Strategic Cycling Corridors Review

Priorities for Metropolitan Melbourne

Prepared by CDM Research for RACV

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Executive Summary

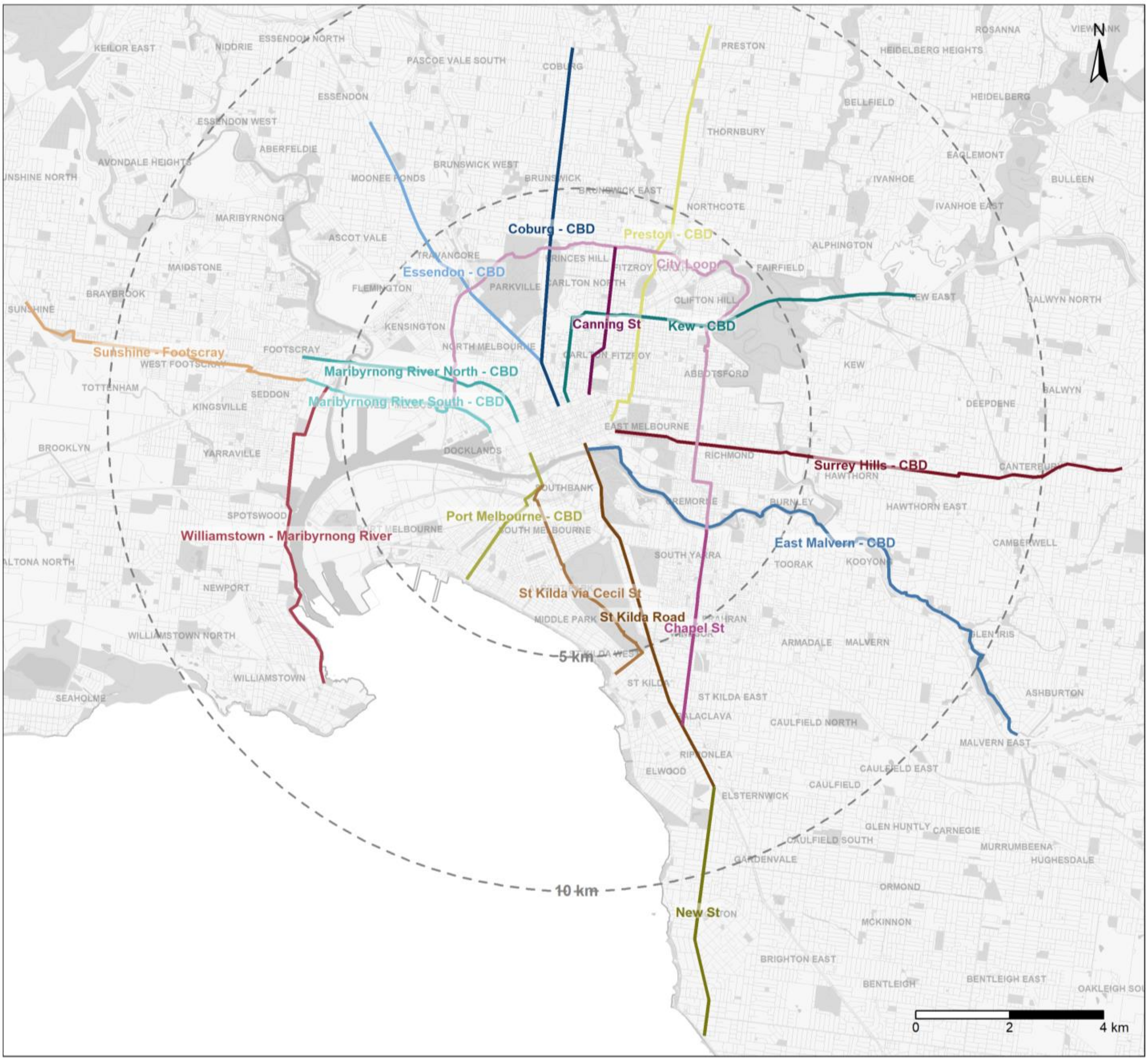
CDM Research was commissioned by the RACV to review the existing Strategic Cycling Corridors (SCCs) and identify a subset of routes which may offer the greatest potential for meeting the objectives of the *Victorian Cycling Strategy 2018-28*. The strategy is focussed on encouraging cycling for transport and the SCCs are envisaged as the “arterials” of the network that connect major activity centres. The study was confined to metropolitan Melbourne.

The review used a simple scoring system to rate each SCC based on attributes such as:

- existing and potential cycling demand for transport,
- cycling safety,
- proximity to residential population and primary and secondary schools,
- network connectivity,
- technical feasibility, and
- potential mode shift from motor vehicle and public transport.

Spatial analysis was performed using the SCCs identified by VicRoads and relevant spatial data, including population, school enrolments and cyclist crash history. This spatial analysis provided quantitative data which was then complemented by subjective scoring of issues such as technical feasibility and potential mode shift. Corridors with the highest scores were identified as having the greatest alignment with the *Victorian Cycling Strategy*, and therefore warrant prioritisation over other corridors.

These corridors are shown in Figure EX.1. The corridors are predominantly radial and serve the Melbourne CBD and suburban areas out to around 10 km. An orbital route extends from Chapel Street in the southeast and along the Capital City Trail through Carlton and Flemington. There are a total 17 trunk corridors with a total length (excluding overlapping routes) of 128 km. It is suggested these routes have the greatest potential of meeting the objectives of the strategy, specifically of encouraging transport cycling activity.



■ **Figure EX.1: Trunk corridors**

1 Introduction

1.1 Strategic context

The *Victorian Cycling Strategy 2018-28* states that:

> *Strategic cycling corridors are the main routes of the bicycle network, like arterials are the main routes of the road network.*
>
> *They are a subset of the Principal Bicycle Network (PBN) which is a high-level plan for some 3,500 km of existing and proposed on- and off-road cycling routes.*
>
> *Strategic cycling corridors are the most important routes for people cycling for transport as they link up important destinations: the central city, national employment and innovation clusters, major activity centres and other destinations of metropolitan or state significance.*
>
> (Victorian Cycling Strategy 2018-28, p. 20)

The Strategic Cycling Corridors (SCCs) have been developed over a number of years by the State government in conjunction with local governments. In the most recent revision (May 2017) there were around 2,300 km of routes identified across Victoria (excluding duplicated sections). This is around 30% of the total Principal Bicycle Network (PBN) (around 7,200 km) measured by distance. The SCCs are around 0.5 – 1.0 km apart in the inner city and around 2 km apart in outer suburban areas (Figure 1.1). The network serves both as radial connections to the inner city and suburban activity centres and as orbital connections.

There is dedicated cycling infrastructure on a portion of the network, albeit of varying quality. For example, the River Corridor SCC follows existing shared paths along Scotchmans Creek, Gardiners Creek and the Yarra River. Along most corridors there is little to no dedicated cycling infrastructure such that bicycle riders share roadspace with motorists.

While the SCCs serving the inner city and major activity centres (e.g. Box Hill, Footscray and the Monash University precinct in Clayton) could reasonably be argued to have a significant transport function consistent with the Victorian Cycling Strategy many other corridors are instead likely to be predominantly used by recreational riders. Examples include the Pakenham to Koo Wee Rup, M80 Ring Road Trail, Healesville to Lilydale Trail and Bittern to Dromana SCCs. Indeed, it is not clear how these corridors are consistent with the stated objective of the Victorian Cycling Strategy.

Many of the SCCs, particularly in inner suburban areas, run along highly contested corridors with multiple modes competing for access (e.g. Sydney Road, St Kilda Road, Bridge Road). There would be significant operational challenges in providing high quality cyclist provision along these corridors, for which compromises – most likely in terms of motor traffic capacity and on-street parking – would need be made. Moreover, there is very limited funding available to build this network. As such, it seems prudent to focus on a core network of routes which may encourage as much transport cycling as possible from limited funding and do as much as possible to complement the existing transport network in areas of greatest need. We refer to these routes as “trunk corridors” in this report. This approach is similar to that adopted by Transport for London with their cycling superhighways.

■ **Figure 1.1: Strategic cycling corridors**

1.2 Objectives of trunk corridors

The proposed vision for these cycling trunk routes is:

> *Cycling trunk corridors are attractive and safe for competent adults to ride to workplaces, education and shops in a way that is time-competitive with driving or taking public transport.*

We note the following with reference to this vision:

- It is assumed the routes would be designed for **competent adults**: this means adults with reasonable bicycle handling skills but whom are unlikely to find riding on busy roads with traffic **attractive** unless provided with some form of protection. Further, it is assumed that the corridors will at least in part be within the road reserve in highly trafficked areas such that they are unlikely to be suitable for unaccompanied young children (particularly at intersections).
- Cycling to **workplaces**, **education** and **shops**: cycling is chosen to travel from A to B for transport, rather than being as a recreational activity. This implies travel time will be a significant factor in determining the attractiveness of cycling *vis a vis* competing modes.

This prioritisation seeks to identify routes which have the greatest likelihood of achieving this vision. That is:

> *Cycling trunk corridors will have high cycling demand, either existing or latent, and offer the greatest potential to reduce cycling crashes.*

This implies that:

- There will very likely be high existing cycling demand on the corridor, given that corridors with high crash frequency tend also to be locations with high cycling demand[1].
- Cycling will offer a comparative advantage compared to other modes for transport trips. That is, driving and public transport will be comparatively unattractive given congestion or crowding and a lack of parking. In turn, this suggests the corridors will feed into major activity centres – most notably the Melbourne CBD and surrounding areas.

These objectives imply routes that serve high population and high workplace density, and with significant constraints on car and/or public transport use, will be assigned a high priority.

[1] There is a significant difference here between crash *frequency* and *risk*; Punt Road, Bell Street and Alexandra Parade have low crash frequency (because there are few riders) but high crash risk (because of the volume and speed of motor vehicles, and absence of cycling infrastructure). Routes such as St Kilda Road and Sydney Road have high crash frequency but *may* have low crash risk (as there are many riders).

1.3 Methodology

In order to identify trunk corridors the existing proposed SCC network was reviewed, as were variations of existing SCC routes that seem intuitively plausible. A simple scoring system was developed to assess each corridor across criteria which are likely to affect how readily each SCC can contribute to the vision for the trunk corridors (which, in turn, is related to the objective of the SCCs).

While necessarily subjective, every attempt was made to maximise the objectivity and repeatability of the scoring system:

- the levels for each attribute are clearly articulated, using quantitative criteria wherever practicable, and
- readily available data was used to inform the scoring system.

This scoring system identified the highest priority routes, which were then reviewed to identify a coherent network of routes that together are most likely to achieve the stated objective of encouraging transport cycling.

2 Scoring system

The scoring system identified key factors that are likely to contribute to a route meeting the investment objectives. The attributes used are described in Table 2.1. It is noted there is some double-counting across some attributes. For example, a corridor with high crash history (safety) is likely to also have high existing demand.

Each of the attributes are assigned a score from 1 to 5. Higher scores are "better", such that corridors with a higher overall score would be expected to be prioritised as a trunk corridor. To encourage a level of consistency the scores are defined quantitatively wherever possible and are described in Table 2.2. The thresholds for the quantitative variables were determined from a preliminary spatial analysis.

