

Traffix Group

Traffic Engineering Assessment

Brunswick Street and Smith Street Activity
Centres – Extended Area

Prepared for
Yarra City Council

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G22790R-02B

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1. Introduction

Yarra City Council has initiated Built Form Frameworks for activity centres in Fitzroy and parts of Collingwood (referred to as the 'Brunswick Street and Smith Street Activity Centres' through this report in keeping with the previous naming convention). These Built Form Frameworks will define the preferred future built form character of the precincts and include principles, guidelines and requirements to guide future development and to manage the level of change. Importantly, these frameworks will inform the preparation of future Design and Development Overlay (DDO) controls and policy for these areas.

Traffic Group has previously prepared a traffic study for Brunswick Street and Smith Street Activity Centres (report reference: G22790-01B, dated November, 2019). This report includes a detailed review of the whole study area, existing transport conditions and reviews the area in detail from a transport planning perspective.

Since that time, the area being studied by Council for the Brunswick Street and Smith Street Activity Centres have been extended further than that covered by the original traffic study. This report focuses only on the extended area, rather than the entire precinct.

Our review of the remaining areas of the Activity Centres can be found within our previous report (G22790-01B, dated November, 2019) and this report should be read as an extension and in conjunction with the main report.

2. Scope & Methodology

The adopted methodology for undertaking this study was as follows:

- Undertake thorough site inspections of the extended study areas to document and map (with a main focus on properties abutting arterial and higher order roads):
 - existing access arrangements for each individual property,
 - existing traffic management treatments for all arterial and local roads and rear laneways within the study areas,
 - existing configuration of each road and laneway within the study areas (including carriageway width and road reservation width), and
 - foreseeable access constraints to each individual property should development occur.
- Review and categorisation of laneways into 3 categories (unconstrained, partially constrained or highly constrained) in order to better understand their potential to currently accommodate additional traffic under their existing conditions and configuration. Key factors include laneway width, laneway length, laneway connections (i.e. continuous or dead-end) and physical layout (i.e. bends within the laneway network). These factors are discussed in more detail further in the report.
- Review of the capacity for laneways and local roads to accommodate the forecast level of traffic based on development potential and their existing configuration.
- Review of what configuration or adjustments may be necessary to laneways or local road configurations in order to accommodate this increase in vehicle movements and to

minimise potential for vehicle conflicts within the study areas. In particular, impacts on Arterial Roads to be minimised as much as practically possible.

- Make recommendations as to the location and form of new, altered and retained access arrangements and laneways required to provide appropriate access to future developments.
- Review draft wording for the traffic engineering aspects of the future Design and Development Overlays, which sets out design objectives and outcomes, permit application requirements, and decision guidelines for assessing future planning permit applications, based on the desired access outcomes for future development.

3. Existing Conditions

3.1. Study Areas

The new study area is divided into three areas as follows:

- Alexandra Parade Precinct
- Fitzroy West Precinct
- Victoria Parade Precinct

This is shown in the locality plan provided on the following page at Figure 1. Land within the study areas is generally zoned 'Commercial 1 Zone', 'Commercial 2 Zone' and 'Mixed Use Zone', as shown in Figure 2.

Both figures show the overall study area, in addition to the area of focus of this report (the refined study area), which includes all properties adjacent to arterial roads and higher order roads.

The Fitzroy West Precinct predominately comprises properties that do not abut arterial roads or laneways. It is made up of 'hinterland' areas where vehicle access location is not critical to the functioning of local road network. As per the previously completed study methodology, these areas have not been reviewed in detail from a traffic planning viewpoint. This is mainly due to the fact that none of these roads have direct frontage/potential access opportunities to arterial roads, and that access to either the local roads or laneways would both be appropriate for these sites.

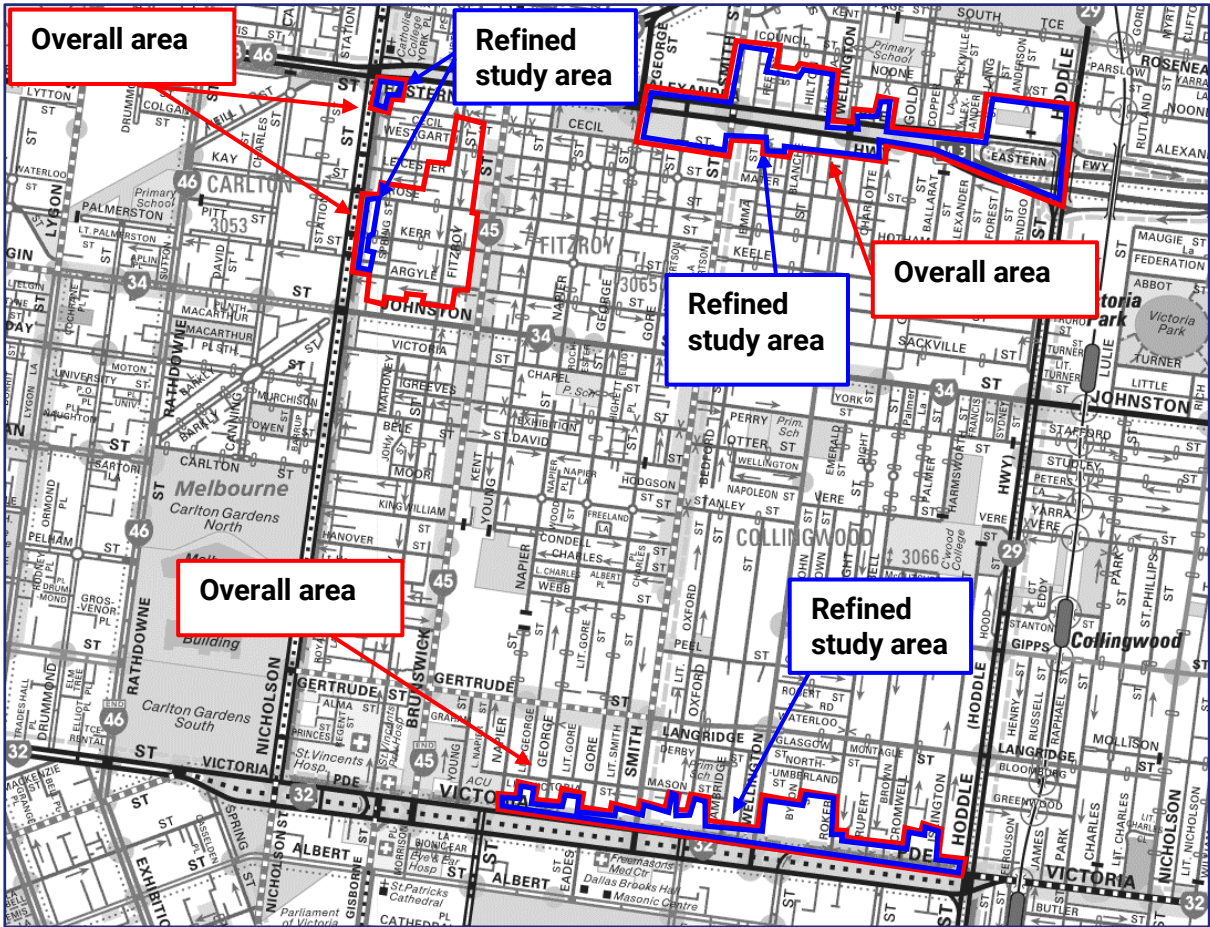


Figure 1: Locality map

Source: Melway

4. Control of Vehicle Access Locations

Our previous report set out in detail vehicle access management principles and methods of access control.

Essentially, conventional planning practice dictates that the provision of vehicle access to private land should prioritise access to lower order roads where possible. There are numerous benefits of limiting vehicle access to arterial roads including creating a pedestrian friendly environment through increasing active frontage, removes conflict points, reduces the number of intersections, and increasing safety and efficiency of the overall road network.

This is further supported through local Council policy, which recognises the role of roads for movement via multiple transport modes. Council's transport modal hierarchy for decision making places pedestrians, cyclists and trams in the top three, and places vehicular traffic at the bottom.

