIDTH

BUS STOP

REFER HB19145-S-CIV-DRG-21007

REFER HB19145-S-CIV-DRG-21009

MACQUARIE STREET

DIMENSIONS LEFT TO RIGHT:
2.6m, 3.3m, 3.0m, 3.0m

RETAIN EXISTING BUS LANE WIDTH

MURRAY STREET

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

CLIENT WSP

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PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 24

SHEET
24

DRAWING No.
HB19415-S-CIV-DRG-21008

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERNS PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 26

SHEET
26

DRAWING No.
HB19415-S-CIV-DRG-21009

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]	[redacted]	[redacted]		23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERN PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ARRANGEMENT PLANS
SHEET 27

SHEET
27

DRAWING No.
HB19145-S-CIV-DRG-21010

REV
A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT: WSP

PROJECT: HOBART SOUTHERN PROJECTS SP02

STATUS: PRELIMINARY

DRAWING TITLE: ARRANGEMENT PLANS SHEET 28

DRAWING No.: HB19145-S-CIV-DRG-21011

SHEET: 28

REV: A

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

pitt&sherry WSP

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CLIENT

PROJECT: HOBART SOUTHERN PROJECTS SP02

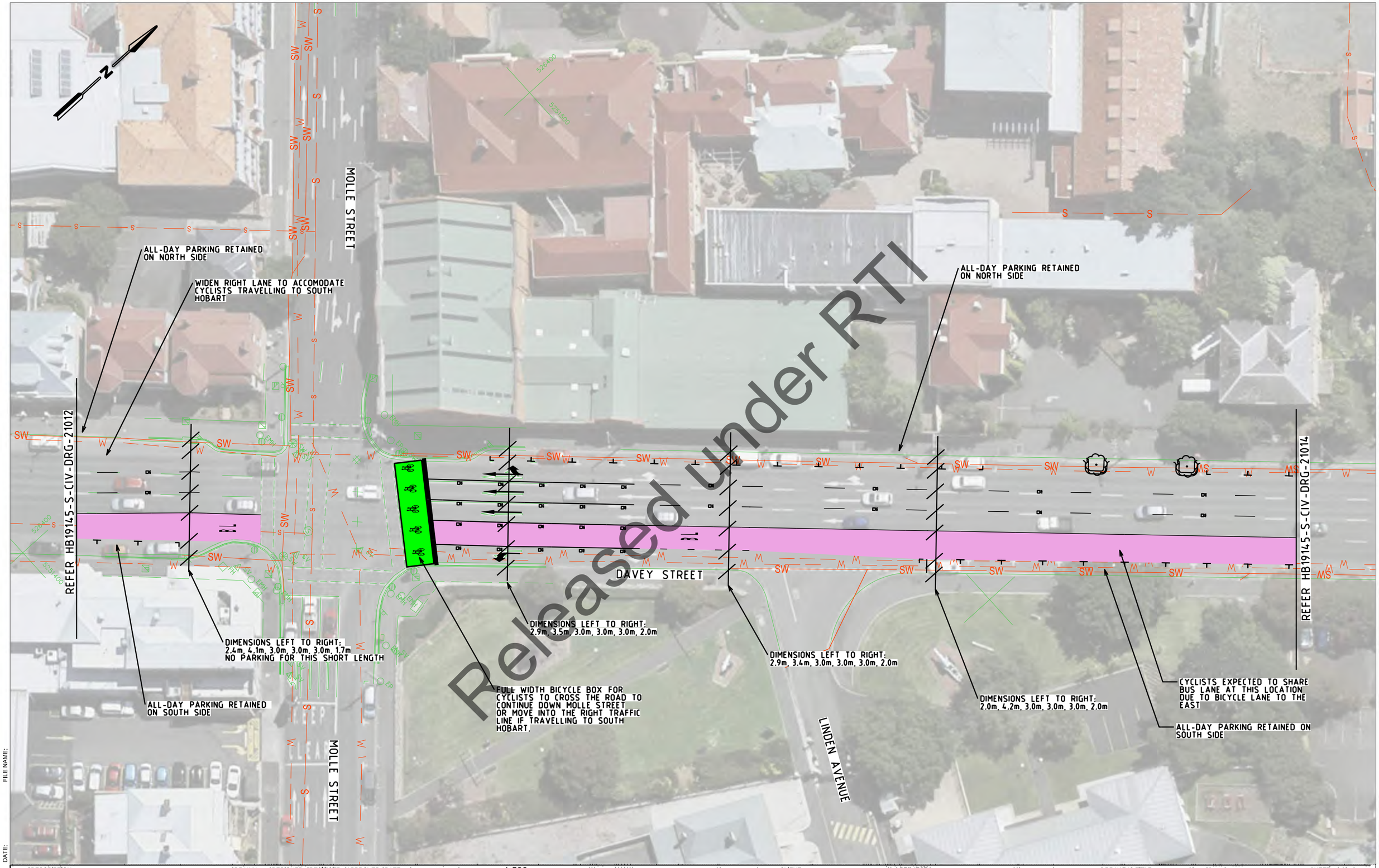
STATUS: **PRELIMINARY**

DRAWING TITLE: ARRANGEMENT PLANS SHEET 29

DRAWING No. HB19145-S-CIV-DRG-21012

SHEET 29

REV A



FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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PROJECT: HOBART SOUTHERN PROJECTS SP02

DRAWING TITLE: ARRANGEMENT PLANS SHEET 30

SHEET: 30

STATUS: **PRELIMINARY**

DRAWING No. HB19145-S-CIV-DRG-21013

REV: A

RECONSTRUCT KERB TO INCREASE THE ROAD WIDTH BY 0.6m. THIS ALLOWS FOR A 1.2m CYCLISTS LANE AT THE INTERSECTION FOR CYCSLITS TO USE THE BICYCLE BOX WITHOUT ENTERING THE BUS LANE.