- **Table 2.1: Attributes**

Attribute	Description
Safety	Corridors are likely to have a pre-existing crash history, quite likely because of high existing demand.
Existing demand	The investment should improve conditions for as many existing riders as possible. Further, existing demand is likely to be a good predictor of latent demand. That is, existing riding suggests many of the motivators for cycling already exist, at least to some extent. Existing demand can be fairly reliably estimated, unlike latent demand (see below)
Latent demand	Population and workplace density, demographics and the unattractiveness of the existing road and path network result in a fair likelihood of high latent demand for riding. Areas of high latent demand will meet all these conditions. However, the prediction of latent demand will be subject to uncertainty.
Network connectivity	Corridors that connect existing cycling infrastructure will likely extend the catchment and facilitate more latent demand, particularly where that existing infrastructure is of high quality.
Technical feasibility	Qualitative assessment of the likely technical challenges. These may be related to cost, for example if a bridge or tunnel is likely to be required. Road management or political issues such as roadspace reallocation (e.g. on-street parking or traffic lane removal) are not considered.
Road congestion benefits	Potential for mode shift from car to bicycle, and pre-existing level of traffic congestion. CBD-destined trips may have small mode shift from car given low pre-existing car mode share. Excludes adverse congestion impacts that may accrue from reallocating roadspace from motor traffic to cycling.
Public transport crowding benefits	Potential for mode shift from public transport to bicycle, and pre-existing level of public transport crowding. CBD-destined trips may have significant mode shift from PT given high pre-existing PT mode share.

Table 2.2: Attribute level descriptions

	Level				
Attribute	**1**	**2**	**3**	**4**	**5**
Safety	<1 rider crashes / km / yr	1-<2 rider crashes/km/yr	2-< 3 rider crashes/km/yr	3-< 4 rider crashes/km/yr	4+ rider crashes/km/yr
Existing demand	<50 riders/day	50-99 riders/day	100-199 riders/day	200-499 riders/day	500+ riders/day
Latent demand	Low density residential or employment area, few trip attractors (e.g. schools, shops, workplaces) within 200 m catchment				Very high residential and employment density along corridor (e.g. Melbourne CBD)
School student density	< 100 students / km within 200 m catchment	100 - <200 students / km within 200 m catchment	200 -< 300 students / km within 200 m catchment	300 - <400 students / km within 200 m catchment	400+ students / km within 200 m catchment
Network connectivity	No cyclist provision in vicinity of corridor, and poor or few roads attractive to riding				Connects existing high-quality cycling infrastructure that is contiguous and connects major trip generators and attractors
Technical feasibility	Very challenging corridor with few options without significant costs				Very easy corridor, e.g. greenfield development or pre-existing corridor
Road congestion benefit	Minimal congestion and/or mode shift from car				Very high congestion and mode shift from car
Public transport crowding benefit	Minimal PT crowding and negligible mode shift from PT				High PT crowding and mode shift from PT

3 Datasets

Data to assist the prioritisation was obtained from:

- Strategic cycling corridor spatial layer from http://data.vic.gov.au dated May 2017,
- cyclist crash statistics from VicRoads Road Crash Information System (RCIS), using the most recent five full calendar years (i.e. 2013 – 17),
- population catchments from the 2016 ABS Census of Population and Employment (SA1 geography[2]),
- employment catchments from the 2016 ABS Census of Population and Employment (DZN geography[3]),
- origin-destination commuting travel from the 2016 ABS Census of Population and Employment (SA2 residential zones to DZN workplace zones),
- existing cyclist counts from VicRoads automatic cyclist counters (where available) and manual counts where available obtained from other sources[4], and
- school location data and enrolments from the Department of Education and Training (https://www.data.vic.gov.au/data/dataset/school-locations-2017, https://www.data.vic.gov.au/data/dataset/all-schools-fte-enrolments-feb-2017) .

In considering the analysis in the following sections it should be noted that some SCCs are incompletely, or incorrectly, coded in the SCC spatial layer. For example, the Coburg to CBD layer extends only as far north as Royal Parade near Princes Park rather than farther north along the Upfield Trail or Sydney Road to Coburg. A few minor errors have been corrected as part of this analysis, but a more complete review and correction was not undertaken. While this will lead to erroneous results where the SCC is incorrectly coded it is anticipated the prioritisation would not be markedly different.

Cyclist crashes were obtained using a 20 m buffer around the SCC. This buffer accommodates small variations between the SCC geography and the crash locations, as well as wide roads, particularly divided roads such as St Kilda Road where the crash location may be coded on the main carriageway or within the service roads.

The population, employment and student densities are calculated as linear densities. That is, the total count within the catchment is divided by the corridor length. In this way shorter corridors are not unduly penalised compared to longer corridors, as the latter will almost invariably tend to have higher populations than shorter corridors.

Catchments were arbitrarily set at 200 m from the SCC. For populations all SA1 zones that were even partially within a 200 m buffer were used in the population calculation, resulting

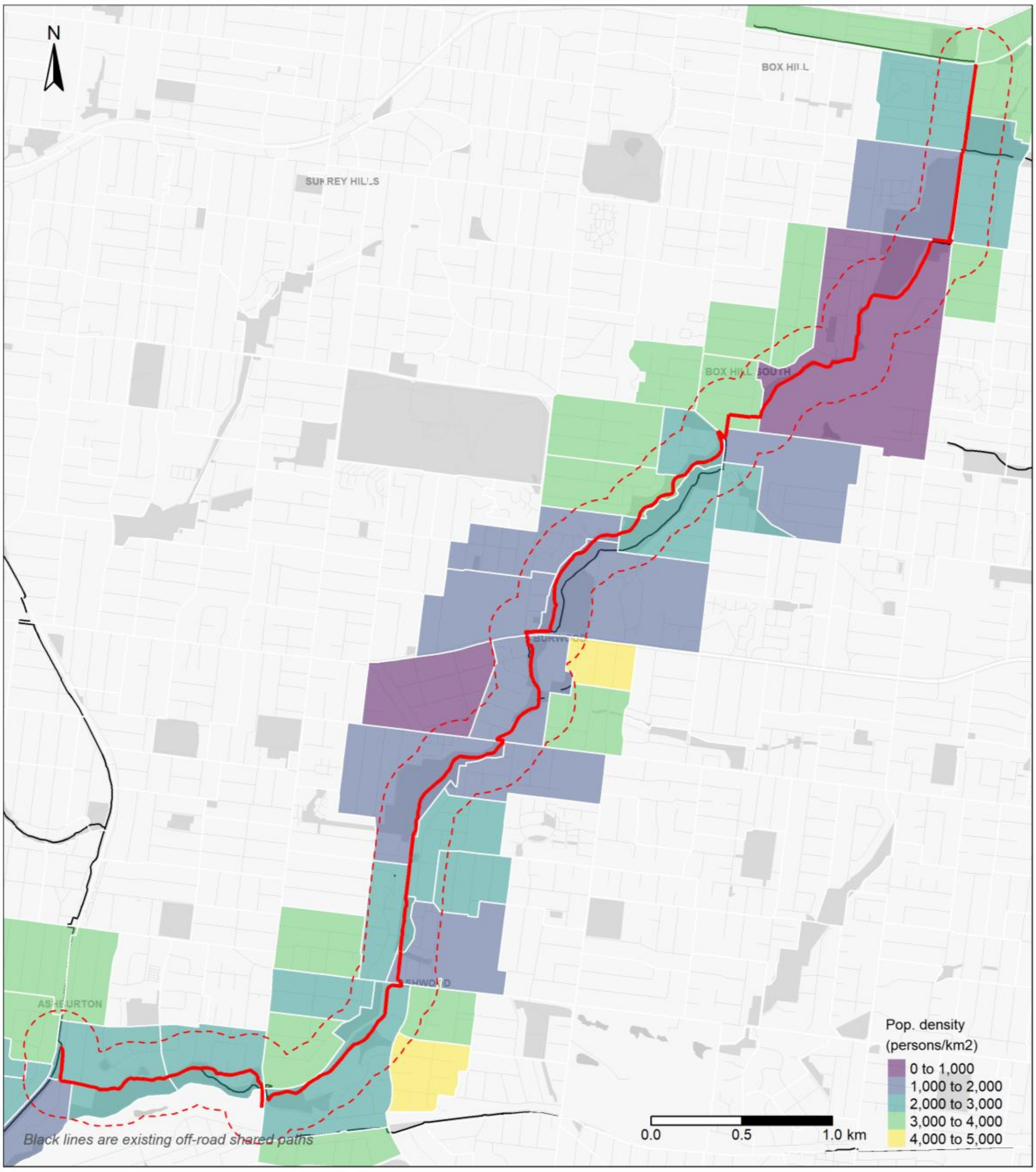
[2] SA1 is the smallest ABS geographic unit and have a population of between 200 and 800 people, with the most typical being around 400.

[3] Destination zones, or DZNs, are set by state transport agencies and are not official ABS geographies. Nonetheless, they roughly accord with SA2s (i.e. roughly suburbs).

[4] The other sources included Bicycle Network Super Tuesday counts and counts obtained along the corridor as part of other studies.

in an effective catchment that is somewhat larger. Moreover, in areas of low population density the SA1 zones are larger, such that the effective catchment will be larger than in more densely populated areas. An equivalent process was applied to SA2 and DZN zones for the employment analysis. An example is shown in Figure 3.1.

School locations were obtained using the school centroid location from the DET dataset and a 200 m buffer.

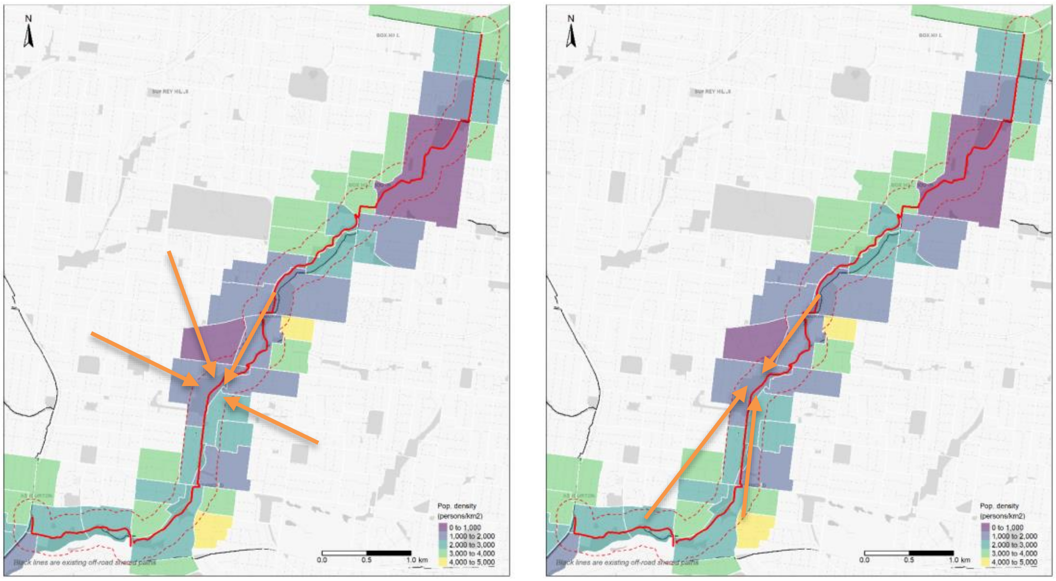


■ **Figure 3.1: Example population catchment (Box Hill - Ashburton SCC), colours are population density (persons/km²)**

Commuter demand was considered in two ways, both using the 2016 census:

- Total employment counts at the destination zone (DZN), which incorporates all commuter movements to that zone (Figure 3.2a).
- Commuter flows that **only** originate within the 200 m residential catchment **and** have a destination within the 200 m catchment (Figure 3.2b).