This hierarchy recognises the importance of sustainable modes into the future and supports the recommended access management strategy to utilise rear laneways and side streets wherever possible. Direct access to arterial roads being a last resort (with consideration for "no parking provision" potentially being preferable for some sites).

However, it is also acknowledged that there are instances where direct vehicle access to arterial roads may need to be provided.

4.1. Control of Vehicle Access

The vehicle access hierarchy has been defined in accordance with the following hierarchy (from highest to lowest preference):

1. Laneways
2. Local Streets
3. Arterial Roads – no access unless there is no alternative

Arterial roads include:

- Brunswick Street
- Smith Street
- Wellington Street
- Gertrude Street/Langridge Street
- Johnston Street
- Nicholson Street
- Alexandra Parade
- Victoria Parade

It is recommended that this hierarchy is also included in the future planning controls for the study area.

In some instances, the strict use of laneways for sole vehicle access may overload the capacity of the laneways in their current form. The following section reviews the capacity of the existing laneways within the study area to accommodate additional development.

5. Right-of-Way Management

The following sections provide:

- An outline of the methodology behind our categorisation of laneways within the study area
- A description of laneway characteristics and how these affect the capacity of laneways to accommodate vehicles, pedestrians and cyclists.
- A detailed description for each of the options considered to improve the laneway network.

5.1. Categorisation of Laneways

As part of the review process of the current capacity of existing laneways to accommodate additional future development traffic volumes, we have reviewed and categorised laneways within the study areas into three categories (unconstrained, partially constrained or highly constrained) in order to better understand their potential to currently accommodate additional traffic under their existing conditions and configuration.

Key factors include laneway width, laneway length, laneway connections (i.e. continuous or dead-end) and physical layout (i.e. bends within the laneway network). These factors are discussed in more detail below.

The laneway assessment classified all laneways within the study area by their potential to accommodate additional traffic. Laneways have initially been classified at three levels:

Unconstrained – these laneways have very few, if any, development constraints. As a result, they are well suited to accommodating additional traffic. Changing the laneway to operate one-way (where possible) has not been considered as a constraint.

Partially Constrained – these laneways have some potential constraints that limit their capacity to accommodate traffic, however they are generally easily addressed. Common issues include insufficient width, long length and lack of splays at critical locations.

Highly Constrained – this laneway has fundamental issues that cannot easily resolved. This usually relates to very narrow laneways or heritage constraints that limit the opportunities to alter the laneways.

When assessing the capacity of laneways, a number of factors need to be considered. For most laneways, it is a combination of factors that contribute to its classification.

The key factors that influence the classification of a laneway are outlined below:

Laneway width. This is the single most important factor to the operation and capacity of a laneway. To provide a single traffic lane, a laneway should be at least 3.0m wide. A width slightly less than 3.0m (down to 2.8m) is also functional, although constrained. Laneways less than 2.8m wide are problematic for vehicle access and should be considered as pedestrian only laneways and/or have very limited development potential (it is acknowledged

that some narrow laneways within the study area are in practice used for vehicle access currently).

Laneways become capable of supporting simultaneous two-way traffic at a width of 5.5m if not built up (i.e. 5.5m between walls) or 6.0m wide between building walls. This width removes most capacity constraints of laneways and effectively makes them unconstrained.

One-way or two-way operation. For single width laneways, a one-way laneway has a significantly higher capacity than a laneway permitting two-way traffic. One-way operation eliminates vehicle conflict within the laneway and can support a high level of access/development from the laneway. One-way laneways are generally classified as unconstrained in this assessment.

Continuous. A continuous laneway can generally be made to operate in a one-way direction. Generally, a continuous, straight laneway was classified as unconstrained because it can be made one-way to address capacity constraints.

A dead end laneway has less capacity to handle additional traffic and the laneway cannot be made one-way to manage traffic flow. However, this factor is only relevant for single width laneways, a laneway wide enough for two-way traffic is not constrained just because it has a dead end.

Laneway Length. This factor ties into laneway width and whether it is a continuous laneway or not. A long, single width (3m up to 6.0m wide) laneway will experience a high level of vehicle conflict due to higher traffic volumes, higher development potential (more properties accessing it) and more chances of vehicles meeting the laneway.

There are no set rules regarding the 'tipping point' for when two-way traffic in a single width laneway reaches capacity. It is a combination of factors including traffic volume, configuration and length that contribute to a laneway's capacity. Laneway length is therefore a contributing factor that impacts on laneways in combination with other factors.

Physical layout. A straight laneway has the highest vehicle carrying capacity. Bends in laneways may create operational issues, particularly if:

- There are no splays around the inside corner of the bend to facilitate vehicle access. For instance, a 90° bend between two 3m wide laneways is inaccessible to vehicles without a splay.
- Due to a lack of sight distance, vehicles cannot see each other approaching the blind corner. For single lane laneways, this can be a serious issue if drivers meet near the bend, the laneways are long and there are no passing opportunities.

Number of Abutting Properties and Frontage. The number of properties and their frontages are relevant to the potential future traffic conditions of a laneway. There are a number of ways this factor can influence laneways:

- Short laneways may only serve a limited number properties and accordingly with a low development potential, a short laneway may effectively be 'unconstrained'.
- A large number of narrow lots might make widening a laneway problematic.
- If the number of abutting properties to the laneway is small, a short, narrow laneway is unlikely to be constrained.

Heritage constraints. We are not heritage experts and we have relied on information provided by Council in this regard. Properties that have heritage value may create issues in that they may not easily be modified and this was taken into account during our initial review. Heritage properties abutting a laneway may limit options to widen the laneway.

The follow factors were not considered when assessing the development potential of laneways:

- The condition of the laneway (does it need maintenance? Is it in disrepair?).
- The material the laneway is constructed with or type of surface treatment (gravel, asphalt, bluestone, etc.).

As existing Council assets, the condition of the laneway is not especially relevant. It is Council's on-going responsibly to maintain laneways as appropriate.

Some larger developments will warrant upgrading the surface of laneways (for instance, from gravel to asphalt). However, the condition of the laneway is less relevant than its physical configuration. Council also has a number of methods of upgrading the surfaces of laneways, including as permit conditions for significant developments or special charge schemes of abutting properties. These issues are easier to resolve than physical issues with a laneway's configuration.

Summary

From the above, it is apparent that the capacities of laneways are impacted by a large number of factors. In addition, it is challenging to concisely quantify how all the various factors influence each other. There are very few 'hard and fast' rules that define when a laneway is constrained or not and accordingly, this assessment is somewhat subjective and our assessment is based on our engineering judgement and experience.

5.2. Upgrading the Capacity of Laneway

Under Clause 56.06 of the Planning Scheme, Table C1 provides an outline of the design of roads, one of which includes an 'Access Lane', which is defined as a *side or rear lane principally providing access to parking on lots with another street frontage*. Table C1 continues on to state that an Access Lane has a traffic volume of up to 300 vehicles per day (vpd) and this is typically adopted as the environmental capacity laneway. This also represents an indicative peak volume of 30 vehicles per peak hour (two-way). This generally applies to single-width laneways (typically in the order of 3m width).

The options in terms of increasing the traffic capacity of existing laneways include conversion to a one-way operation, increasing laneway width, provision of splays around laneway corners and the provision of a passing area at the entrance to a laneway.

Upgrades for non-vehicle travel could also be undertaken on laneway, including converting appropriate laneways to shared areas.

5.3. Recommendations

Our recommendations regarding various laneway upgrades are summarised at Table 1.

The table provides the detailed reason behind the recommendations for the various laneways within the study area and references the laneways by the numbers defined in Appendix C.

Laneways not included in the following table are unlikely to require updates or modifications, either due to already being functional for higher traffic volumes or being within areas where the development potential (intensity of development) of abutting properties is low.

It is of note that laneways reviewed as a part of our previous report have been re-included if they are within the new study area boundaries and we have maintained their previous naming/numbering convention. All new laneways have been numbered starting at the end of the previous ROW list (i.e. starts at ROW 123).