BICYCLE BOX TO MOVE CYCLISTS IN FRONT OF BUS AND TURNING VEHICLES AT INTERSECTION TO IMPROVE SAFETY

ALL-DAY PARKING ON NORTH SIDE RETAINED

ALL-DAY PARKING ON NORTH SIDE RETAINED

DAVEY STREET

REFER HB19145-S-CIV-DRG-21013

REFER HB19145-S-CIV-DRG-21015

BUS STOP

CYCLISTS SHARE BUS LANE

CONSTRUCT KERB EXTENSION TO INCREASE FOOTPATH WIDTH

ALL-DAY PARKING ON SOUTH SIDE RETAINED

DIMENSIONS LEFT TO RIGHT:
1.8m, 3.5m, 3.0m, 3.0m, 3.1m, 2.3m

REMOVE PARKING ON SOUTH SIDE TO ACCOMMODATE A BICYCLE LANE FOR THE HILL CLIMB BETWEEN SANDY BAY ROAD AND LINDEN AVENUE

LINDEN AVENUE

HAMPDEN ROAD

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT: WSP

PROJECT: HOBART SOUTHERN PROJECTS SP02

STATUS: PRELIMINARY

DRAWING TITLE: ARRANGEMENT PLANS SHEET 31

SHEET: 31

DRAWING No.: HB19145-S-CIV-DRG-21014

REV: A

ALL-DAY PARKING ON NORTH SIDE RETAINED

DIMENSIONS LEFT TO RIGHT:
1.8m, 3.8m, 3.1m, 3.1m, 3.1m, 2.3m

DIMENSIONS LEFT TO RIGHT:
2.0m, 4.0m, 3.0m, 3.0m, 3.3m, 2.0m

DIMENSIONS LEFT TO RIGHT:
3.1m, 3.0m, 3.0m, 3.0m, 2.8m

OFF-PEAK PARKING ON NORTHSIDE TO INCREASE RIGHT TURN INTO HARRINGTON STREET

HARRINGTON STREET

DAVEY STREET

REFER HB19145-S-CIV-DRG-21014

REFER HB19145-S-CIV-DRG-21016

DIMENSIONS LEFT TO RIGHT:
1.8m, 3.5m, 3.1m, 3.1m, 3.1m, 2.3m

HEATHFIELD AVENUE

REMOVE BUS STOP

REMOVE PARKING ON SOUTH SIDE TO ACCOMMODATE A BICYCLE LANE FOR THE HILL CLIMB BETWEEN SANDY BAY ROAD AND LINDEN AVENUE

SANDY BAY ROAD

FILE NAME:

DATE:

DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
80% SUBMISSION	[redacted]				23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

CLIENT WSP

pitt&sherry

pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

PROJECT
HOBART SOUTHERN PROJECTS
SP02

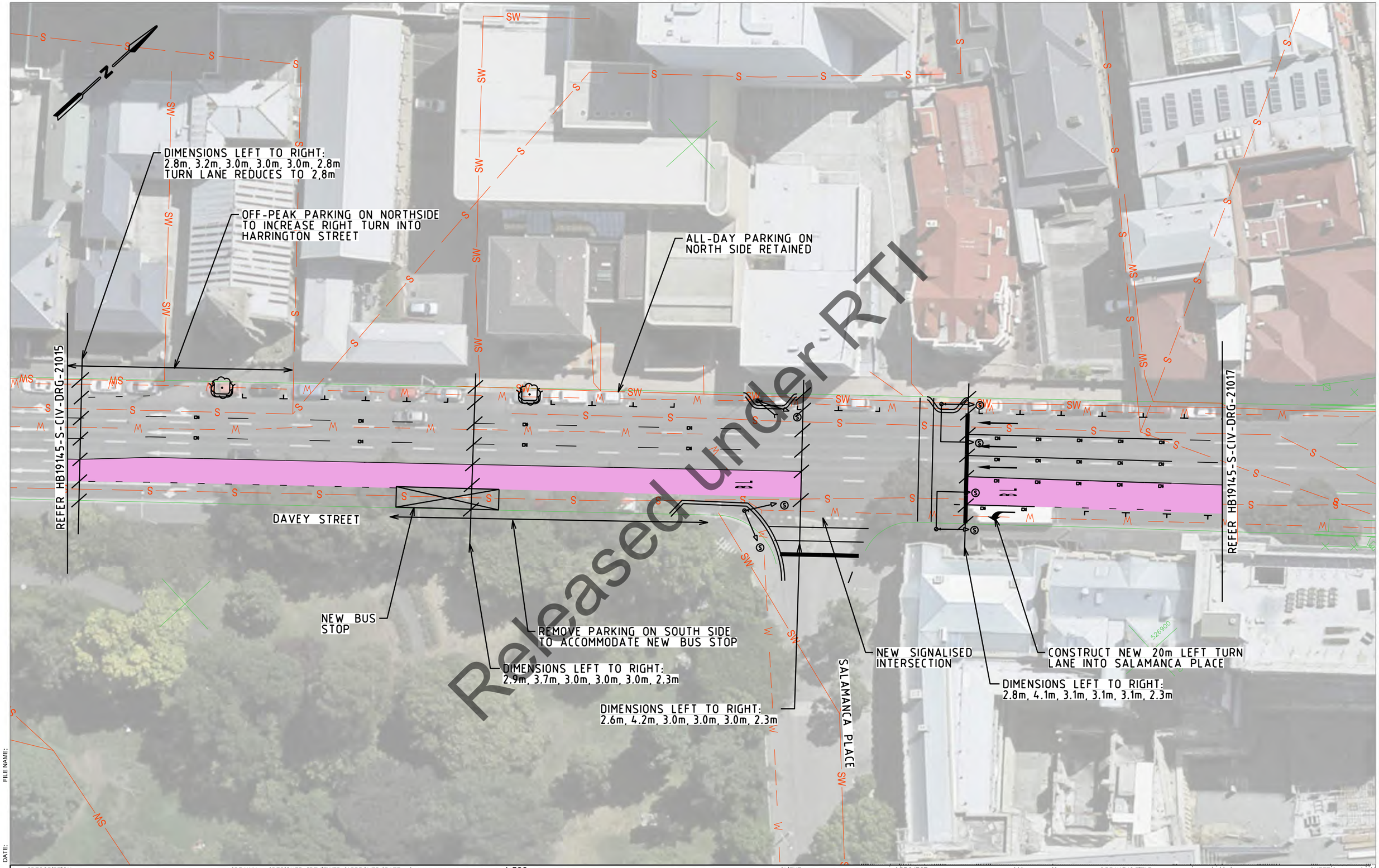
STATUS
PRELIMINARY

DRAWING TITLE
ARRANGEMENT PLANS
SHEET 32

SHEET
32

DRAWING No.
HB19145-S-CIV-DRG-21015

REV
A



FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]	[redacted]	[redacted]		23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

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CLIENT
WSP

PROJECT
HOBART SOUTHERN PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLANS
SHEET 33

SHEET
33

DRAWING No.
HB19145-S-CIV-DRG-21016

REV
A

RETAIN EXISTING LANE SHIFT ACROSS INTERSECTION

ALL-DAY PARKING ON NORTH SIDE RETAINED

REFER HB19145-S-CIV-DRG-21016

BUS LANE

DIMENSIONS LEFT TO RIGHT:
2.6m, 4.2m, 3.3m, 3.3m, 3.3m, 2.3m

REMOVE BUS STOP

BUS LANE AHEAD

DAVEY STREET

MURRAY STREET

FILE NAME:

DATE:

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	80% SUBMISSION	[redacted]	[redacted]	[redacted]		23/04/20

SCALE AT A3 1:500

5 0 5 10 15 20

CLIENT WSP

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PROJECT
HOBART SOUTHERN PROJECTS
SP02