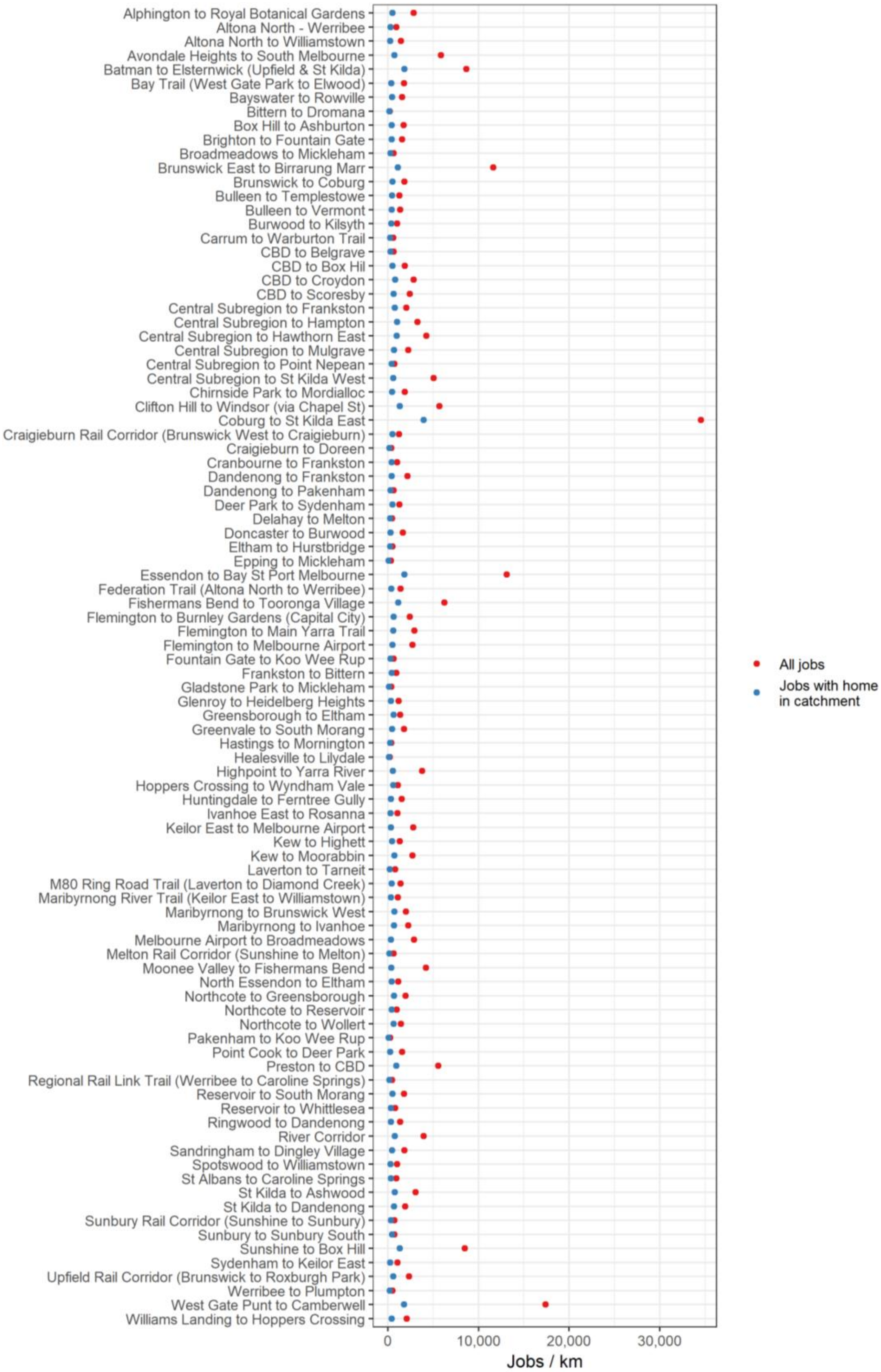
The second of these methods results in much lower estimates of the potential "commuting market" for the corridor. This is also likely to be the more realistic estimate of the potential commuting market given that, for example, commuting mode choice from a trunk corridor along Sydney Road is unlikely to influence a commuter trip from Thornbury to Sydney Road (as most of this trip would be perpendicular to Sydney Road). The total employment and employment only starting and finishing within each corridor is provided in Figure 3.3



(a) Employment counts from all home locations

(b) Commuter flows from home locations in catchment

■ **Figure 3.2: Employment flows**



■ **Figure 3.3: Total employment and employment with home within catchment**

4 Corridor statistics

Summary statistics for the strategic cycling corridors are presented in Figure 4.1. The corridors are ordered from those with the greatest crash frequency (per kilometre) to least crash frequency. The key findings from this analysis are:

- Many strategic cycling corridors have negligible crash history (although this does not mean they present negligible risk of injury to riders - in many cases the opposite will be true).
- Strategic cycling corridors with high crash rates include the Clifton Hill to Windsor (Chapel Street), Coburg to St Kilda East (Upfield Trail, Royal Parade, Elizabeth Street, Collins Street, Spencer Street, Cecil Street) and Central Subregion to Hampton (St Kilda Road, New Street) routes.
- Population density (per kilometre of route) is, unsurprisingly, highest for corridors in the inner city. By far the densest corridor is Coburg to St Kilda East.
- Commuting trip density is highest for Coburg to St Kilda East, although it is reiterated the spatial coding for this site extends only as far north as Princes Park. Commuting trip density is high for all the inner city corridors.
- School student density (per kilometre of route) is highest for the Central Subregion to Hampton, Kew to Moorabbin (Glenferrie Road, Tooronga Road, Frankston railway corridor) and Central Subregion to Mulgrave (Main Yarra Trail, Gardiners Creek Trail, Glen Waverley railway corridor, Watsons Road).

Overall, the top six SCCs (down as far as Essendon to Bay St Port Melbourne) appear to be high on all three statistics, and distinctly so compared to most other corridors.

■ **Figure 4.1: Strategic cycling corridor statistics**

5 Prioritisation

5.1 Strategic cycling corridors

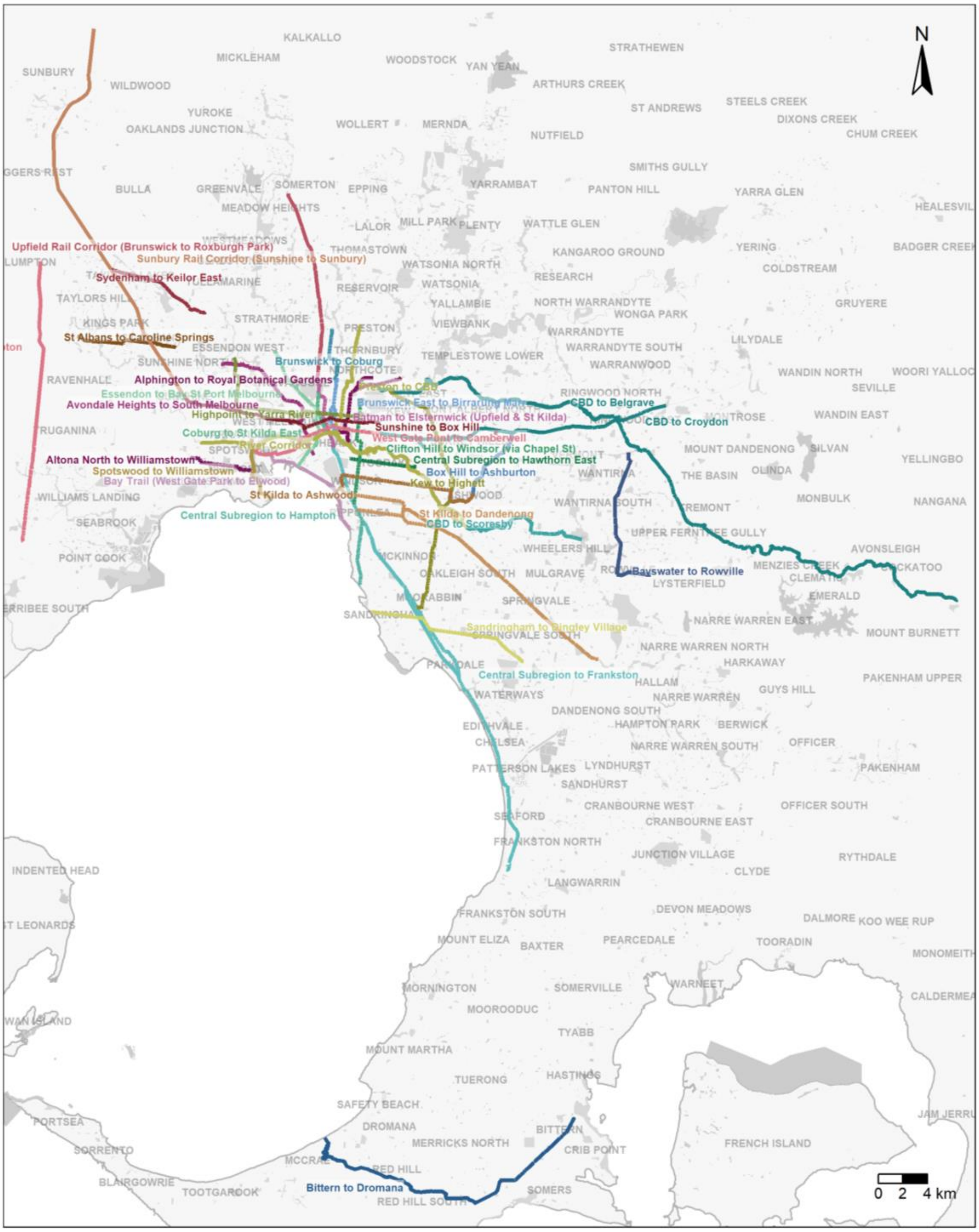
The SCCs considered to have the greatest prospect of meeting the investment objectives and having a high crash history, population or student catchment based on the analysis in Section 4 were subject to the scoring system. In addition, to benchmark the scoring system a range of other representative SCCs were selected to test the approach. The scores and results are presented in Table 5.1 and the SCCs themselves are mapped in Figure 5.1.

In interpreting the results of this table it is emphasised that the implied precision should not be taken literally. That is, a difference of one or two units in the total score should be interpreted as meaning there is no discernible difference between the corridors. With this caveat in mind it is suggested there are three main groups in this analysis:

- "High" corridors (scores ≥ 30):
  - There are five corridors with scores above 30 and include routes along Chapel Street (Clifton Hill to Windsor), St Kilda Road (Batman to Elsternwick), Canning Street and Exhibition Street (Brunswick East to Birrarung Marr), Napier Street (Preston to CBD) and Royal Parade (Coburg to CBD).
  - These sites are all predominantly in inner suburban areas where there are significant deterrents to private car use (i.e. congestion and parking) but have good public transport.
- "Moderate" corridors (scores 20 – 29):
  - Corridors that serve predominantly middle suburban areas, often feeding into the inner city.
  - Generally longer than the highest scoring corridors, reflecting diminishing marginal returns as corridors extend into lower demand middle and outer suburban areas.
- "Low" corridors (scores < 20):
  - Generally outer suburban corridors with low population and employment density and rarely feed into major activity centres (and certainly not the Melbourne CBD).
  - In some instances these are relatively short local routes that are likely to serve a more localised transport function, or are predominantly recreational or sport cycling-focussed.