Table 1: Recommendations for ROW upgrades

ROW	Classification	Modifications	Reason
59: ROW (from Emma St to Emma Street)	Partially constrained	Provide splay on southern corner No. #35 Emma St.	A splay is needed to make the ROW traversable at its southern end.
122: ROW (from Derby Street to Victoria Parade)	Partially constrained	One-way traffic flow	This laneway is long and abuts numerous properties.
128: ROW (from Council Street to Alexandra Parade)	Partially constrained	Modifications rely on outcome of current permit application	There is a current permit for the laneway is to be partially converted to private land in lieu of consolidated development on the block. This will result in a change to the way that the ROW operates. This is discussed in more detail in the following section.
129: ROW (from Council Street to Alexandra Parade)	Partially constrained	One-way traffic flow	This laneway is long and abuts numerous properties.
131: ROW (from Noone Street to Alexandra Parade)	Partially constrained	One-way traffic flow	This laneway is long and abuts numerous properties.
132: ROW (from Noone Street to Alexandra Parade)	Partially constrained	One-way traffic flow	This laneway is long and abuts numerous properties.
134: ROW (from Noone Street to Alexandra Parade)	Partially constrained	One-way traffic flow	This laneway is long and abuts numerous properties.

Following this review, it is evident the recommendations for various laneways generally fall into two groups. These are described below:

One-Way Laneways

There are many laneways within the study area that run parallel with the arterial road and are relatively short in length (under 100m) and provide straight, through links between two local roads. These generally serve properties that have preferred building heights of 5-6 storeys.

Instead of physical changes (such as widening), the recommended solution to increased traffic volumes is that these laneways are made one-way to eliminate capacity constraints. The direction of the one-way arrangement would be subject to consultation.

Council has the option to either:

- Pro-actively make these changes now, to provide certainty to all landowners and developers about the future operation of these laneways, or
- Change these laneways on a case-by-case basis as development proposal eventuate. We do not prefer this option, because it provides no certainty to developers or the community in regards to the laneway. The outcome of this uncertainty is each individual developments will apply a heterogeneous mix of solutions to improve the laneway for their individual needs and the simple solution of a one-way arrangement (avoiding land loss) is rarely implemented. As changes to one-way operation requires community consultation, there is no certainty of Council support to change a laneway to one-way if proposed by a development.

Geometrically constrained laneways

These laneways typically have physical issues such as:

- No splays on corners and limited ability to provide them with properties outside of the study area, new buildings that did not provide the splays or heritage issues.
- Limited ability to widened the ROW due to heritage issues, subdivision pattern or properties abutting the laneway falling outside the study area.
- Dead ends

These laneways have a finite capacity that is unlikely to be improved or the solutions are unfeasible in our view. In this case, it is recommended that Council encourage limited car parking on sites relying on these laneways.

5.3.1. ROW 128 Network

There is a current permit application for the development site of 592-622 Smith Street, 2-12 Alexandra Parade and 1-7 Reeves Street, Clifton Hill under Permit No. PLN19/0845.

An aerial photograph of this network is shown in Figure 3.

The proposal includes the closure of the east-west laneway that runs from Reeves Street to the north-west section of the ROW. This will become a private pedestrian link. This will have impacts on the operation of the ROW, turning it into more of an L-shaped ROW between Council Street and Reeves Street, with a short dead end section. In this case, it would be recommended to provide a splay on the north-eastern corner of the L-shaped bend (#1

Council Street) if the site is redeveloped to help facilitate the turning movement from Council Street to Reeves Street.

If the application does not eventuate, then a one-way arrangement could be facilitated along the north-south portion of the ROW in order to minimise vehicle conflict.



Figure 3: ROW 128

Source: nearmap.com

6. Design and Development Overlay – Draft Schedules

We have reviewed the Design and Development Overlay (DDO) draft schedule for all three of the study areas.

The following section reviews the items related to traffic engineering matters and provides our commentary. It is of note that most of the traffic engineering matters are universal across all of the study areas, and as such, these items have only been reviewed once.

The relevant sections of the DDO is copied out below:

Design and Development Overlay Schedule XX – All Areas

2.11 Access, Parking and Loading Areas Requirements

Pedestrian access to buildings should be achieved via streets and avoid primary access from laneways. Where pedestrian access from a laneway is appropriate, it should include a pedestrian refuge or landing.

Ensure pedestrian entrances are clearly visible, secure and have an identifiable sense of address.

Residential and commercial pedestrian entrances should be distinguishable from each other.

The common pedestrian areas of new buildings should be designed with legible and convenient access, with hallway and lobby areas of a size that reflects the quantity of apartments serviced and which can be naturally lit and ventilated.

Resident and staff bicycle parking should be located and designed to be secure and conveniently accessible from the street and associated uses.

Vehicle access should be achieved from laneways or side streets (in that order of preference).

Car parking should be located within a basement or concealed from the public realm.

Vehicle ingress and egress into development, including loading facilities and building servicing, should be designed to ensure a high standard of pedestrian amenity and limit potential conflict between vehicle movements and pedestrian activity.

Development with redundant vehicle access points should reinstate the kerb, line-marked parking bays, and relocate any parking signs.

Development with laneway access may require a ground level set back in order to achieve practicable vehicle access. Between ground level and first floor, a headroom clearance of 3.5m minimum should be achieved.

Properties on the inside corner of bends in laneways or at intersections between two laneways should provide a minimum 3m x 3m splay to facilitate vehicle access.

5.0 Application Requirements

The following application requirements apply to an application for a permit under Clause 43.02, in addition to those specified elsewhere in the scheme and must accompany an application, as appropriate, to the satisfaction of the responsible authority:

- a *Traffic Engineering Report* prepared by a suitably qualified traffic engineer that demonstrates how the development:
 - minimises impacts on the level of service, safety and amenity of the arterial road network (including tram services);
 - reduces car dependence and promotes sustainable transport modes; and
 - which includes an assessment of the cumulative impacts of traffic and parking in the Precinct including an assessment of the ongoing functionality of laneway/s, where applicable.

6.0 Decision Guidelines

The following decision guidelines apply to an application for a permit under Clause 43.02, in addition to those specified in Clause 43.02 and elsewhere in the scheme which must be considered, as appropriate, by the responsible authority:

- whether the requirements in Clauses 2.2 to 2.11 are met;
- whether the design of the streetscape interface makes a positive contribution to an active, pedestrian-oriented street environment and/or public realm;
- the cumulative impact of development on traffic and parking in the nearby area, including on the functionality of laneways; and
- whether the layout and appearance of areas set aside for vehicular access, loading and unloading and the location of any proposed car parking is practicable, safe and supports a pedestrian-oriented design outcome.

Design and Development Overlay Schedule XX – Alexandra Parade

To encourage development designs that promote pedestrian activity and passive surveillance, contributes to a high quality public realm, and avoid overshadowing of opposite footpaths on Alexandra Parade, side streets and public spaces.

2.11 Access, Parking and Loading Areas Requirements

Development must not provide additional vehicular access from Alexandra Parade.

Ensure access to service laneways is maintained in order to facilitate commercial use of the properties fronting Alexandra Parade.

Design and Development Overlay Schedule XX – Fitzroy West

To encourage development designs that promote pedestrian activity and passive surveillance, contributes to a high quality public realm, and avoid overshadowing of opposite footpaths on the southern side along the key pedestrian and green streets of Westgarth, Leicester, Rose, Kerr and Argyle Streets.

Design and Development Overlay Schedule XX – Victoria Parade

To encourage development designs that promote pedestrian activity and passive surveillance, contributes to a high quality public realm, and avoid overshadowing of opposite footpaths, public spaces and the boulevard's central median.

2.11 Access, Parking and Loading Areas Requirements

Development must not provide additional vehicular access from Victoria Parade.

Ensure access to service laneways is maintained in order to facilitate commercial use of the properties fronting Victoria Parade.

6.1. Response to DDO Draft Schedule

The majority of the traffic related items in the DDO Draft Schedule were adopted from our previous recommendations within our traffic report (G22790-01B), and as such, we are satisfied that they are appropriate.

