AECOM

BOX HILL INTEGRATED TRANSPORT STRATEGY

Issues and Opportunities Report

for **Whitehorse City Council**

11 October 2019

Issues and Opportunities Report

Integrated Transport Strategy for Box Hill

Client: Whitehorse City Council

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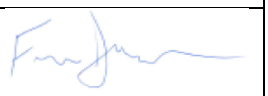
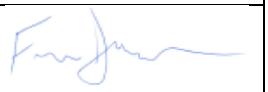
A	30-Sep-2019	Initial draft	Frank Jaskiewicz Associate Director - Transport Advisory	
B	11-Oct-2019	Revised per client comment	Frank Jaskiewicz Associate Director - Transport Advisory	

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1.0 Introduction

1.1 Background

The Box Hill Metropolitan Activity Centre (MAC) is the largest activity centre in the City of Whitehorse. Over the last decade, the Box Hill MAC has experienced substantial growth and development. This has included the opening of the new Australian Tax Office (ATO) building, the substantial redevelopment of the Box Hill Hospital and Box Hill Institute facilities, and significant private investment in developments such as The Chen Hotel and Sky One. Multiple high-rise mixed-use developments have also been approved within the precinct, and further development is expected in the coming years.

AECOM has been engaged by Whitehorse City Council (WCC) to develop an Integrated Transport Strategy (ITS) for Box Hill. The ITS aims to form a program of transport upgrades that both addresses near-term concerns and establishes an achievable and sustainable transport future. The ITS will support the various plans and strategies developed by Council and State Government, and will consider the integration of all transport modes, access and parking.

The ITS is intended to guide the future direction and development of transport in Box Hill, and to ensure that existing and new infrastructure can accommodate the expected levels of growth. Key objectives of the ITS are to:

- establish the need and basis for a holistic approach to transport for Box Hill
- identify improvements to the walking, cycling and public transport networks in Box Hill
- identify means of efficiently managing car traffic in Box Hill
- set transport priorities for Box Hill for the next ten years
- identify potential Council-led infrastructure improvements
- identify infrastructure improvements that will require coordination with other stakeholders, government agencies and developers
- establish advocacy positions for infrastructure initiatives controlled by the State and/or Federal Governments.

The outcome of this process will be an aspirational blueprint for the future development of transport in Box Hill. It will account for not only the growing need for sustainable circulation in a constrained context, but also how the transport network can be best integrated with its evolving surroundings and emerging technologies.

This study follows up the previous Box Hill ITS Background Study (Appendix A), which establishes the nature of the existing and future contexts from which the main issues and opportunities have been extracted.

1.2 Location and regional context

Box Hill MAC is located approximately 14 kilometres east of Melbourne CBD and is the largest activity centre in the City of Whitehorse. As shown in Figure 1, the study area is bound by Severn Street to the north, William and Watts Streets to the east, Albion Road to the south, and Kingsley Gardens to the west.

The MAC has been identified as a key centre for metropolitan development in successive metropolitan strategies, providing retail, education, civic, medical, community service, entertainment and recreational opportunities for the regional population, as well as serving as a hub for the local community.

It should be noted that whilst the study area has been defined as above, factors and movements from outside this boundary are likely to have an influence on Box Hill transport. These will be considered accordingly as part of the ITS.

Figure 1 Study area

1.3 Purpose of this report

This document outlines the main issues facing the transport system in Box Hill MAC as the community grows and establishes the range of opportunities that may be available to help address them. It is intended to inform discussion on the desired outcome of investment in the transport system.

Together with the vision, this report will be used as a basis for cross-checking the effectiveness of the proposed actions developed as part of the ITS. The issues raised in this report are preliminary in nature and may be supplemented or refined as further engagement with the community takes place throughout this process.

1.4 Report structure

This report is organised into the following sections:

- **Section 1: Introduction**
- **Section 2: Issues and opportunities** – Identification of the key issues and opportunities for the transport network in Box Hill MAC
- **Section 3: Stakeholder engagement and community insights** – A summary of the key outcomes and actions from stakeholder workshops, and the main community insights on issues and opportunities to date.
- **Section 4: Conclusion and next steps** – Key report findings and the way forward

2.0 Issues and opportunities

The transport network in Box Hill represents a complex interconnected system of both static and moving infrastructure. The location where these assets converge is one of the most active and congested sub-centres in metropolitan Melbourne, as pedestrians, cyclists, cars, trucks, trams and buses all vie for space on the street network, in many cases to connect with the rail and tram spines that serve the precinct.

The following section provides a summary of the transport issues and opportunities facing the Box Hill MAC over the next 10 years, as informed both by existing conditions and by future growth in travel demand resulting from expected development projects.

This transport issues and opportunities report follows a detailed background study outlining the existing situation and growth forecasts for various modes of transport available within the Box Hill MAC. The findings from the background study and from recent stakeholder and community engagement in relation to issues and opportunities have been summarised in Table 1. The background study to the Box Hill ITS is included as Appendix A and should be read in conjunction with this report.

Table 1 Transport issues overview by mode

Mode/Themes	Issues
Pedestrian	• There is a lack of consistent wayfinding within the MAC. • Overall walkability is hindered by long intersection cycle times and narrow paths. • While pedestrian mode share to the train station is high, pedestrian mode share to work for Box Hill residents is relatively low. • Disability accessibility is limited, restrictive and inefficient.
Cycling	• There is limited on-road bicycle infrastructure on key east-west and north-south corridors. • There is insufficient off-road cycling infrastructure to enable a continuous, 'low-stress' cycling network. • The journey to work cycling mode share in Box Hill is very low (less than one percent).
Bus	• Poor bus service frequencies outside of peak hours limit the attractiveness of off-peak travel. • The bus interchange is outdated and degraded, impacting on its attractiveness and useability. • Buses are delayed in road network congestion, impacting on journey times and service reliabilities.
Tram	• There is a lack of clear pedestrian access between the tram terminus and the train station (located almost 200 metres apart).
Rail	• Rail crowding is expected with projected population growth within the corridor.
Private vehicles	• There is a high car dependency for journey to work trips within the study area as well as for other purpose trips. • A mode shift away from private vehicle travel is required as road capacity is already constrained.
Freight	• Whitehorse Road goes through the heart of the busy activity centre but also acts as a freight route, carrying large vehicles and regional traffic.

Mode/Themes	Issues
Road safety	• Whitehorse Road / Station Street and Whitehorse Road / Elgar Road intersections both recorded six or more crashes within the past five years. • 38 of the 127 (30%) casualty crashes in the preceding five years were pedestrian related, which included one fatality on Whitehorse Road and 12 serious injury crashes. • Limited safe crossing opportunities leads to risky behaviour and impacts on pedestrian safety, particularly on Station Street and Whitehorse Road. • Six bicycle crashes have been recorded in the last five years within the MAC. • A lack of physically separated cycling infrastructure, combined with high vehicle volumes and speeds, impacts on cyclist safety on roads.
Parking	• The lack of a "cap" on parking provision within new developments is encouraging private vehicle ownership and reliance and contributing to the road network congestion in the activity centre. • A large supply of long-term car parking is contributing to the general tendency for driving to and within the activity centre.

Whilst Table 1 provides a synopsis of the challenges facing each component of the Box Hill transport system, it is the combination and conflict between multiple elements – each competing for priority on the finite space available to them – that warrant the most attention. These have been further informed by the stakeholder and community feedback gathered through the early stages of this process.

These key conflicts, outlined in Table 1, can be summarised into the five key issues as illustrated below.

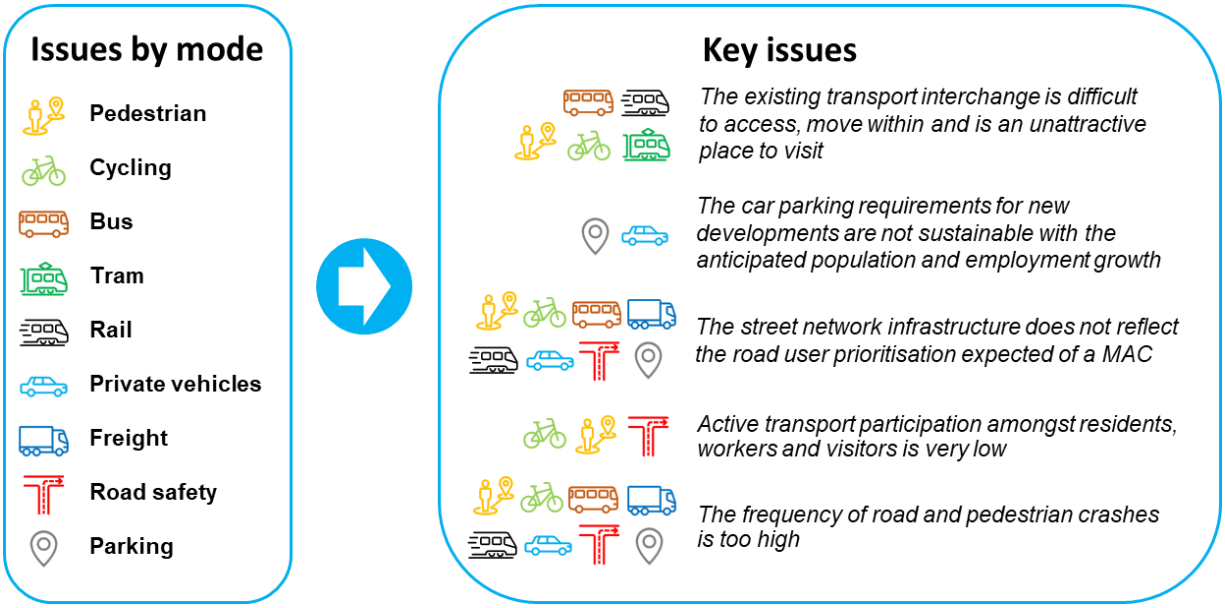


Figure 2 Key transport issues within Box Hill MAC

The five key issues, sub-issues and relevant opportunities are discussed in greater detail in subsequent sections. It is the resolution of these issues that offer the most opportunity for improved transport outcomes in Box Hill.

2.1 Transport interchange

Issue: The existing transport interchange is difficult to access, move within, and is an unattractive place to visit.

Implication: Access, movement and amenity issues limits its potential to maximise on social and economic outcomes for the local community.

Background: The Box Hill transport interchange is located at the heart of the MAC providing access to bus, rail, tram and taxi services and is well utilised by residents, workers and visitors of Box Hill. With increased development intensity and Box Hill's position as a second CBD, it is imperative to ensure the transport interchange operates in an efficient manner with adequate capacity to cater for future growth in population and employment.

Box Hill is ranked as the ninth busiest train station in Melbourne with over 11,000 commuters (the fifth busiest excluding the City Loop) and is the region's fourth busiest bus interchange. These statistics highlight the significance of the transport interchange and its role in contributing to the local economy.

Challenges and opportunities associated with the interchange have been broken down into three main components, as follows.

1. Navigating and transferring between modes within the interchange is confusing and inefficient.

Box Hill shopping centre is accessible via multiple entry points from Whitehorse Road, Station Street, Carrington Road and Nelson Road. Box Hill train station is located beneath Box Hill Central shopping centre, while the bus interchange is on its upper floor. Access to both transport facilities are via elevators, lifts and ramps provided within the shopping centre. The pedestrian route to transfer between these two public transport modes is long, indirect and difficult to identify through the retail area.

An escalator is provided from the shopping centre for passenger access to and from the bus interchange. A lift is also provided for disability access, however is only available during the opening hours of the shopping centre which restricts accessibility outside these hours. Signage in the shopping centre and wayfinding between the interchange and other modes of transport is unclear amongst the clutter of background activity.

Additionally, personal safety in the bus interchange is compromised by an outdated design with poor sight lines and a lack of passive surveillance.

> *"Connection between the bus and train is terrible, you need to walk around the shopping centre (when closed) and are exposed to the elements, or you need to walk through crowds of shoppers when the shopping centre is open."*
>
> *"The interchange could be better connected into Box Hill with other reasons to use and visit the area, including restaurants and cafes and civic uses like a library."*
>
> *Anonymous community comments*

Market Street / Main Street – facing south towards Box Hill Central entrance

There is no indication at the entrance to the shopping centre (from where public transport users transferring from trams would enter) that the bus and train stations are accessed through this portal.

Figure 3 Box Hill Central entrance

2. The bus interchange is an unattractive place to make connections.

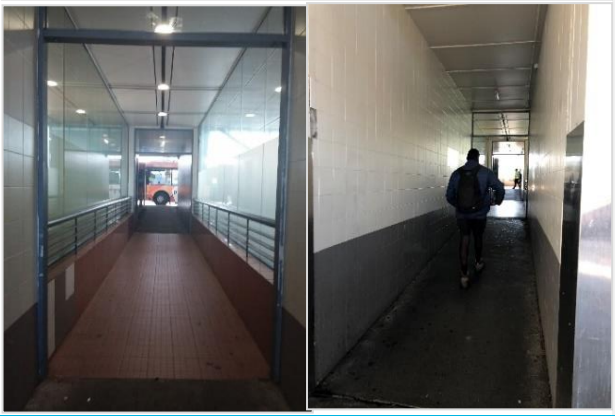
The transport interchange is dated in appearance relative to other competing centres. The effective width for waiting passengers is narrow, making it difficult for patrons navigating to their bus bays to pass through queues of people boarding a bus. Despite its prime location and high usage, there is a significant opportunity to improve access and facilities at the interchange.

"The interchange is dated and depressing. It is no longer fit for purpose, or the volume of users. There is not enough seating, no toilets and the lift is hidden and prone to breaking down."

Anonymous community comment

Bus station – internal, west side

The bus station appears old, outdated and uninviting.



Bus station – internal

Connecting walkways and routes within the bus station are narrow and closed-in.

Figure 4 Existing bus interchange

3. What are the public transport opportunities for the interchange?

Following the announcement of the Suburban Rail Loop (SRL) project, the Box Hill transport interchange is well-positioned to undergo a major upgrade within the next decade before the first stage of SRL is open for service. As such, the following opportunities should be considered to ensure Box Hill is prepared to accommodate future expansion and growth:

- Evaluation of the long-term design options for the bus interchange, either above the railway station or (alternatively) along the surrounding main roads and local streets.
- Bus priority infrastructure such as bus lanes and signal priority to reduce bus service delays
- Improved bus frequencies during the inter-peak, off-peak and weekends to reduce dependence on private vehicles for short local trips, and to encourage walking, cycling and public transport use among local residents and those who work in Box Hill
- Potential of a development/infrastructure contribution scheme to support future infrastructure works within the MAC
- Additional train services along the Belgrave/Lilydale train corridor to manage rail crowding
- Extension to the existing tram line to serve a larger catchment to the east of Box Hill MAC.

Box Hill is not alone in facing these types of challenges. Whilst the solutions to be developed for Box Hill will be specific to the local community and context, general precedents from elsewhere can often point the way forward in terms of what may be possible (and help to visualise the outcome).

The two case studies identified below show modern, attractive bus interchange options that highlight the possibilities for Box Hill MAC. The Christchurch case study shows what can be achieved in an off-street facility, while the Frankston case study demonstrates an on-street example.

Case study 1: Bus interchange as catalyst to revitalising the city, Christchurch

Following the 2011 Christchurch earthquake, a Recovery Plan to rebuild the city was developed in coordination with a strategy to re-envision Christchurch as ‘An Accessible City’. A new bus interchange was one of the anchor projects in this coordinated approach, focusing on an integrated transport and land use solution that ‘put people first’. The result was a flexible, multi-tiered interchange hub that enables access to buses, intercity coaches, taxis and a central cycle parking area. The new interchange also transformed the overall public transport experience with its airport-style lounge and high level of amenity.

Case study 2: Frankston Station Precinct and Young Street bus interchange, Frankston

Rather than having buses turn off the road into a separate off-street bus facility, the Frankston Station bus interchange utilises a series of bus stops located on-street, directly adjacent to the train station entrance. This allows both an easy and direct bus-train transfer for passengers, whilst also avoiding long delays associated with entry, circulation and exit movements in a contained interchange.

Further to this, works are currently being undertaken on Young Street to create a safer pedestrian environment, and to support improved bus connections within the precinct.

Figure 5 Transport opportunities for a more welcoming and prosperous activity centre

2.2 Street network

Issue: The street network does not reflect the road use prioritisation needed to support a MAC.

Implication: The allocation of road space is inefficient and a key factor in the congestion on the road network, with resulting adverse economic, environmental and social impacts to the community.

Background: Box Hill has been designated by the State Government in *Plan Melbourne* as a Metropolitan Activity Centre (MAC). A MAC is intended to provide a diverse range of jobs, activities and housing for catchments that are well served by public transport. They are major hubs of service delivery including government, health, justice and education services, and provide retail and commercial opportunities. Challenges and opportunities associated with the street network have been broken down into three main components, as follows.

1. The allocation of road space does not align with road user priorities.

To achieve the goals of a MAC, it is important that Box Hill has high amenity public spaces to support a range of land uses, and a transport network which encourages and prioritises active and public transport modes as preferred choices over private vehicles. Box Hill's transport network already has some of these attributes, with Main Street and Market Street functioning as pedestrian-only malls. However, aside from these two streets, the road network in general does not include sufficient features to support the prioritisation of walking, cycling and public transport and reflect Box Hill as a key destination.

Figure 6 shows the current Department of Transport Movement and Place classifications for the three declared roads within Box Hill MAC. Classifying transport links in this manner considers both their movement and place functions, as well as their roles within the road hierarchy based on broader network connectivity and desired traffic distribution outcomes. Key insights into Whitehorse Road, Station Street and Elgar Road include:

Whitehorse Road

- Three lanes for general traffic each direction, which is not typical for its GT3 and F3 classifications
- No bus priority infrastructure (bus lanes and signal priority), which does not align with a B2 classification which generally warrants these features
- Not classified as a C1 or C2 cycling route despite being part of the Principal Bicycle Network
- Place and amenity qualities which presently do not reflect its high value P2 classification.

Station Street

- No bus priority infrastructure (bus lanes and signal priority), which does not align with its B1 classification
- Not classified as a C1 or C2 cycling route despite being part of the Principal Bicycle Network
- Place and amenity qualities which presently do not reflect its W2 and P2 classifications.

Elgar Road

- Generally aligns with its traffic movement and place classifications relative to Whitehorse Road and Station Street
- Improved walking infrastructure (additional crossings, crossing priority) needed to align with its W2 classification
- No cycling facilities provided despite a portion of it between Mont Albert Road and Brougham Street classified as a C1 cycling route.

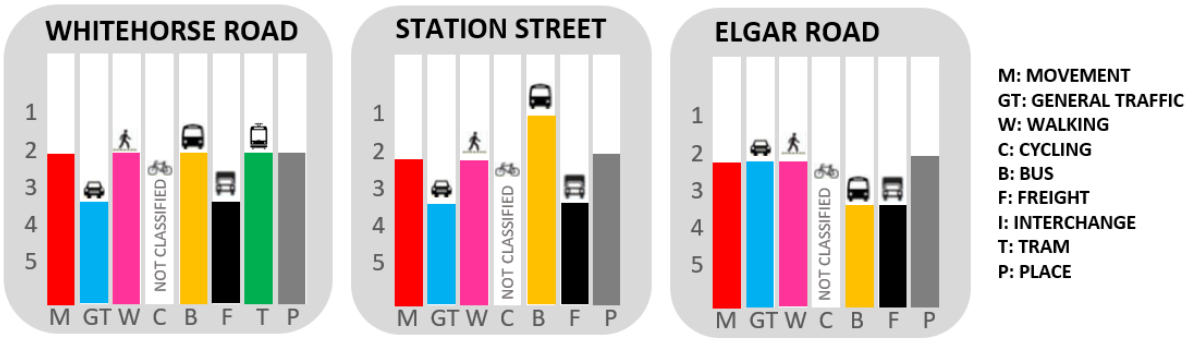


Figure 6 Current Movement and Place classifications for Whitehorse Road (east of Elgar Road), Station Street (south of Whitehorse Road) and Elgar Road (south of Whitehorse Road)

2. The cross-sections of some roads encourage private vehicles to travel through Box Hill.

Key streets within the centre, namely Whitehorse Road and Station Street, exhibit an allocation of road space that is highly skewed towards vehicle movement over sustainable transport modes and public space. Whitehorse Road and Station Street are the major east-west and north-south roads respectively in the study area.

As shown in Figure 7, Whitehorse Road has three traffic lanes in each direction plus parking, which expands to four approach lanes at the Station Street intersection. Whitehorse Road also includes a wide central median.

Station Street is an undivided road with two traffic lanes in each direction, on-street parking, and localised widening at intersections. Footpaths along shopfronts are narrow (less than 3m wide in some sections) which lead to difficulty coping with high pedestrian movements.

There are no cycling facilities or bus priority infrastructure provided on either main road, despite being major routes within the activity centre.

This prioritisation of private vehicle mobility over other modes within the centre contributes to local congestion, and also impedes on local accessibility to and within the centre, as well as the place function of the centre itself. In addition to this, the road cross-sections encourage through traffic, with posted speeds of 60 km/h on Whitehorse Road and a large amount of road space allocated to through traffic lanes. The dominance of through vehicles is further indicated by an estimation that approximately half the cars on roads in Box Hill are through traffic[1]. This not only results in road congestion but also impacts on the functionality of the activity centre while making no contribution to the local economy.

> *"Station Street is not working for anyone. Close it off to cars and create a cycle and pedestrian friendly street."*
>
> *Anonymous community comment*

[1] Review of Strategic Direction Box Hill Metropolitan Activity Centre Analysis & Options (MGS, 2019)

Source: Nearmap © 2019

Figure 7 Whitehorse Road and Station Street Intersection

3. What are the opportunities for streets and public spaces in Box Hill?

The following opportunities should be considered on key parts of the transport network to improve walking, cycling and public transport, to better reflect the road user prioritisation, walkability and amenity expected of a MAC:

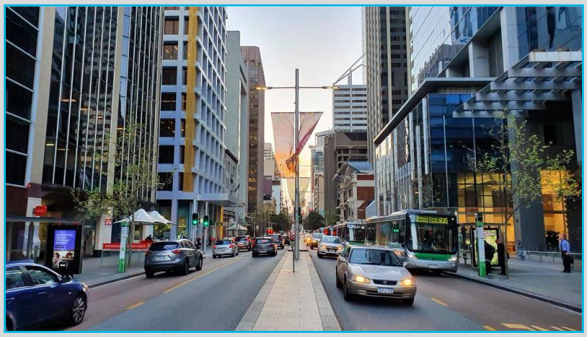
- Reallocation of the road space along Whitehorse Road and Station Street to other uses, such as dedicated bus lanes and wider pedestrian paths to support a shift toward more sustainable transport modes while also supporting the place function of the activity centre. This will require modifications to the turning lane designations between major arterial roads.
- Speed limit reductions along Whitehorse Road and further reductions along Station Street north of Whitehorse Road to discourage vehicle traffic travelling through the centre, and to improve road safety
- Provision of signal priority at intersections for buses and pedestrians to improve efficiency of sustainable transport modes
- In line with the Movement and Place classifications, encourage through traffic around the centre of Box Hill and discourage through traffic on Whitehorse Road and Station Street through the centre of Box Hill
- Relocation of the off-road car parking within the central median of Whitehorse Road for improved placemaking and possible open space.

Whilst the solutions to be developed for Box Hill will be specific to the local community and context, general examples from elsewhere can often point the way forward in terms of what may be possible. The two case studies identified below show what can be achieved by creating bus lanes and additional community spaces such as outdoor dining – an important component of what the community values, as outlined within Section 3.

> *"Change some of the smaller carparking spaces into public space, spaces for events or green spaces."*
>
> *Anonymous community comment*

Case study 1: Reallocating road space on St Georges Terrace, Perth

In 2011, the City of Perth undertook significant changes to St Georges Terrace, a major east-west traffic route, as part of an initiative to transform the CBD into a more pedestrian-friendly environment. Six traffic lanes were reduced to two, and the space was reallocated to provide bus lanes, wider footpaths and a wider central median (see image below). The speed limit was reduced to 40 km/h and an additional signalised pedestrian crossing was introduced. Benefits of the project include improvements to bus services, the walking environment and public realm.



Case study 2: Mountain Highway level crossing removal, Bayswater

As part of Victoria's Level Crossing Removal Program, Mountain Highway was reduced from three lanes to two lanes per direction to provide additional space for new bike lanes, wider footpaths, shorter crossings, outdoor dining, urban design enhancements, and improved connections to the shops and amenities of the station precinct.

Figure 8 Case studies of street and public space opportunities

2.3 Active transport

Issue: **Active transport participation amongst residents, workers and visitors is poor.**

Implication: Poor active transport mode share is contributing to poor public health and increased carbon emissions.

Background: A good active transport network supported by end of trip facilities at key attractors such as the transport interchange, Box Hill shopping centre, and the health and education precincts are needed to further encourage walking and cycling as attractive modes of access. Currently over 7,600 commuters are walking to Box Hill train station each weekday, with thousands more visiting the shopping centre. High volume walking routes have been observed to include Carrington Road, Main Street, Market Street, Station Street and Whitehorse Road, despite several of these corridors not having a favourable walking infrastructure.

Challenges and opportunities associated with active transport have been broken down into four main components, as follows.