Table 5.1: SCC prioritisation

CORRIDOR	Length (km)	Crashes/yr /km	AADT	Population linear density (pers/km)	Student linear density (students/ km)	Commuting density (trips/km)	ATTRIBUTE								TOTAL
							Safety	Existing demand	Latent demand	Schools	Network connectivity	Technical feasibility	Road congestion benefit	PT crowding benefit	
Clifton Hill to Windsor (via Chapel St)	9.5	4.8	1,400	4,995	407	1,311	5	5	5	5	4	4	5	4	37
Brunswick East to Birrarung Marr	7.9	3.1	2,000	5,156	253	1,104	4	5	4	3	5	4	5	5	35
Batman to Elsternwick (Upfield & St Kilda)	17.5	2.8	2,100	5,042	210	1,832	3	5	5	3	5	3	5	5	34
Preston to CBD	9.6	1.9	1,000	3,902	349	928	2	5	4	4	4	5	5	5	34
Coburg to St Kilda East	5.7	4.7	2,400	10,070	315	3,967	5	5	4	4	3	4	3	5	33
Central Subregion to Hampton	11.2	3.5	500	4,120	626	1,016	4	5	4	5	3	2	3	3	29
Brunswick to Coburg	5.2	0.6	800	4,332	297	503	1	5	4	3	4	4	3	4	28
Alphington to Royal Botanical Gardens	12.3	1.6	400	2,533	143	517	2	4	4	2	4	4	4	4	28
West Gate Punt to Camberwell	23.3	0.0	600	929	76	1,777	1	5	5	1	4	4	3	5	28
St Kilda to Ashwood	14.3	1.0	400	3,667	466	790	2	4	4	5	4	4	3	2	28
Box Hill to Ashburton	9.9	0.0	600	2,400	207	416	1	5	3	3	5	5	3	2	27
Avondale Heights to South Melbourne	13.9	1.0	2,000	3,069	106	744	2	5	4	2	4	3	3	4	27
Upfield Rail Corridor (Brunswick to Roxburgh Park)	15.6	0.2	1,100	1,996	29	592	1	5	3	1	4	4	4	5	27
River Corridor	37.0	0.2	2,000	1,786	62	781	1	5	3	1	4	5	3	5	27
Essendon to Bay St Port Melbourne	13.1	2.5		5,214	271	1,831	3	1	4	3	4	4	3	5	27
Bay Trail (West Gate Park to Elwood)	17.5	2.8	1,300	5,042	210	403	3	5	2	3	4	5	2	2	26
Sunshine to Box Hill	18.8	1.8	700	4,380	26	1,335	2	5	4	1	4	3	2	4	25
St Kilda to Dandenong	34.3	0.5	200	2,875	219	683	1	4	4	3	3	4	4	2	25
Highpoint to Yarra River	15.9	1.6		3,012	155	576	2	1	4	2	3	4	4	5	25
CBD to Scoresby	26.7	0.1	600	1,996	89	632	1	5	2	1	5	5	3	2	24
Central Subregion to Hawthorn East	5.5	0.9	800	4,615	57	985	1	5	5	1	2	2	4	4	24
Kew to Highett	22.5	0.2	500	2,504	219	459	1	5	3	3	4	4	3	1	24
Spotswood to Williamstown	6.2	0.4	700	1,007	41	309	1	5	3	1	3	5	3	3	24
CBD to Box Hill	12.2	0.4	600	2,924	387	539	1	5	4	4	2	2	3	2	23
CBD to Croydon	25.7	0.2	500	2,447	193	839	1	5	2	2	3	3	4	2	22
CBD to Belgrave	99.5	0.0	300	877	47	323	1	4	3	1	3	5	3	2	22
Central Subregion to Frankston	49.4	0.8	500	2,594	272	763	1	5	3	3	2	2	2	2	20
Broadmeadows to Mickelham	33.4	0.2	200	1,337	58	307	1	4	2	1	3	5	3	1	20
Sydenham to Keilor East	18.8	1.8	200	4,380	26	284	2	4	2	1	3	4	2	2	20
Sunbury Rail Corridor (Sunshine to Sunbury)	35.7	0.0	200	1,255	67	334	1	4	2	1	3	5	2	2	20
Altona North to Williamstown	5.6	0.6	200	2,282	80	253	1	4	3	1	3	4	2	1	19
Altona North to Werribee	27.7	0.2	300	1,076	70	300	1	4	3	1	3	4	2	1	19
Bayswater to Rowville	16.8	0.0	200	1,543	36	478	1	4	3	1	3	3	2	1	18
St Albans to Caroline Springs	8.7	0.0	200	2,591	83	347	1	4	3	1	2	4	2	1	18
Werribee to Plumpton	23.3	0.0	300	929	76	233	1	4	2	1	1	4	3	1	17
Sandringham to Dingley Village	13.9	0.3	100	1,961	114	470	1	3	2	2	2	4	2	1	17
Bittern to Dromana	29.0	0.0	50	301	25	167	1	2	1	1	1	4	2	1	13



■ **Figure 5.1: Select strategic cycling corridors subject to scoring system**

5.2 Trunk corridors

The highest-ranking SCC corridors were selected and then mapped. This mapping was then used to subjectively identify priority routes that would:

- in *combination* likely complement one another and serve a wider geographic market, and
- predominantly serve the inner city with a focus on radial connections into the Melbourne CBD.

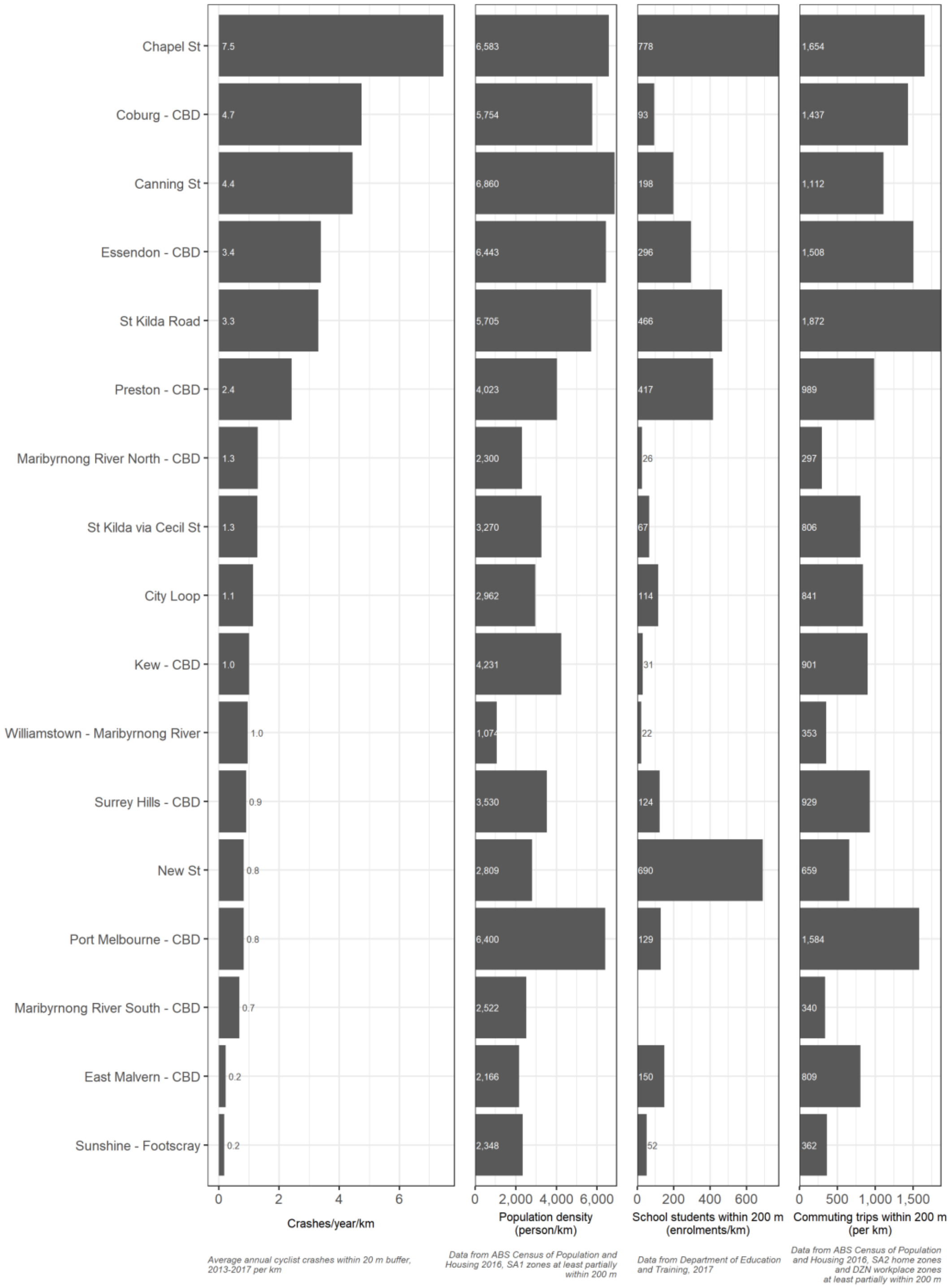
The resulting network of 17 routes are shown in Figure EX.1. The most notable features of this network are the following:

- radial routes in all directions from the CBD along major arterials (e.g. St Kilda Road, Royal Parade, Bridge Road and Footscray Road) and existing river corridors (i.e. Main Yarra Trail),
- an orbital route connecting densely populated inner-city suburbs and the radial routes running along Chapel Street, Lennox Street and the Capital City Trail,
- corridors generally extend out to around 10 km from the CBD, and
- in three instances a middle-suburban extension to the corridor (i.e. Sunshine – Footscray and Williamstown – Maribyrnong River extensions to the Maribyrnong River South – CBD corridor, New Street Brighton extension to St Kilda Road and Chapel Street corridors).

The key statistics for each corridor are shown in Figure 5.2 and reflect similar results as for the strategic cycling corridors. Specifically, these are:

- the compelling safety case for action along Chapel Street,
- high population and commuting density along many corridors, and particularly those in the inner city, and
- high student catchments along Chapel Street, St Kilda Road, Preston – CBD and New Street.

The scoring for each corridor is given in Table 5.2. Again, it is suggested there is a compelling case for prioritising Chapel Street, St Kilda Road and the Preston – CBD (i.e. St Georges Road, Napier Street) corridors. Others with high merit include the Canning Street route, Essendon – CBD (i.e. Flemington Road, Mount Alexander Road) and City Loop (Lennox Street and Capital City Trail from Abbotsford to West Melbourne).



■ **Figure 5.2: Trunk corridor statistics**

Table 5.2: Trunk corridors prioritisation

CORRIDOR	Length (km)	Crashes/ yr/km	AADT	Population linear density (pers/km)	Student linear density (students/ km)	Commuting density (trips/km)	ATTRIBUTE: Safety	Existing demand	Latent demand	Schools	Network connectivity	Technical feasibility	Road congestion benefit	PT crowding benefit	TOTAL
Chapel St	4.2	7.5	1,400	6,583	778	1,654	5	5	5	5	4	5	5	3	37
St Kilda Road	7.9	3.3	2,100	5,705	466	1,872	4	5	5	5	5	3	5	5	37
Preston - CBD	9.1	2.4	1,000	4,023	417	989	3	5	4	5	4	5	5	5	36
Canning St	3.3	4.4	2,000	6,860	198	1,112	5	5	4	2	5	4	5	5	35
Essendon - CBD	7.4	3.4	700	6,443	296	1,508	4	5	5	3	4	4	5	5	35
City Loop	16.3	1.1	1,500	2,962	114	841	2	5	4	2	5	5	5	5	33
Coburg - CBD	7.8	4.7	2,000	5,754	93	1,437	5	5	4	1	3	4	5	5	32
East Malvern - CBD	13.6	0.2	2,000	2,166	150	809	1	5	5	2	5	5	5	4	32
New St	5.4	0.8	500	2,809	690	659	1	5	3	5	4	5	4	3	30
St Kilda via Cecil St	5.3	1.3	300	3,270	67	806	2	4	3	1	4	5	5	5	29
Maribyrnong River South - CBD	4.4	0.7	2,000	2,522	0	340	1	5	3	1	5	5	4	5	29
Kew - CBD	9.4	1.0	570	4,231	31	901	2	5	3	1	5	2	5	5	28
Port Melbourne - CBD	3.4	0.8	950	6,400	129	1,584	1	5	3	2	3	4	5	5	28
Maribyrnong River North - CBD	5.1	1.3	300	2,300	26	297	2	4	4	1	3	4	5	4	27
Sunshine - Footscray	7.0	0.2	200	2,282	51	362	1	4	3	1	4	5	3	3	24
Surrey Hills - CBD	11.1	0.9	250	3,530	124	929	1	4	5	2	3	1	4	4	24
Williamstown - Maribyrnong River	7.1	1.0	700	1,074	22	353	1	5	3	1	3	5	3	3	24

6 Conclusion

The present analysis has identified cycling trunk corridors which are consistent with the encouraging cycling for transport, as embedded within the Victorian Cycling Strategy. Moreover, they are consistent with the "strategic" moniker insofar as they form the arterial network of a high-quality cycling network in inner metropolitan Melbourne.