The only exception to this is within *2.11 Access, Parking and Loading Area Requirements* for both Victoria Parade and Alexandra Parade, whereby developments are restricted from providing any additional vehicular access to these arterial roads (by the word *must*).

We agree that there should be preference to access from lower order roads, however there are certain exceptions to this rule, and as such we do not consider that a blanket ban on access to these roads is appropriate. Key examples include properties with no other road frontages and those with high development intensity rear access outcomes may not be feasible (due to the capacity of the rear laneway) or desirable (it may introduce large volumes of non-local traffic into local streets).

The 'Porche' and 'Melbourne Pathology' sites in Victoria Parade are key examples where this may be the case.

Our view is this requirement should be modified from 'must' to 'should' or must with some caveats.

We would recommend that the wording within *2.11 Access, Parking and Loading Area Requirements* for both areas replace the word '*must not*' from '*Development must not provide additional vehicular access from Alexandra Parade/Victoria Parade*' to '*should not provide vehicle access to Alexandra Parade/Victoria Street, where possible*'.

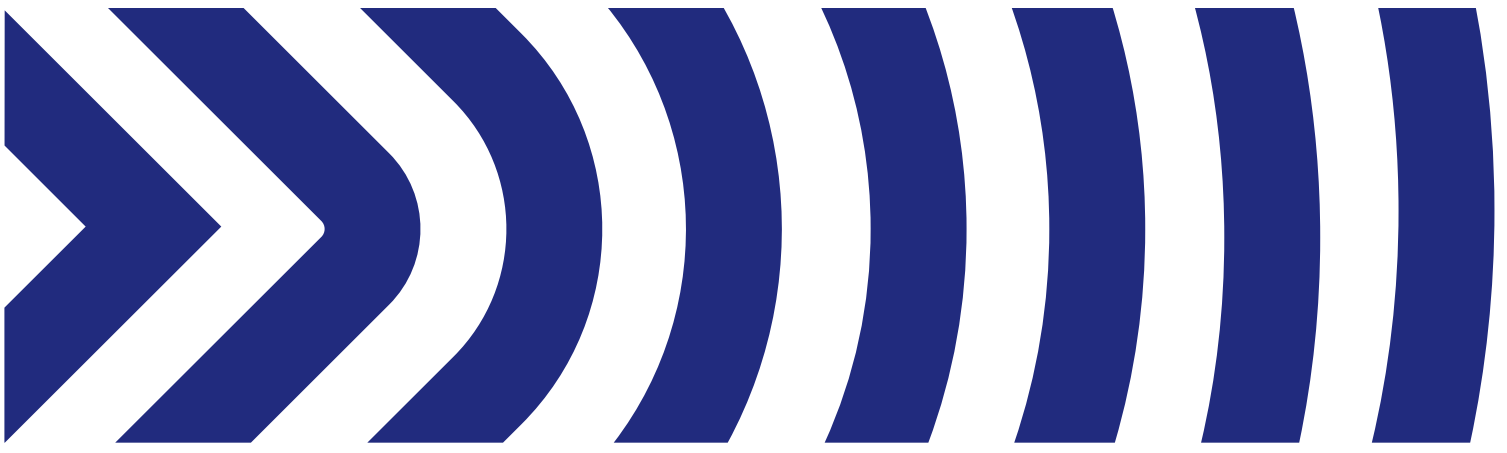
7. Conclusions

The access arrangements for all properties within the extended Brunswick Street and Smith Street Activities centre have been reviewed.

A number of key recommendations regarding how vehicle access should be planned, and recommended changes to ROWs within the extended area has been proposed in order to facilitate safe and efficient vehicle access to abutting land within the review area.

This report also reviews proposed Design and Development Overlay Draft Schedule to apply within the activity centre at Section 6.1. We are satisfied with the wording of the controls but do recommend that some limited flexibility is provided regarding access control to Victoria Parade and Alexandra Parade.

Specifically, we would recommend that the wording within *2.11 Access, Parking and Loading Area Requirements* for both areas replace the word '*must not*' from '*Development must not provide additional vehicular access from Alexandra Parade/Victoria Parade*' to '*should not provide vehicle access to Alexandra Parade/Victoria Street, where possible*'.

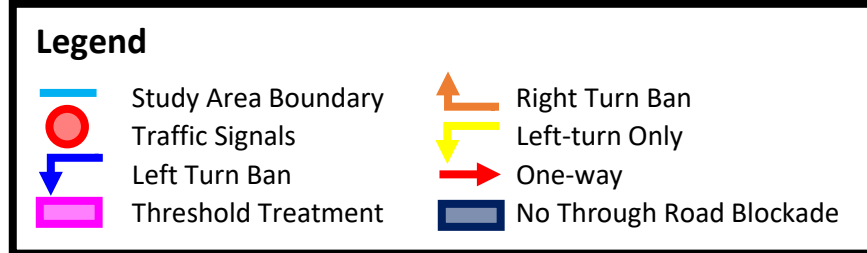


Appendix A

Existing Traffic Management Conditions

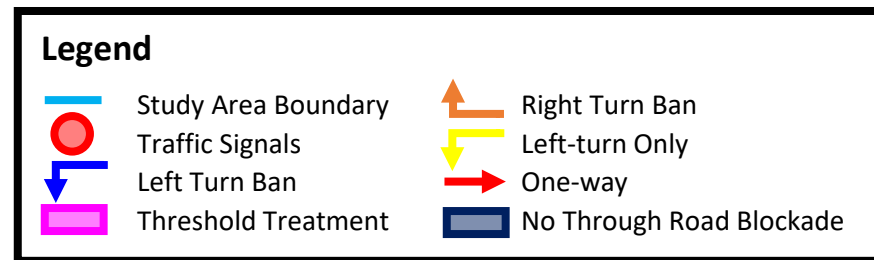


MAP NO.1



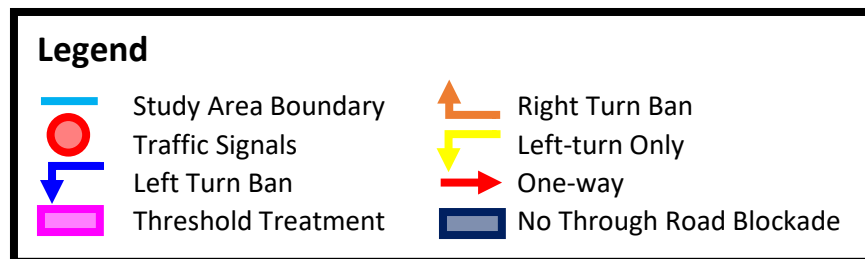


MAP NO.2













MAP NO.3





MAP NO.4









Legend

 Study Area Boundary	 Right Turn Ban
 Traffic Signals	 Left-turn Only
 Left Turn Ban	 One-way
 Threshold Treatment	 No Through Road Blockade