1. Walking and cycling are generally not the easiest or most appealing options.

Approximately 52 percent of people who both live and work within Box Hill drive to work despite the relatively short travel distance (a maximum of approximately three kilometres within Box Hill's boundaries). Note that this represents around 1,200 vehicles and excludes those who commute to Box Hill from other parts of metropolitan Melbourne. For those that both live and work within Box Hill, if the proportion commuting to work via car was reduced from 52 to 30 percent, approximately 260 private vehicle trips would be removed from the road network, many of these during peak travel periods.

This high journey to work car more share in Box Hill contrasts with the fact that over 7,600 commuters walk to Box Hill train station each weekday, potentially reflecting the perceptions of parking availability and road congestion at the station versus at nearby employment destinations, many of which provide their own parking supply.

The existing walking infrastructure does not provide an amenable pedestrian environment for those with mobility difficulties, particularly within the transport interchange. Footpaths on several roads appear to be poorly maintained, and the lack of crossings at key desire lines particularly across Station Street and Whitehorse Road can make walking in Box Hill MAC challenging (see Figure 9).

> *"Long wait times for pedestrian crossings are a deterrent for many to walk around the area. It becomes easier to drive."*
>
> *Anonymous community comment*

Pedestrian desire line across Station Street from Bank Street to Main Street mall

Although a pedestrian underpass is provided at this location, many pedestrians still choose to walk across Station Street at ground level.

Station Street

Limited footpath width

Inadequate space for outdoor dining and other placemaking features

Long waiting times at traffic signals

Figure 9 Walking issues in Box Hill MAC

2. North-south connectivity options within the MAC are limited

The rail reserve is a major east-west barrier that runs across the Box Hill MAC. There are limited opportunities to cross the railway line, with only two north-south roads over the railway line within the 1.2 km east-west span of the MAC study area (at Elgar Road and Station Street) and an additional level crossing (for pedestrians and cyclists only) near Linsley Street, on the eastern boundary of the study area, 400 metres east of Station Street . While the limited north-south connectivity affects all modes, pedestrians and cyclists are most impacted due to the longer time it takes them to divert to indirect routes. For example, the north-south route along Nelson Road and Thurston Street-Surrey Drive, which is designated as a strategic cycling corridor by the Department of Transport, has no direct connection across the railway line – requiring a detour of approximately 800 metres via Elgar Road or Station Street.

Whitehorse Road also presents as a major crossing barrier for pedestrian and cyclist north-south connectivity – given its width and high volumes of high-speed traffic – as seen in Figure 10.

> *"Missing link in the bike path is needed to encourage bike riders and ensure rider safety. Bike riders are pushed onto the road in Box Hill and it is dangerous for drivers and riders."*
>
> *Anonymous community comment*

Whitehorse Road

Few safe connections across the road

Figure 10 Whitehorse Road, one of the major barriers for north-south connectivity

3. Box Hill MAC lacks a connected 'low-stress' cycling network.

Cycling participation is low in Box Hill MAC despite that it consists of several key attractors including the transport interchange, shopping centre, and the educational and health precincts. Lack of segregated cycling infrastructure on busy arterial roads and bicycle priority at intersections contribute to poor participation in cycling amongst local residents. This is reflected in the journey to work cycling mode share of less than one percent.

Figure 11 shows the limited extent of the Box Hill cycling network, identifying existing dedicated cycling routes (green) and proposed routes (red) that are yet to be built. This highlights that cyclists presently must ride amongst traffic for most trips.

While the network indicatively shows a proposed strategic cycling corridor along the Main Street pedestrian mall, this would need to be evaluated against safety risks to pedestrians as well as impacts to pedestrian comfort and amenity. While the cycling route along the railway line creates a great opportunity for those travelling to and from Box Hill MAC, its value to the community could be supplemented by the addition of safe and secure cycle parking on both ends of the mall, as well as improved wayfinding into and through the precinct.

Whitehorse Road and Station Street have posted speed limits of 60 km/h. The exception is Station Street between Whitehorse Road and Harrow Street, which is 40 km/h between 8am and 7pm. The 60 km/h speed limit encourages swift movement of general traffic and deters apprehensive cyclists. The most recent Super Tuesday cyclist counts obtained at several key intersections within Box Hill showed over 100 male cyclists and only one female cyclist, indicating that the conditions are perceived to be unsafe.

Figure 11 Box Hill cycling facilities

4. What are the opportunities to improve active transport participation?

The following opportunities should be considered to improve active transport mode share:

- Participation in the development of the Hawthorn to Box Hill strategic cycling corridor feasibility study (scheduled to commence within the next six months)
- Coordination with the Suburban Rail Loop project to advocate for improved access by foot and bike including a new connection across the rail line to link Thurston Street and Nelson Road
- Cycling upgrade of Albion Street and Brougham Street to build on their existing traffic calming treatments
- Implement the Easy Ride Routes to create an interconnected low stress cycling network. Easy Ride Route 'North South 2' follows the Nelson Road and Thurston Street corridor.
- Additional bicycle parking and end of trip facilities at key locations within the MAC
- Improved wayfinding through provision of continuous and obvious cycling routes supplemented by signs and pavement markings
- Reduced waiting times for pedestrians and cyclists at major intersections
- New at-grade crossings along Station Street at Main Street and between Albion Road and Howard Street
- Accommodation of electric bicycles through appropriately sized facilities and suitable parking areas
- Exploration of opportunities to safely accommodate food delivery services by bike and e-bike.

The two case studies identified below show what can be achieved by implementing behaviour change initiatives and improved signal priority at intersections.

> *"More bike parking is needed within the train station (Parkiteer); more bike parking is needed across the area like at tram stops."*
>
> *Anonymous community comment*

Case study 1: Your Move travel behaviour initiative, Perth

Your Move is a free program that provides information, materials and support to encourage individuals, workplaces and schools to find more active ways to travel. As part of the initiative local councils have implemented wayfinding programs that guide pedestrians and cyclists through local areas, showing directions and journey times to key destinations such as train stations. Other initiatives implemented under the program include installing bike repair stations, holding events for participants, and in some cases, providing financial incentives.

Case study 2: Napier Street 'advisory' bike lanes, Fitzroy

Although already a key cycling route, Yarra City Council has recently adjusted the line markings on Napier Street to reflect the design for a *'fietsstraat'*, also known as a cycle street or bicycle boulevard. This line marking treatment prioritises cyclists, with a single central vehicle lane for two-way traffic and wide 'advisory' bike lanes on each side. Motor vehicles are required to give way to cyclists in the bike lanes when passing other vehicles in the opposite direction. This project has complemented the 'Thanks for 30' speed limit trials in the Fitzroy area.

Figure 12 Case studies of walking and cycling opportunities

2.4 Road safety

Issue: **The frequency of road crashes is too high.**

Evidence: There have been 127 road crashes in the last five years (a rate of one crash every two weeks) within the Box Hill MAC area.

Background: Box Hill's standing as a metropolitan activity centre dictates that it attracts high volumes of people – in vehicles, on foot and on bikes – within one place at the same time. Busy streets inevitably lead to congestion and delays, which in turn can lead to risky driving behaviour and dangerous pedestrian and cycle crossing movements. When busy streets are combined with high traffic speeds, this can result in serious injury, particularly to pedestrians.

Challenges and opportunities associated with road safety have been broken down into five main components, as follows.

1. Station Street is unsafe, particularly for pedestrians.

One of main road safety issues observed in the Box Hill MAC is along Station Street south of Whitehorse Road. Although a pedestrian underpass is provided across Station Street between Main Street and Bank Street, a significant number of people still cross at ground level. This could be due to several reasons, such as the indirect route for those walking from or to Station Street north or south (as shown within Figure 13), lack of awareness of the underpass (not clearly signed or identifiable), and concerns about personal safety and security (perceived or actual). People who cross Station Street at group level do so without the benefit of controlled crossings, pedestrian refuges or other safety measures. Most people cross the road when there is a gap in traffic owing to adjacent signals. Due to these issues, there were eight crashes recorded on Station Street involving pedestrians in the last five years, as identified in Figure 14.

"The pedestrian underpass needs to be improved, it is not well lit and it feels unpleasant. There are often people drinking or arguing in this area."

"Street lighting across Box Hill needs some work to encourage people to walk to the tram, bus or train station or to walk home. The area feels unsafe."

"Pedestrians and cyclists need better separation in shared areas. It is unclear when you are in a shared area and when you have the right of way."

Anonymous community comments

Crossing Station Street at Main Street

Indirect walking routes via the underpass lead to many people crossing at ground level.

Figure 13 Safety issues with pedestrians crossing Station Street at-grade

Figure 14 Crashes within the 5-year period to December 2018

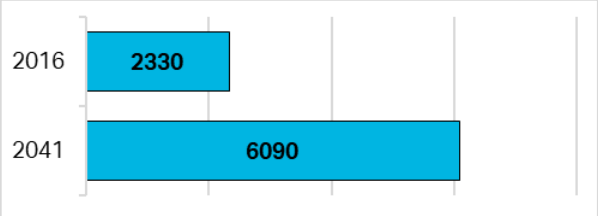
2. There is a lack of physically separated cycling infrastructure.

As discussed previously, cycling infrastructure in the Box Hill MAC is limited, impacting on cyclist safety and the cycling participation rate within the area. The poor quality and safety of cycling infrastructure is reflected in the gender split in cycling numbers, as the overwhelmingly high proportion of males may suggest that the cycling infrastructure is not considered safe by a wide cross section of the community.

Without a dedicated safe cycling network within Box Hill MAC, cyclists are required to either share the road with general traffic or share narrow footpaths with pedestrians, which is illegal with the exception of those who are under 12 years of age, those who are riding with someone under 12, or those who have a disability. These cycling environments result in conflict with road and/or footpath users and impede the efficiency of all modes.

3. There is a high proportion of vulnerable road users in the forecast population.

As highlighted in Figure 15, by 2041 the proportion of vulnerable road users (populations belonging to the 0-17 and 65+ age groups) is forecast to increase more than a factor of two. With increased development and population growth, the level of pedestrian activity within the MAC will significantly increase. Without intervention, the number of road crashes involving vulnerable pedestrians can be expected to increase.



Growth in the number of vulnerable road users less than 18 and greater than 65 years of age.

Figure 15 Change in age profile between 2016 and 2041

4. A large proportion of vehicle crashes occurs at intersections.

The Department of Infrastructure and Regional Development's Black Spot Program notes that a minimum of three casualty crashes over the preceding five years meets the eligibility criteria for designation as a safety deficient location. There were more than three crashes recorded at the following intersections within Box Hill MAC:

- Thames Street and Station Street – 16 crashes
- Whitehorse Road and Elgar Road – 8 crashes
- Whitehorse Road and Station Street – 6 crashes
- Severn Street and Station Street – 6 crashes
- Albion Street and Station Street – 5 crashes
- Thames Street and Nelson Road – 5 crashes
- Elgar Road and Prospect Street – 4 crashes
- Elgar Road and Carrington Road – 4 crashes
- Whitehorse Road and Dorking Street – 4 crashes (included one fatality)
- Whitehorse Road and Nelson Road – 4 crashes
- Cambridge Street and Station Street – 3 crashes

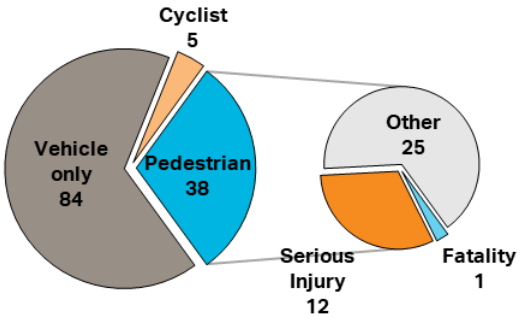


Figure 16 Reported crashes within Box Hill MAC from 2013 to 2018

- Howard Street and Station Street – 3 crashes.

It is understood that there are no plans by the Department of Transport or Council to address this crash history.

5. Higher than necessary vehicle speeds contribute to crash frequency and severity.

The relationship between vehicle speed and road traffic accidents is well established. In particular, arterial roads where pedestrians and cyclists mix with moderate to high speed traffic represent one of the highest risk traffic environments in metropolitan areas. This is exhibited by the pedestrian and bicycle causality crash locations shown in Figure 14 above.

Research has shown that the severity of pedestrian injuries arising from a vehicle impact increases moderately from 0 to around 37 km/h, then increases sharply thereafter, with death almost certain at impact speeds of around 55 km/h or higher. This relationship is shown in Figure 17. A similar relationship has also been shown for crashes that involve cars only, however at higher speeds due to the protective features of modern vehicles.

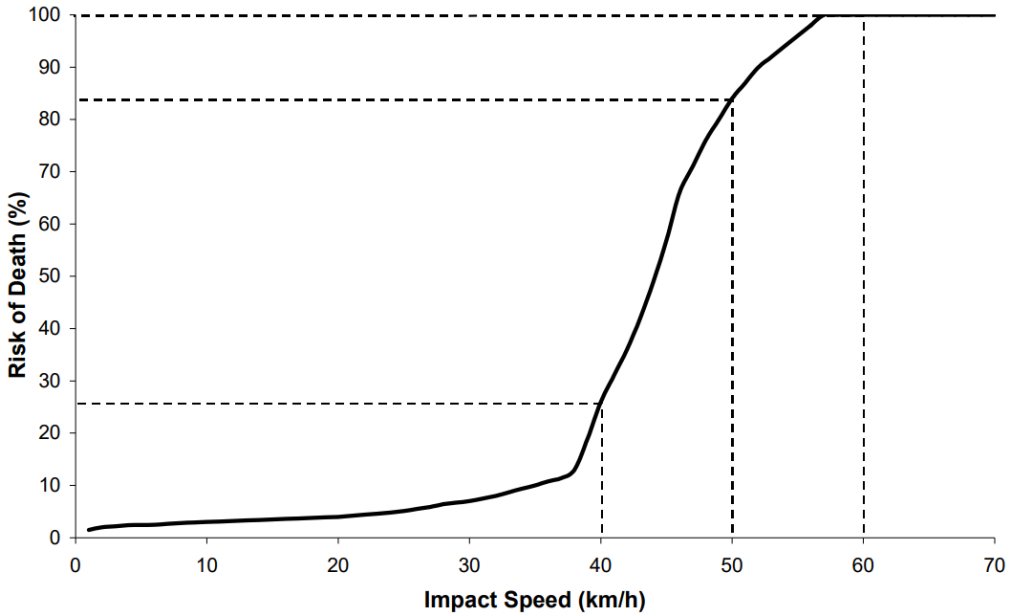


Figure 17 Relationship between vehicle impact speed and risk of pedestrian death

Source: Curtin – Monash Accident Research Centre

6. What are the opportunities to improve road safety in Box Hill MAC?

The following opportunities should be considered to improve road safety:

- Apply for funding through the Department of Infrastructure and Regional Development's Black Spot Program for improvements to intersections and mid-block locations that meet the criteria.
- Investigate the feasibility of new pedestrian crossing opportunities.
- Investigate signal time changes to reduce pedestrian waiting times.
- Introduce time-based speed limits along key streets such as Whitehorse Road, Station Street north of Whitehorse Road and area wide 40 km/h speed zones for key areas, such as the medical precinct.
- Undertake pilot schemes to trial new measures such as a 40 km/h or 30 km/h speed limit in local streets (see Case Study 1 below).
- Upgrade key streets such as Station Street and Whitehorse Road to improve road safety and transport efficiency (see Case Study 2 below).

The two case studies identified below shows what can be achieved by implementing trials to test potentially widespread initiatives and upgrading streets with road safety as a key priority.

Case study 1: 'Thanks for 30' – 30km/h area-wide speed limits trials, Fitzroy and Collingwood

The City of Yarra is currently conducting the first trial of a 30 km/h area-wide speed limit in the northern areas of Fitzroy and Collingwood, with the trial period having commenced a year ago. This initiative is based on international research which shows that 30 km/h is the safe speed for built up areas where there is a mix of pedestrians and cyclists with vehicles. The risk of pedestrian death rises exponentially with collision speeds beyond 30 km/h.

It is estimated that pedestrian fatality rates increase from below 10 percent at 30 km/h to approximately 25 percent at 40 km/h, then to more than 80 percent at 50 km/h.

Case study 2: Dandenong Central Area Pedestrian Safety Improvements, Dandenong

The Dandenong Central Activity Centre is a busy hub of business, retail, medical and educational activity. To improve pedestrian safety, improvements are being made within the activity centre, including:

- Implementation of lower speed limits in busy pedestrian areas, including introducing 40 km/h speed limits on both sides of Princes Highway, which includes Dandenong Plaza and Dandenong Market, Dandenong Hospital, and Dandenong High School
- Installation of raised pedestrian crossings at key intersections, increasing visibility of pedestrian crossings and providing better access for pedestrians
- Installation of raised platforms at intersections to slow down approaching vehicles.

Figure 18 Case studies of road safety opportunities

2.6 Car parking

Issue: Current car parking requirements for new developments are not sustainable with the anticipated population and employment growth.

Implication: If the current trend of high car parking supply and limited demand management continues, the future road network will not have the capacity to accommodate the number of vehicle trips generated.

Background: As cities across the world begin to prioritise city living that does not require using a car for every trip, many local governments are moving away from blanket policies of providing abundant parking. Many are adjusting planning rules and parking prices to discourage driving when other options are available, and in some cases even prohibiting new parking spaces from being built in congested or sensitive locations.

Challenges and opportunities associated with car parking have been broken down into five main components, as follows.

1. Car parking supply requirements within new developments is contributing to road network congestion and increased cost of apartments.

With over 6,800 additional dwellings planned in the foreseeable future, Box Hill will be required to accommodate ongoing investment and growth in the commercial sector and must manage access to the centre to support this growth. This could be achieved by making use of existing public transport infrastructure and managing car parking efficiently to reserve parking for those who most need it.

Table 2 outlines the current minimum and maximum statutory parking rates for Box Hill relative to other activity centres. Based on the recommendations of the Box Hill Central Activities Area Car Parking Strategy developed in 2014, a reduction in the minimum residential and office parking rates was approved in December 2015. While this reduction was needed at the time, the more aggressive step of implementing a maximum cap on parking (as has Footscray and Melbourne CBD) was not taken. As a result, developers are permitted to provide greater levels of parking than is required, potentially encouraging greater share of private vehicle access. At the time of writing this report, Moreland City Council were consulting on proposed changes to implement maximum parking rates on key activity centres, as noted in the table below.

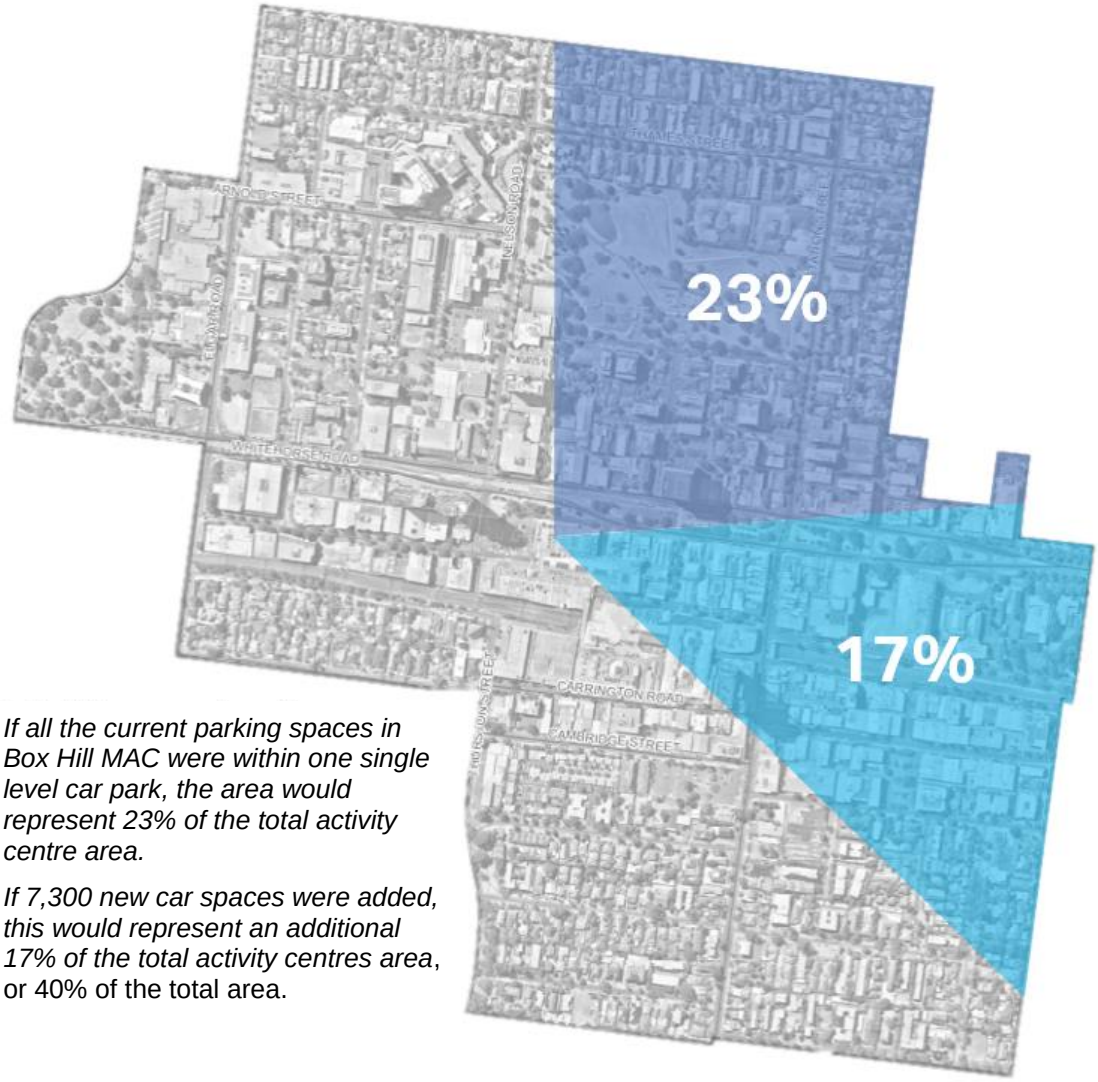
Table 2 Minimum and maximum statutory parking rates for Box Hill relative to other activity centres

	Spaces per 1-bedroom dwelling		Spaces per 2-bedroom dwelling		Spaces per 3-bedroom dwelling or more		Office (spaces per 100 sqm.)	
	Min	Max	Min	Max	Min	Max	Min	Max
Box Hill	0.5	-	0.75	-	1.0	-	2.0	-
Melbourne CBD	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.5
Footscray	0.5	1.0	0.8	1.0	1.0	1.5	1.5	2.0
South Yarra / Prahran	1.0	-	1.0	-	2.0	-	3.0	3.5
Brunswick (current)	1.0	-	1.0	-	2.0	-	3	3.5
Brunswick (proposed)	-	1.0	-	1.0	-	2.0	3	3.5
Geelong	1.0	-	1.0	-	2.0	-	3	3.5
Chatswood (NSW)	1.0	-	1.0	-	1.0	-	1.0	-

2. The supply of convenient long-term parking encourages private vehicle use.

There are approximately 9,000 publicly available car parking spaces provided in Box Hill MAC including free, ticketed, time restricted and unrestricted parking, with approximately 59 percent of these car parking spaces considered long term (four or more hours). Concerns have been raised across various car parking studies regarding the provision of car parking without appropriate limits on length-of-stay, especially along streets in the transport and retail precinct, and throughout the hospital and western TAFE precincts.

With an additional 7,300 car parking spaces proposed as part of the currently planned high-rise residential development projects, there is an urgent need to address this issue to regulate the number of private vehicles travelling into Box Hill and worsening traffic congestion and public amenity. For example, in line with a recent planning scheme amendment associated with the Principal Public Transport Network (PPTN), minimum parking rates could in some areas be reduced to zero where a dwelling is located within 400 metres of a significant public transport facility. This could be supplemented with the introduction of car share schemes. Car share schemes have been shown to reduce car ownership in areas with good access to public transport by providing convenient occasional access to a car when public transport may not be an efficient option.



If all the current parking spaces in Box Hill MAC were within one single level car park, the area would represent 23% of the total activity centre area.

If 7,300 new car spaces were added, this would represent an additional 17% of the total activity centres area, or 40% of the total area.

Figure 19 Equivalent car parking area within Box Hill MAC assuming all spaces were on a single level

3. Commuter parking supply at Box Hill station is often used for purposes other than accessing public transport, reducing parking for train riders.

Box Hill Station provides approximately 500 long term car parking spaces in the southern shopping centre car park, and a further 75 car parking spaces on Bank Street. These has been observed to be fully occupied before 8.00 am and are occupied by many people not using public transport, such as people working in the area. As these car parks accommodate multiple uses including staff and retail car parking for patrons, there is a need to better manage access and egress points to ensure non-commuters are not allowed to use long term commuter car park spaces.

A utilisation and compliance audit conducted by PTV in 2014 suggests that benefits of the commuter car park are being realised by non-public transport commuters.

"To reduce congestion caused by commuters we should create park and ride carparks in Blackburn and Surrey Hills. People living in Box Hill don't need a commuter carpark."

Anonymous community comments

4. Poor wayfinding for parking spaces is contributing to road congestion within the MAC.

Research shows that 30 percent[2] of congestion is caused by people looking for parking spaces, with an average cruise time of eight minutes.