While it is recognised there is spatial inequity through investing solely in the inner metropolitan area it is noted that:

- The constraints on both the public transport and private transport networks are most acute in the inner suburban area.
- The disincentives to private car travel in the inner suburban area (i.e. congestion and parking) are already acute, and likely to remain so. While the public transport network is good compared to outer suburban areas it is congested and often not time competitive with cycling.
- The population density and mixed land use patterns of the inner suburban area contributes to comparatively short travel distances, many of which will be well within comfortable cycling distances.
- Space is most constrained in the inner metropolitan area, and contested between private, public and active transport, such that modes which are most space efficient (i.e. public transport and active transport) ought to be given preferential treatment in the interests of maximising mobility with the finite space available.
- The socio-demographics of many inner suburban areas are more amenable to cycling, and indeed the knowledge economy will rely upon attracting and retaining talent which is attracted to liveable communities with ready access to non-motorised transport.

These arguments suggest that it will be the very high-quality routes in the inner metropolitan area which will encourage the greatest transport cycling activity for a given level of investment. Such arguments are supported by cyclist counts on the existing network which shows far higher cycling activity in the inner suburban area.

6.1 Further work

A number of improvements may be warranted to the spatial analysis used in this study:

- Crash data queries could run additional checks that the crashes within the 20 m buffer around the corridor are not on intersecting roads, particularly where the intersecting road is grade-separated (e.g. the Main Yarra Trail passes underneath a number of roads such as Church Street and Punt Road, the current spatial query will capture cyclist crashes on these roads within 20 m of the path).
- Population and employment catchment estimates may be improved by one or more of the following:
    - testing sensitivity to differing catchment buffers (currently 200 m),

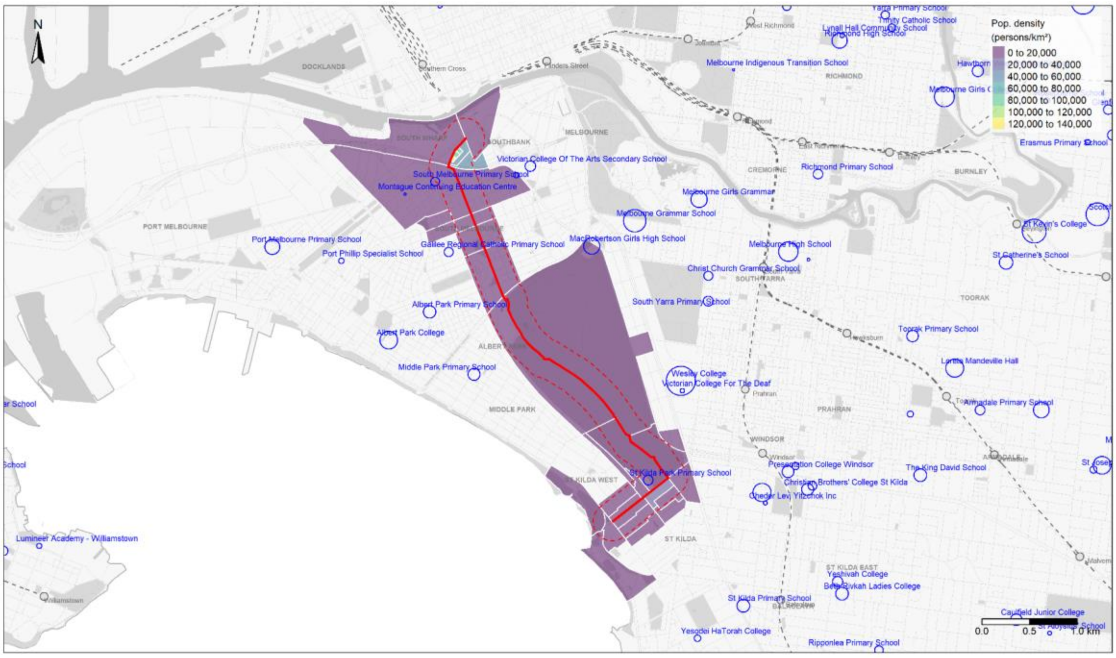
  - apportioning the population (SA1) and employment (DZN) based on the overlapping area of the buffer within the zone, rather than taking the full zone, and
  - applying a network routing algorithm, ideally using weights for link types, such that the effective catchment better handles natural barriers (e.g. rivers and lakes) and is sensitive to network effects (e.g. the presence of a connecting shared path may be expected to increase the effective catchment).
- Census journey to work data may be used to:
  - calculate the existing mode shares, and test scenarios with varying levels of elasticity to riding for pre-existing users of each mode, and
  - estimate demand potential by estimating the trip distance distribution from the origin-destination matrix.
- Education travel is currently only captured for primary and secondary schools, not for tertiary institutions. Further work would be required to obtain tertiary enrolment data by campus and to geocode campus locations.

While these improvements may improve the robustness of the analysis they are unlikely to materially affect the prioritisation.

Other potential areas of further work may include identifying a suite of treatments which would be consistent with the notion of trunk corridors. There is ongoing work within Transport for Victoria and VicRoads establishing guidance for the design of Strategic Cycling Corridors which would meet this need.

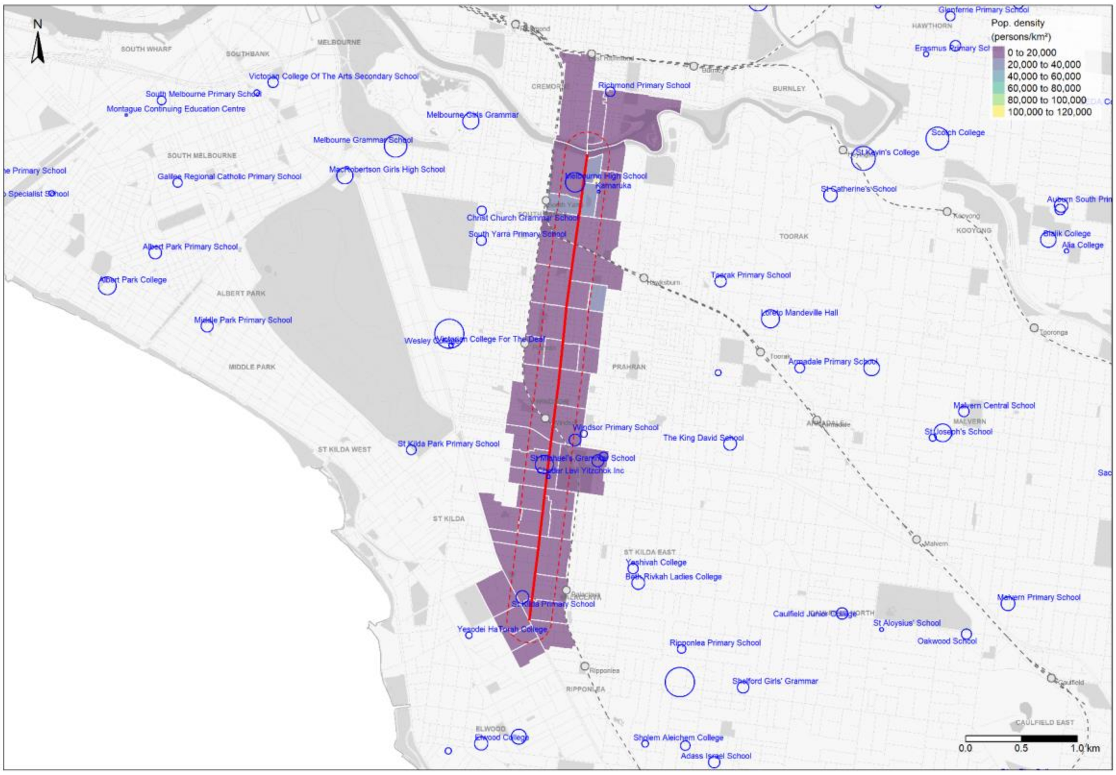
Appendix A: Trunk corridor maps

This appendix provides maps of each of the trunk corridors and includes population density within the catchment.