STATUS
PRELIMINARY

DRAWING TITLE
ALIGNMENT PLAN
SHEET 34

DRAWING No. HB19145-S-CIV-DRG-21017

SHEET 34

REV A

	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	APPROVED	DATE
A	DRAFT CONCEPT DESIGN	[redacted]	[redacted]	[redacted]		21/04/2020

SCALE AT A3 1:500

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CLIENT: WSP

PROJECT: HOBART VISION TRANSPORT PROJECT

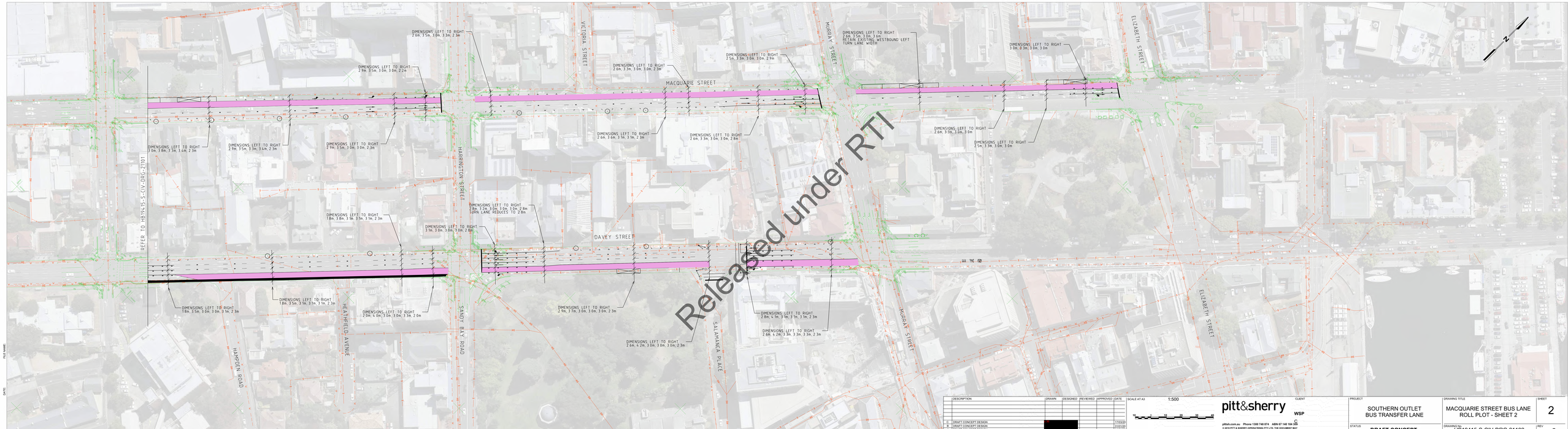
STATUS: DRAFT CONCEPT

DRAWING TITLE: MACQUARIE STREET BUS LANE ROLL PLOT - SHEET 1

SHEET: 1

DRAWING No.: HB19415-S-CIV-DRG-21101

REV: A



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C	DRAFT CONCEPT DESIGN					17/03/20
B	DRAFT CONCEPT DESIGN					31/01/20
A	DRAFT CONCEPT DESIGN					14/01/20