Lack of wayfinding to determine the location of free car spaces leads to difficulty in navigating the road network and circulating within multi-level car parks.

"Install parking sensors to let drivers know where parking is available, to stop drivers circling in a carpark and in the centre."

"There is too much parking in Box Hill central area. More carparks equal more congestion. Most people who live in central area don't need cars."

Anonymous community comments

5. What are the opportunities to improve parking efficiency?

The following opportunities may improve parking efficiency and reduce road congestion within the MAC:

- Replacement of minimum with maximum statutory parking rates for new developments in Box Hill
- Improved wayfinding and parking technology to direct drivers to empty car parking spaces within the MAC
- Support and advocate for car share schemes to reduce private vehicle ownership
- Support for travel behaviour change initiatives to encourage the use of sustainable transport modes for large businesses within Box Hill MAC
- Relocation of on-street parking to off street (where practical) for more efficient use of kerbside parking areas
- Facilitation and promotion of innovative ride share technologies to reduce the need for individual long term car parking spaces.

[2] The High Cost of Free Parking, Donald Shoup

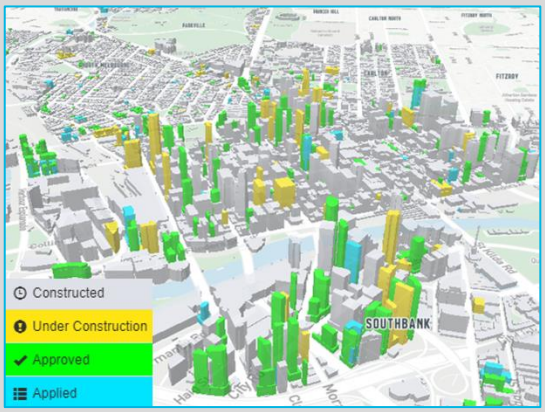
While it is acknowledged that some level of car parking is essential – particularly for mobility impaired travellers and visitors to some locations where alternatives are not readily available or practical – the minimisation or strategic relocation of non-essential car parking can help support the overall goals of Box Hill as a vibrant activity/community centre.

The two case studies identified below show what can be achieved by changing parking rates and relocating commuter parking to stations with less activity.

Case study 1: Replacing minimum parking rates with maximum parking rates, Melbourne CBD and Moreland City Council

The City of Melbourne has set maximum parking rates for new developments (shown in green and yellow in the below image) within Melbourne CBD. They have also removed any minimum parking requirements for new development, making parking provision optional for developer consideration.

Moreland City Council has likewise begun the process of making changes to parking requirements for new development, including removing minimum parking requirements in the Brunswick, Coburg and Glenroy activity centres. This is intended to help slow the growth of cars and traffic congestion in these areas.



Case study 2: Relocation of commuter parking from Footscray to West Footscray stations

As part of the Regional Rail Link project, commuter parking was relocated from Footscray station to West Footscray station with the intention of increasing development opportunities in central Footscray. This also included improvements to Footscray station's forecourt and public space areas (shown in the photo below). Station patronage has subsequently increased despite the reduction in commuter car parking.

This case study may suggest an opportunity to investigate the potential benefits of moving non-essential commuter parking from Box Hill to other locations outside the constrained activity centre.

Figure 20 Parking case studies

3.0 Stakeholder engagement and community insights

3.1 Stakeholder engagement

An issues and opportunities workshop was held with key stakeholders over two sessions on Thursday 5 September 2019, to allow the AECOM team to gain further understanding of the issues and opportunities pertaining to a number of topics. Attendees from the workshops included representatives from local organisations and interest groups, as well as the Department of Transport.

The workshops included interactive sessions where participants were split into groups to discuss and record their ideas on the issues and opportunities on post-it notes organised into a number of key topics.

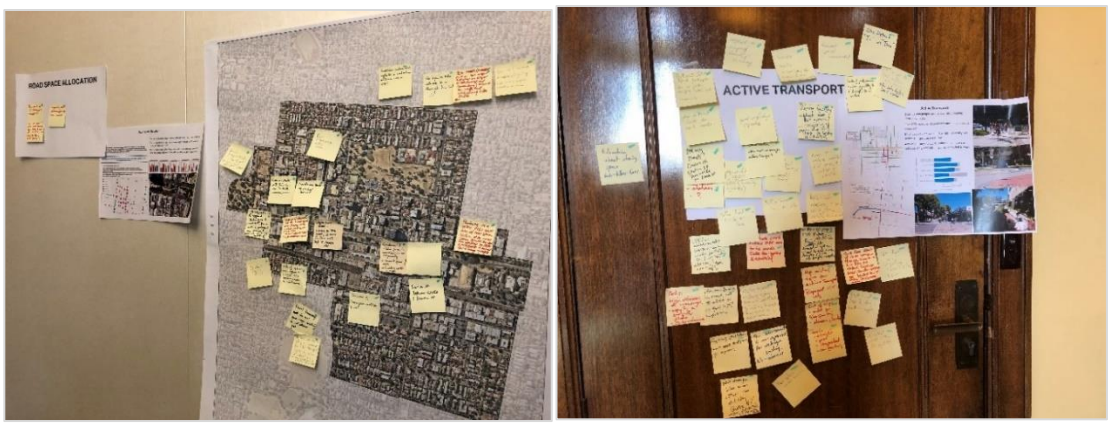


Figure 21 Example notes from issues and opportunities workshop

A detailed summary of the key points and main outcomes from the workshops are provided in the minutes in Appendix B.

3.2 Community insights

Community insights were also gathered through engagement activities undertaken by Place Score and Conversation Caravan to gather input on what aspects of Box Hill are most highly valued by residents, businesses and visitors. This included:

- On-site face-to-face surveys, with data collected between Tuesday 20 and Tuesday 27 August 2019 via two means:
  - ***Care Factor Survey***, where respondents were asked about which 'place attributes' were most important to them in their ideal town centre
  - ***Street Place Experience (PX) Assessments*** Respondents were asked how 'place attributes' impacted their personal enjoyment at the following six locations:
    - Nelson Road between Whitehorse Road and Epworth Eastern
    - Prospect Street between Box Hill Central carpark entrance and 30 Prospect Street
    - Market Street between Whitehorse Road and Main Street
    - Carrington Road between 65 Carrington Road and Station Street
    - Whitehorse Road (north side) between Station Street and Bruce Street
    - Station Street between Whitehorse Road and Carrington Road
- Online engagement through WCC's ***OurSay*** platform, where respondents were asked about issues they experienced accessing Box Hill using various modes.

Detailed findings from the community engagement are provided in the Community Insights Report included as Appendix C, with a brief summary provided in the following sections.

Public transport (including transport interchange)

The feedback gathered from the community has emphasised the following priorities in relation to public transport (including the transport interchange):

1. **Invest** in increasing public transport options as alternatives to private vehicle use.
2. Encourage **change of travel behaviour** from use of private vehicles to public transport.
3. Improve **pedestrian connections** between destinations and transport modes to create a seamless experience.
4. Provide **information** to aid **wayfinding** and support public transport use.
5. Envision the interchange as a **hub of the community**.

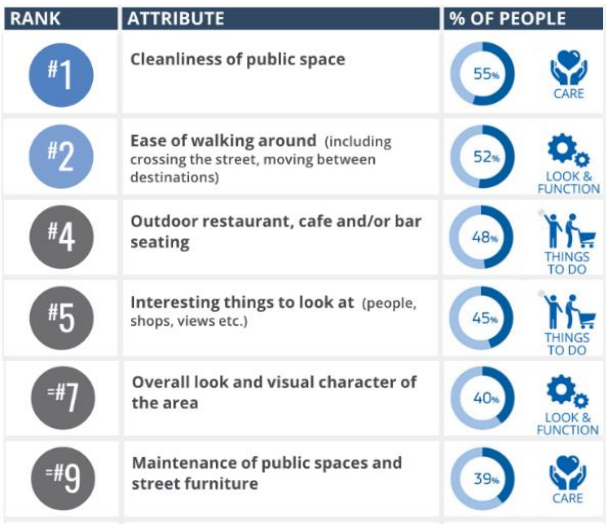
In addition, *'walking, cycling and public transport options'* was ranked number 14 out of 50 attributes for what the overall Box Hill community most cares about.

The key issues and opportunities relating to public transport (including the transport interchange), as identified by the community, are as follows:

- **Issue 1:** Dissatisfaction with the connection between the bus station and train station
- **Issue 2:** The interchange does not reflect Box Hill identity or culture
- **Opportunity 1:** Investment in public transport options
- **Opportunity 2:** Potential to change travel behaviour
- **Opportunity 3:** Improved connections between destinations and transport modes
- **Opportunity 4:** Increase information to support public transport use
- **Opportunity 5:** The interchange as a hub connecting the community

Streets and public spaces

With respect to streets and public spaces, the feedback gathered to date has emphasised the following priorities (out of 50 attributes) shown in Figure 22.



The key issues and opportunities relating to streets and public spaces, as identified by the community, are as follows:

Issue 1: Delays to public transport services and traffic flows

Opportunity 1: Reprioritisation of road space

Opportunity 2: Investment in improving place outcomes

Opportunity 3: Diversion of transit traffic

Figure 22 Values and priorities in relation to streets and public spaces

Walking and cycling

With respect to walking and cycling, the feedback gathered to date has emphasised the following priorities:

1. Improve and encourage walking by **investing in walking infrastructure** and enforcing regulations for enhancing the physical environment.
2. **Improve pedestrian connectivity** between destinations and different forms of transport to create a seamless experience.
3. **Improve bike infrastructure** at the interchange and bike connectivity within and beyond Box Hill.

Further to this, **'ease of walking around'**, including crossing the street and moving between destinations, is considered the second most important attribute (out of 50) for those living and working in Box Hill, as shown in Figure 23.

The key issues and opportunities relating to walking and cycling, as identified by the community are as follows:

Issue 1: Difficulty in walking around

Issue 2: Challenges for cyclists

Issue 3: Impact of delivery vehicles on pedestrians and cyclists

Opportunity 1: Improving and encouraging walking

Opportunity 2: Improving bike connectivity and infrastructure

Figure 23 Values and priorities in relation to walking and cycling

Road safety

The feedback gathered from the community has emphasised the following values and priorities in relation to road safety:

- Make Box Hill a safe place to move around on foot or by bike.
- Make Box Hill feel safe for all users to spend time in – day and night.

In addition, physical safety (paths, cars, lighting etc.) was one of the worst performing attributes cited by the community along Prospect Street and Whitehorse Road.

Furthermore, out of 50 care factor attributes, the surveyed members of the Box Hill community have ranked **physical safety #16** and **sense of safety #13**.

The key issues and opportunities relating to road safety, as identified by the community are as follows:

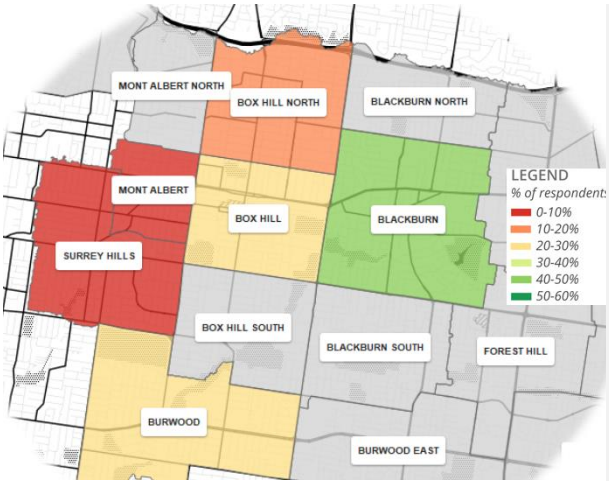
- **Issue 1:** It can be dangerous to walk around
- **Issue 2:** People do not feel safe
- **Opportunity 1:** Make it a safe place to move around on foot or by bike
- **Opportunity 2:** Make it feel safe to spend time in – day and night

Car parking

The feedback gathered from the community is summarised in Figure 24, showing how much residents of Box Hill and surrounding suburbs value car access and parking, from green (high) to red (low).

The key findings include:

- *'Car accessibility and parking'* is only the **40th** most important place attribute out of 50 total attributes. There is a public perception that car parking is a critical issue for the community in Box Hill, however this finding confirms that this is not the case.
- Only **23 percent** of respondents who drove to Box Hill selected '*car accessibility and parking'* as being most important to them.



The key issues and opportunities relating to car parking, as identified by the community are as follows:

Issue 1: Conflicted community – for and against parking

Opportunity 1: Shift investment to active and public transport, and other 'place' improvements

Opportunity 2: Creating a park-and-ride precinct

Figure 24 Care Factor percentages for 'car accessibility and parking' by suburb

4.0 Conclusion and next steps

This report provides a snapshot of the current issues and opportunities present in Box Hill and an indication of how these may develop in the future if nothing is done to address them. With the level of population and employment growth forecast in the next 20 years, a key challenge facing Box Hill is ensuring its transport infrastructure can keep pace with this growth.

The following points highlight the key ideas and themes being considered in the next stages of this study:

- **Car Parking:** Convenient access to over 4,500 long term parking spaces could be a key attributor for low participation in active and sustainable modes of transport by those who live and work in Box Hill. Parking provision for new developments should also be reviewed to manage car use for future residents.
- **Safety:** Increased physical and personal safety could help to encourage people to get out of their cars, and increase walking, cycling and public transport use. These sustainable modes will assist with enabling Box Hill to accommodate more trips in a rapidly growing activity centre.
- **Improvements for Walking and Cycling:** Increased participation in walking and cycling could eventually lead to reduction in road congestion and associated costs caused by delays. Optimally this could also help buses to become more reliable (depending on the level of success).
- **Improvements for Public Transport:** A generally upgraded public transport interchange and facilities, along with improved connectivity, information and wayfinding, could help to improve the overall look and visual character of Box Hill (an attribute highly valued by the community) and encourage a change of travel behaviour.
- **Better use of streets and public space:** Public space is limited in Box Hill. Road space, in some areas, could be used more productively to provide an improved sense of safety and ease of walking around (the second highest valued attribute by the community).

Further feedback is being sought from the community on possible strategies to address the issues and opportunities highlighted in this report. This feedback will be used to inform the direction and level of intervention for the actions being developed for the ITS.

Appendix A

Box Hill MAC ITS Background Study

AECOM

BOX HILL INTEGRATED TRANSPORT STRATEGY

Background Study

for **Whitehorse City Council**

3 June 2019

Box Hill: Integrated Transport Strategy

Background Study

Client: City of Whitehorse

ABN: 0000

Prepared by

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Quality Information

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Date	03-Jun-2019
Prepared by	Dhano Arjuna
Reviewed by	Callan Jones

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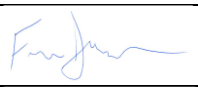
			Name/Position	Signature
A	26-Mar-2019	Draft report for comment	Frank Jaskiewicz Associate Director	
B	03-Jun-2019	Final report	Frank Jaskiewicz Associate Director	

Table of Contents

1.0 Introduction

1.1 Background

AECOM has been engaged by Whitehorse City Council to undertake a background study to assist in the development of the Integrated Transport Strategy for the Box Hill Metropolitan Activity Centre (MAC) in 2019/20.

Over the last decade, the Box Hill MAC has experienced substantial growth and development. In particular, there has been the opening of the new Australian Tax Office (ATO) building, the substantial redevelopment of the Box Hill Hospital and Box Hill Institute facilities, and significant private investment in developments such as The Chen Hotel and Sky One. Multiple high-rise mixed-use developments have also been approved within the precinct, and further development is expected in the coming years.

This background study forms the first stage of the development of an Integrated Transport Strategy for Box Hill. The study assembles essential contextual information on government objectives, existing strategies, plans and programs, and the available evidence on the nature and scale of the problems and opportunities facing those living and working within Box Hill MAC.

As there is a considerable volume of material and analysis within this report, this guide uses summary sections to simplify the interpretation of data and raises key questions on which City of Whitehorse would welcome readers' views.

1.2 Report purpose and structure

The purpose of this background study is to:

- provide an evidential foundation and starting point for the upcoming Box Hill Integrated Transport Strategy (ITS); and
- identify any data gaps that requires additional data collection.

The report is structured as follows:

- Section 1: Introduction (this Section)
- Section 2: Strategic and Policy Context
- Section 3: Box Hill Profile and Characteristics
- Section 4: Transport Network
- Section 5: Conclusions
- Section 6: Next Steps.

1.3 Study area

Box Hill MAC is the largest activity centre in the City of Whitehorse and is located approximately 15 kilometres east of Melbourne CBD. It provides retail, education, civic, medical, community service, entertainment and recreational opportunities for the regional population, as well as serving as a hub for the local community. The MAC has been identified as a key centre for metropolitan development in successive metropolitan strategies, most recently in *Plan Melbourne*.

Figure 1 shows the study area for the Box Hill MAC. The study area is bound by Albion Road to the south, William Street and Watts Street to the east, Severn Street to the north, and Kingsley Gardens to the west.

It should be noted that whilst the study area has been defined, factors and movements from outside the area are likely to have an influence and will therefore need to be considered where appropriate.

Figure 1 Study area

2.0 Strategic context

Transport planning is rarely, if ever, a fully local matter. Transport networks are connected across cities and between regions, with flows being shaped over time by changing patterns of settlement, commuting and visitation. As such an integrated transport strategy needs to recognise the broader planning and development context — that is, where does it fit within larger state and federal planning priorities.

State and Local Government are responsible for delivering transport legislation, policy and strategic solutions to Box Hill and the wider Whitehorse municipality. The Federal Government plays a central role in guiding strategy and channelling funding to the lower level Governments for transport projects, while State Government has a mandate to coordinate priorities and set the agenda on transport issues.

At the Local Government level, it is essential the Box Hill Integrated Transport Strategy aligns with both State and Federal transport objectives to obtain support and funding for recommended projects. The Strategy requires a contextual understanding of transport developments within Box Hill that aligns with broader State and Federal initiatives.

Section 2.0 of this report details the strategic context of the Box Hill Integrated Transport Strategy. It focuses on State Government transport legislation, broad state-wide planning documents, and strategies related to the core transport infrastructure of Box Hill, primarily road transport, public transport, cycling and walking. The Local Government context is also examined, highlighting delivery and planning objectives of Council. Finally, the Federal Government context is discussed with an emphasis on national level strategic principles and funding of potential projects. The implications of government planning frameworks and approaches for developing the Box Hill Integrated Transport Strategy are drawn out at the end of this section.

2.1 State Government

2.1.1 Victorian Cycling Strategy 2018-2028

The Victorian Cycling Strategy 2018-2028 was developed by the Victoria Government. The Strategy aims to increase the volume, frequency and diversity of Victorian commuters using cycling as a mode of travel to work and education. The Strategy lays out how this can be achieved by investing in a safer, stress-free, connected transport network that prioritises strategic cycling corridors. Objectives to improve the ease of cycling transport must consider women, children and senior Victorians to improve inclusivity of cycling infrastructure. The strategy outlines that central to the Strategy goals is the need to plan for emerging technologies that markets cycling to a wide audience.

2.1.2 Plan Melbourne 2017-2050

Plan Melbourne is a long-term planning document that lays out a blueprint for the accommodation of Melbourne's future growth in population and employment. It is underpinned by nine principles for Melbourne's future and culminates in 90 policy recommendations to be rolled out in the coming decades.

Plan Melbourne identifies Box Hill as a place of state significance in investment and growth for its role as a Metropolitan Activity Centre (MAC). MACs provide a diverse range of jobs, activities and housing for catchments that are well served by public transport. They are major hubs of service delivery including government, health, justice and education services, and provide retail and commercial opportunities.

The Plan highlights that local street design plays a large role in enabling people to make more sustainable travel choices for local trips. It aligns with ***VicRoads' Movement and Place Approach*** which considers how streets should perform their movement and place function.

Within Plan Melbourne, 20-minute neighbourhoods are supported by further policy directions. This includes locating schools and other facilities near existing public transport and providing safe walking and cycling routes and drop-off zones.

The Plan sets out several policies to support improved provision of transport infrastructure for various types of localised trips. These include:

- Policy 3.1.6 Support cycling for commuting to work and education, particularly through developing strategic cycling corridors.
- Policy 3.3.2 Creating a network of cycling links for local trips to support cycling in local streets. It is suggested that doing so will encourage under-represented groups such as women, families and school-age children to consider cycling.
- Policy 4.1.2 Improve local travel options and integrate place-making practices into road-space management.
- Policy 3.3.1 Priority should be given to pedestrian movements in neighbourhoods, and the needs of pedestrians should be a priority in all urban environments.

The Plan also advocates for creating pedestrian-friendly neighbourhoods where pedestrian routes are high-quality, safe, direct and pleasant.

2.1.3 Towards Zero 2016-2020 Road Safety Strategy

The Towards Zero 2016-2020 Road Safety Strategy is a significant plan developed by Victoria's road safety partners VicRoads, TAC, Victoria Police and the Victorian Government that aims to reduce road related deaths by 20 percent and seeks a 15 percent reduction in road accident related serious injuries from 2016 levels by 2020.

Central to these goals is the encouragement of investment in safe road infrastructure and engagement with local communities.

2.1.4 Infrastructure Victoria's 30-Year Strategy 2016

Infrastructure Victoria is an independent advisory body that informs the State Government on infrastructure priorities across Victoria. The 30-Year Strategy, published in 2016, makes several recommendations pertaining to road, public transport, walking and cycling. The recommendations are designed to address a list of broader identified needs. The following needs are applicable to the transport network of Box Hill:

- **Need 1:** Address infrastructure demands in areas of high population growth
- **Need 4:** Enable physical activity and participation
- **Need 6:** Improve accessibility for people with mobility challenges
- **Need 10:** Meet growing demand to access economic activity in central Melbourne
- **Need 11:** Improve access to middle and outer Metropolitan major employment centres
- **Need 19:** Improve resilience of critical infrastructure.

2.1.5 VicRoads Sustainability and Climate Change Strategy 2015-2020

The Sustainability and Climate Change Strategy 2015-2020 is an overarching document guiding transport development through a series of initiatives aimed at improving sustainability of Victoria's road network and consideration of climate change impacts from road-based travel and infrastructure. These include:

- review of the VicRoads Traffic Noise Reduction Policy
- development of a network air quality model
- review of stormwater management practices
- review of biodiversity management practices
- benchmarking the carbon footprint of our roads
- development of tools to support triple bottom line assessments and meet our obligations under the Transport Integration Act 2010
- development of tools that assist VicRoads to engage with the community to ensure solutions reflect community health, wellbeing and environmental values.

The strategy also includes assessment of the climate change risks to transport infrastructure and communities.

2.1.6 PTV's Network Development Plan - Metropolitan Rail 2012

The Network Development Plan – Metropolitan Rail 2012 was developed by Public Transport Victoria. The Plan aims to expand the capacity of Melbourne's rail network over the next 20 years and beyond. The key strategic objectives of the plan are to:

- expand the capacity of the existing network to meet the growing needs of the city
- redesign train services to maximise opportunities for seamless coordination with buses and trains
- extend the network to serve new growth areas.

The Plan identifies that the Eastern suburbs of Melbourne are expected to experience significant population growth and details several transport solutions to the region surrounding Box Hill.

2.1.7 Transport Integration Act 2010

The Transport Integration Act is Victoria's principal transport legislation and covers the entire transport portfolio for the Victorian Government. The Act sets out a series of objectives that inform a vision of an integrated and sustainable transport system that is inclusive, prosperous and environmentally responsible. The Transport Integration Act provides a mandate for government and non-government stakeholders to share common goals of an efficient, integrated transport network.

The six legislated objectives are:

- social and economic inclusion
- economic prosperity
- environmental sustainability
- integration of transport and land use
- efficiency, coordination and reliability
- safety, health and wellbeing.

2.1.8 Pedestrian Access Strategy – A strategy to increase walking for transport in Victoria 2010

The Pedestrian Access Strategy established the Victorian Government's vision for pedestrian-friendly transport systems throughout Victoria. Five strategic directions are established to guide transport planning decisions, including the following:

- encourage people to walk by changing attitudes and behaviours
- collaborate to improve provision of walking
- create pedestrian friendly built environments, streets and public spaces
- increase the safety of walking
- continue integration of walking with public transport.

2.1.9 VicRoads SmartRoads Network Operating Plan

The SmartRoads Network Operating Plan outlines an approach to managing competing interests for limited road space by giving priority use of the road to different transport modes at particular times of the day depending on travel demand and adjacent land use and activity.

Goals of the plan include:

- facilitate good pedestrian access into and within activity centres in periods of high demand.
- prioritise trams and buses on key public transport routes that link activity centres during morning and afternoon peak periods.

- encourage cars to use alternative routes around activity centres to reduce the level of 'through' traffic.
- encourage bicycles by developing and promoting the bicycle network.
- prioritise trucks on important transport routes that link freight hubs and at times that reduce conflict with other transport modes.

2.2 Local Government

2.2.1 Review Vision of Box Hill Metropolitan Activity Centre 2019

Council has appointed consultants to lead a review of the vision and existing strategic direction for Box Hill, as well as updating the existing Structure Plan where appropriate. The review will provide future guidance for the Box Hill Metropolitan Activity Centre considering the scale and pace of development and change that Box Hill has experienced since the Structure Plan was initially prepared. This review is expected to be completed in 2019.