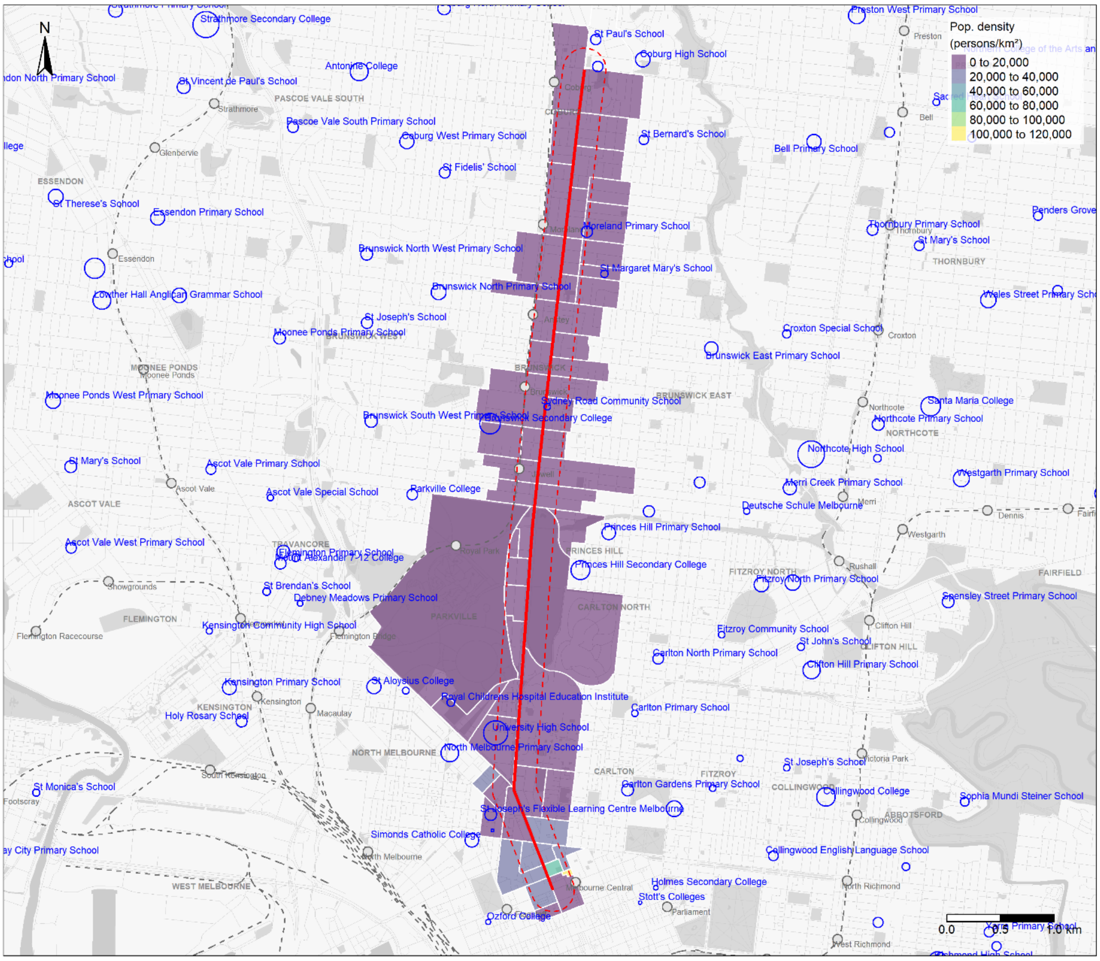


■ **Figure 6.1: St Kilda via Cecil St**

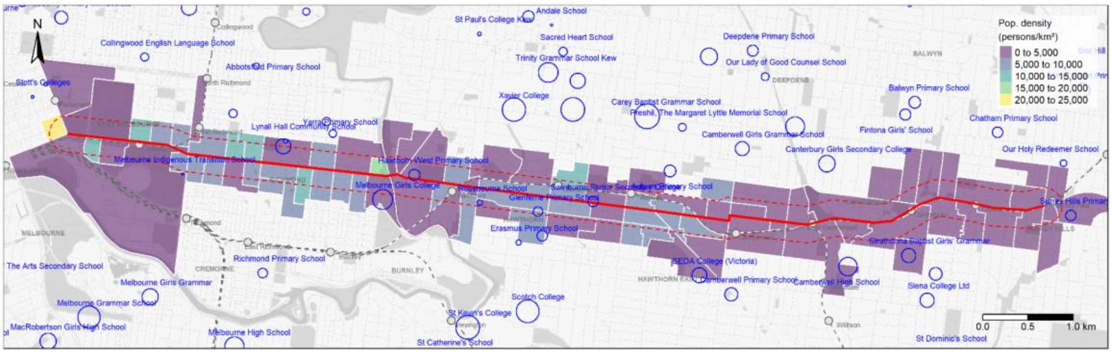
■ **Figure 6.2: Canning St**



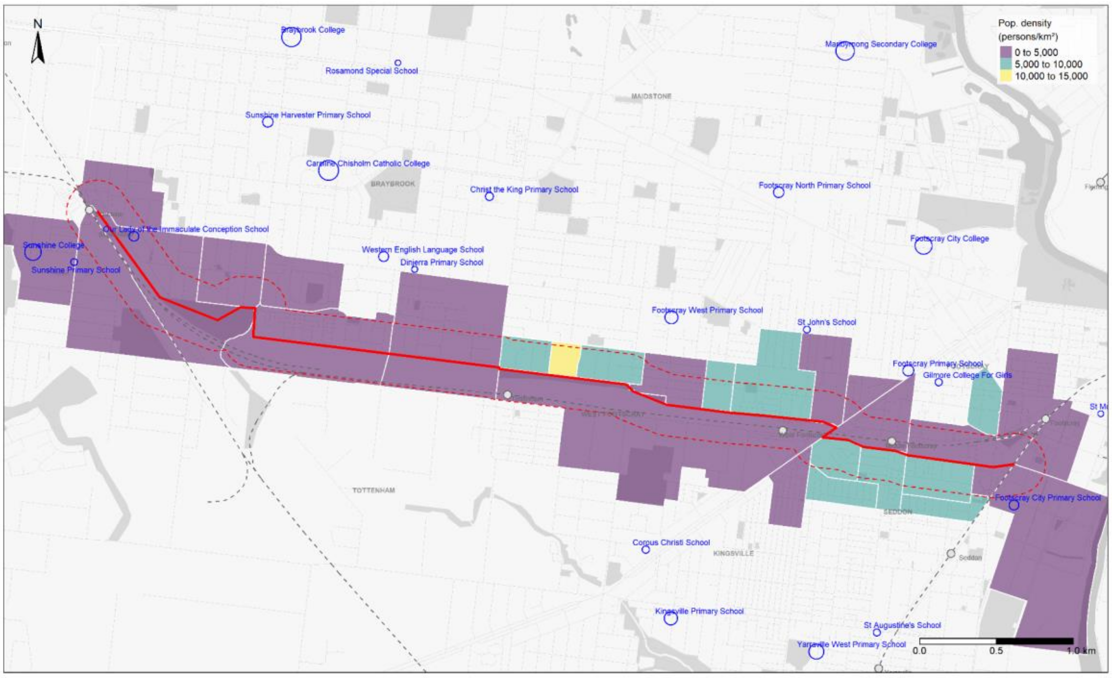
■ **Figure 6.3: Chapel St**



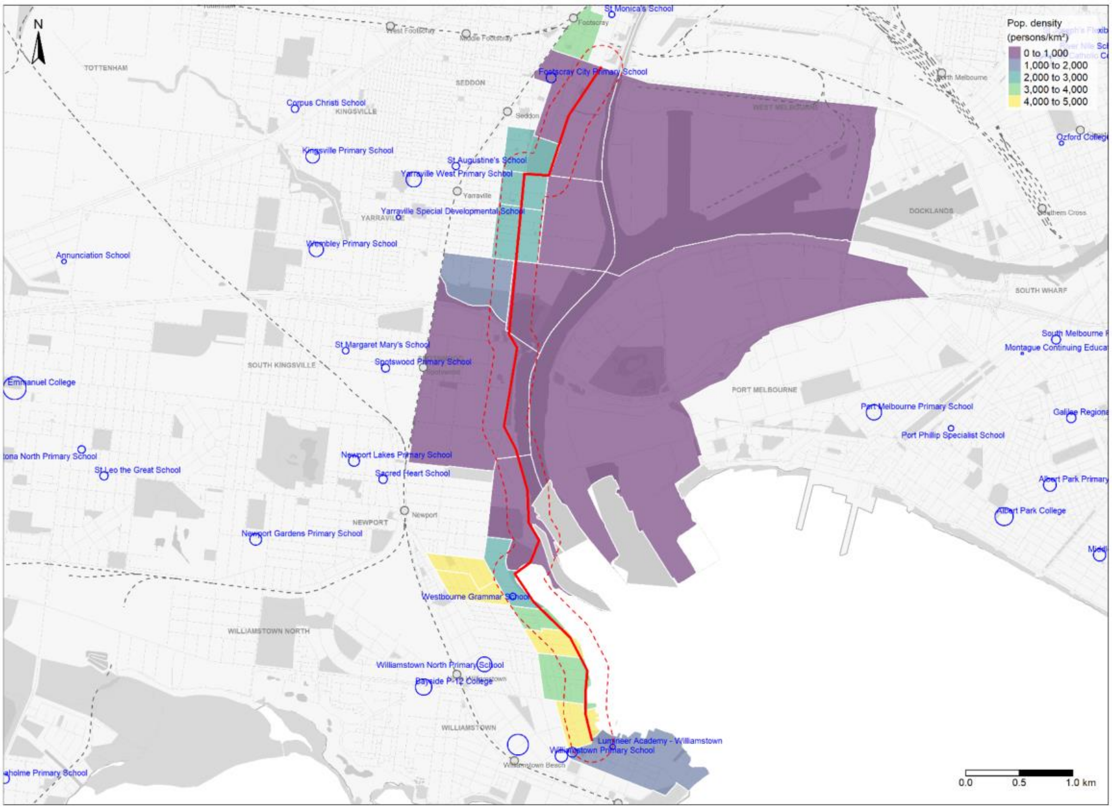
■ **Figure 6.4: Coburg to CBD**



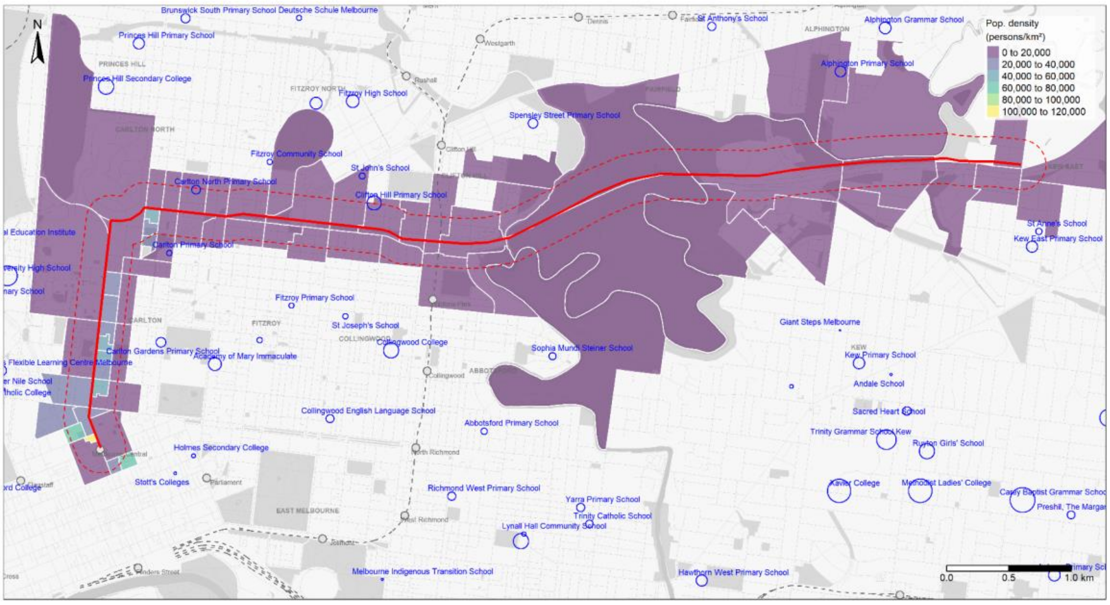
■ **Figure 6.5: Surrey Hills to CBD**



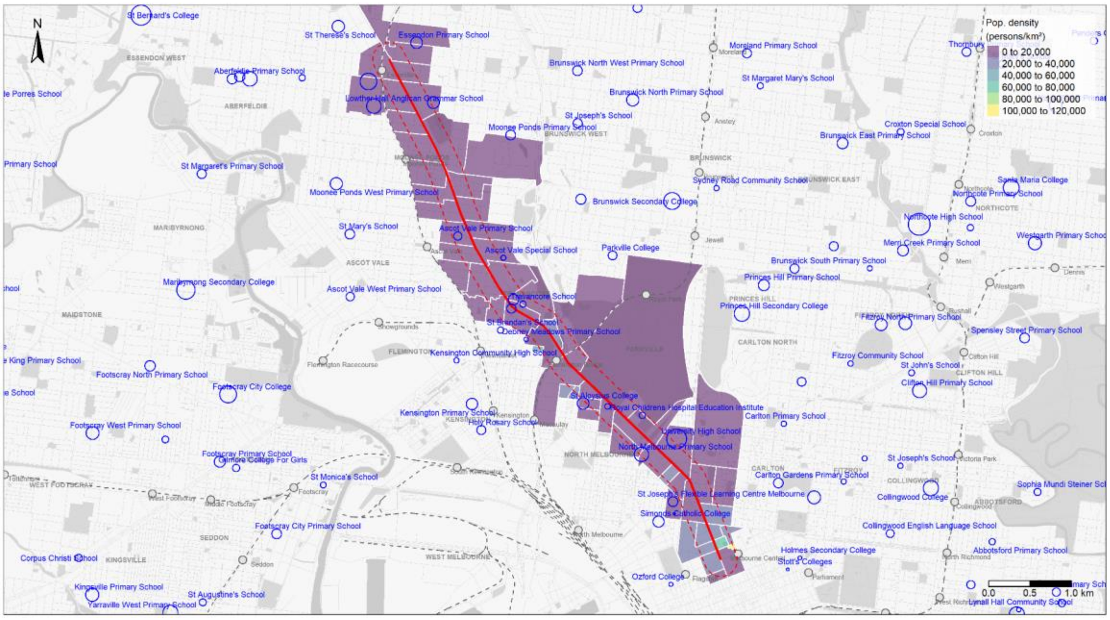