SCALE AT A3 1:500

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CLIENT WSP

PROJECT SOUTHERN OUTLET BUS TRANSFER LANE

STATUS **DRAFT CONCEPT**

DRAWING TITLE MACQUARIE STREET BUS LANE ROLL PLOT - SHEET 2

SHEET 2

DRAWING No. HB19415-S-CIV-DRG-21102

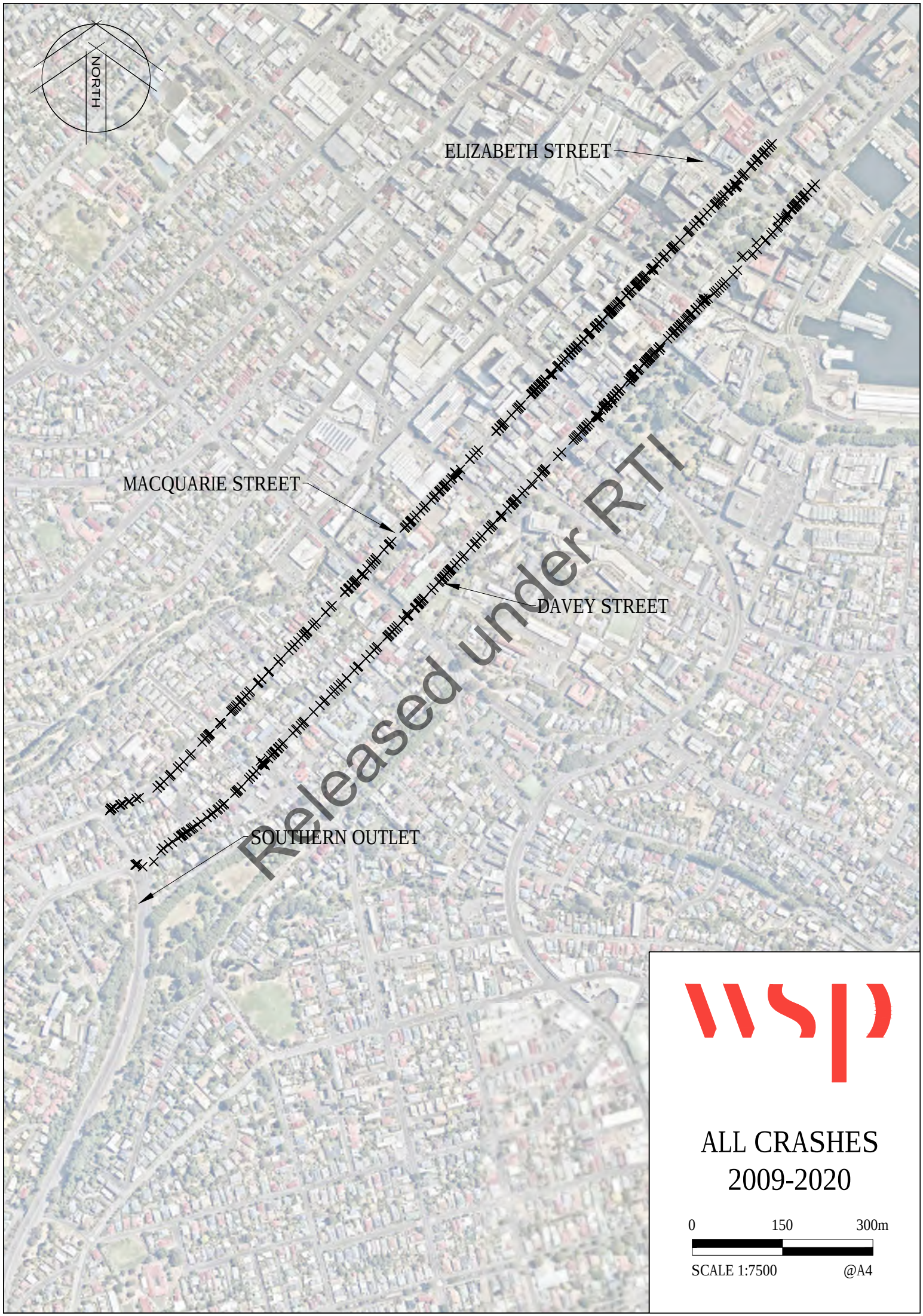
REV C

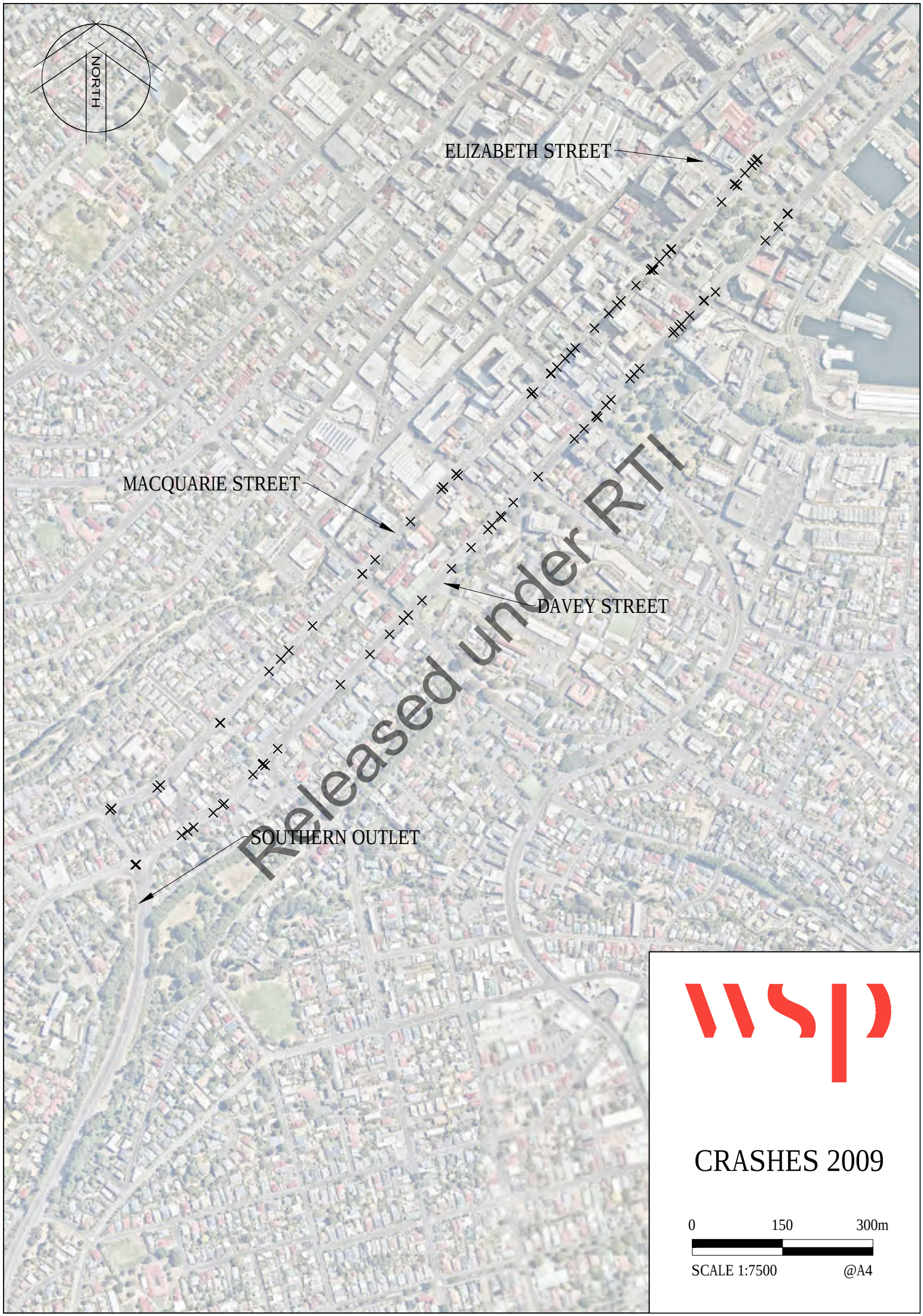
FILE NAME

DATE

APPENDIX B

CRASH STATISTICS OUTPUTS


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
ALL CRASHES
2009-2020
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2009
0
150
300m
SCALE 1:7500
@A4