2.2.2 The Eastern Metropolitan Partnership 2018

The Eastern Metropolitan Partnership is an advisory group established by the Victorian Government. The Partnership provides a platform for local governments that share regional interests to align priorities and allow communities to engage with Local Governments and the State Government. The Partnership provides advice to Governments on community priorities and infrastructure requirements.

The Partnership's advice to the Victorian Government for 2018 included:

- **Regional Connectivity** – Making it easier get around the region, especially through improving bus services and opportunities for active transport
- **Integrated Health and Social Services** - Improving access to the full range of health and social services for the region's most vulnerable people
- **Social Inclusion** - Creating a region where all people, regardless of age, gender, cultural background, or physical ability feel connected and able to participate in community life, with an initial focus on addressing gender equity and unconscious bias in community sport
- **Affordable and Social Housing** - Increasing the supply of affordable and social housing in the region to meet a shortfall of 11,400 dwellings over the next 2 decades
- **Jobs for Youth** - Improving the transition for the region's young people from secondary school to meaningful training or employment.

2.2.3 Box Hill Car Parking Strategy Implementation 2018

This study reviewed the progress of 15 of the 38 recommendations of the 2014 Car Parking Strategy relating to the management of on and off-street car parking in Box Hill. This study identified that all 15 of the 38 recommendations had been completed.

As part of this study, Council completed another survey of car parking in Box Hill and provided updated statistics on parking usage. For the 2014 Strategy, a car parking survey was completed in 2012. The following comparison was made between 2012 and 2018 car parking surveys:

- comparing with the 2012 surveys, overall parking occupancy for the study area has marginally increased from 64% in 2012 compared with 66% in 2018
- the on-street parking occupancy for the study area has increased from 50% in 2012 to 53% in 2018
- the off-street parking occupancy for the study area has increased from 71% in 2012 to 78% in 2018.

2.2.4 Whitehorse Planning Scheme Review 2018

The Whitehorse Planning Scheme guides decisions about land use and development within the City of Whitehorse. A review of the plan is mandated within the *Planning and Environment Act 1987* and was

undertaken in 2018. The review incorporates an assessment of the performance of the Planning Scheme against set measures within the Planning Scheme itself.

The Review provides a list of 44 recommendations. A number of these relate to planning initiatives within the municipality. The Review particularly highlights the need to align Council planning objectives with Plan Melbourne, Box Hill's importance as a MAC, and advocacy to improve the Box Hill transport interchange.

2.2.5 Box Hill Transit Interchange Ministerial Advisory Group Report 2017

The Box Hill Transit Interchange Ministerial Advisory Group assessed transport needs of Box Hill relating to the transit interchange such as train, tram and bus transfers, commuter car parking, the surrounding road network, and the relationship with Box Hill Central.

The results of the investigations relating to transport development were as follows:

- Box Hill is experiencing development pressure as a mini CBD. This is driven by both private investment and government investment in health and transport;
- the bus interchange is well located, but has poor amenity due to issues with cleanliness, weather protection, safety and disability access;
- the bus interchange has capacity for growth as it is operating at 65 percent of its designated bus movement capacity;
- bus operations are impacted by urban growth pressures impacting bus reliability due to congestion;
- the railway station needs accessibility improvements; and
- Box Hill's governance does not reflect its status as it does not have roundtable operations management, governance or planning coordination.

The report then led to the formation of the Box Hill Transport Interchange Steering Committee.

2.2.6 Box Hill Metropolitan Activity Centre 2016

The City of Whitehorse established the Box Hill Metropolitan Activity Centre 2016 policy was developed as part of the Whitehorse Planning Scheme. The policy outlined an implementation imperative of a sustainable, safe and accessible Box Hill. The policy identifies eight activity precincts and seven built precincts within Box Hill along with a public space framework and access framework for all developments pertaining to Box Hill's public realm. The policy includes a series of objectives regarding placemaking strategies in Box Hill, including infrastructure that supports walking as the primary means of access in central Box Hill and an increase in public transport use.

2.2.7 Box Hill Central Activities Area Car Parking Strategy 2014

The City of Whitehorse developed this strategy to effectively manage existing and future car parking conditions providing for worker, shopper and visitor needs to support sustainable and economic growth. The strategy identified 38 recommendations, that look to better manage the existing car parking, changes to car parking rates for commercial and residential developments, and options to reduce car parking demand through travel behaviour change.

This led to Amendment C158, Parking Overlay for reduced parking rates for residential and office land uses in the Box Hill Activity Centre, which came into effect in December 2015.

2.2.8 Box Hill Access and Mobility Plan 2011

Commissioned by the Department of Transport, the Box Hill Access and Mobility Plan identifies risks and barriers to the provision of safe and effective movement of people to and within the Box Hill Central Activities Area (CAA). This required the identification of existing issues and opportunities for access and mobility in Box Hill. Both population and employment were expected to double in the CAA over the coming 20 years, significantly increasing the number of trips within Box Hill.

Prioritisation of cycling, walking and public transport were found to be essential to ensuring Box Hill can meet transit demand. With support from stakeholders, seven morning peak scenarios for development of Box Hill transport planning were established and tested using the Melbourne

Integrated Transport Model (MITM). The modelling found, that without interventions, all major roads through the area would be at or near capacity during the morning peak by 2031 (assumed to be the same for the evening peak). The scenarios modelled were incorporated into the Access and Mobility Access Plan. Some of the measures for development included bus priority lanes on Station Street, additional bus services in the area and speed limit reductions throughout Box Hill.

2.2.9 Whitehorse Integrated Transport Strategy 2011

The Whitehorse Integrated Strategy 2011 was developed to incorporate road safety, active transport and sustainable transport initiatives. It creates a framework to consider different modes of transport available in Whitehorse municipality and provides direction on the facilitation of transport options and networks. The Strategy aligns Council's approach to advocate for improved transport infrastructure and guides policy and strategic objectives for the City of Whitehorse.

Included in the strategy is an Action Plan that sets out a series of actions and priorities for Council to pursue. Council performed the lead advocacy role in developing the list with support from key stakeholders.

A summary of key actions relating to Box Hill and the progress status are below:

- Action 1.1.2: Advocate for improved pedestrian facilities and access at Box Hill Central Activities District, including along Whitehorse Road and Station Street.

Since 2011 Council have ensured ongoing advocacy to improve pedestrian facilities including better pedestrian timing for the traffic signals and upgrades to a pedestrian underpass.

- Action 1.1.3: Investigate and implement as recommended, improved pedestrian facilitated and access and Box Hill Central Activities District.

Carrington Road in Box Hill has since received streetscape upgrades. There have been no other significant pedestrian upgrades.

- Action 2.2.2: Complete a feasibility study and advocate for the construction of the bicycle CAD Connector between Box Hill and Ringwood.

The feasibility study has since been finalised and the path construction is mostly complete.

- Action 3.3.1: Advocate for the urgent upgrade of the Box Hill Transport Interchange – including better connectivity between tram, train and bus services and improved passenger waiting facilities in terms of comfort and information.

Since 2011 the upgrade of the Box Hill Transit Interchange has been an ongoing advocacy position for Council. There have been no significant upgrades to the interchange since the Whitehorse Integrated Transport Strategy 2011 was published.

- Action 3.3.3: Advocate for the construction of the third railway line between Box Hill and Ringwood, with the implementation of grade separations for the level crossings.

It has since been advised that a third railway line between Box Hill and Ringwood is a longer-term priority for the State Government, approximately 30-50 years. Landholder, VicTrack, has assured Council that land is available for future development of this track.

There have been level crossing removals at Blackburn, Rooks, Mitcham and Heatherdale Roads easing congestion on the roads and reducing travel times throughout the transport network of Box Hill.

- Action 4.4.4: Lobby VicRoads to down grade the road classification of Station Street Box Hill to increase the focus on road base public transport and pedestrians.

Downgrading of Station Street road classification has not yet been achieved.

- Action 4.4.6: Continue to investigate the feasibility of introducing a car-share scheme within the Box Hill CAD in association with a private car share company and to implement when economically viable.

While there has not been a private car share scheme implemented in Box Hill, some changes in planning permit conditions indicate a scheme could be implemented for future development.

- Action 4.4.8: Investigate the adoption of reduced parking rates for new developments located in the Box Hill Central Activities District or where appropriate, in Major Activity Centres and in the vicinity of train stations, to encourage the use of more sustainable forms of transport.

Council successfully reduced parking rates for Box Hill in December 2015.

2.2.10 Whitehorse Integrated Transport Strategy Background Report 2011

The Whitehorse Integrated Transport Strategy Background Report 2011 reviewed municipal demographics of Whitehorse and built on Council's Integrated Transport Strategy 2002. The document reviewed the consequential strategies relating to Whitehorse municipal transport systems and major developments requiring a review and refresh of the ITS.

2.2.11 Box Hill Transit Activity Centre Structure Plan 2007

The Box Hill Transit Activity Centre Structure Plan builds upon studies commissioned by Council, The Box Hill Transport Interchange Study, The Box Hill Urban Design Framework and a Housing Study. Council aimed to integrate findings of all three studies into a clear framework for development of Box Hill.

The Structure Plan identifies issues and strategic opportunities in Box Hill such as socio-economic issues, clustered economic activity, cultural distinctiveness and public transport. The Plan presents a vision for Box hill to becomes one of the most significant urban centres in Melbourne's eastern suburbs. The vison was to be implemented via a planning framework that encompassed a network of public spaces, safe and attractive streetscaping, land use that addresses community needs and buildings that contributed to the quality of the public environment. A series of strategies and actions are listed in the Plan underpin Council's vision.

2.3 Federal Government

The Department of Infrastructure, Regional Development and Cities is the relevant Commonwealth Department concerned with National transport objectives. The Department provides strategic policy advice to shape the framework that underpins the integration of road, rail, maritime and aviation in Australia. The Department aims to ensure safe, efficient and sustainable domestic and international transport systems which are vital to Australia's continuing prosperity.

In addition to broader strategic alignment the Federal Government also plays a role by contributing funding to transport projects. In the neighbouring municipality of Boroondara, significant funding from the Federal Government will be invested in the North East Link road project. In 2017, $1.75 billion was made available for North East Link. Key to receiving such funding lies in ensuring that strategic objectives in Box Hill align with those of the Federal Government.

2.4 Framework implications for the Box Hill Integrated Transport Strategy

The broad range of State Government strategies highlight the importance of an integrated transport network with different modes working in synergy with sustainable infrastructure. More specifically, the objectives present a series of shared core principles, with a focus on safety, inclusivity, minimised congestion, and prioritisation of greenhouse gas emission reduction.

These core principles have implications for the Box Hill Integrated Transport Strategy. Projects to be delivered will need to align by prioritising pedestrian and cycling infrastructure that is easily accessed by women, children, disabled and elderly users. Congestion reduction measures should address the population growth of Box Hill and surrounding suburbs, such as smart and adaptable road traffic infrastructure and prioritising bus and tram routes that connect Box Hill to other activity centres.

Existing strategies from Local Government also highlight a need to support State Government planning, particularly by promoting Box Hill as a MAC. The transport interchange plays a central role in Box Hill's significant role as a mini CBD. Local Government strategies provide implementation insight by prioritising upgrades to the transport interchange and promoting ease of connectivity within inner Box Hill and between transport modes.

The Federal Government, while not designing strategic transport initiatives, is an important stakeholder in the congestion busting and integration strategies for Victoria's transport integration.

Projects receiving Federal Government funding require comprehensive evidence-based justifications to support the Federal Government is an ‘informed investor’. The prospects of securing federal funding for important transport investments will be higher if underpinned by robust, transparent and forward-leaning analysis.

With State Government at the helm of transport planning in Victoria and Local Government providing implementation objectives to promote Box Hill as a MAC, the Box Hill Integrated Transport Strategy should ideally align with a series of core overarching themes if strategic projects are to be advanced and delivered.

3.0 Box Hill profile and characteristics

The following section discusses the key demographics, profiles and characteristics of the study area, and is structured as follows:

- land use
- population
- significant development sites
- employment
- education
- age
- language
- mode share
- key origins
- key destinations.

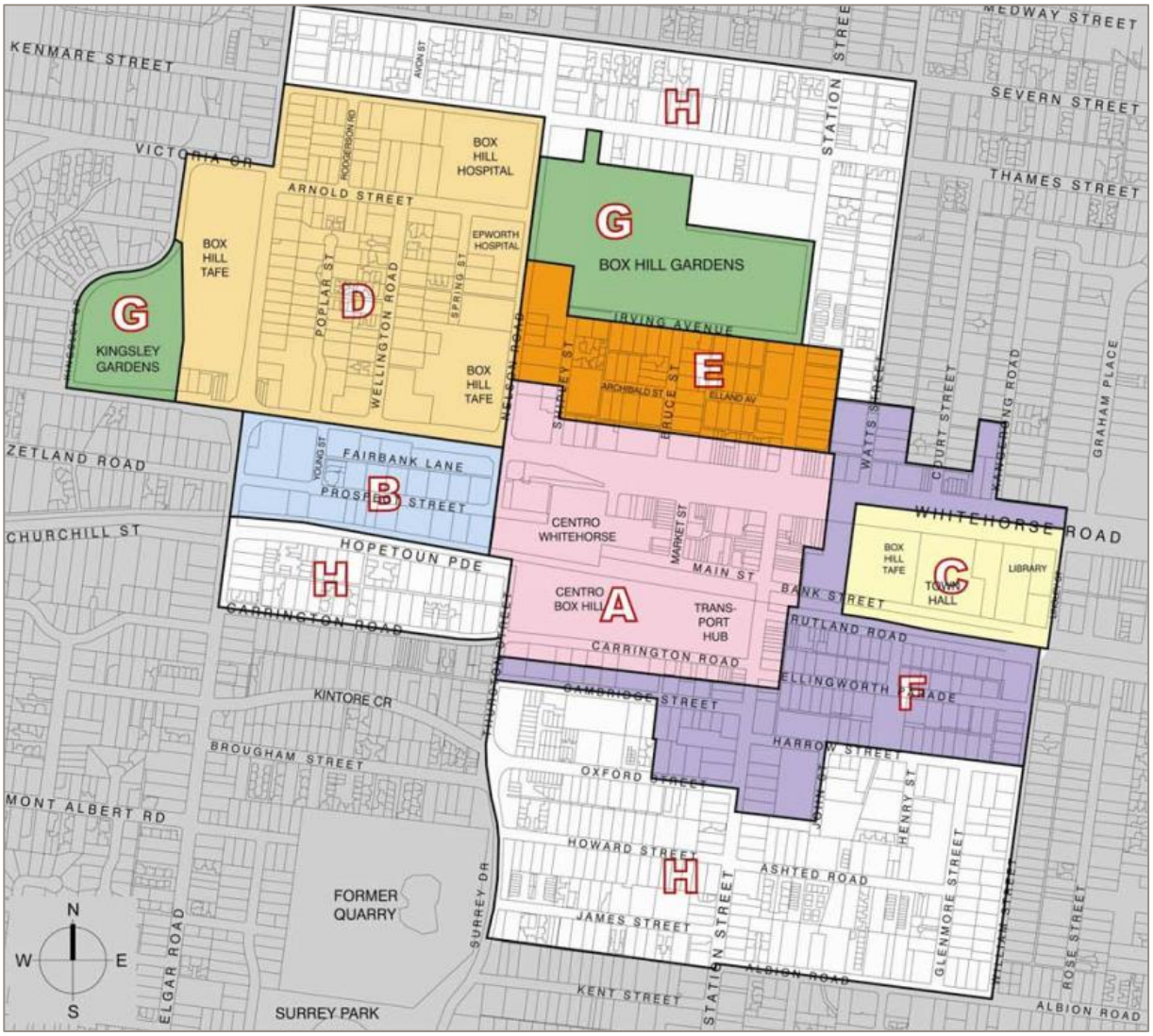
The key findings from Sections 3.0 and Section 4.0 have been highlighted in blue throughout this background study.

3.1 Land use

Box Hill MAC – Activity Precinct Plan (shown in Figure 2) highlights the different types of land uses within the metropolitan activity centre. Table 1 outlines the various land uses within the study area. Box Hill provides retail, education, office, civic, medical, community service, entertainment, dining and recreational opportunities for both local and regional populations.

Table 1 Precinct descriptor

Precinct		Description
A	Box Hill Transport and Retail Precinct	Box Hill Transport and Retail Precinct: Retail sustained throughout the area complemented by entertainment, hospitality, commercial and other uses with extended hours of activity creating a central focus for Box Hill
B	Prospect Street Precinct	Prospect Street Precinct: Consolidation as the primary office precinct in the activity centre.
C	Civic and Eastern TAFE Precinct	Consolidation of cultural, community and educational facilities in the precinct.
D	Hospital and Western TAFE Precinct	Growth and enhancement of educational and medical institutions and support for related businesses and services, plus high density residential (including student housing).
E	Box Hill Gardens Precinct	Provision for significant high to medium density residential growth with small scale offices, limited retail and community services and retail to activate ground level street frontages.
F	Southern and Eastern Precincts	Mix of office and retail uses responding to prominent Whitehorse Road and Station street frontages, mixed sue (residential) as transition to purely residential precincts.
G	Box Hill Gardens and Kingsley Gardens	Convenient access to high quality public open space and recreational opportunities within the activity centre.
H	Residential Precincts	The areas' residential role and amenity protected but medium density residential development encouraged. (most areas surrounding the study area are also residential)



Source: Whitehorse Planning Scheme

Figure 2 Land use

3.2 Population

Box Hill has experienced significant growth in population from 2001 to 2016 relative to Whitehorse LGA and Metropolitan Melbourne as shown in Table 2. Over the coming decades, the population of Box Hill MAC is projected to continue to increase at an accelerated rate. The average annual growth rate (AAGR) between 2016 and 2041 is projected be 3.5 percent, higher than the AAGR for Whitehorse LGA and Metropolitan Melbourne.

The 2036 population forecasts have been derived from the 2019 MGS Structure Plan which have investigated population forecasts from VIF and a revised forecast with a lower growth rate providing forecasted population range for 2036.

Box Hill's population is expected to double by 2036

Table 2 Historical and projected population

Region	2001	2016	AAGR '01-16	2031	2036	2041	AAGR '16-41
Box Hill	5,090	8,500	+3.5%	14,520	16,900 to 18,600	20,070	+3.5%
Whitehorse LGA	146,170	167,990	+0.9%	193,590	--	215,050	+1.0%
Metro Melbourne	3,500,250	4,628,200	+1.9%	6,058,790	-	7,016,050	+1.7%

Source: Box Hill Narrative Report, SGS Economics and Planning, March 2018 and 2019 MGS Structure Plan

Table 3 shows the population density of Box Hill, Whitehorse LGA and Metropolitan Melbourne at key years between 2001 and 2041. In 2041, the population density for Box Hill is expected to reach 15,440 residents per square kilometre, an increase of a factor of 2.4 on 2016 levels.

Table 3 Historical and projected population density (population/square kilometre)

Region	2001	2016	AAGR '01-16	2031	2036	2041	AAGR '16-41
Box Hill	3,915	6,530	+3.5%	11,170	13,000-14,310	15,440	+3.5%
Whitehorse LGA	2,285	2,625	+0.9%	3,025	-	3,360	+1.0%
Metro Melbourne	350	465	+1.9%	610	-	700	+1.7%

Further investigation into the ABS census data shows that Melbourne CBD's population density reached 15,550 residents per square kilometre in 2016. This means the population density of Box Hill MAC in 2041 will be at a similar level to Melbourne CBD only three years ago.

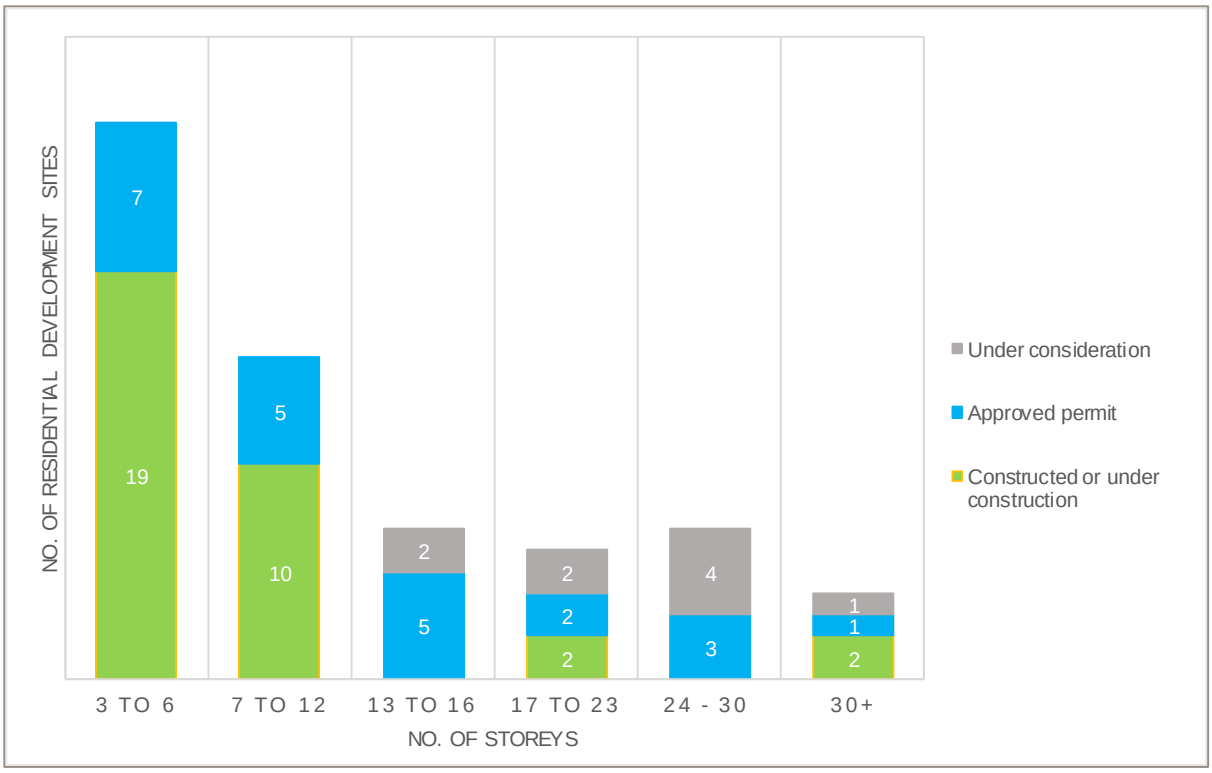
Box Hills population density in 20 years' time is forecast to be comparable to Melbourne CBD today

3.3 Significant development sites

Box Hill is currently experiencing an influx of residential development, with the majority of these projects being located within the core activity centre. Figure 3 highlights the number of development sites by height of development within the study area and the current project status.

Under the Planning Scheme, it is expected that these residential projects would result in approximately 6,800 additional dwellings with 7,300 car parking spaces and 3,100 bike parking spaces required. The average household size of Box Hill was 2.4 persons per dwelling based on 2016 census data. If this continues, the study area's population could increase by up to 16,000 residents following the completion of these projects.

An additional 6,800 dwellings, 7,300 car parking spaces and 3,100 bike parking spaces



Source: 2019 MGS Structure Plan

Figure 3 Number of development sites in Box Hill

Appendix A shows a spatial representation of all commercial and residential developments including the number of dwellings and site area within the Box Hill MAC and a detailed list of all residential developments.

3.4 Employment

Up to 11,100 new jobs by 2036

Box Hill is the largest activity centre in the City of Whitehorse with a diverse offering including retail, education, civic, medical, entertainment and commercial offices. As one of the nine MAC's designated under Plan Melbourne, Box Hill is supported by strong public and private transport networks and is anticipated to have significant growth and public investment in the future with the aim to provide a CBD type offering outside Melbourne CBD. From 2006 to 2016, Box Hill experienced significant growth in employment at 2.5 percent per year as demonstrated in Table 4. This AAGR pattern is expected to continue at a similar rate into the future.

Table 4 Historical and projected employment

Region	2006	2016	AAGR '06-16	2036	AAGR '16-36
Box Hill	14,600	18,500	2.4%	26,900 – 29,600	1.9 – 2.4%

Source: 2019 MGS Structure Plan

3.5 Education

Table 5 shows approximately 39 percent of residents living within Box Hill were undertaking some form of education with the majority of these being tertiary students. This is expected given its proximity to Box Hill Institute (750 m), Deakin University (3.5 km) and Swinburne University (7.5 km). These educational institutions are well connected to Box Hill by private and public transport networks, making Box Hill an attractive location for students to reside given its diverse offerings in housing and other amenities.

Table 5 Percentage of people attending an educational institution in 2016

Region	Percentage of people attending an educational institution
Box Hill	39.4%
Whitehorse LGA	32.4%
Metro Melbourne	41.1%

Source: 2016 Census Quickstats

Both Whitehorse LGA and Metropolitan Melbourne comprise similar proportions of preschool, primary and secondary school students as outlined in Table 6. However, the proportion of tertiary students varies significantly between Box Hill and Metropolitan Melbourne with almost twice as many tertiary students within Box Hill.

It is expected that the high percentage of tertiary students residing in Box Hill will continue as technical institutes and universities continue to expand with local and international student demand.