■ **Figure 6.6: Sunshine to Footscray**



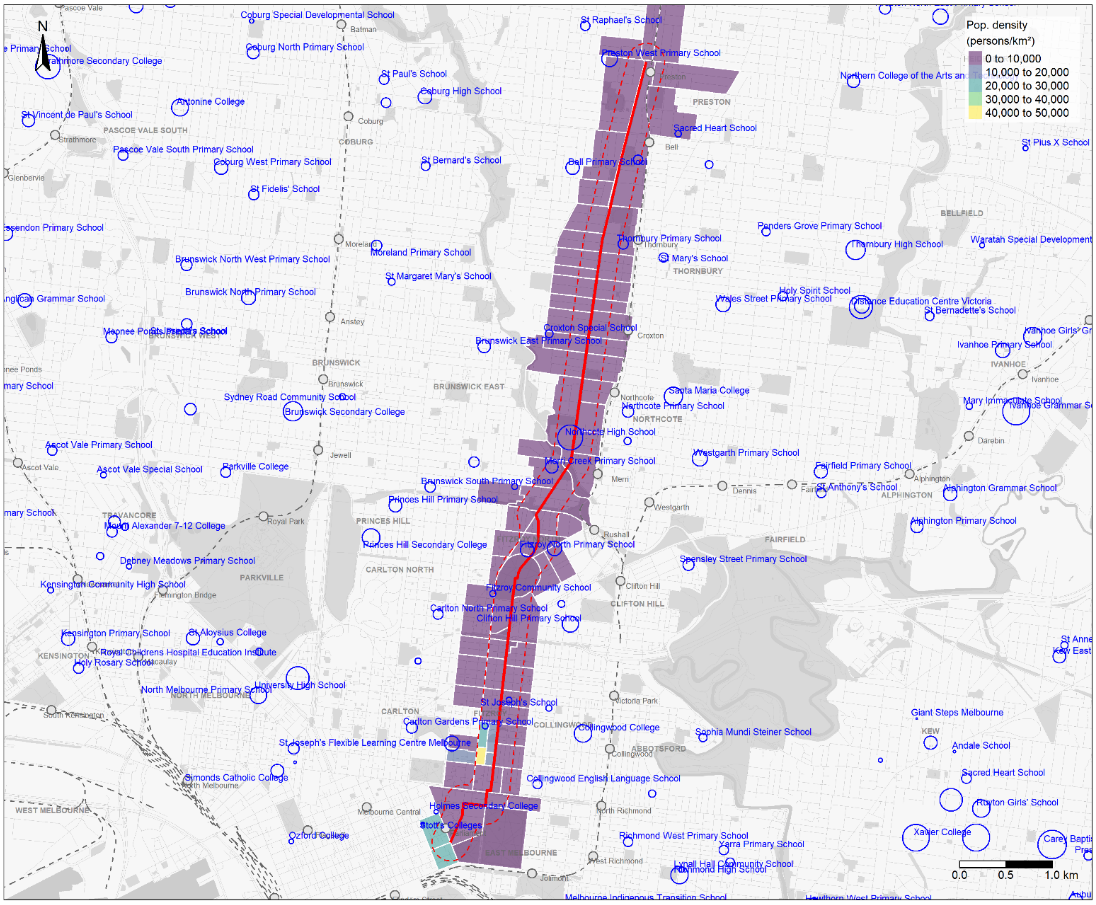
■ **Figure 6.7: Williamstown to Footscray**



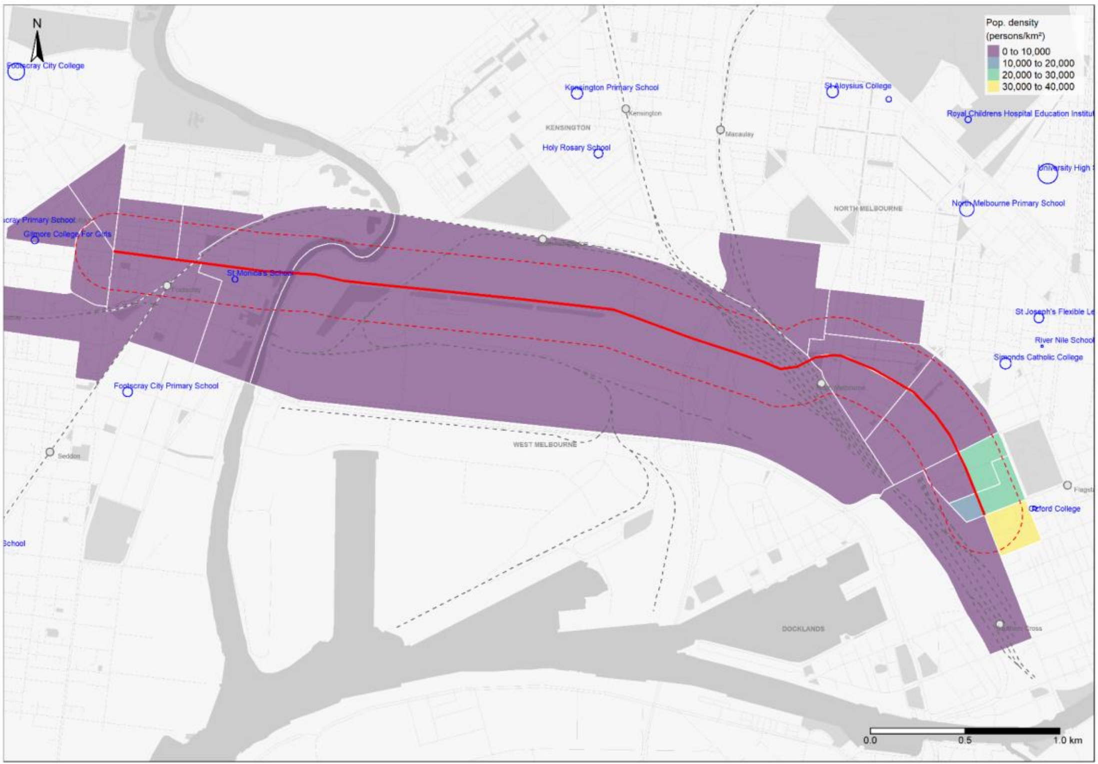
■ **Figure 6.8: Kew to CBD**



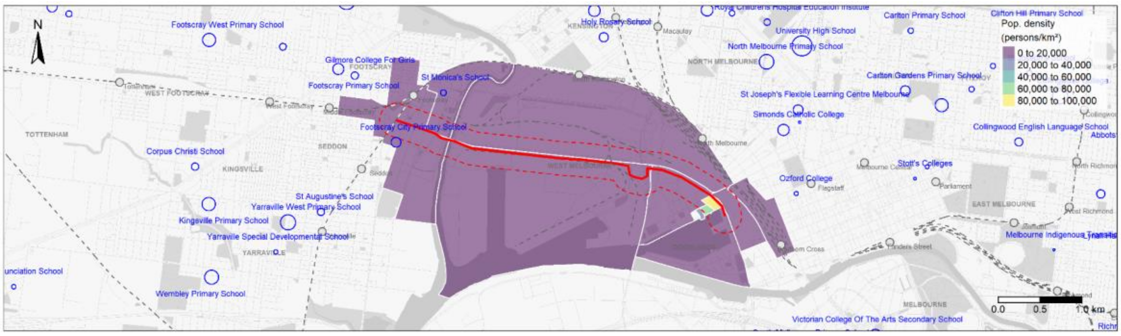
■ **Figure 6.9: Essendon to CBD**



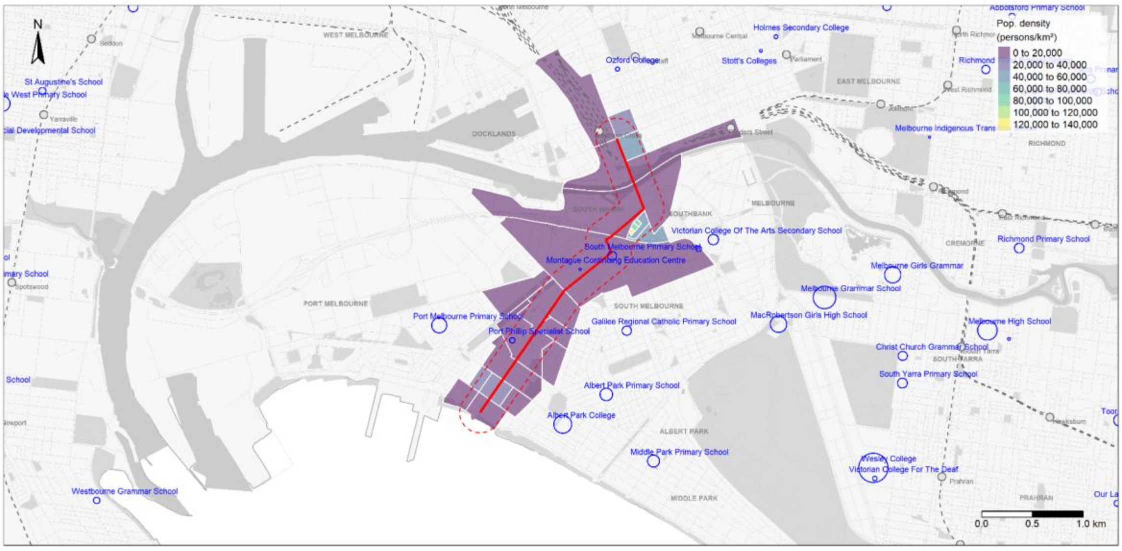
■ **Figure 6.10: Coburg to CBD**



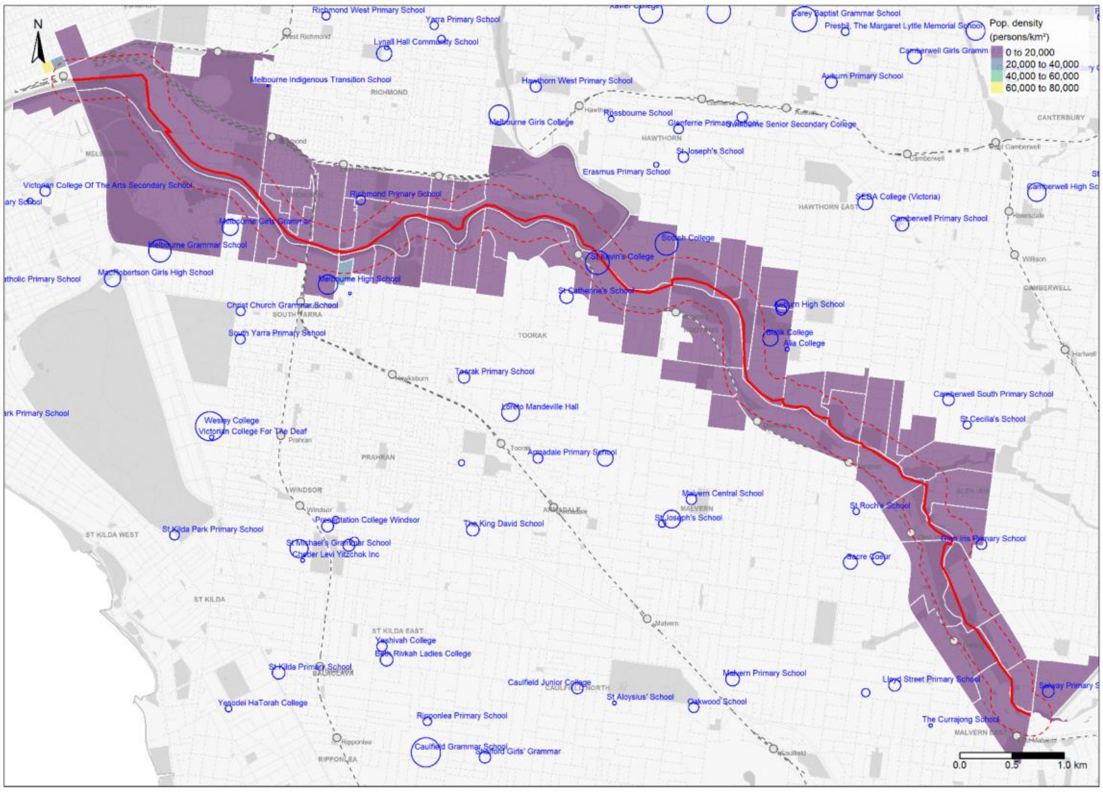
■ **Figure 6.11: Maribyrnong River North to CBD**