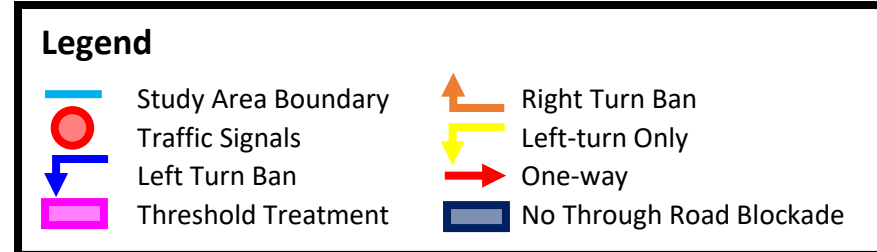
MAP NO.5

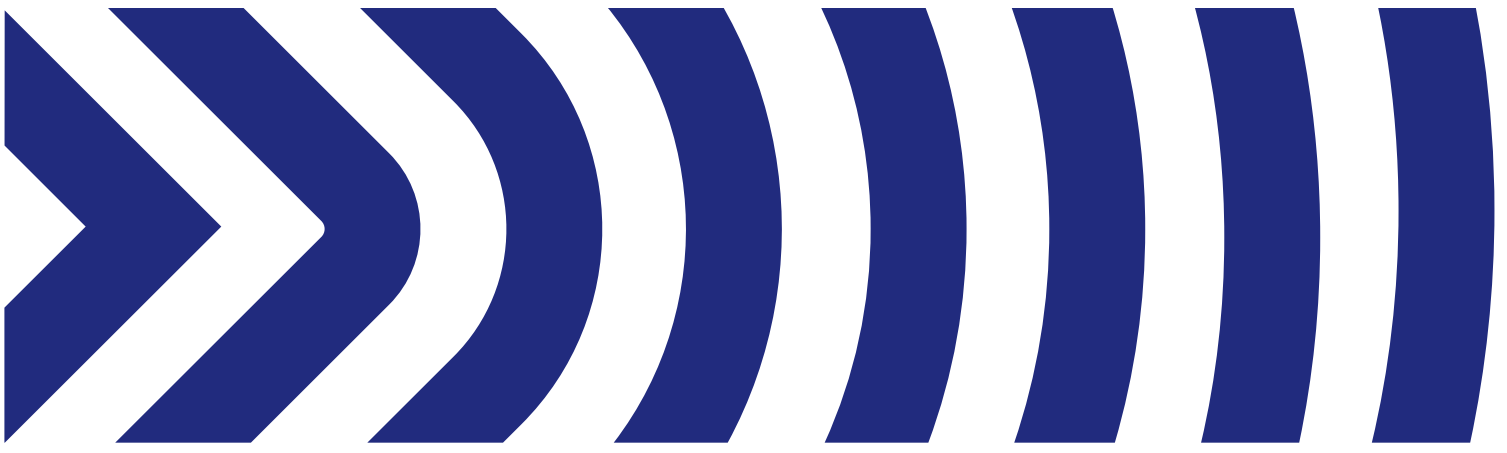
Legend

	Study Area Boundary		Right Turn Ban
	Traffic Signals		Left-turn Only
	Left Turn Ban		One-way
	Threshold Treatment		No Through Road Blockade



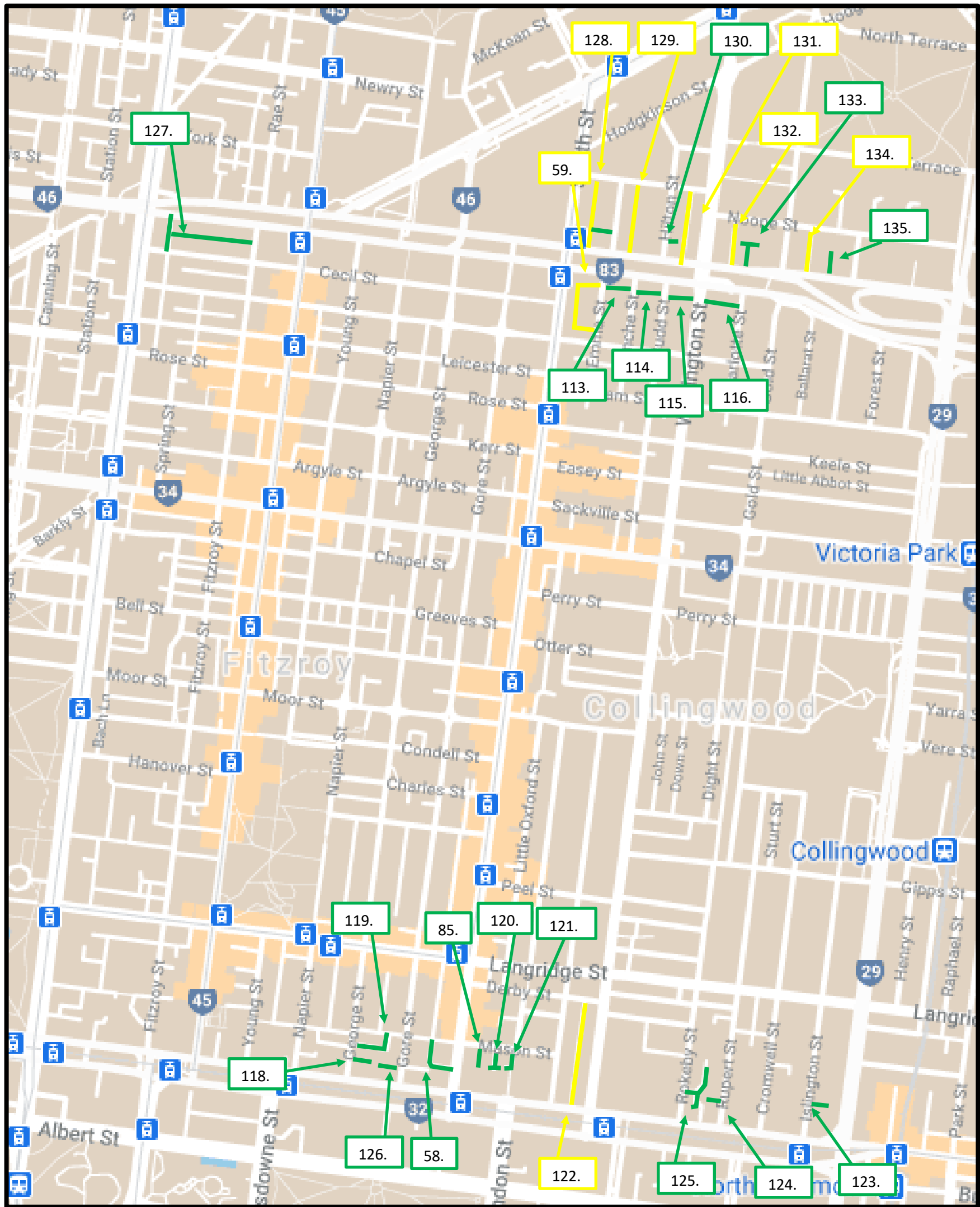
MAP NO.6





Appendix B

Existing Laneway Conditions



Legend

- Unconstrained Laneway
- Partially Constrained/Minor Improvement Required
- Highly Constrained/Challenging to Remedy


Appendix B

Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>58: Little Smith Street (from Little Victoria Street to Smith Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.1m-4.5m • Road Reserve – 3.1m-6.2m • Traffic management – Two-way • Parking – No parking • Footpath – Narrow path/kerbing on both sides for north-south section, none for east-west section • Material – Asphalt and Bluestone • Layout features – there is a 90 degree bend in the ROW with a narrow kink from the property on the southwest corner making it difficult to traverse. <p>Constraints: Unconstrained Laneway</p> <ul style="list-style-type: none"> • Short in length • Corner does not need to be traversed 	
<p>59: ROW (from Emma St to Emma Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 2.9m-3.05m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – there are two 90 degree bends on the ROW, with a splay provided for the northern bend. The southern bend does not have a splay and is difficult to traverse. There is also construction going on adjacent to the ROW. <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Lack of splay on the southern bend 	
<p>85: ROW (from Mason Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.3m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Unsealed road <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	

Appendix B

Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>113: ROW from Emma Street to Blanche Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 2.8m • Traffic management – Two-way, No entry from Alexandra Parade to both Blanche Street and Emma Street. Right turns are also not permitted from these streets to Alexandra Parade • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – There is a connecting ROW to the south, with splays provided on both corners at the intersection <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Could be made one-way • Continuous 	
<p>114: ROW (from Blanche Street to Budd Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3m • Traffic management – Two-way, No entry from Alexandra Parade to both Blanche Street and Budd Street. Right turns are also not permitted from these streets to Alexandra Parade • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – There is a connecting ROW to the south, with a splay provided on the southeast corner. <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Could be made one-way • Continuous 	




Appendix B

Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>115: ROW (from Budd Street to Wellington Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.05m • Traffic management – Two-way, No entry from Alexandra Parade to Budd Street. Right turns are also not permitted from Budd Street to Alexandra Parade • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – There is a connecting ROW to the south, with a splay provided on the southeast corner. <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Could be made one-way • Continuous 	
<p>116: ROW (from Wellington Street to Charlotte Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.15m • Traffic management – Two-way, No entry from Alexandra Parade to Charlotte Street. Right turns are also not permitted from Charlotte Street to Alexandra Parade • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – There is a connecting ROW to the south, with no splays provided. <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Could be made one-way • Continuous 	
<p>118: ROW (from George Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.55m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	