Table 6 Percentage of students attending various types of educational institutions in 2016

Region	Preschool	Primary	Secondary	Tertiary	Other	Not stated
Box Hill	2.8%	11.4%	13.0%	47.4%	6.4%	18.9%
Whitehorse LGA	5.5%	23.8%	20.2%	32.9%	3.5%	14.1%
Metro Melbourne	5.2%	25.1%	19.4%	26.1%	3.5%	20.5%

Source: 2016 Census Quickstats
Note – the Box Hill region defined in QuickStats is different from the MAC study area. The QuickStats study area is slightly larger especially to the south and east as shown in Appendix I .

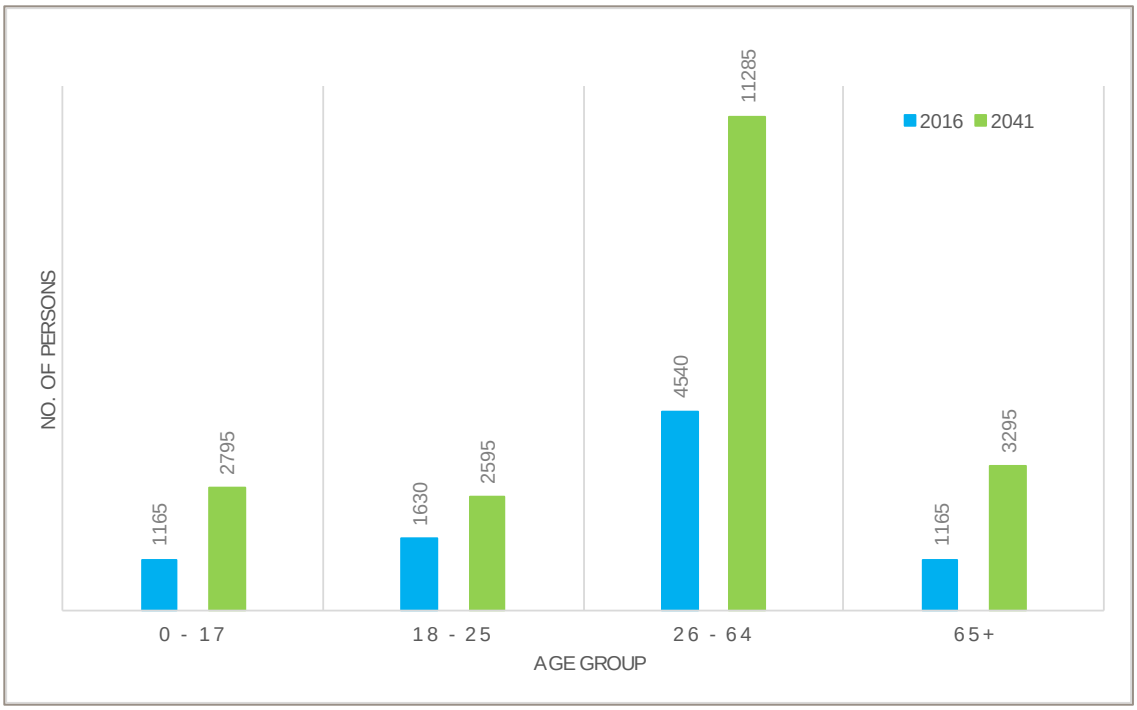
3.6 Age

The 2016 ABS census data shows that most of the Box Hill's population belong to the 'working' 26 – 64 age category and that by 2041 this is expected to increase more than by a factor of two. Similar population growth has been predicted for the minor (age 17 and below) and elderly aged population (age 65 and over) groups. Figure 5 shows the population forecast broken down by age.

Based on the information presented above, it is essential to consider VicRoads' safe system philosophy which underpins Victoria's strategic approach to road safety for the wider Box Hill MAC. Figure 4 shows the four pillars embedded within the safe system approach which includes safer speeds, safer road users, safer vehicles and safer roads.

Source: Towards Zero 2016/2020, Victoria's Road Safety Strategy 7 Action Plan

Figure 4 The four pillars of the Safe System

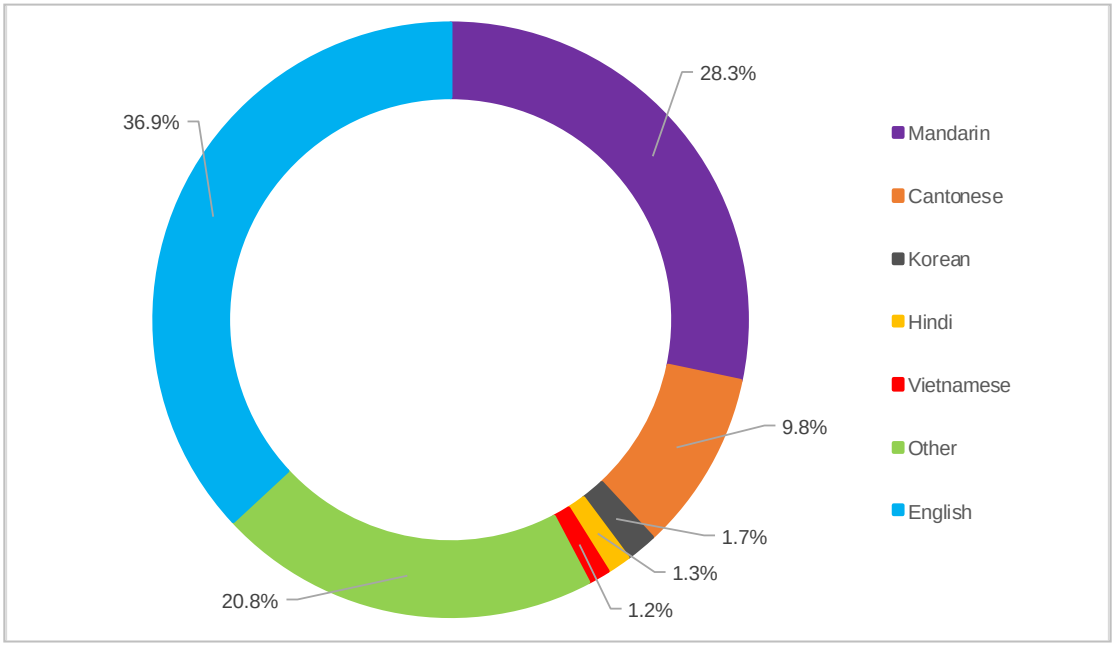


Source: Box Hill Narrative Report, SGS Economics and Planning, March 2018

Figure 5 Change in age profile between 2016 and 2041

3.7 Language

Box Hill is a culturally diverse activity centre with large proportions of residents born overseas, particularly the north-east and south-east of Asia. Figure 6 shows that more than 60 percent of the population speaks a language other than English at home, with Mandarin and Cantonese being the most common at 38 percent. This finding is relevant to potential application of wayfinding information within the study area.



Source: 2016 Census Quickstats

Figure 6 Primary languages spoken at home in Box Hill

3.8 Mode share

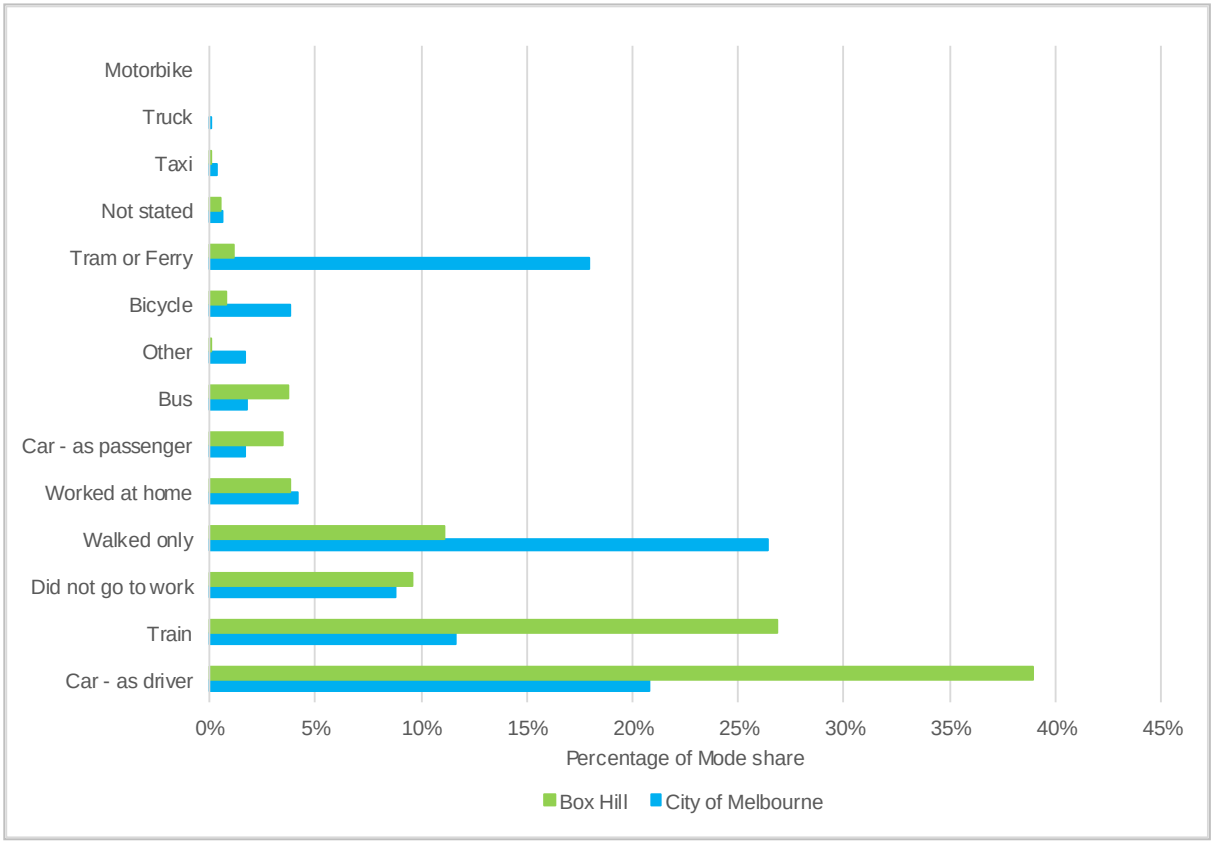
Figure 7 shows the journey to work travel modes for Box Hill relative to City of Melbourne. As Box Hill's population and employment grows into the future, mode share is likely to follow a similar trend to City of Melbourne where car mode share is lower, and a greater share of residents and employees travel by more sustainable travel modes such as by foot or bicycle.

43% of journeys to work undertaken in private vehicles, only 12% either walked or cycled to work

The mode share data findings show that:

- travel to work by private vehicle was the most preferred option (43 percent mode share) for residents of Box Hill
- a high proportion (27 percent mode share) of residents take the train to work, highlighting the relatively high number of patrons at Box Hill Station (see Section 4.4.1 Station Patronage)
- there is a relative low proportion of walk or cycle to work (12 percent combined mode share) in comparison with the City of Melbourne (30 percent combined mode share)
- a relative high proportion of residents take the bus to work (4 percent mode share) in comparison with the City of Melbourne (2 percent mode share).

A detailed mode share table is outlined within Appendix B.



Source: ABS Census Data

Figure 7 A comparison of journey to work mode share between Box Hill and the City of Melbourne in 2016

3.9 Key origins of those that work in Box Hill

Table 7 outlines the top eight origins of people who work in Box Hill in 2016 and the percentage of travellers who access Box Hill by private vehicle, public transport and active transport.

Most people who work in Box Hill live locally, yet active transport usage is low

The key findings show that:

- 52 percent of people who live and work within Box Hill still drive their private vehicle despite the furthest trip being only 2.8 kilometres. If this was reduced to 30 percent, approximately 260 private vehicles would be removed from the roads, most likely during peak hours.
- more than 60 percent of work-related trips to Box Hill were carried out in private vehicles by residents living within seven kilometres
- access by public transport is relatively low (less than 23 percent) considering Box Hill includes a train station, tram route 109, and over 10 bus services. This may be attributed to the high number of public and private car parking spaces (over 13,000) within the study area (refer to Section 4.9.2).

Table 7 Key origins of people who work in Box Hill in 2016

Origin (SA2 region)	Distance to Box Hill (approx.)	Private vehicle percentage	Public transport percentage	Active transport percentage	TOTAL
Box Hill	n/a	52.5%	7.3%	40.2%	1,137
Box Hill North	2.0 km	61.8%	11.1%	27.1%	639
Blackburn	2.5 km	79.1%	14.0%	6.9%	430
Doncaster	4.0 km	81.2%	16.1%	2.7%	329
Mitcham	6.0 km	76.0%	22.0%	2.0%	285
Ringwood East	11.0 km	77.0%	21.0%	2.0%	257
Doncaster East	5.5 km	90.4%	8.0%	1.6%	251
Balwyn	4.5 km	72.8%	22.8%	4.4%	250

Source: ABS Census Data

A spatial representation of key origins of people who work in Box Hill is provided in Appendix C.

3.10 Key destinations from Box Hill

Table 8 outlines the top eight destinations of people who travel to work from Box Hill in 2016 and the percentage of travellers who egress Box Hill by private vehicle, public transport and active transport. The information shows that:

- a high proportion (83 percent mode share) take public transport to Melbourne and Docklands
- public transport mode share to Southbank and Richmond is significantly less than Melbourne and Docklands
- only 30 percent of people travel by active or public transport to Burwood despite it only being three kilometres away
- no one cycles to Clayton and Southbank despite these suburbs being an equal or less distance from Box Hill than Melbourne, Docklands and Richmond.

Table 8 Key destinations of people who travel to work from Box Hill in 2016

Destination (SA2 region)	Distance from Box Hill (approx.)	Private vehicle percentage	Public transport percentage	Active transport percentage	TOTAL
Box Hill	n/a	52.5%	7.3%	40.2%	1,137
Melbourne	14.5 km	15.2%	83.4%	1.4%	939
Docklands	15.5 km	14.8%	83.1%	2.1%	236
Richmond	12.0 km	67.6%	29.6%	2.8%	179
Burwood	3.0 km	69.8%	14.5%	15.7%	172
Blackburn	2.5 km	84.1%	13.8%	2.1%	138
Southbank	15.0 km	45.2%	54.8%	-	135
Clayton	10.5 km	87.7%	12.3%	-	122

Source: ABS Census Data

Most workers are destined for Melbourne or locally with Box Hill

A spatial representation of key destinations of people who travel to work from Box Hill is provided in Appendix D.

4.0 Transport network

The following section discusses the transport network within Box Hill, including movement and place, pedestrians, cyclists, rail, buses, trams, private vehicles, road safety, parking and future transport infrastructure.

4.1 Movement and Place

Late last year, Whitehorse City Council participated in a Movement and Place Trial with VicRoads. During the trial, draft Strategic Focus Scores (SFS) for movement aspects were established for Box Hill as shown in Figure 8. The larger the SFS pie chart corresponds to the size of the problem and the SFS colour shows which transport mode needs to be addressed.

VicRoads draft movement & place assessment shows most of the problems in Box Hill are pedestrian related

The SFS movement results shows that:

- most of the issues that need to be addressed with the MAC are pedestrian related
- Station Street has the largest movement issues within Box Hill, primarily associated with pedestrian and cycling
- Whitehorse Road major issues are generally within the MAC and are linked to pedestrian issues at the intersections of Station Street, Nelson Road and Elgar Road
- Elgar Road has moderate traffic issues.

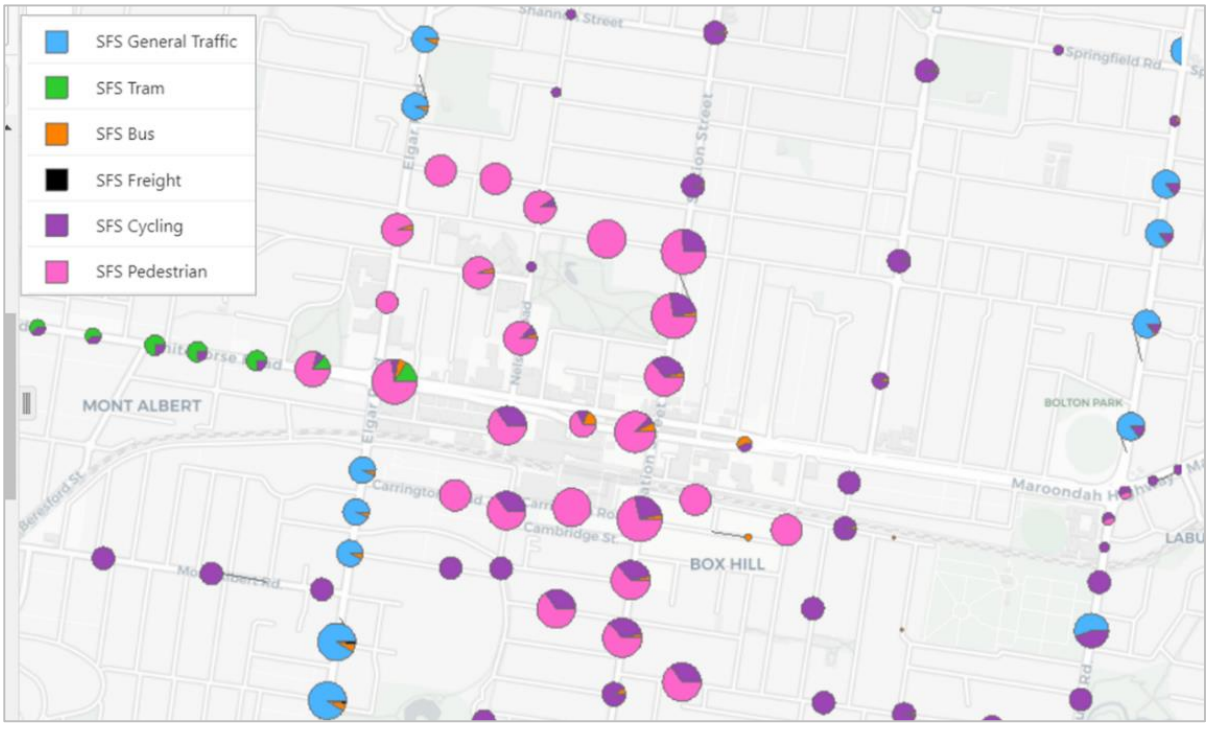
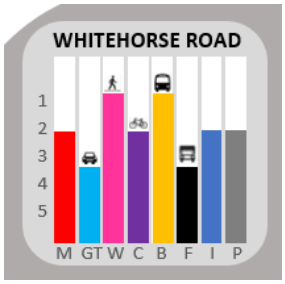


Figure 8 Draft Strategic Focus Score for movement within Box Hill

Key roads within Box Hill MAC have been classified under the Movement and Place Framework as shown in Appendix E. It should be noted this is a draft version developed by VicRoads and is subject to change. The classifications outline the levels of priority for place, interchange and movement broken down by transport mode. Whitehorse Road for example is categorised as Movement (M) 2, Place (P) 2 and Interchange (I) 2. In terms of movement, the top priorities are walking (W1) and bus (B1) movements followed by cyclists (C2). General traffic and freight movements are not top priorities for Whitehorse Road with GT3 and F3 ratings.



VicRoads top priorities for Whitehorse Road are walking and bus movements

4.2 Pedestrians

Key pedestrian generators in Box Hill include the shopping centre, transport hub, Box Hill Institute campuses, Box Hill Hospital and medical precinct, the civic precinct and the primary and secondary office precincts as shown in Figure 9. These generators are mainly located to the west, north and east of the Box Hill interchange.

Source: Whitehorse TravelSmart Map 2018

Figure 9 Existing places of interest within Box Hill

Table 9 highlights the pedestrian demand at key intersections within Box Hill MAC. This data shows high volumes of pedestrian movement are surrounding the activity centre core, including Box Hill Mall

and Nelson Road medical and education precinct experiences high levels of pedestrian movement. Levels of pedestrian movement are expected to increase due to new commercial and residential development occurring along Whitehorse Road.

Table 9 Pedestrian demands at intersections during the two hour morning peak

Intersection	North	East	South	West	Total
Whitehorse Road and Station Street	366	104	301	150	921
Nelson Road and Thames Street	32	124	70	349	575
Thurston Street and Oxford Street and Surry Drive and Brougham Street	21	132	2	51	206
Linsley Street and Bank Street	93	60	-	23	176
Elgar Road and Mont Albert Road	24	23	0	31	78

Source: Survey conducted by Matrix on 5th March 2019 7am to 9am
Note: "North" denotes pedestrian movement in east-west direction at the northern leg

For further detail on the pedestrian volumes at these intersections, refer to Appendix F.

Vicinity Centres installed people counters in late 2018 at various entry points. They have provided visitation data for Box Hill South and Box Hill North shopping centres for the first three months of 2019. The counters show that:

- approximately 18,700 people entered the northern precinct via Main Street, Market Street and Prospect Street entrances on an average day
- approximately 26,700 and 9,500 people entered the southern precinct via Main Street and Carrington Road respectively on an average day.

Thousands of pedestrians access Box Hill North and Box Hill South shopping centres every day

A list of issues and constraints in relation to pedestrian accessibility and mobility has been compiled based on a review of background literature and observations made on site. These include:

- High levels of pedestrian activity observed along Carrington Road, Main Street, Market Street, Station Street (between Ellingworth Parade and Whitehorse Road), and Whitehorse Road (between Station Street and Clisby Court)
- Moderate levels of pedestrian activity observed along Bank Street, Nelson Road (between Whitehorse Road and Thames Street), Station Street (north of Whitehorse Road), and Whitehorse Road (between Station Street and Linsley Street)
- Low levels of pedestrian activity observed along Elgar Road, Hopetoun Parade, Poplar Street, and Prospect Street
- Crossing delays on Whitehorse Road, specifically adjacent Market Street and Station Street intersections
- Challenging access to the tram stop and the open space within the central median along Whitehorse Road due to long delays at signals, high vehicle demands and safety crossing concerns
- Lack of connectivity between major pedestrian attractors in the MAC
- General lack of permeability throughout the MAC
- Difficulty of access to the bus interchange by pedestrians and disabled passengers

- Lack of consistent wayfinding within the MAC
- High frequency of pedestrians jaywalking along Station Street, in preference to using the underpass and designated signal crossings
- Clutter (excessive signage, wheelie bins etc) on footpaths, reducing effective width for pedestrians
- Tactile pavement inconsistently provided at crossings
- Obstructed visibility at the pedestrian crossing on Nelson Road, due to parked cars in the immediate vicinity of the crossing
- A lack of well-located crossings along Nelson Road and Arnold Street, as pedestrians were observed to cross away from the formal crossings that are provided
- Poor provision for pedestrians at the five-leg Nelson Road and Thames Street roundabout, given the surrounding land uses.

A spatial representation of the pedestrian movement patterns within Box Hill and daily average pedestrian counts at Box Hill hopping centre is provided in Appendix F.

Additional information relating to pedestrians is also discussed in Section 4.3.3 Interchange and Section 4.8 Road Safety.

4.3 Cyclists

The Victorian Cycling Strategy 2018-28 has a goal to increase the number, frequency and diversity of Victorians cycling for transport by:

- investing in a safer, lower-stress, better connected network
- making cycling a more inclusive experience

The Strategic Cycling Corridors are the most important routes for cycling for transport and link up important destinations include the central city, national employment and innovation clusters, major activity centres and other destinations of metropolitan or state significance.

A key action in the Strategy is to review the Strategic Cycling Corridor network in conjunction with council and other key stakeholders. This review is currently in progress, with the latest draft network being provided to council for comment in February 2019. Whitehorse City Council are currently working closely with the Department of Transport (DoT) to review these links. DoT aim to finalise the review mid-year.

Appendix G shows a map of proposed strategic cycling corridors for Maroondah, Monash and Whitehorse City Councils. These proposed routes are in draft and are subject to changes.

Figure 10 shows the proposed strategic cycling corridors within Box Hill including:

- off-road access from the south along Surrey Park
- an informal bike route from the north along Nelson Road (note – no off-road or on-road cycling treatments currently exist)
- off-road access from the east with a shared use path located north of the railway line which connects to Dorking Road
- on-road bike lanes from the west along Mont Albert Road. On the east side of Elgar Road, Mont Albert Road meets the start of the former quarry site north of Surrey Park. No pedestrian or cyclists can access this site due to the existing wire fence.