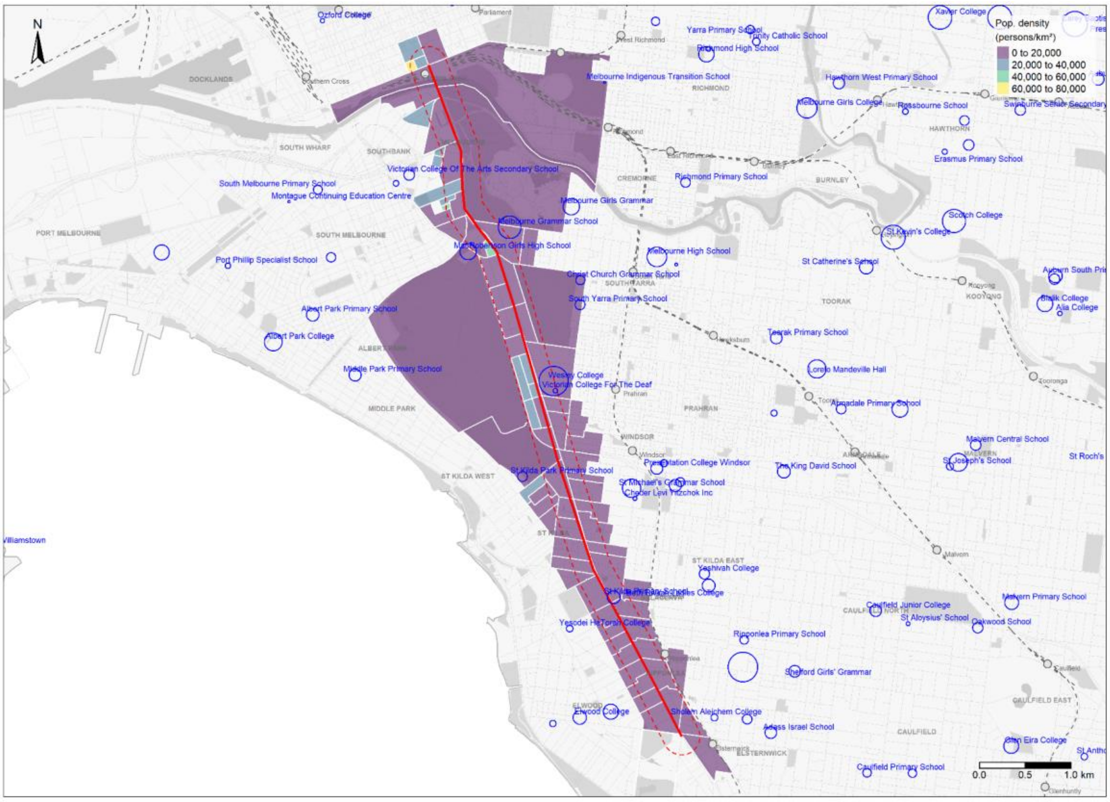
■ **Figure 6.12: Maribyrnong River South to CBD**



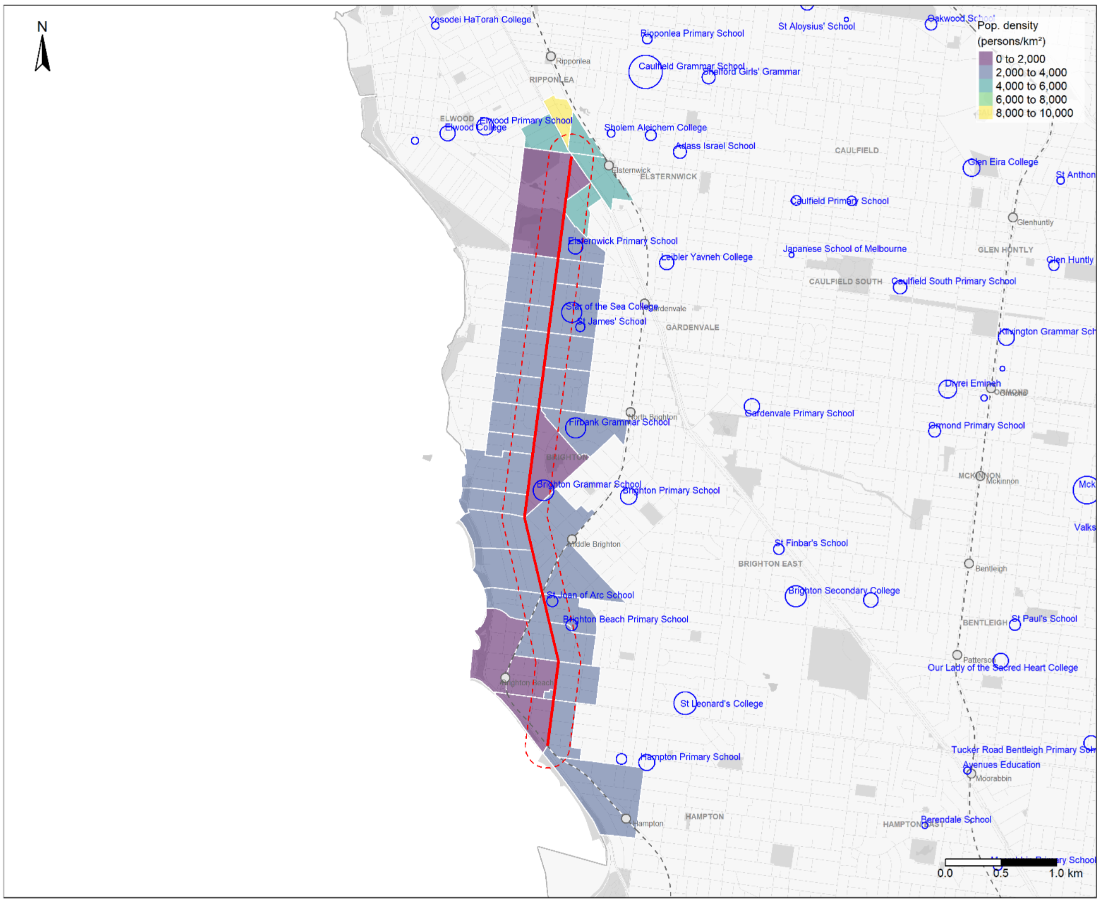
■ **Figure 6.13: Port Melbourne to CBD**



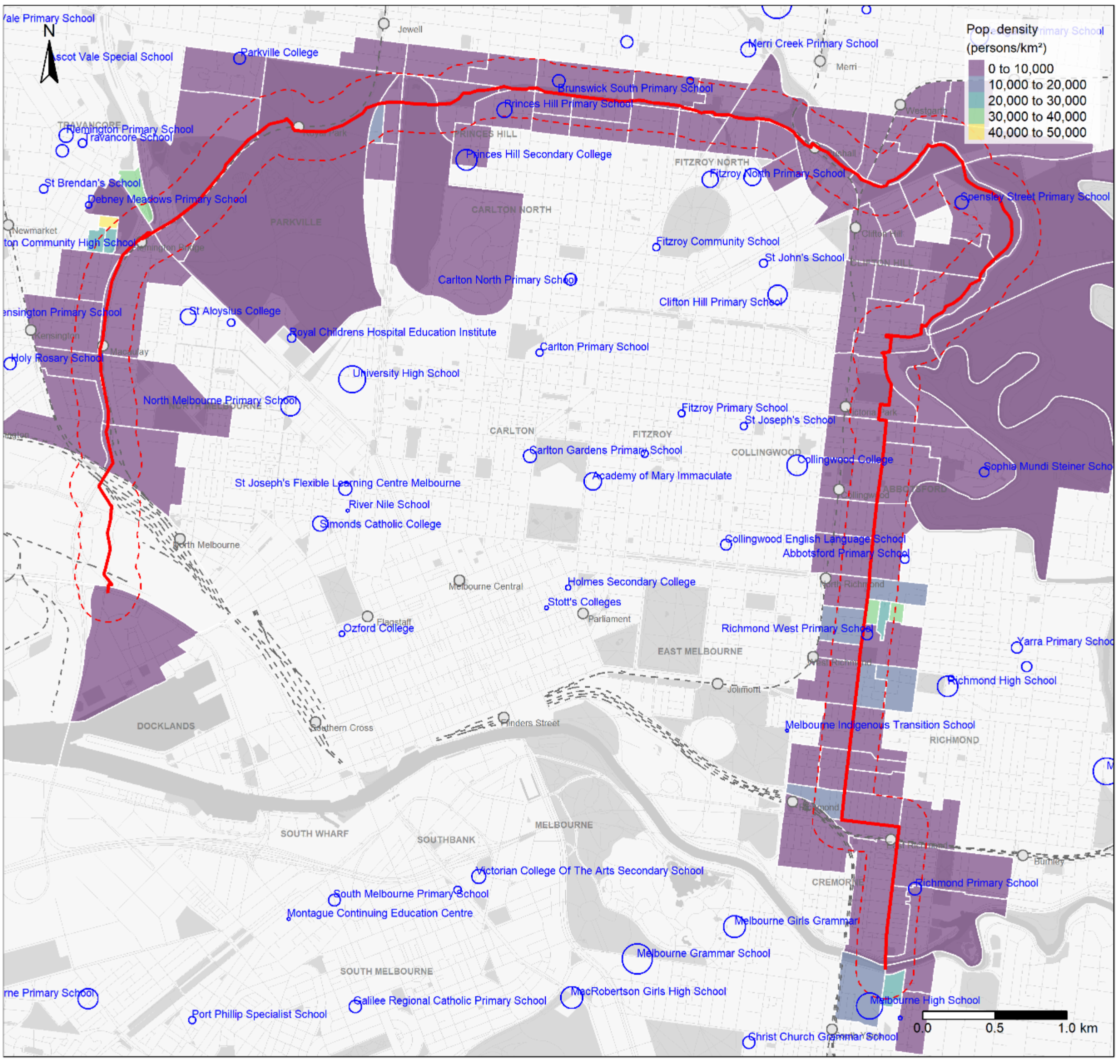
■ **Figure 6.14: East Malvern to CBD**



■ **Figure 6.15: St Kilda Road**



■ **Figure 6.16: New St**



■ **Figure 6.17: City loop**