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Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>119: ROW (from Little Victoria Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.2m-3.65m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Asphalt • Layout features – There is a 90 degree bend, with a splay provided on the northwest corner <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	
<p>120: ROW (from Mason Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4m-6.2m • Road Reserve – 4.9m • Traffic management – Two-way • Parking – No parking • Footpath – Footpath on west side • Material – Asphalt • Layout features – There is a T-intersection at the south end of the ROW, with an open car park section which allows for turning <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Wide road, which allows easy manoeuvrability 	
<p>121: ROW (from Mason Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.2m-4.45m • Traffic management – Two-way, Mason Street is one-way eastbound • Parking – No parking • Footpath – No footpath • Material – Asphalt • Layout features – There is a 90 degree bend at the south end of the ROW, with an open car park section which allows for turning <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	

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Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>122: ROW (from Derby Street to Victoria Parade)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.55m • Traffic management – Two-way, vehicles must enter/exit left at Victoria Parade • Parking – No parking • Footpath – No footpath • Material – Asphalt • Layout features – Long and has a large number of vehicles taking access <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Length • Should be one-way • High development potential 	
<p>123: ROW (from Islington Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.2m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	
<p>124: ROW (from Rupert Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 2.9m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Concrete <p>Constraints: Unconstrained</p> <ul style="list-style-type: none"> • Narrow width • Short in length • Limited number of properties, and modifications can be utilised to increase width 	

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Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>125: ROW (from Rokeby Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.1m-3.4m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Partially bluestone, partially asphalt • Layout features – Has a T-intersection head, where the ROW splits into two directions. Splays are provided on both sides of the split <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Wider around bends and splays provided at each corner, which facilitates adequate room to turn 	
<p>126: ROW (from Gore Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.6m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	
<p>127: ROW (from Nicholson Street to Cecil Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.5m-3.8m • Traffic management – One-way (southbound) • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – Has a T-intersection head, where the ROW extends from the centre point of the N-S section to Young Street in the east. No splays are provided <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length • Already one-way • Bend does not require traversal 	

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Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>128: ROW (from Council Street to Alexandra Parade)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.8m-4.1m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Asphalt • Layout features – Has a T-intersection head, where the ROW extends from the the N-S section to Reeves Street in the east. A splay is only provided on the northern corner. <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Long and high development potential • Required works would depend on outcome of current permit application that proposed to convert a portion of the ROW to private land 	
<p>129: ROW (from Council Street to Alexandra Parade)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.2m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – Has two separate E-W sections connected to the northern portion via 90 degree bends, with no splays provided on any corners. <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Long and high development potential • Could be made one-way 	
<p>130: ROW (from Hilton Street to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.2m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Concrete <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length 	



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Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>131: Hilton Lane (from Council Street to Alexandra Parade)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.1m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Asphalt <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Long and narrow • Could be made one-way 	
<p>132: ROW (from Noone Street to Alexandra Parade)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.6m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Asphalt <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Could be made one-way • Limited development potential 	
<p>133: ROW (from Alexandra Parade to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 3.0m- 5.6m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone <p>Layout features – Has a T-head at its end, with no splays, however laneway is wider in vicinity of intersection.</p> <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length • Limited development potential 	

Appendix B

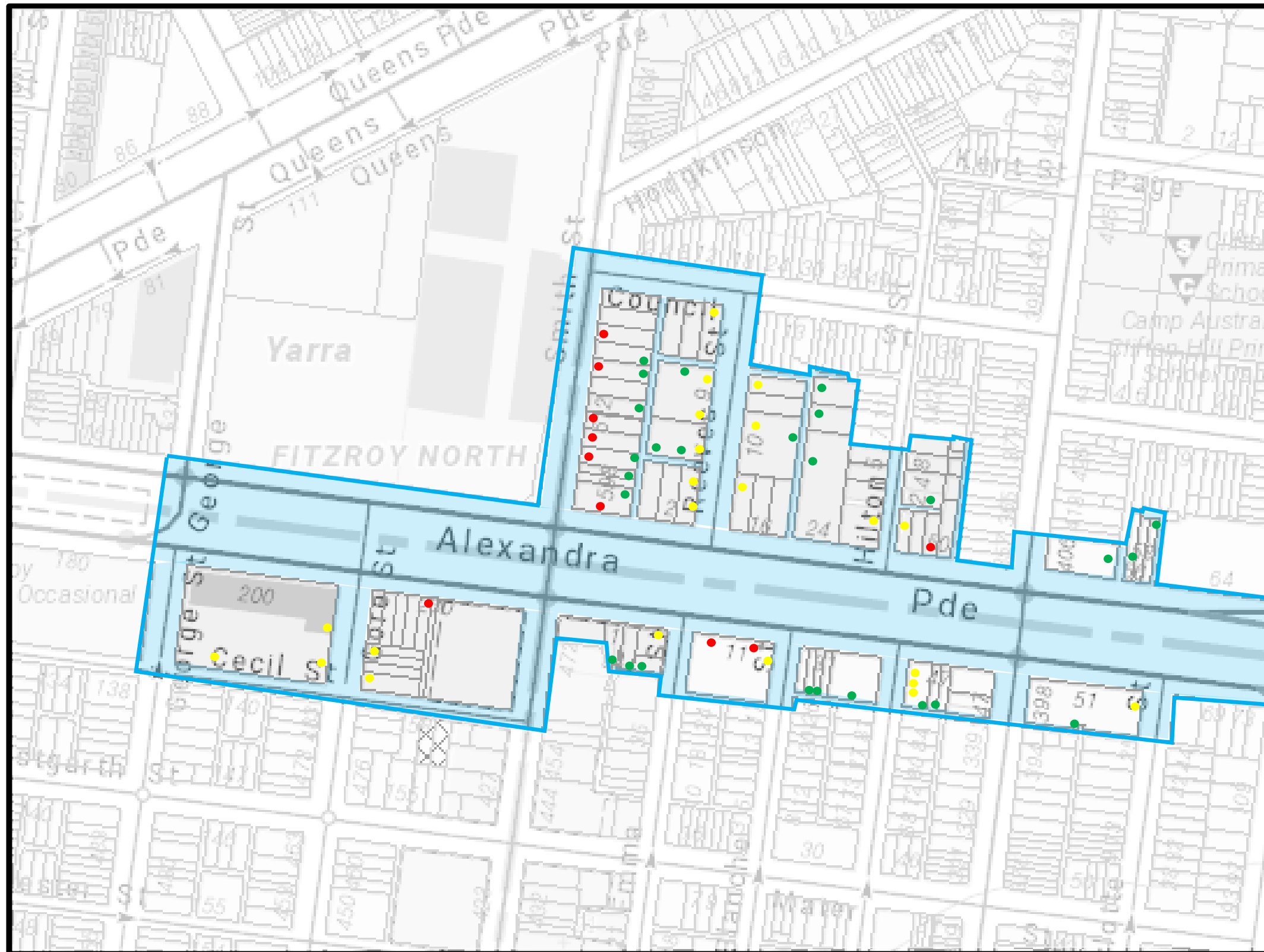
Brunswick Street & Smith St Activity Centre Traffic Study – Extended Area: Existing Road Network

Street Name	Description	Photo
<p>134: Copper Lane (from Alexandra Parade to Noone Street)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.2m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone • Layout features – Has a T-head at its end, with no splays, however laneway is wider in vicinity of intersection. <p>Constraints: Partially constrained</p> <ul style="list-style-type: none"> • Could be made one-way • Limited development potential 	
<p>135: ROW (from Alexandra Parade to END)</p>	<p>Existing Conditions:</p> <ul style="list-style-type: none"> • Carriageway width – 4.2m • Traffic management – Two-way • Parking – No parking • Footpath – No footpath • Material – Bluestone <p>Constraints: Unconstrained laneway</p> <ul style="list-style-type: none"> • Short in length • Limited development potential 	