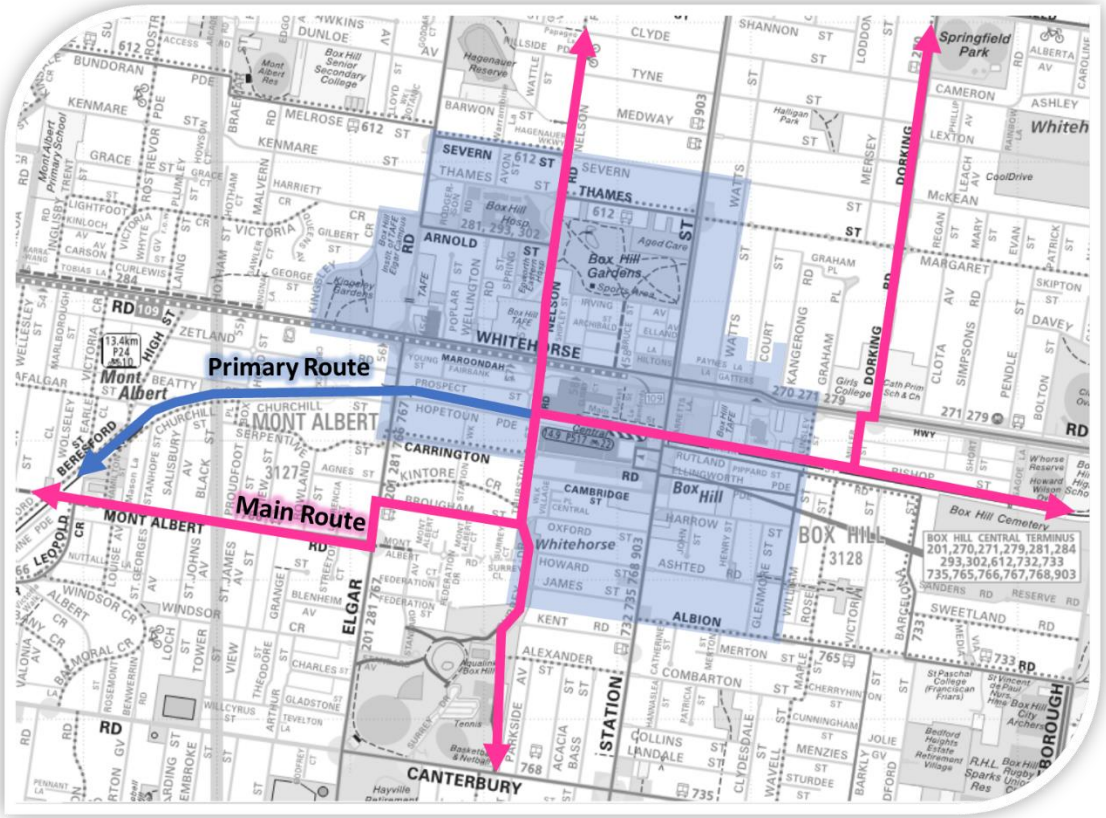
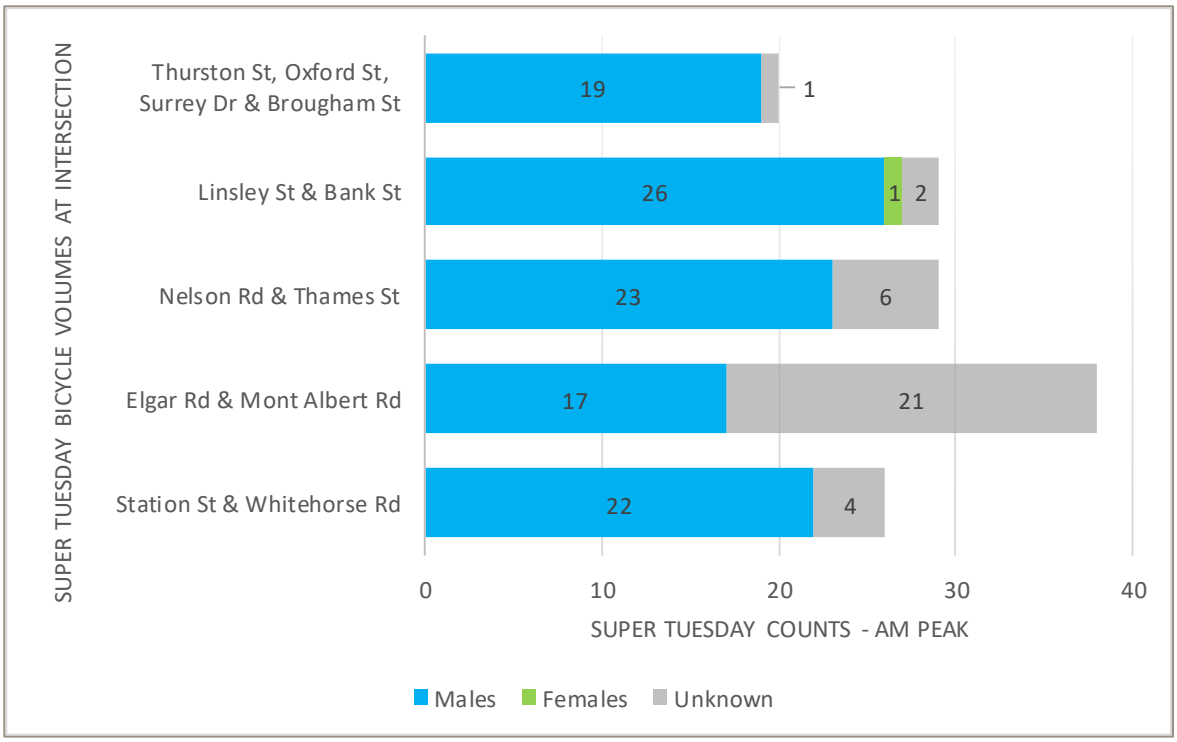


Figure 10 Strategic Cycling Corridors within Box Hill

Bicycle survey data obtained from Whitehorse City Council show that bicycle volumes are relatively low given that the Box Hill MAC consists of key attractors such as the shopping centre, public transport stops, medical and educational institutes. This is reflected in the cycling mode share of less than one percent as outlined in Figure 7.

Figure 11 outlines super Tuesday bicycle volumes by gender for the top five intersections within Box Hill MAC. Across these intersections within the study area over 100 male cyclists and only one female cyclist was recorded in the Super Tuesday survey conducted by Matrix. This could be attributed to the level of protection and stressful nature of the existing cycling network within Box Hill. To increase female participation, it is essential to provide a stress-free cycling network with greater segregation and physical separation from general traffic.

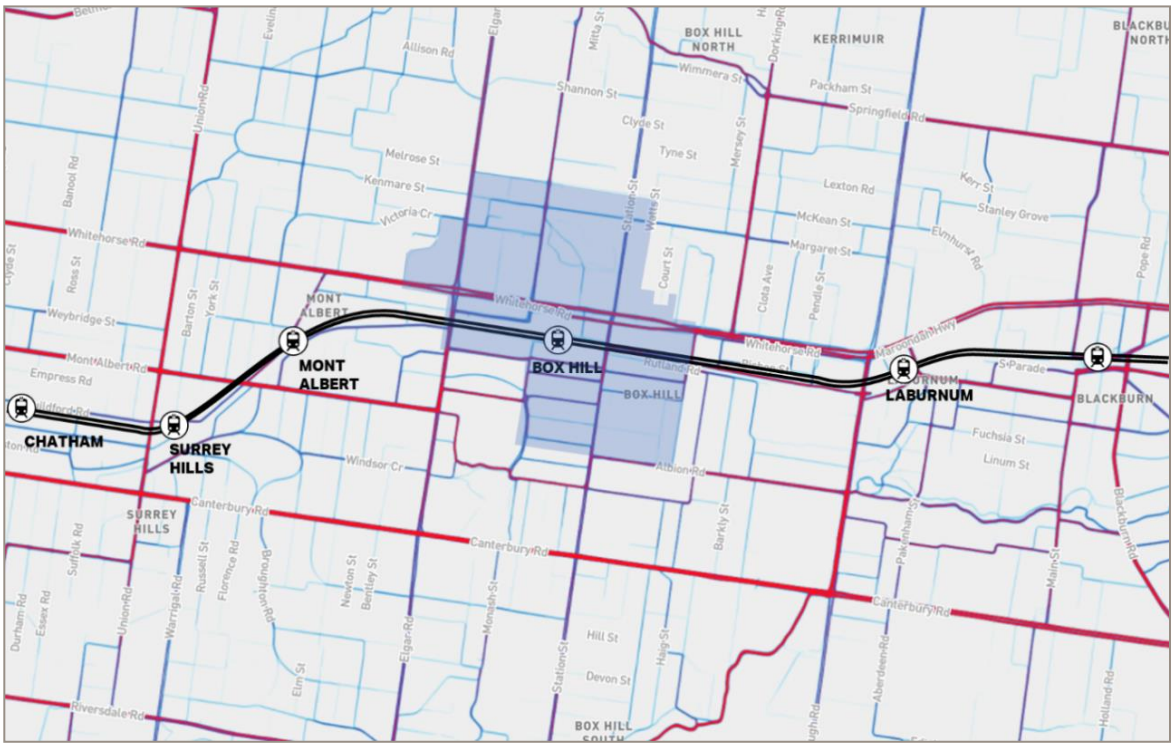
Over 100 male cyclists and only one female cyclist was recorded in the Super Tuesday Survey within Box Hill



Source: Survey conducted between 7am and 9am on the 5th of March 2019 by Matrix

Figure 11 Super Tuesday bicycle volumes

Figure 12 shows a heatmap of cyclist demand obtained from STRAVA. Based on this information, Whitehorse Road and Mont Albert Road is preferred along the east-west direction. Elgar Road and Nelson Road appear as the preferred north-south routes yet to a lesser extent relative to the difference between Whitehorse Road and Mont Albert Road.



Source: www.strava.com

Figure 12 Cyclist demand

A list of issues and constraints in relation to cyclist movement has been compiled based on a review of background literature and observations made on site:

- cycle use in the study area is currently observed to be low due to the speed and volume of traffic on arterial roads and lack of cycling facilities;
- there is limited secure bicycle parking available within the Box Hill Pedestrian Mall;
- although bicycle signage is consistently provided, there appears to be a lack of continuous bicycle lanes or shared use paths;
- there is little or no bicycle priority at intersections or along major roads; and
- north-south routes are limited by the rail line especially along Nelson Road.
- In accordance with Whitehorse Cycling Strategy 2016, there are opportunities to provide a bicycle network throughout the MAC. Cycling paths and facilities should be provided as per Principal Bicycle Network Design Guidelines including:
    - dedicated physically separated bicycle lanes where possible;
    - smooth pavement surfaces on bike lanes;
    - advanced start lines and storage boxes at signalised intersections;
    - management of traffic signal operations to favour cyclists;
    - avoidance of angle or perpendicular parking along bike lanes;
    - off-street paths wide enough for safe shared use with pedestrians; and
    - careful design of intersections including green pavements for bike lanes, particularly where movements are complex and lane alignments are confusing.

4.4 Rail

Box Hill Station is a premium station and is serviced by the Belgrave and Lilydale metropolitan rail lines. This station consists of four platforms, with platform 4 used for outbound trains during peak hours, platforms 2 and 3 being used by all trains servicing this station, and platform 1 not being used at this point of time.

4.4.1 Station patronage

Box Hill was ranked ninth (based on weekday entries) across all stations in Melbourne's metropolitan rail network with average weekday entries surpassing several popular stations including Sunshine and Dandenong, as highlighted in Table 10. Excluding the five train stations within Melbourne CBD, only South Yarra, Footscray and Caulfield stations exceed patronage levels at Box Hill station.
Box Hill station's current patronage levels along with its significant population and employment growth reinforces the importance of Box Hill station in Melbourne's metropolitan rail network and the need to support growth and enhancement of this MAC.

Ninth busiest station across Melbourne

Table 10 Average weekday, Saturday and Sunday entries

Ranking	Station	Weekday entries	Saturday entries	Sunday entries
1	Flinders Street	92,515	53,680	41,710
2	Southern Cross	66,474	24,460	19,640
3	Melbourne Central	53,831	26,950	20,610
4	Parliament	38,888	7,930	5,910
5	Flagstaff	18,820	0	0

Ranking	Station	Weekday entries	Saturday entries	Sunday entries
6	Footscray	18,197	7,450	4,990
7	South Yarra	15,808	7,800	5,260
8	Caulfield	14,609	6,750	4,630
9	Box Hill	12,412	6,250	4,490
10	Richmond	11,160	9,900	6,720
11	Glenferrie	10,349	3,420	2,420
12	Dandenong	7,761	4,340	3,010
13	Sunshine	7,089	2,650	1,910
14	Oakleigh	6,581	3,920	2,860
15	Camberwell	6,562	3,390	3,270
16	Huntingdale	6,183	1,950	1,260
17	Watergardens	5,852	1,790	1,250
18	Williams Landing	5,851	1,050	700
19	Ringwood	5,730	3,090	2,110
20	Essendon	5,690	2,480	1,560

Source: Weekday station entries data obtained from the Department of Transport based on 2017 – 2018 data. Saturday and Sunday entries is based on 2013/14 data.

4.4.2 Frequency and operating hours

Both the Belgrave and Lilydale lines provide high frequency services with express and local services operating for most of the weekday. Table 11 highlights the first and last train services to operate from Box Hill along their respective lines, and Table 12 outlines the service frequencies provided during weekdays and weekends. In addition, hourly night time services operate to / from Box Hill on weekends.

Table 11 Box Hill station operating hours

Railway line	Weekday
To City	5:05 am to 11:51pm
To Belgrave/Ringwood	5:28am to 12:39am

Table 12 Train service headways at Box Hill Station

	Train headways (min)				
Direction	AM Peak	Inter peak	PM peak	Saturday peak	Sunday
To City	2-6	15	2-12	10	10
To Belgrave	17-32	30	8-17	20	20
To Lilydale	8-17	30	8-15	20	20

Source: PTV website

It should be noted that train frequencies to stations west of Ringwood are higher due to many services terminating at Ringwood.

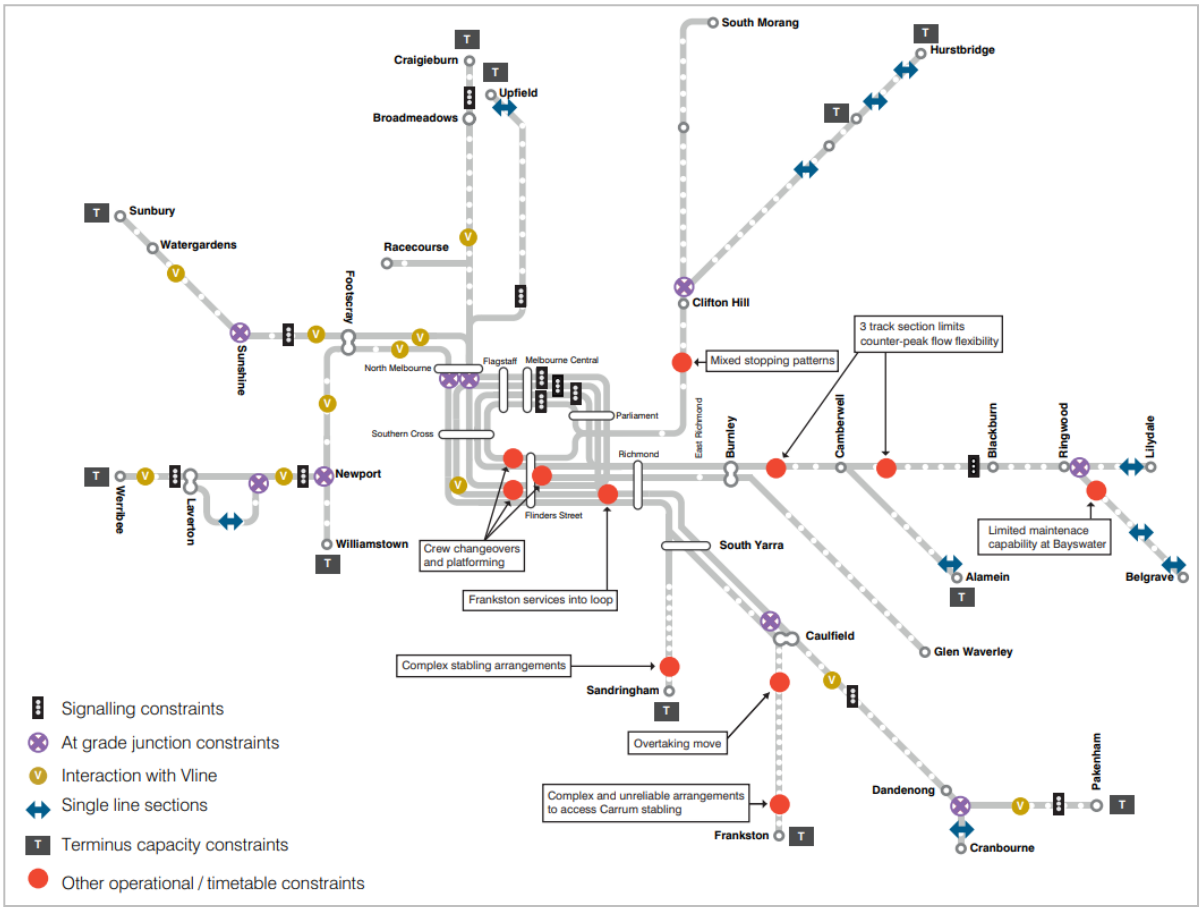
Based on *PTV Network Development Plan* published in December 2012, the future planned changes to train headways at Box Hill station have been outlined as follows:

- Peak:
  - Train headways are not planned to improve between now and 2030 (no additional services).
  - Train headways will slightly improve in 2030 and again in 2038, with three additional services planned for 2030 and a further three in 2038.

- Off-peak
  - Train headways are not planned to improve between now and 2038 (no additional services).

No plans to improve headways between now and 2030

As shown in Figure 13, the presence of a three-track section between Hawthorn and Canterbury limits counter peak flow flexibility for both the Belgrave and Lilydale lines.



Source: Network Development Plan, PTV December 2012

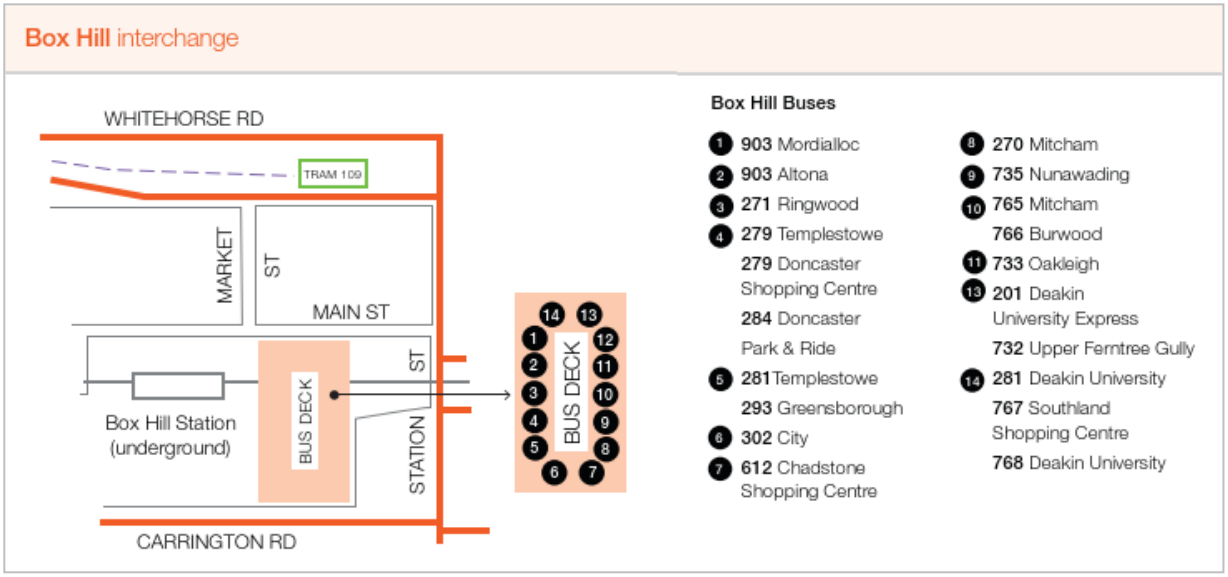
Figure 13 Key network constraints

4.4.3 Interchange

A summary of observations from the site visit conducted at the interchange on 14 February 2019 is as follows:

- effective width for waiting passengers is narrow, making it difficult for passengers to pass through a queue of people boarding a bus.
- accessibility for people with mobility difficulties is a challenge from the top deck of the bus terminus to the underground train station.
- signage from the shopping centre and wayfinding between the interchange and other modes of transport are unclear.
- the general state of the interchange raises concerns regarding safety and security, cleanliness, amenity and lighting.

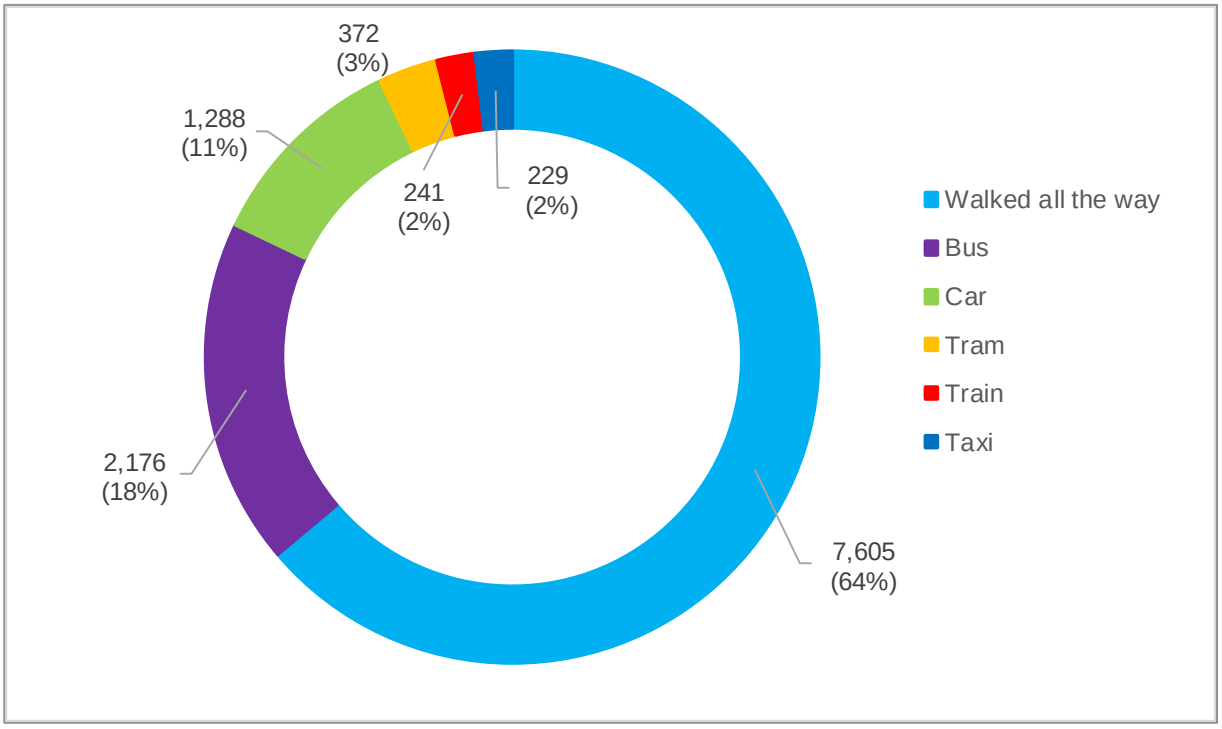
Figure 14 shows a diagrammatic layout of the train-bus-tram interchange system at Box Hill. Box Hill bus interchange is situated on the top level of Box Hill Shopping Centre. The interchange provides 14 bus bays arranged in 'saw tooth' layout with one-way circulation in the anti-clockwise direction.



Source: Whitehorse TravelSmart Map 2018

Figure 14 Box Hill Interchange

Figure 15 shows how station patrons access the station. The data shows that approximately 80 percent of station patrons arrived either by walking or by bus on weekdays. This highlights the significant level of pedestrian activity and bus to train transfers at the station. Although survey data does not indicate any passengers cycling to the station, it was observed during the site visit that the number of bicycle hoops placed beyond the ticket gates at the station were insufficient for the level of bicycle demand.



Source: DOT website

Figure 15 Weekday entry by access mode in 2015/16

Walking to Box Hill train station

Being centrally located in a residential area, Table 13 shows that Box Hill train station was ranked 11th across all stations in Melbourne's metropolitan rail network based on the average number of commuters who had walked to their respective train stations. The 7,600+ daily walking trips to the station and other walking trips associated with other land uses, including those within the shopping centre, highlights the importance of walking infrastructure in Box Hill.

Over 7,600 commuters walk to Box Hill train station each weekday

Table 13 Average weekday entries at Box Hill Station - Walking

Ranking	Station	Weekday entries: Walking to station 2015-16
1	Flinders Street	70,926
2	Melbourne Central	46,485
3	Southern Cross	45,058
4	Parliament	32,951
5	Flagstaff	16,956
6	South Yarra	11,730
7	Footscray	11,441
8	Glenferrie	10,025
9	Caulfield	9,919
10	Richmond	7,780
11	Box Hill	7,605
12	Camberwell	5,020
13	Prahran	4,173
14	Clayton	3,806
15	Springvale	3,648

Source: Access egress mode share by station obtained from the Department of Transport based on 2015 – 2016 data

Bus to Box Hill train station

As the Box Hill train station is located within the bus interchange which is a terminus for 15 bus routes, approximately 2,100 commuters arrived at the train station by bus. Hence it was ranked fourth across all stations in Melbourne's metropolitan rail network, greater than both Dandenong and Southern Cross, as outlined in Table 14. This emphasises the importance of the bus interchange and how it allows public transport users to transfer at this location between various transport modes.