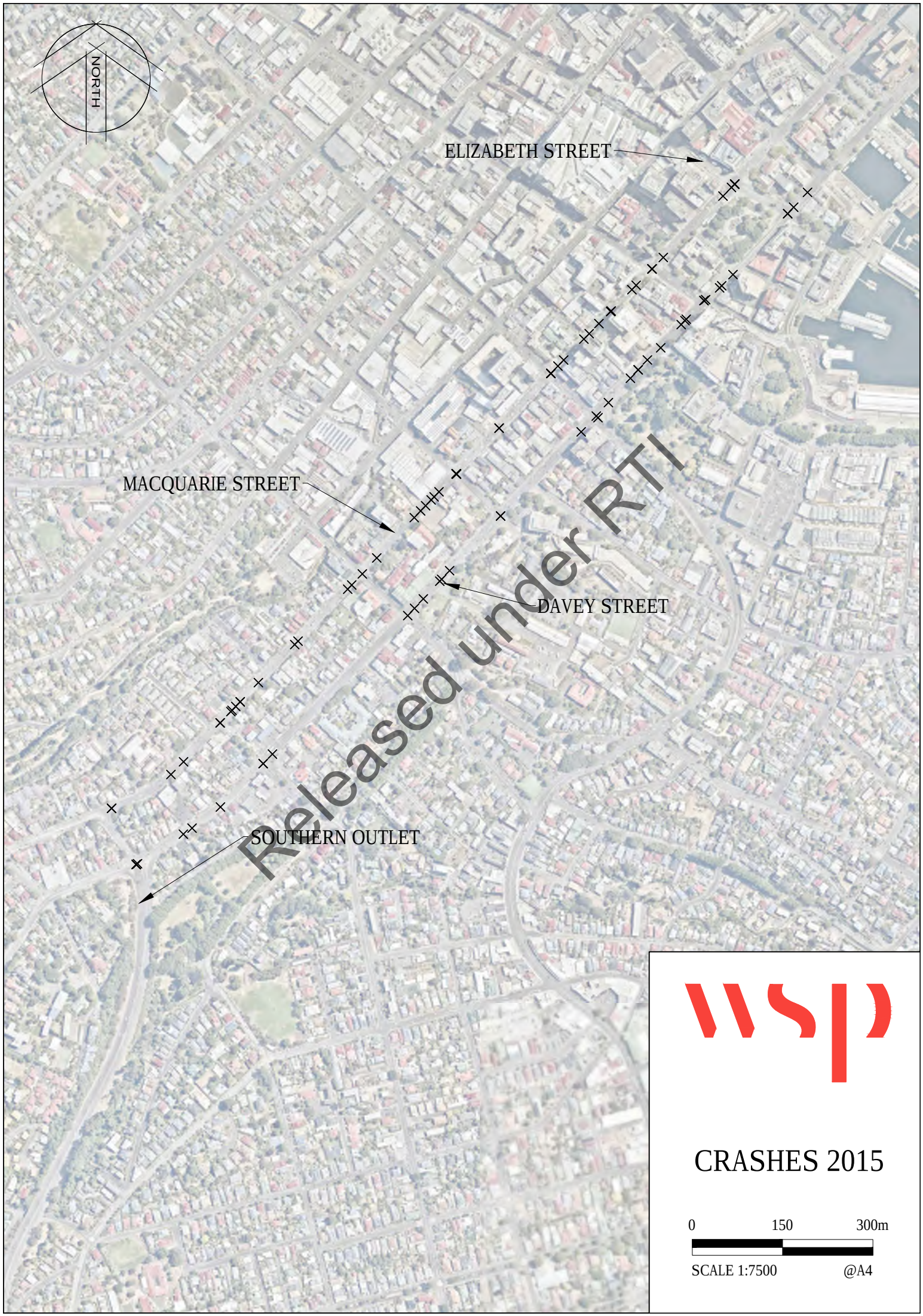

NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2010
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2011
0
150
300m
SCALE 1:7500
@A4

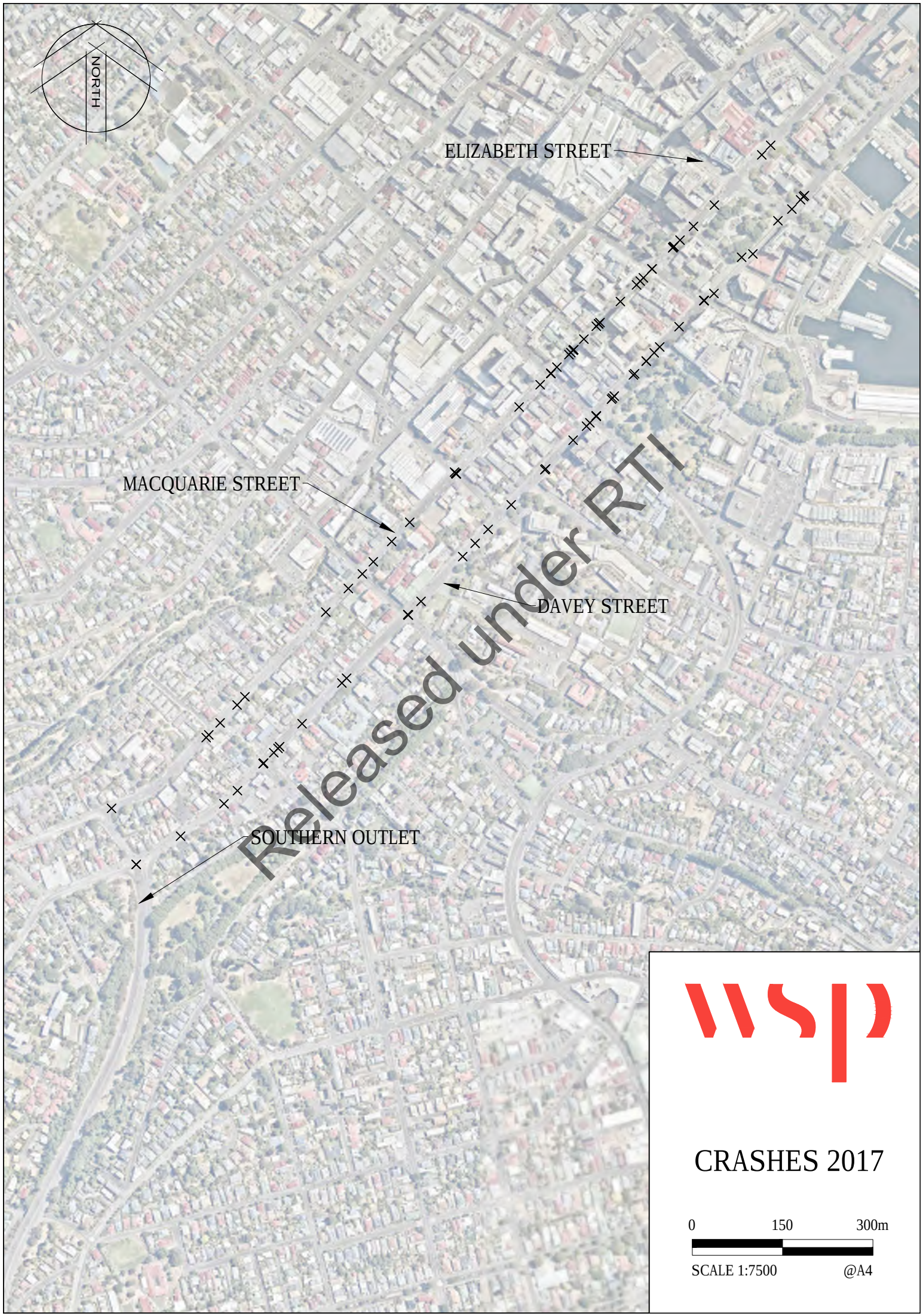

NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2012
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2013
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2014
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2015
0
150
300m
SCALE 1:7500
@A4