Appendix C

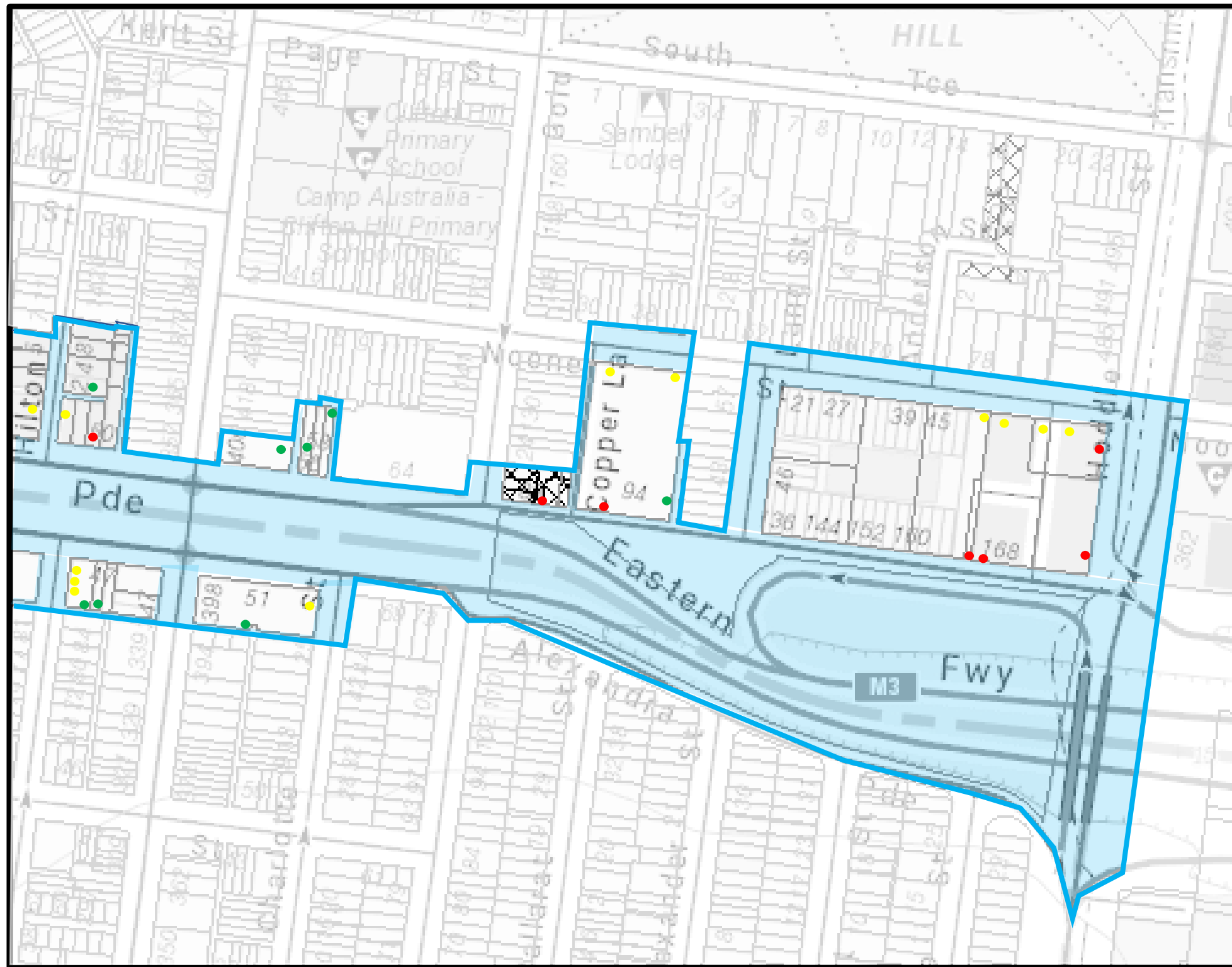
Existing Access Arrangements



MAP NO.1





Legend

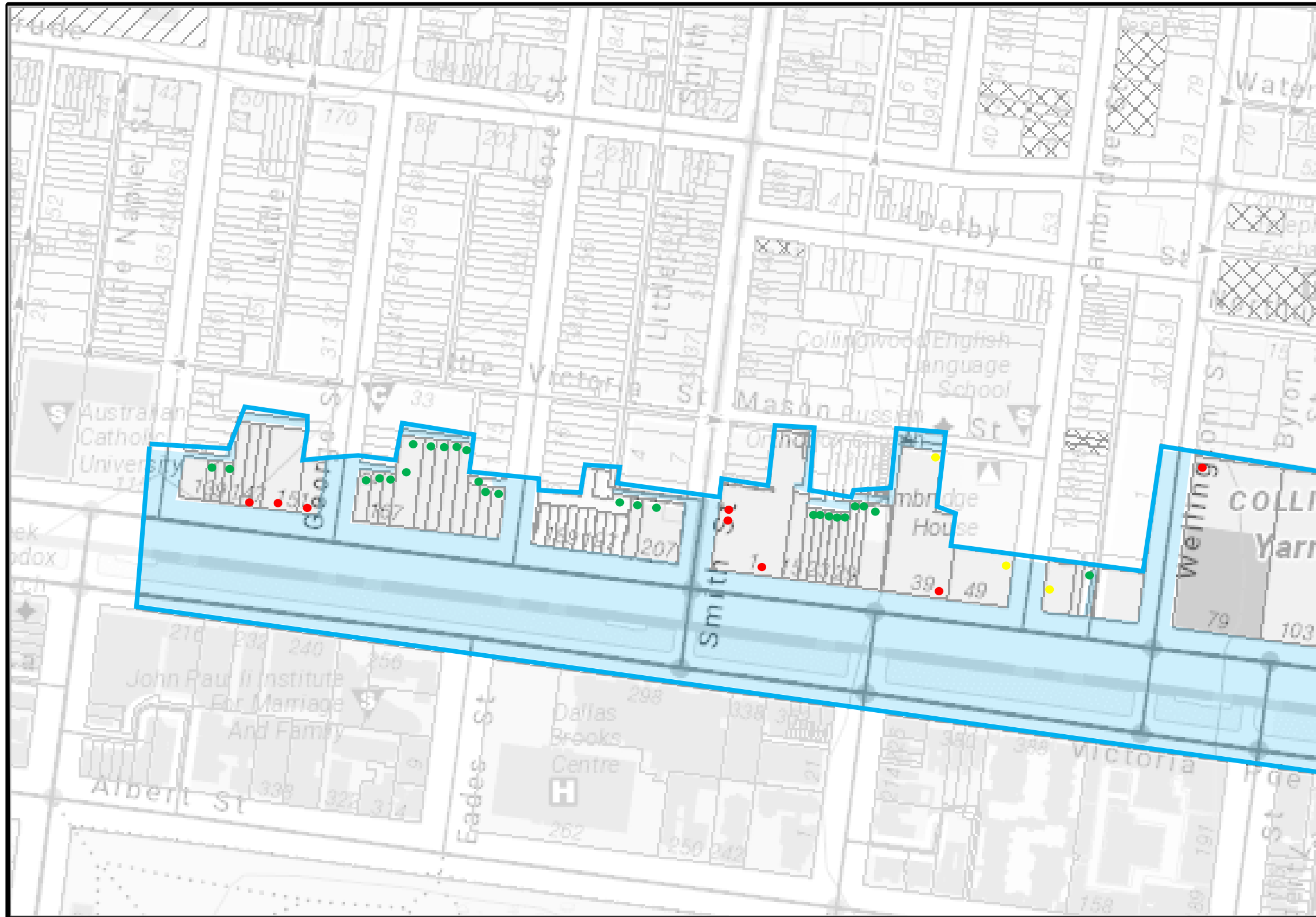
 Study Area Boundary	 Access to RoW
 Access to Alexandra Pde	 Access to side street