Fourth busiest bus interchange in Melbourne

Table 14 Average weekday entries at Box Hill Station - Bus

Ranking	Station	Weekday entries: Bus to Train 2015-16
1	Huntingdale	3,108
2	Dandenong	2,633
3	Southern Cross	2,404
4	Box Hill	2,176
5	Oakleigh	2,152

Source: Access egress mode share by station obtained from the Department of Transport based on 2015 – 2016 data

Tram to Box Hill train station

Table 15 shows that less than 400 commuters use the tram to get to Box Hill train station. Train stations like Flinders Street, Melbourne Central, Parliament and Southern Cross are well serviced by various tram routes with better combined peak frequencies as opposed to Tram 109. The key contributor could be the lack of clear pedestrian access between the tram stop on Whitehorse Road and the train station. It is noteworthy to mention that the following table highlights the number of Box Hill Station patrons who arrived at the station via tram and not the overall number of tram users within Box Hill MAC.

Table 15 Average weekday entries at Box Hill Station - Tram

Ranking	Station	Weekday entries: Tram to Train 2015-16
1	Flinders Street	17,114
2	Melbourne Central	5,666
3	Southern Cross	5,020
4	Parliament	4,830
5	South Yarra	1,397
6	Footscray	1,343
18	Jolimont	379
19	Essendon	375
20	Box Hill	372
21	Glenhuntly	369

Source: Access egress mode share by station obtained from the Department of Transport based on 2015 – 2016 data

Car to Box Hill train station

Approximately 11 percent of station patrons arrived by car at Box Hill train station as shown in Table 16. While 11 percent is relatively low, Table 16 highlights several other stations with lower car to train mode shares such as Camberwell and Footscray Station.

Footscray Station shows 6.6 percent mode share and only two years earlier, the mode share was over 15 percent. Due to the Regional Rail Link (RRL) project and the relocation of commuter car parking to West Footscray Station, car mode share significantly decreased despite an increase in Footscray Station patronage. This example highlights the possibilities of reduced commuter parking yet increased station activity and patronage.

approx. 11% of station patrons arrived by car at Box Hill train station

Table 16 Average weekday entries at Box Hill Station - Car

Ranking	Station	Weekday entries: Car to Train Percentage Mode Share 2015-16
17	North Melbourne	3.2%
31	Footscray	6.2%
32	Northcote	6.6%
48	Camberwell	9.5%
54	Box Hill	10.8%
111	Dandenong	20.4%
112	Sunshine	20.7%
189	Frankston	40.8%

Source: Access egress mode share by station obtained from the Department of Transport based on 2015 – 2016 data

Train to Train transfer

Box Hill train station was ranked 20th across all stations in Melbourne's metropolitan rail network for train to train transfers, as shown in Table 17. As express services along the Belgrave and Lilydale lines stop at Box Hill, fair number of commuters transfer from an express service to a stopping service or vice versa at this station.

Table 17 Average weekday entries at Box Hill Station - Train

Ranking	Station	Weekday entries: Train to Train 2015-16
1	Flinders Street	31,967
2	Richmond	14,274
3	Southern Cross	8,167
4	Parliament	4,922
5	Caulfield	4,426
6	North Melbourne	3,989
7	Melbourne Central	3,446
8	South Yarra	3,333
9	Footscray	3,267
10	Flagstaff	1,352
11	Newport	1,296
12	Camberwell	1,281
13	Ringwood	725
19	Laverton	280
20	Box Hill	241
21	Glenferrie	230

Source: Access egress mode share by station obtained from the Department of Transport based on 2015 – 2016 data

4.4.4 Rail crowding

Metropolitan train load standard surveys are conducted annually to compare passenger loads against the benchmark standards of capacity. The surveys were conducted over 12 weekdays in May 2018. Surveying times were between 6.30 am and 12.00 pm for city-bound services and 2.00 pm and 7.00 pm for outbound services. Based on this survey data, the AM peak was between 7.01 am and 9.30 am and PM peak was between 3.31 pm and 7.00 pm. The results are used to determine when and where extra services may be required to reduce crowding.

Table 18 compares the Ringwood corridor and network wide survey results for both the AM and PM peaks. The results show that both the Ringwood corridor and network wide services had capacity breaches above the benchmark. While the Ringwood corridor performed slightly better than network wide, results of 5 percent and 4 percent as shown in still shows rail capacity issues along the Ringwood corridor.

Table 18 Train load surveys results in May 2018

Railway line	Period	Number of services	Services above benchmark	Percentage of services above benchmark
Ringwood corridor	AM Peak	40	2	5%
	PM Peak	49	2	4%
Network wide	AM Peak	256	25	10%
	PM Peak	310	15	5%

Source: Metropolitan Train Load Standards Survey Report, Transport for Victoria, May 2018

Management of rail crowding levels plays an important role in encouraging sustainable public transport use among local residents and those who work within the MAC. If train services operate above the benchmark standard, it can lead to poor passenger experience and potentially loss in rail commuters.

Figure 16 shows the train load survey results for the last three years. Previous year results are similar to those in 2018.

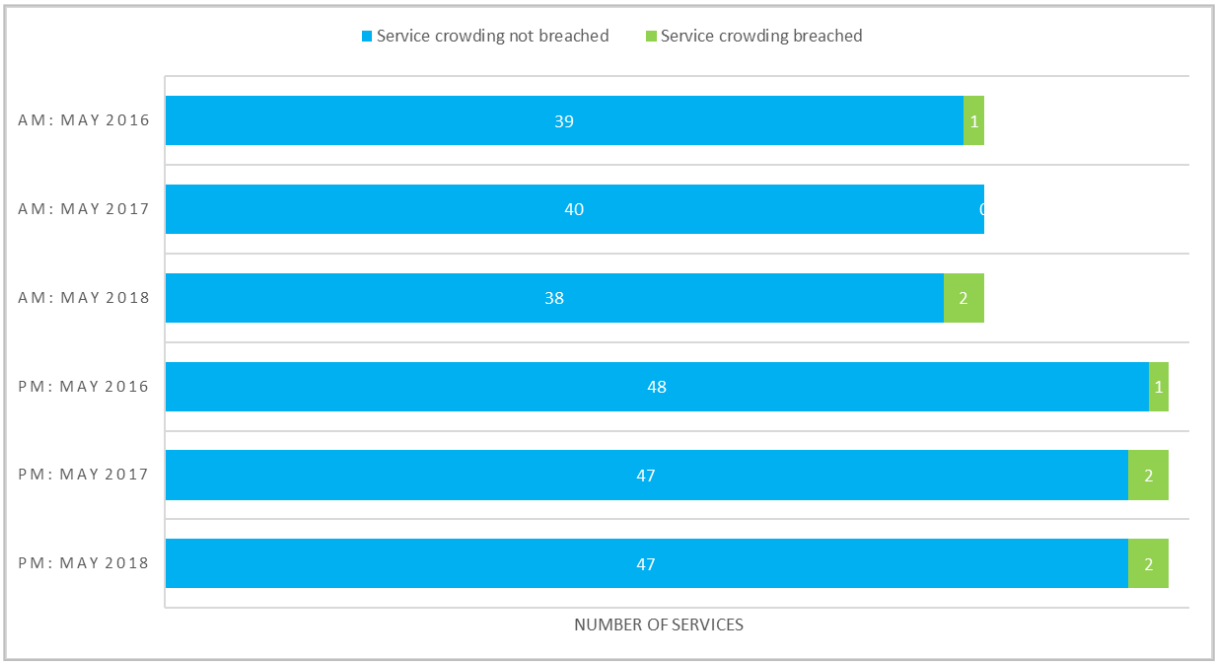


Figure 16 Historical load survey results for the Ringwood corridor

Rail crowding still occurs during peak periods. Without additional services, crowded trains will become a more common occurrence

4.5 Buses

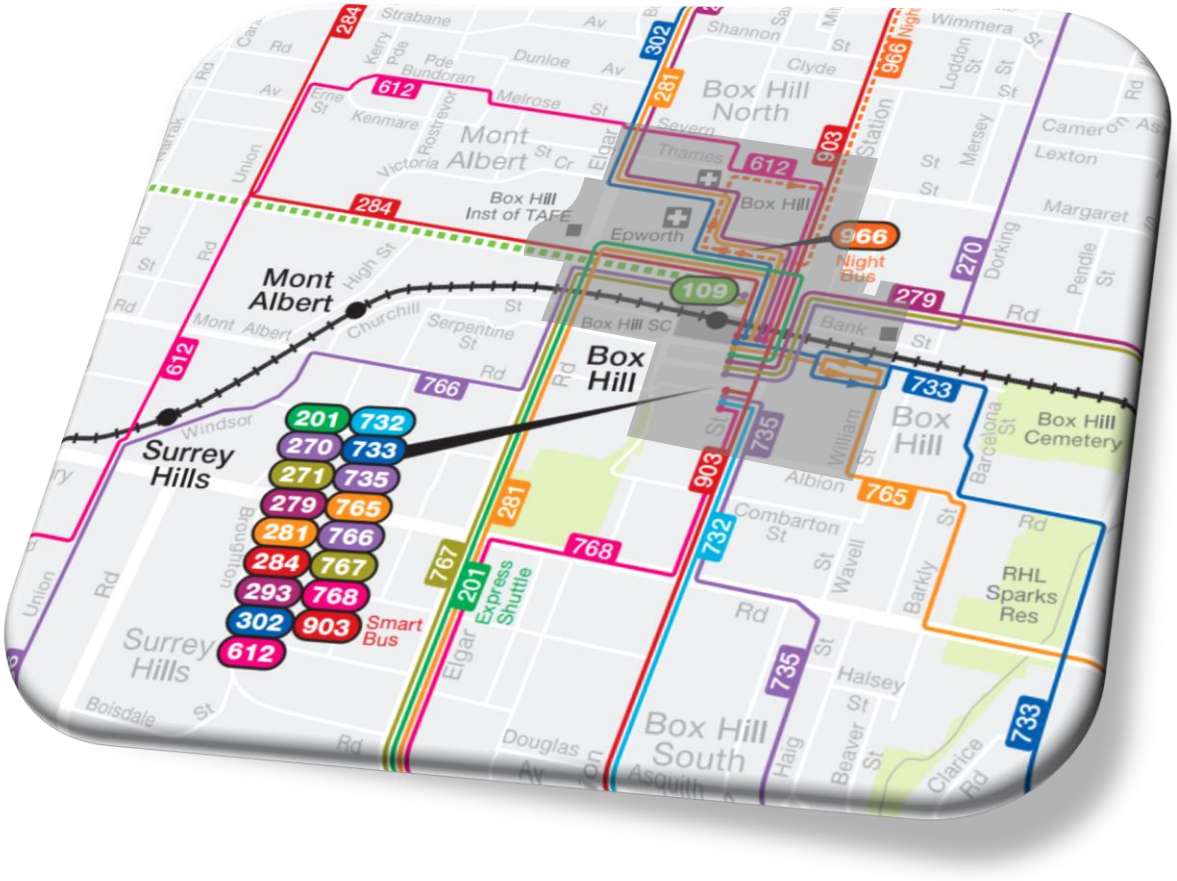
The bus interchange in Box Hill is located on the top level of Box Hill Shopping Centre. It serves as a terminus for 15 bus routes except for routes 281 and 902 (smart bus service). Bus access to the interchange is via a ramp from Station Street. Buses heading north and east leave the bus interchange via the ramp and turn left onto the Station Street. Buses heading toward the south and west leave the interchange via a ramp onto Carrington Road.

A list of issues and constraints in relation to bus delays has been compiled based on a review of background literature and observations made on site. Key turning movements where buses experience delays due to traffic congestion, predominately during peak periods, include:

- the right turn from Station Street into the access ramp, as the right turn lane is used by both buses and private vehicles
- the right turn from Carrington Road to Station Street (bus service 732, 735 and 768), as Carrington Road is used heavily by taxis, pedestrians and private vehicles.
- the right turn from Whitehorse Road into Station Street (bus service 201, 281, 284, 293, 302, 766, 767).

While the key turning movements experiencing delays have been highlighted above, other movements and services also experience delays in times of high demand due to the level of bus activity and lack of bus priority measures.

Figure 17 highlights all the bus services which traverse the study area.



Source: adapted from PTV public transport map

Figure 17 Existing bus network in Box Hill (study area shown in medium grey)

Table 19 outlines the bus headways and patronage levels that operate from Box Hill MAC. The table has been ranked from the highest level of service to the lowest based on weekday peak frequencies. The following conclusions could be drawn based on this information:

- bus routes 732, 733 and 767 had at least 3,000 average daily riders, however these services operate every 15-20 minutes during peaks and 20-30 minutes during inter-peak periods. Bus 279 on the contrary only had 1,900 average daily riders yet operates at 15-minute headways during both peak and inter-peak periods. Despite their higher patronage numbers, bus routes 732, 733 and 767 terminate operations by 9.20 pm during weekdays and earlier during the weekends.
- bus routes 612 and 735 had at least 1,100 average daily riders, however these services operate every 25-30 minutes during peaks. Many other bus services with similar patronage levels operate at 20-minute headways during peaks.
- most services operate weekday peak hour services with headways of approximately 10-20 minutes. However, the headways drop to 30-60 minutes during weekday interpeak and weekend periods.
- only three services operate after 11 pm on weekdays, and only one on Saturday evenings. The last Sunday service is 9.25 pm.

Table 19 Bus route headways

		Monday - Friday				Saturday		Sunday	
Service	Destination	Peak Freq. (min)	Last Service	Interpeak Freq. (min)	Average daily patronage 2013 - 2014	Last service	Typical Freq. (min)	Last Service	Typical Freq. (min)
903	Altona	10	11.00 pm	15	19,310	12.30 am	15	9.25 pm	30
279	Doncaster SC	15	12.15 am	15	1,912	7.55 pm	30	9.15 pm	60
732	Upper Ferntree Gully	15	9.20 pm	20	3,728	9.00 pm	30	9.05 pm	60
733	Oakleigh	15	9.15 pm	30	3,637	9.00 pm	30	8.50 pm	60
270	Mitcham	20	11.15 pm	20	1,456	7.25 pm	30	5.55 pm	60
302	City	20	10.40 pm	30	2,405	10.40 pm	30	8.15 pm	60
271	Ringwood	20	10.30 pm	30	1,171	8.00 pm	30	No service	
201	Deakin University	20	9.55 pm	20	NA	No service		No service	
765	Mitcham	20	9.20 pm	35	1,827	9.20 pm	30	8.50 pm	60
767	Southland	20	9.00 pm	30	3,441	9.00 pm	30	9.05 pm	40
293	Greensborough	20	8.50 pm	30	1,101	6.10 pm	60	6.10 pm	120
281	Templestowe	20	6.15 pm	30	1,524	5.55 pm	60	No service	
612	Chadstone	25	7.05 pm	30	1,333	5.40 pm	60	No service	
735	Nunawading	30	9.00 pm	30	1,186	9.20 pm	60	8.55 pm	60
766	Burwood	30	7.00 pm	30	240	6.25 pm	40	No service	
284	Doncaster Park & Ride	30	6.05 pm	30	267	5.55 pm	60	No service	
768	Deakin University	50	6.50 pm	50	NA	No service		No service	
966	City (Night Bus)	No service			NA	3.50 am	30	4.50 am	30

Source: PTV website (as of 7th March 2019)

Table 20 highlights the daily bus boarding specific to Box Hill and has been ranked based on weekday patronage volumes. When compared with Table 19, key findings include:

- routes 903, 279,270, 733 and 732 are the most popular bus routes among Box Hill residents, these services operate with typical headways of approximately 10-20 minutes during weekdays;
- however, weekend bus patronage drops significantly for routes 279, 270, 733 and 732, this could be contributed to headways of approximately 30 – 60 minutes;
- route 966 which provides direct link to Melbourne CBD is heavily underutilised by Box Hill residents due to poor weekend headways. Residents are most likely to take the train or tram to the city as they operate every ten minutes during weekends; and
- routes 612, 766, 284 and 768 were the least popular bus routes amongst Box Hill residents with typical weekday and weekend headways of 30 and 60 minutes respectively.

Table 20 Bus boarding's within Box Hill

			Daily Patronage		
Service	Destination	Weekday Peak Freq. (min)	Weekday	Saturday	Sunday
903	Altona	10	2,143	1,380	1,049
279	Doncaster SC	15	889	340	219
270	Mitcham	20	853	199	131
733	Oakleigh	15	846	526	373
732	Upper Ferntree Gully	15	745	426	258
767	Southland	20	544	521	413
302	City	20	484	306	181
765	Mitcham	20	423	305	143
281	Templestowe	20	379	239	-
735	Nunawading	30	350	167	132
293	Greensborough	20	299	135	50
271	Ringwood	20	274	117	-
201	Deakin University	20	197	-	-
612	Chadstone	25	175	37	-
766	Burwood	30	165	61	2
284	Doncaster Park & Ride	30	87	57	-
768	Deakin University	50	46	-	4
966	City (Night Bus)	No service	1	1	

13 out 18 bus services in Box Hill ranked in the top 100 for patronage out of 260 in metropolitan Melbourne

Figure 18 highlights the level of service (LOS) for all bus routes near Box Hill during the AM peak period. The results show that those within walking distance of Elgar Road, Whitehorse Road and part of Station Street have a high LOS. Most bus routes have a medium LOS with three to six services operating during the AM peak period. A few disparate routes have a low LOS most notably south-west of Box Hill.

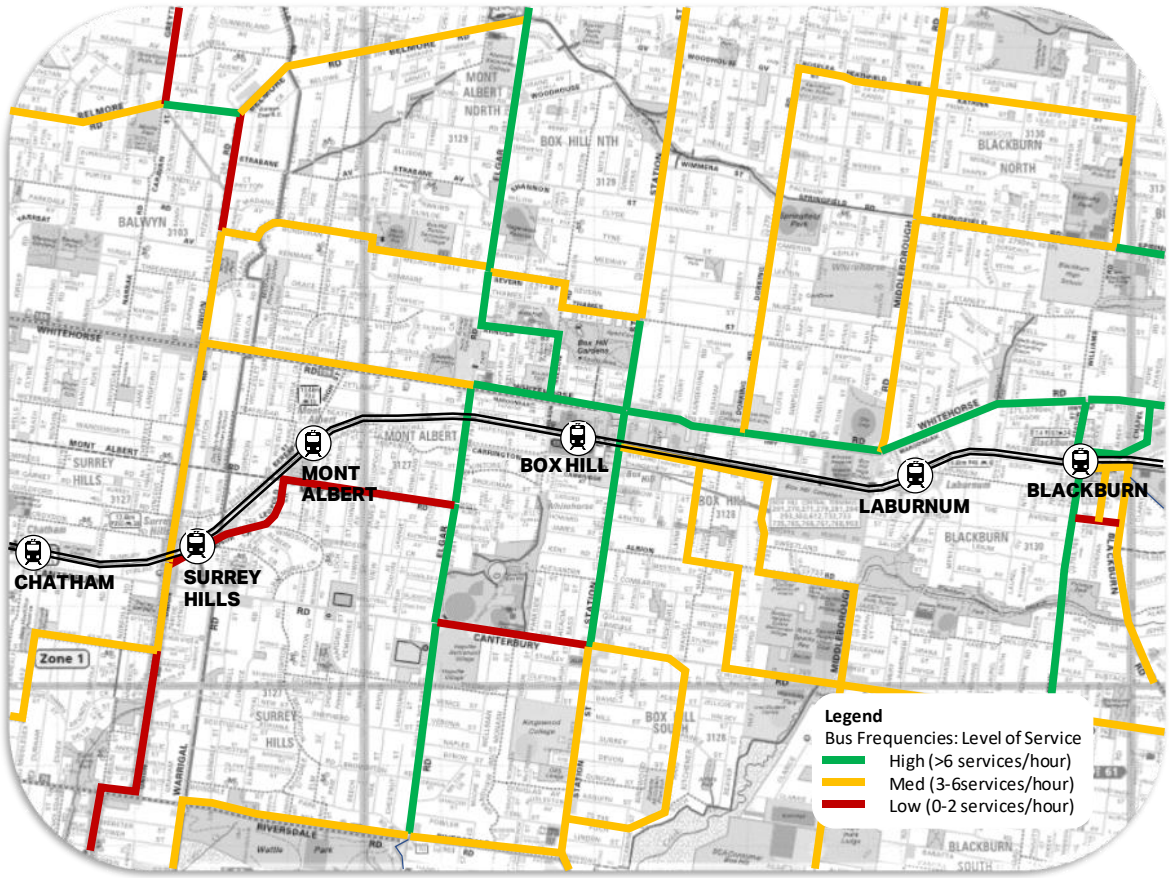


Figure 18 Level of service for bus routes in the AM peak period

Despite key roads within Box Hill having frequent bus services, the lack of bus priority infrastructure causes unreliability which in part can play a role in car dependency.

Limited bus priority infrastructure within Box Hill

Figure 19 to Figure 21 highlight the network wide average weekday, Saturday and Sunday bus patronage along with their respective route number, ranking and peak headways. Bus routes which service Box Hill have been highlighted in red while other bus routes operating in Melbourne have been highlighted in blue. Accordingly, the following observations have been made:

- 13 out of 18 Box Hill bus services were ranked in the top 100 for average weekday bus patronage;
- 10 out of 18 bus services were ranked in the top 100 for average Saturday bus patronage;
- 8 out of 18 bus services were ranked in the top 100 for average Sunday bus patronage;
- bus routes 903, 732, 733 and 767 were consistently ranked in the top 15 for average weekday, Saturday and Sunday bus patronage; and
- some high patronage Sunday services have more passengers than some weekday services yet run at only 60-minute headways.

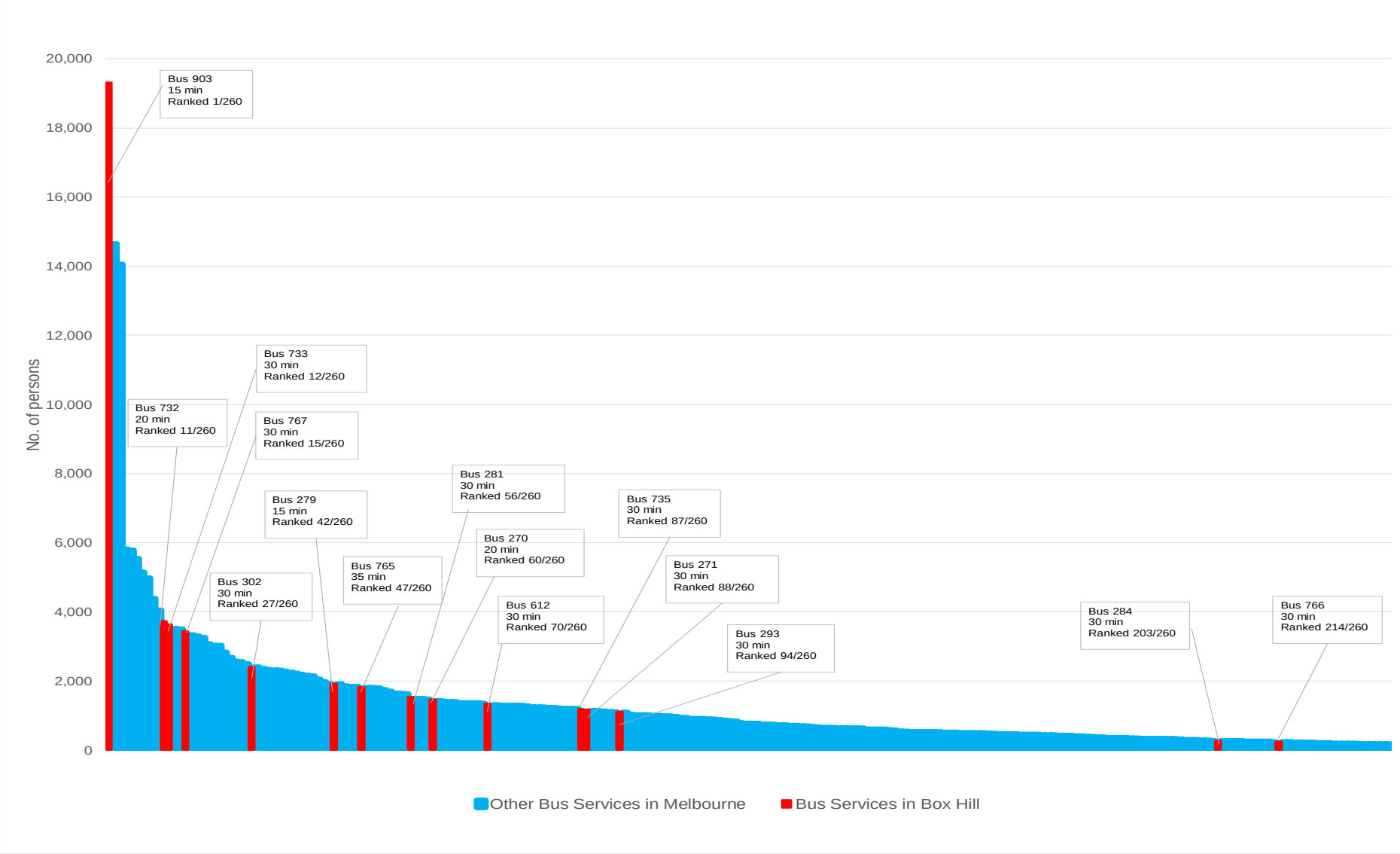


Figure 19 Average weekday bus patronage for FY 2014 / 2015 and peak headways for Box Hill bus services