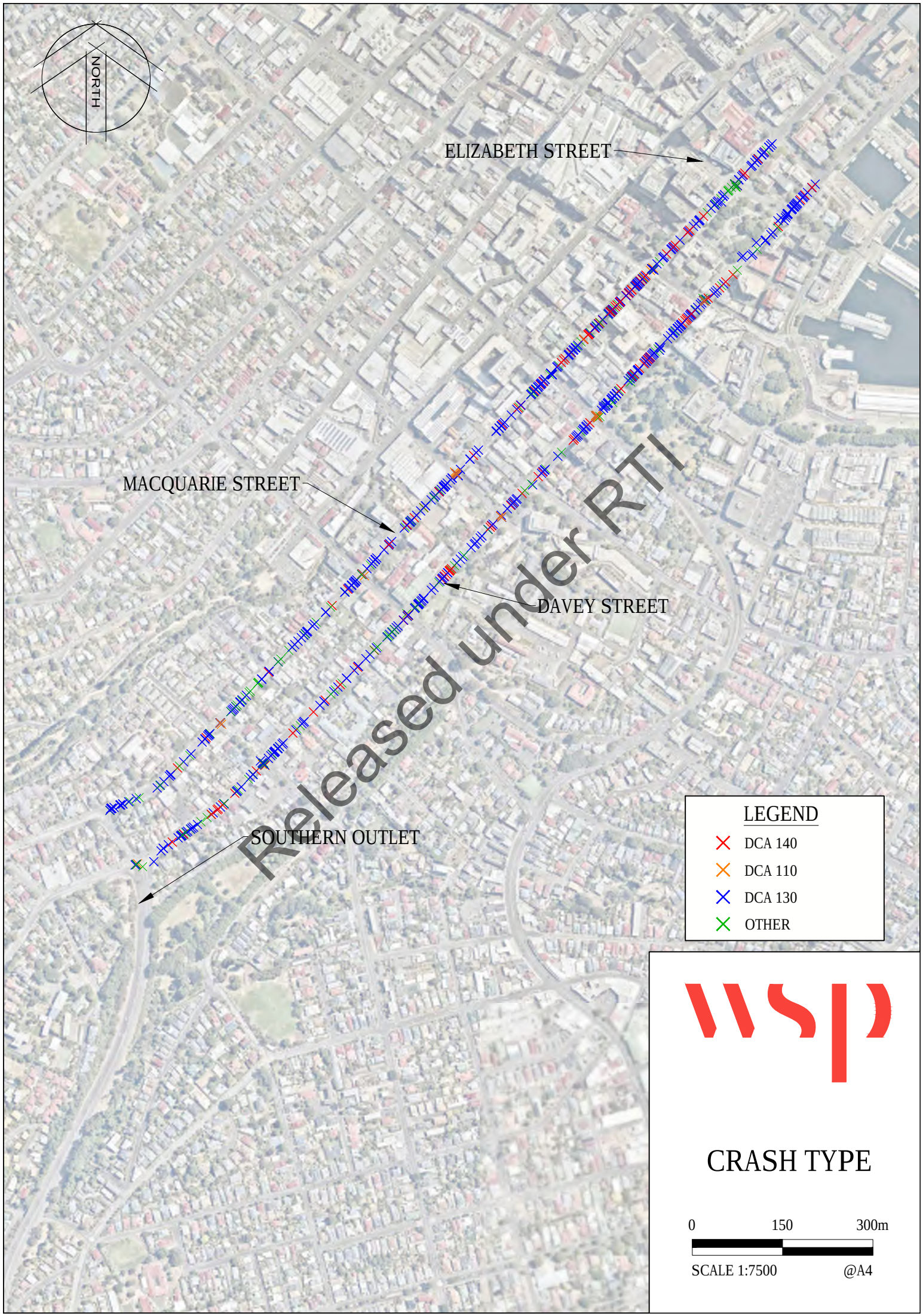

NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2016
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2017
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2018
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2019
0
150
300m
SCALE 1:7500
@A4


NORTH
ELIZABETH STREET
MACQUARIE STREET
DAVEY STREET
SOUTHERN OUTLET
Released under RTI
wsp
CRASHES 2020*
*INCOMPLETE YEAR
0
150
300m
SCALE 1:7500
@A4



APPENDIX C

AUDIT SITE PHOTOS

APPENDIX C-1
EXISTING CONDITIONS – MACQUARIE STREET

Item 2.1

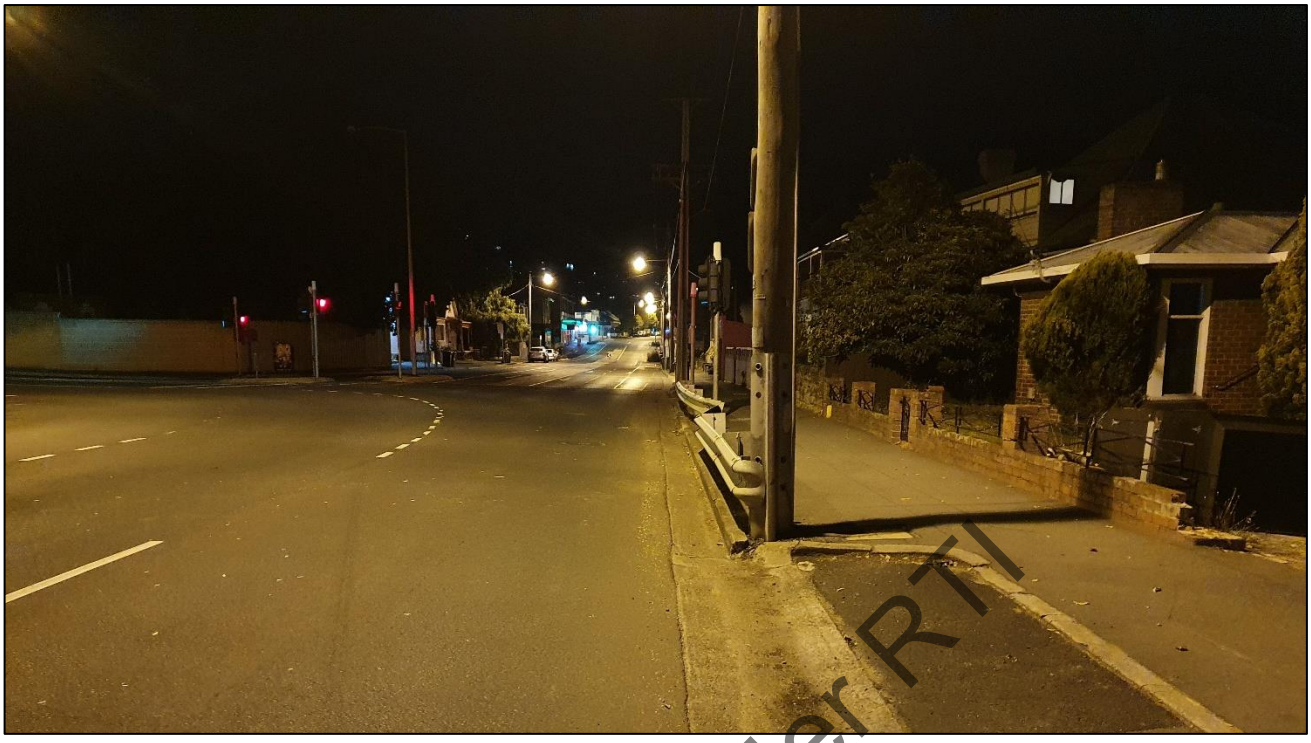


Figure C.1 Power pole at the Macquarie Street and Southern Outlet intersection

Item 2.2

Figure C.2 Worn Line Marking - Macquarie Street looking at right turn from Southern Outlet

Figure C.3 Worn Line Marking - Right turn from Southern Outlet onto Macquarie Street