MAP NO.2

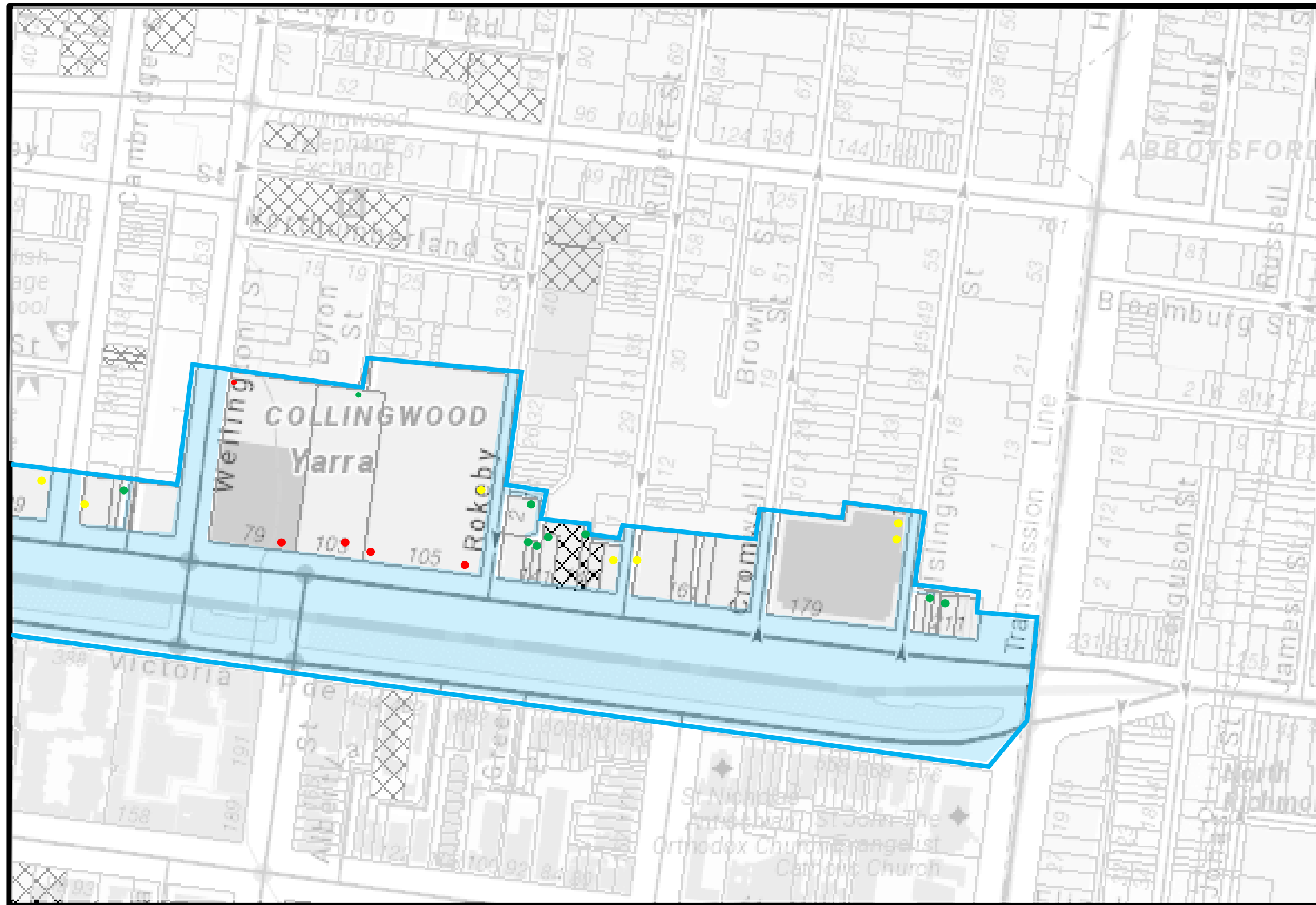
Legend

 Study Area Boundary	 Access to RoW
 Access to Alexandra Pde	 Access to side street



MAP NO.3





MAP NO.4

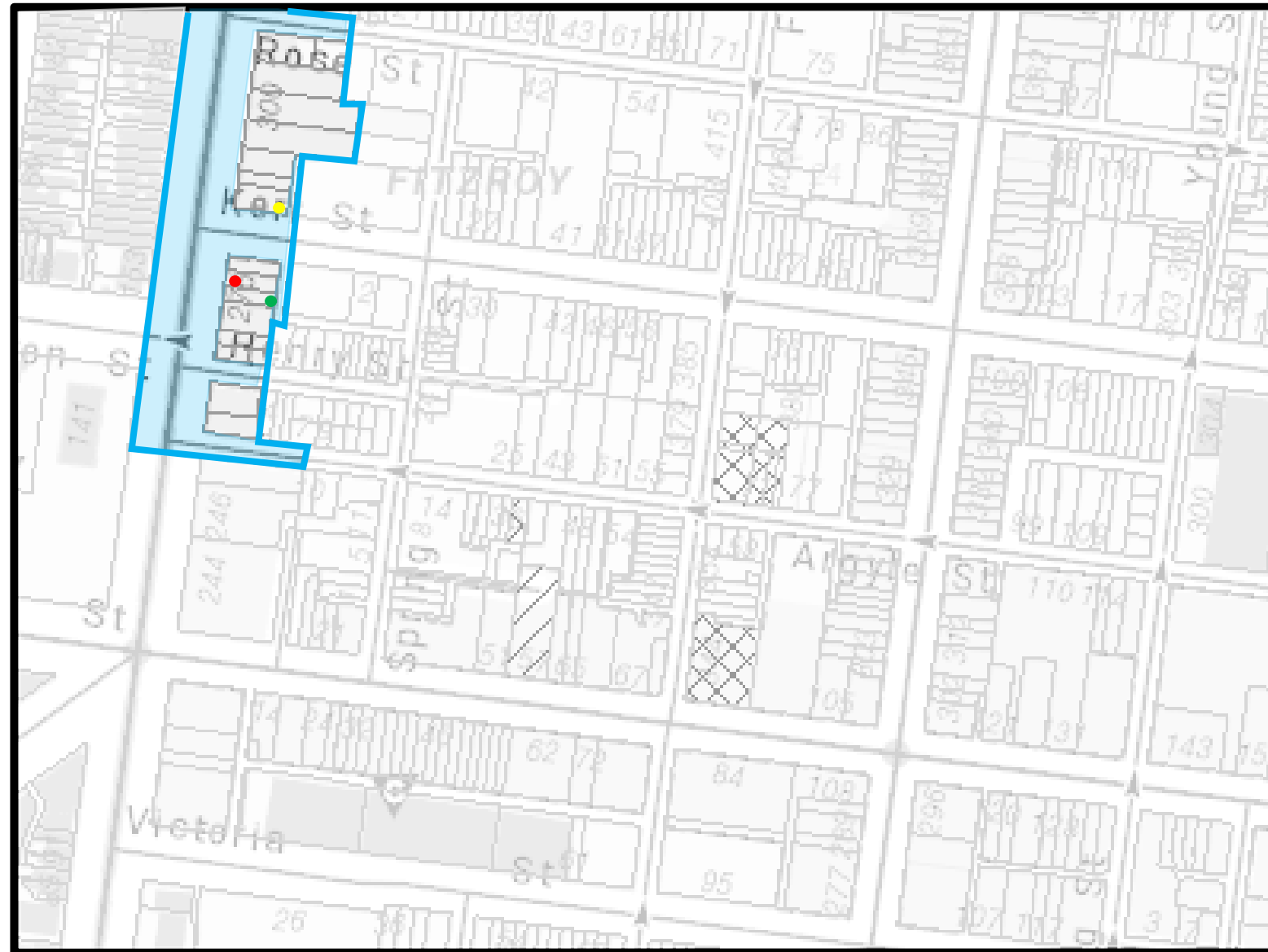
Legend

 Study Area Boundary	 Access to RoW
 Access to Victoria Pde	 Access to side street



MAP NO.5

Legend	
 Study Area Boundary	 Access to RoW
 Access to Nicholson St	 Access to side street



MAP NO.6

Legend

- Study Area Boundary
- Access to Nicholson St
- Access to RoW
- Access to side street