Item 2.3

Figure C.4 Street Light

Item 2.4

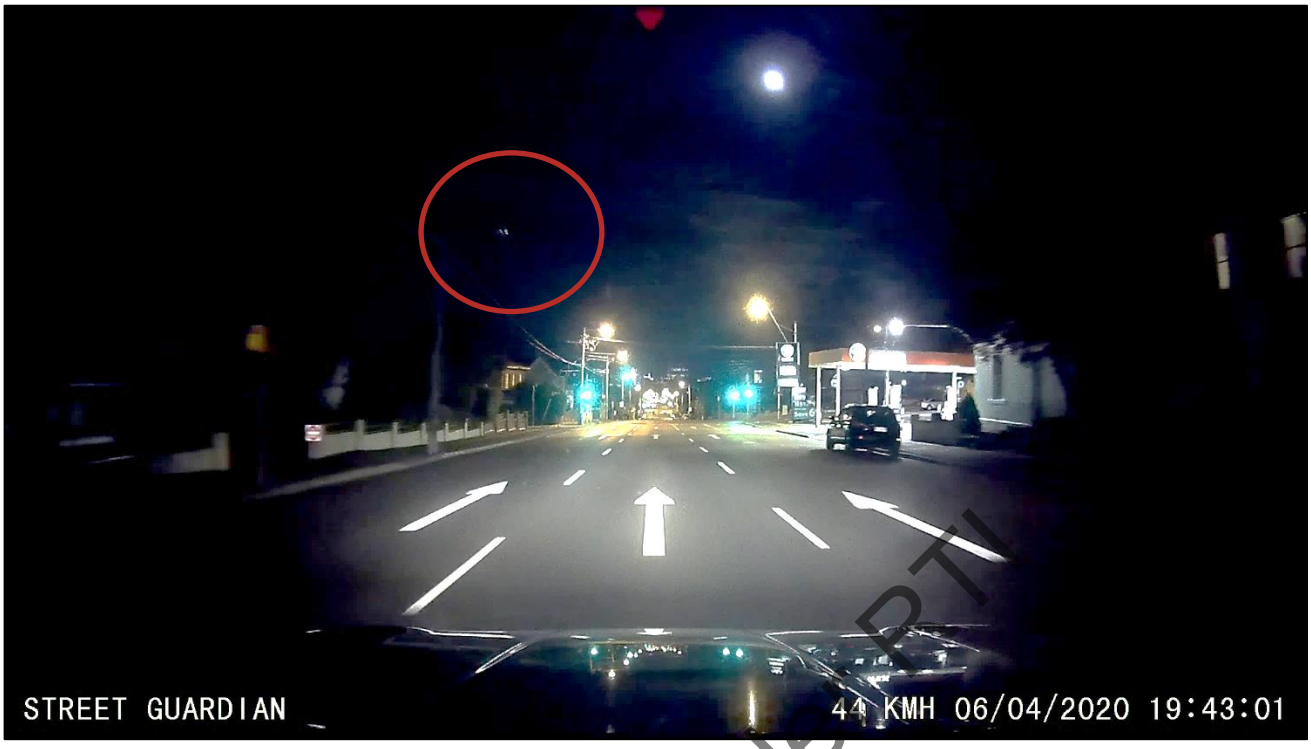


Figure C.5 Street Light

Item 2.5

Figure C.6 Tree obscuring streetlight

Figure C.7 Tree obscuring streetlight

APPENDIX C-2
EXISTING CONDITIONS – DAVEY STREET

Item 3.1

Figure C.8 Tree obscuring streetlight

Item 3.2

Figure C.9 Trees encroaching traffic lanes

Item 3.3

Figure C.10 Safety Barrier in median

Item 3.4

Figure C.11 Safety Barrier on right hand side

Item 3.5

Figure C.12 Centre Linemarking

Item 3.6

Figure C.13 Retaining Wall in Crash Zone

Item 3.7

Figure C.14 Rutted Pavement

Item 3.8

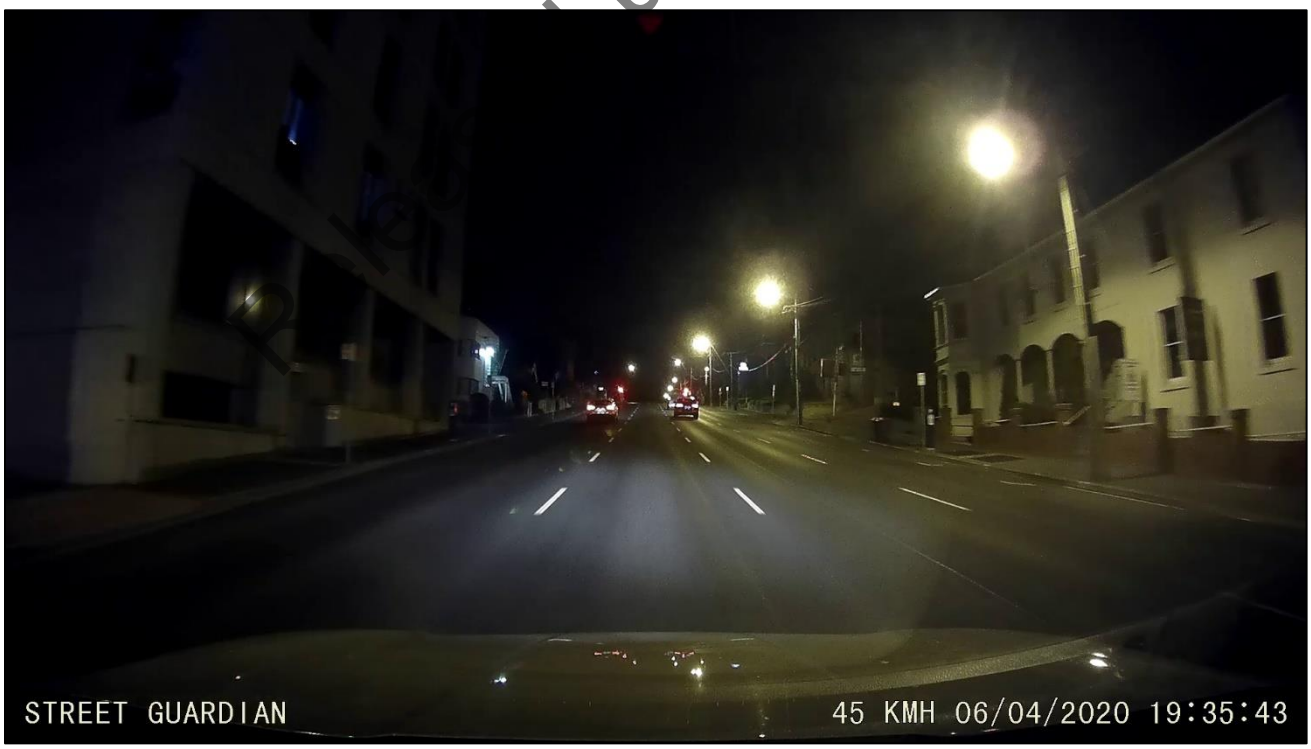


Figure C.15 Poor street lighting on left hand side

Item 3.9

Figure C.16 Tree obscuring streetlight

Item 3.10

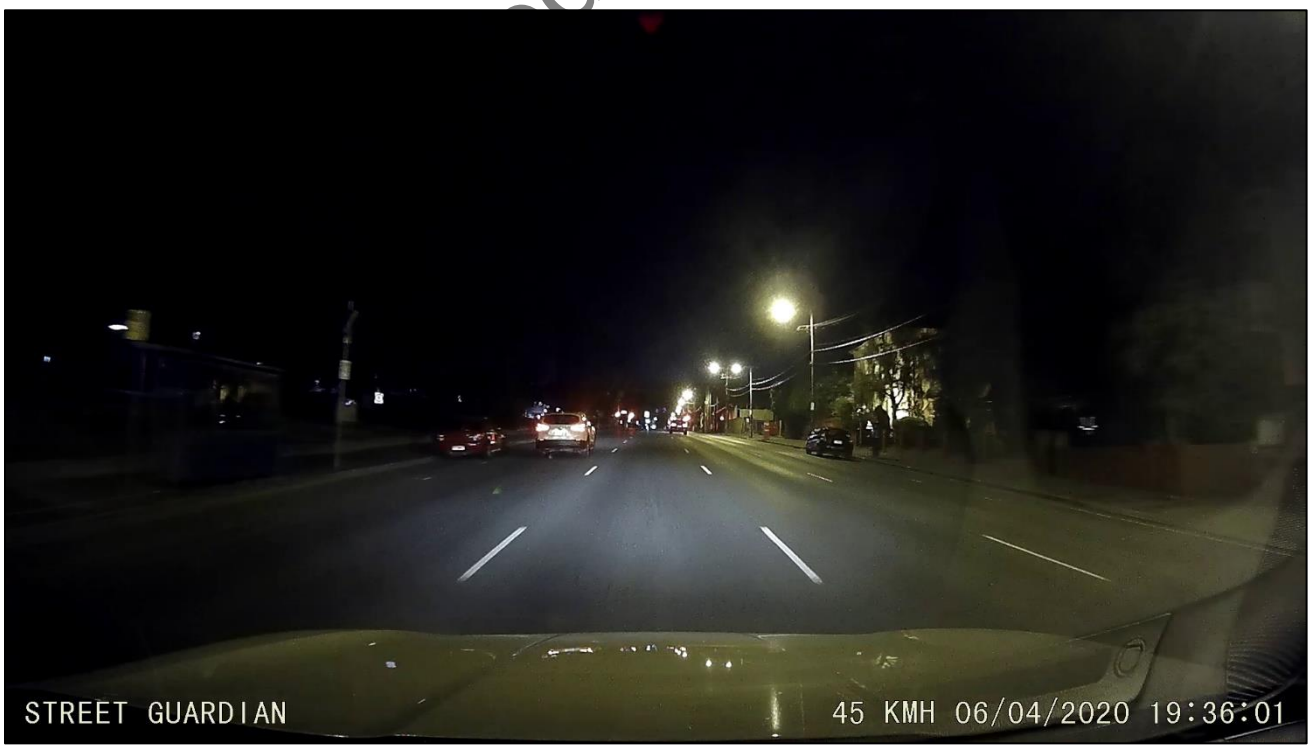


Figure C.17 Poor street lighting on left hand side

Item 3.11

Figure C.18 Poor street lighting on left hand side

Item 3.12

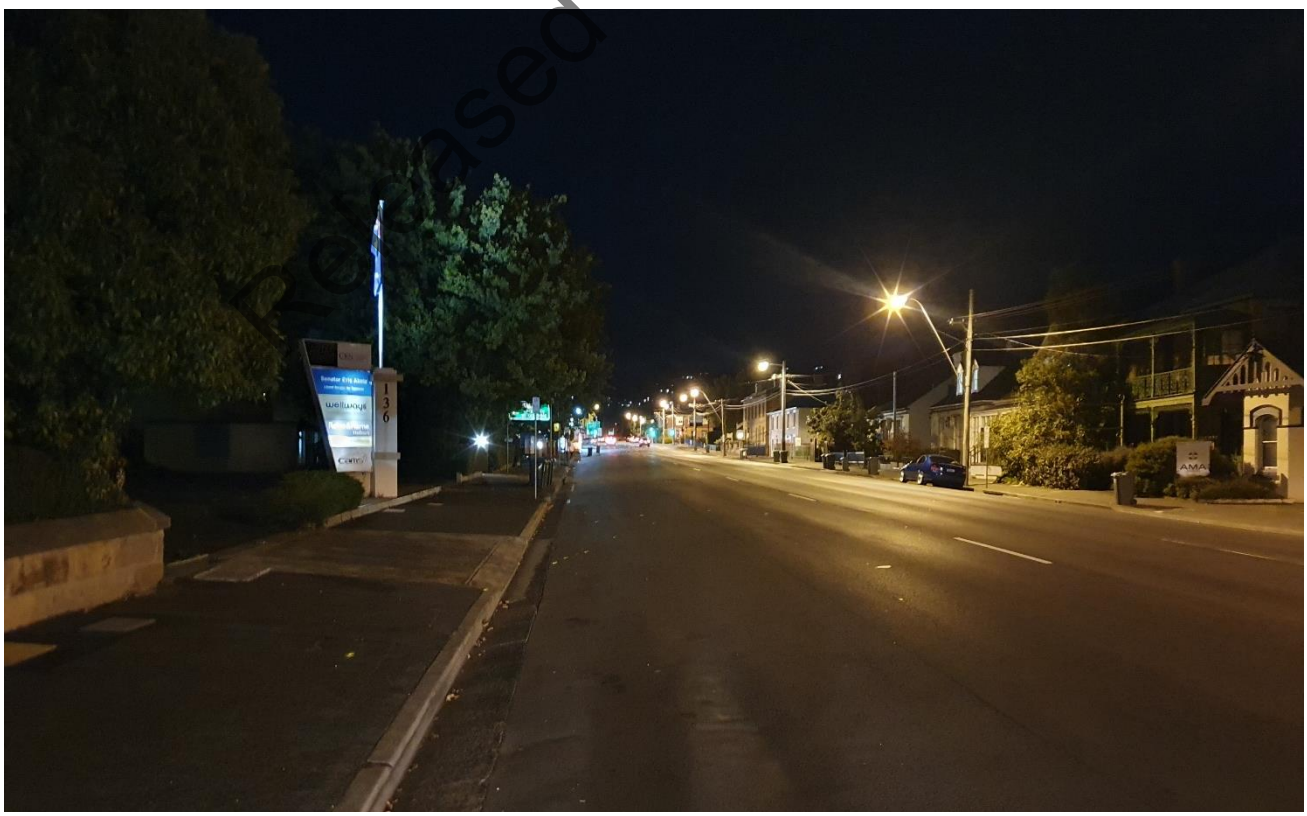


Figure C.19 Obscured Signs

Item 3.13 and Item 3.14

Figure C.20 Rutted Pavement and excessive crossfall

Item 3.15

Figure C.21 Obscured signs

Item 3.16

Figure C.22 Obscured traffic light