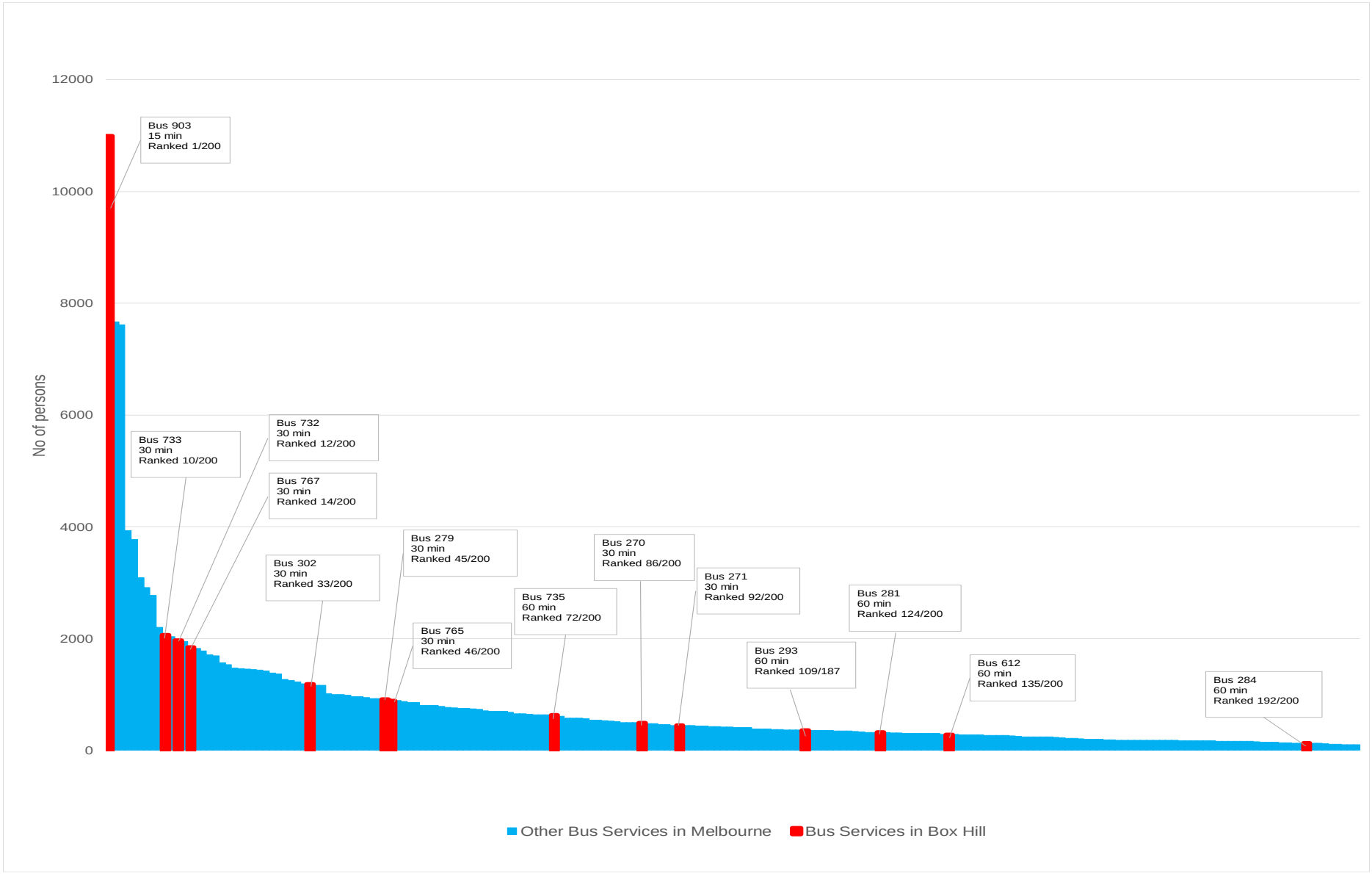


Figure 20 Average Saturday bus patronage for FY2014 / 2015 and peak headways for Box Hill bus services

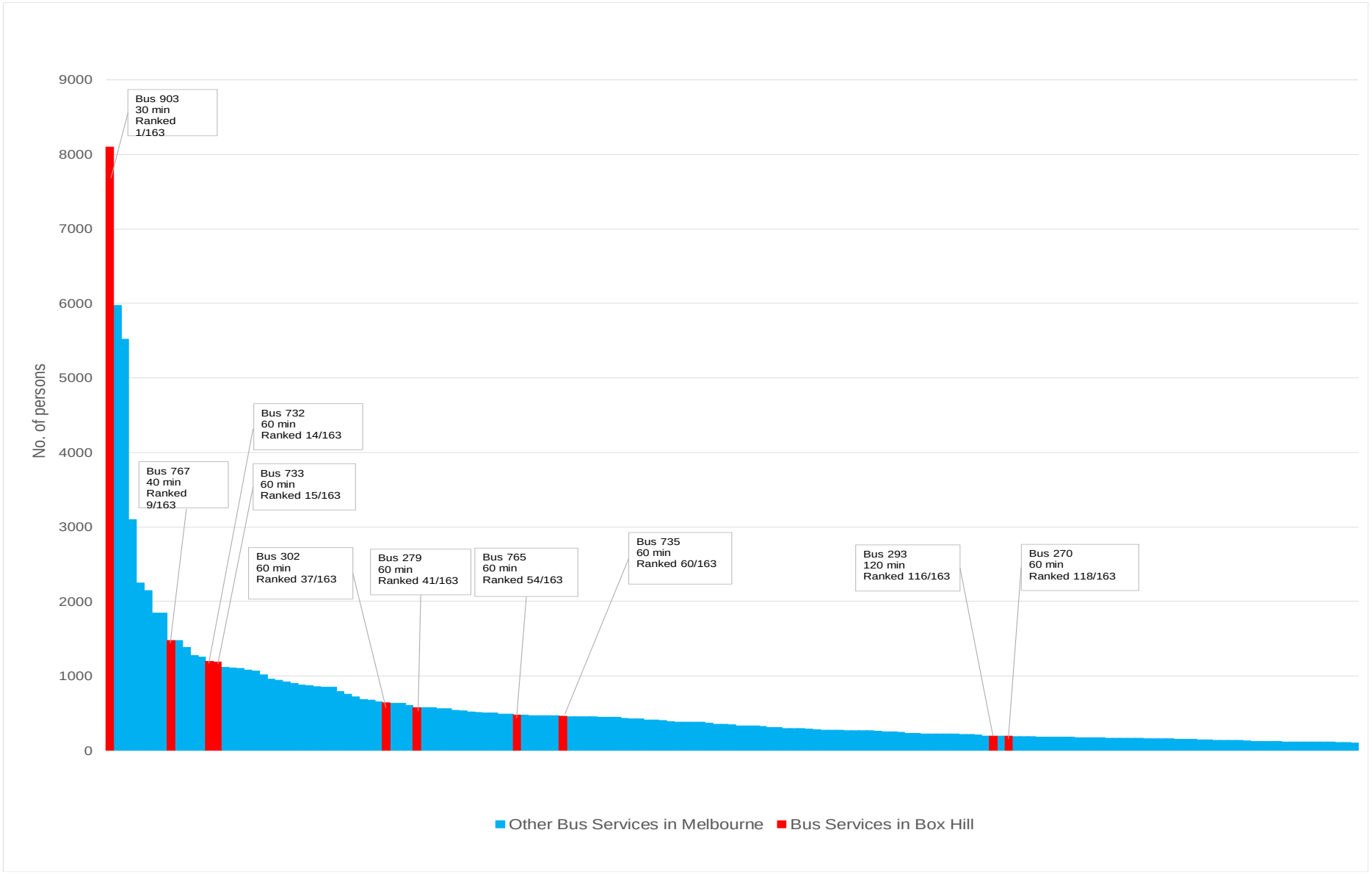


Figure 21 Average Sunday bus patronage for FY2014 / 2015 and peak headways for Box Hill bus services

4.6 Trams

Box Hill tram terminus is located along the median strip of Whitehorse Road, approximately 200 metres from the bus interchange and train station. Tram 109 is the only tram route that operates from this terminus. Tram 109 goes all the way to Port Melbourne via Melbourne CBD as shown in Figure 22.

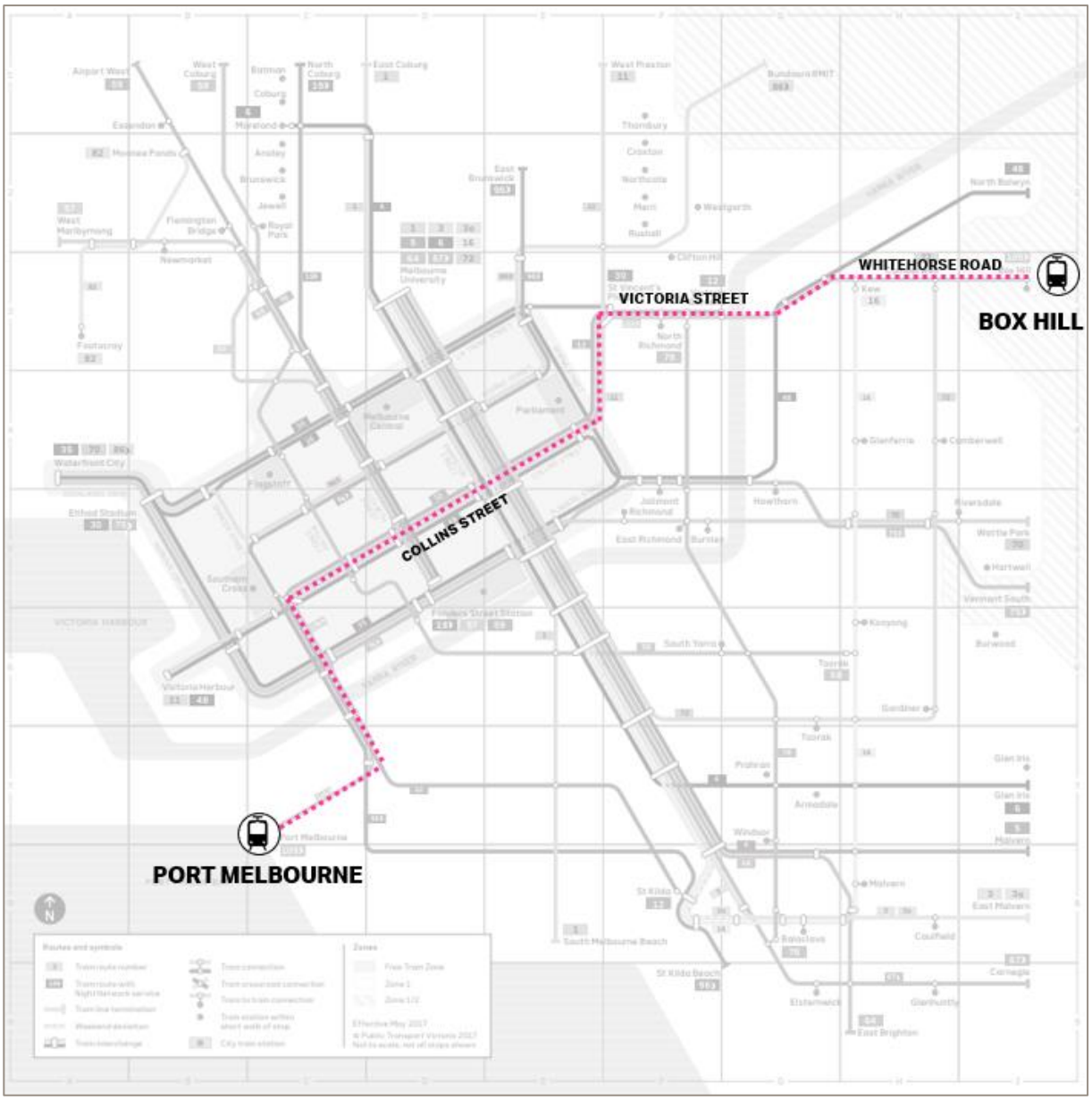


Figure 22 Tram route 109 - Box Hill to Port Melbourne

Based on information available from PTV, tram route 109 operates at relatively good service levels when compared to other tram services in Melbourne. Table 21 outlines the typical headways for this service.

Table 21 Tram service headways for route 109

		Monday - Friday			Saturday		Sunday	
Service	Destination	Peak Freq. (min)	Last Service	Typical Freq. (min)	Last service	Typical Freq. (min)	Last Service	Typical Freq. (min)
109	Port Melbourne	6	1.10 am	10	3.15 am	10	12.50 am	12

PTV are developing plans to upgrade the tram terminus in Box Hill. The proposal would allow for:

- two tram platforms (one tram can queue while another tram arrives/departs),
- longer platforms to accommodate E-Class trams
- relocating the terminus slightly west, to remove the existing tram/pedestrian conflict

As a separate project, PTV are also developing plans to install a new electrical substation near the Box Hill Tram Terminus to help power the tram network and improve reliability.

4.7 Private vehicles

4.7.1 Household car ownership

As stated in Table 22, most households in the study area own at least one car, with 39 percent of work-related journeys undertaken using private vehicles. As expected for a MAC, this percentage is low when compared with Whitehorse LGA and metropolitan Melbourne regions. The table also shows a general relationship that less car ownership equates to lower private vehicle journey to work mode share.

Table 22 Number of cars per dwelling and private vehicle journey to work mode share

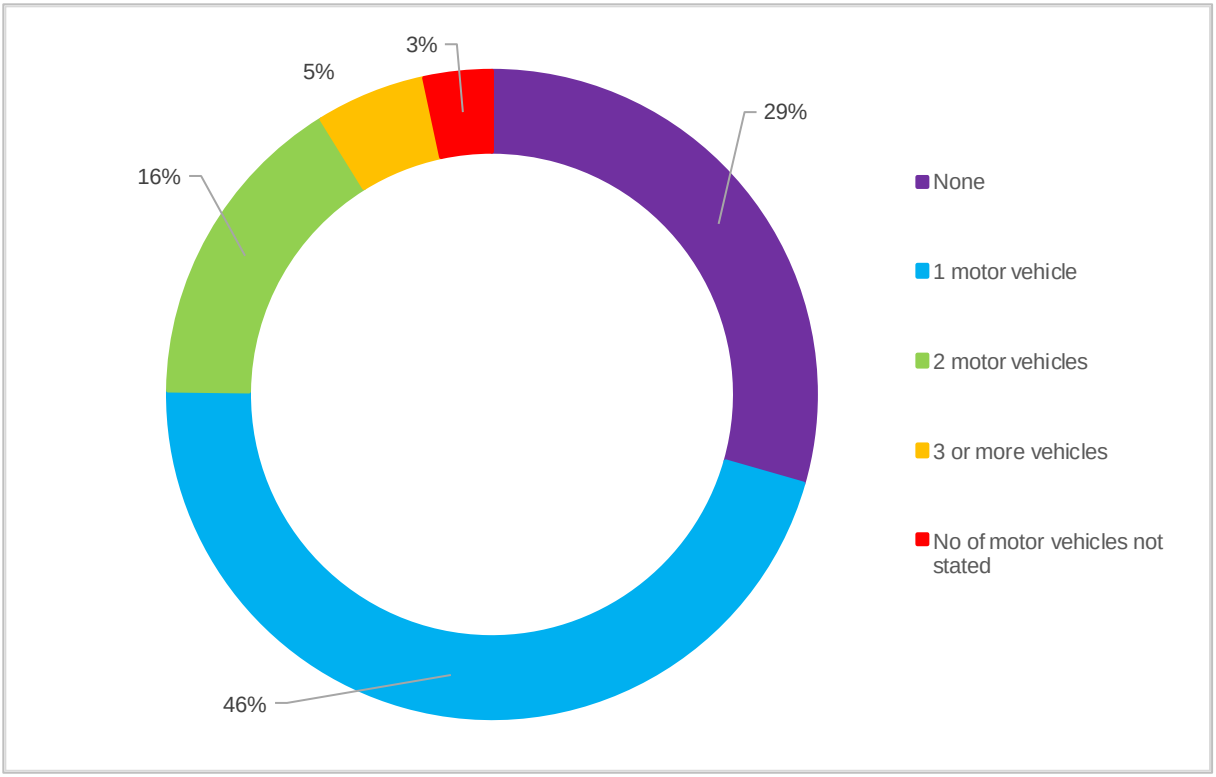
Region	Number of cars per dwelling	Private vehicle journey to work mode share
Box Hill	1.2	39%
Whitehorse LGA	1.7	69%
Metro Melbourne	1.7	60%

Source: ABS Census data

most households own at least one car, with 39 percent of work-related journeys undertaken using private vehicles

4.7.2 Motor vehicle registry

Approximately 3,400 motor vehicles were registered in Box Hill based on 2016 census data. Approximately 46 percent of Box Hill's population owned one motor vehicle, and 29 percent did not own any motor vehicle. This shows that residents do not depend heavily on motor vehicles as Box Hill is supported by a strong public transport network.



Source: ABS Census data

Figure 23 Proportion of registered motor vehicles in Box Hill

4.7.3 Traffic volumes

Table 23 highlights the traffic volumes on key north-south and east-west roads within the study area. Traffic volume data for key arterial roads were obtained from VicRoads' for the years 2007 and 2017, and traffic volume data for local / collector roads were obtained from Whitehorse City Council for the year 2017. Outputs from VITM Strategic Modelling were sourced to establish the AAGR from 2017 to 2031. These growth rates were applied to the traffic volumes observed in 2017 to establish 2031 traffic volumes along these roads.

Historical data between 2007 and 2017 shows Whitehorse Road has slightly reduced in traffic volumes. Other roads in the MAC typically show negligible growth. Forecast growth to 2031 shows a similar trend with little growth anticipated.

Typically, the north-south roads are showing a greater proportion of commercial vehicles especially on Elgar Road with up to 6.8 percent of traffic made up of commercial vehicles. This is likely to be attributed to the proximity of the Eastern Freeway, situated to the north of Box Hill MAC. Whitehorse Road has relatively low commercial vehicle usage of only 3.4 percent to 4.3 percent.

Historical data shows Whitehorse Road has slightly reduced in traffic volumes, other roads show negligible growth, forecast growth to 2031 shows a similar trend with little growth anticipated.

Table 23 Historical and projected two-way daily traffic volumes with percentage of commercial vehicles

Road	2007	2017	AAGR '07-17	2031	AAGR '17-31
North-South Roads					
Station Street, north of Whitehorse Road	20,000 (6.4%)	21,200 (4.6%)	0.60%	21,520	0.10%
Station Street, south of Whitehorse Road	22,000 (3.9%)	21,000 (4.1%)	-0.50%	22,300	0.40%
Elgar Road, north of Whitehorse Road	26000 (6.7%)	26,000 (6.8%)	0.00%	28,000	0.50%
Elgar Road, south of Whitehorse Road	28,000 (6.6%)	30,000 (6.6%)	0.70%	31,050	0.23%
Nelson Road	NA	10,000	-	12,900	1.70%
Thurston Street	NA	4,950	-	6.950	2.30%
East-West Roads					
Whitehorse Road, east of Station Street	29,000 (4.3%)	27,000 (3.5%)	-0.70%	28,000	0.23%
Whitehorse Road, between Elgar Road and Station Street	29,000 (3.4%)	29,000 (3.6%)	0.00%	29,400	0.01%
Whitehorse Road, west of Elgar Road	25,000 (2.5%)	23,000 (3.95)	-0.80%	24,310	0.40%
Carrington Road, between Thurston Road and Station Street	NA	4,600	-	4,950	0.50%
Thames Street, between Elgar Road and Station Street	NA	8,600	-	10,750	1.50%
Ellingworth Parade	NA	1,800	-	2,150	1.22%

Source: VicRoads AADT Data and Council Traffic Counts

4.7.4 Travel speed

Figure 24 highlights the average weekday 85th percentile speed of key roads within the study area where the recorded average weekday vehicle volumes were over 5,000. The data shows Whitehorse Road recording a relatively low speed of 53 km/hr to 56 km/hr, as compared with the posted speed limit of 60 km/hr. The only location where there is a demonstrated speeding issue is along Hopetoun Parade where the 85th percentile speed is 57 km/hr, seven kilometres per hour faster than the posted speed limit.

85th percentile speed along Whitehorse Road was between 53 and 56 km/hr, lower than 60 km/hr posted speed limit

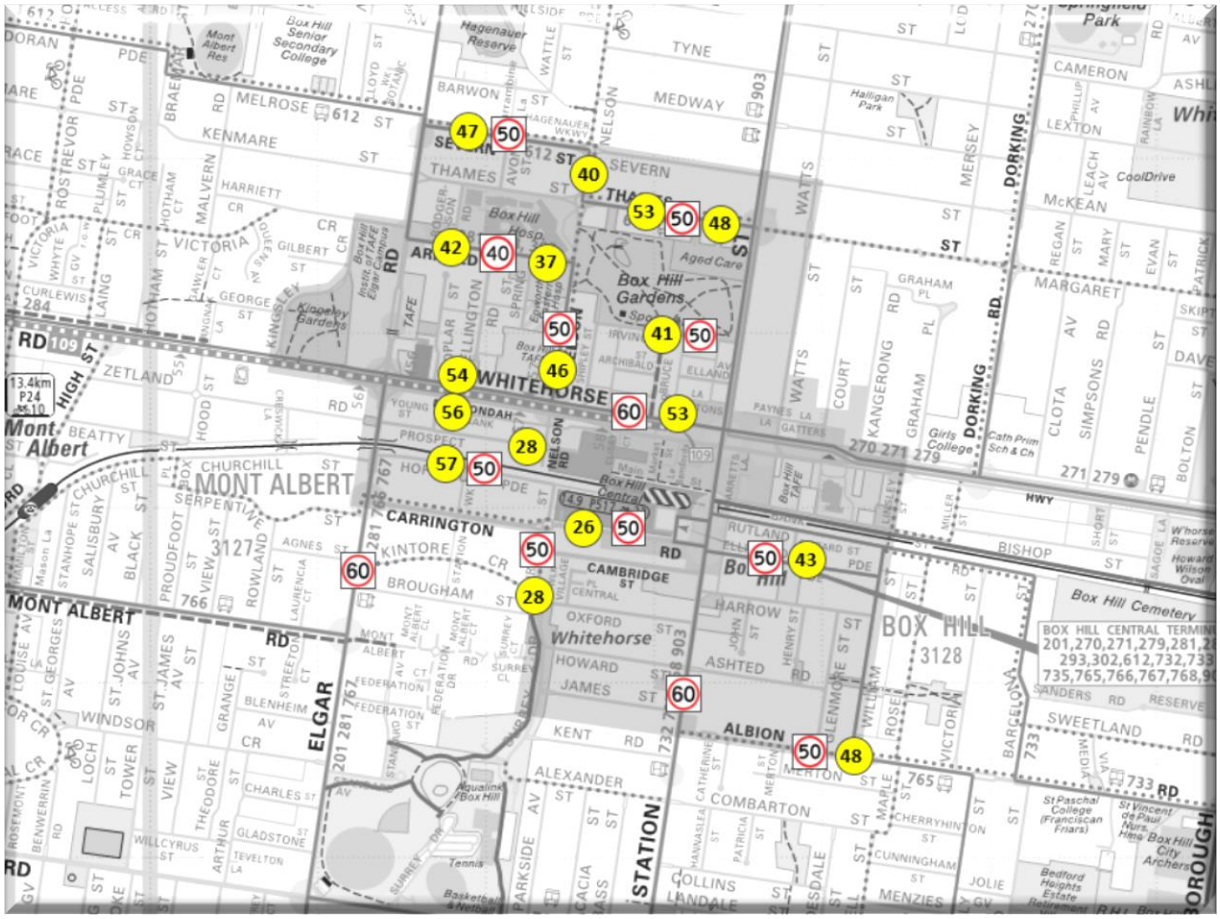


Figure 24 Average weekday 85th percentile speed and posted speed limits in Box Hill

4.8 Road safety

An analysis of reported casualty crashes for the study corridor has been undertaken for a five-year period (December 2013 to December 2018) using the VicRoads CrashStats database. The database includes all crashes occurring on roads or pathways that were reported to Victoria Police and resulted in a fatality or injury. The categories of casualty crash severity are defined as follows:

- **Fatality**: One or more persons are killed in the crash or die within 30 days from injuries sustained in the crash.
- **Serious Injury**: One or more persons are admitted to hospital as a result of injuries sustained in the crash.
- **Other Injury**: One or more persons are given medical treatment for injuries sustained in the crash.

There were 127 casualty crashes recorded in the study area in the latest five-year period. A summary of the collision type and severity is shown in Table 24 below.

Key findings include:

- the importance of implementing a safe systems approach within the study area in evident, as there were 38 crashes recorded with one fatality and 12 serious injury crashes which involved pedestrians.
- a total of five crashes involving cyclists were recorded along key cycling corridors within the study area.
- out of the 35 crashes recorded with vehicles travelling in the same direction, 24 crashes were rear end crashes, likely attributed to traffic congestion within the study area.

- out of the 22 crashes recorded with vehicles travelling in opposing directions, 20 crashes were right/through-lane crashes, suggesting the need for safer priority for right turning vehicles.

Table 24 Crash types in Box Hill

DCA code	Fatal	Serious	Other
100-109 Pedestrians	1	12	25
110-119 Adjacent directions	0	1	15
120-129 Opposing directions	0	7	15
130-139 Same direction	0	5	30
140-149 Manoeuvring	0	0	6
150-159 Overtaking	0	0	1
160-169 On path	0	0	1
170-179 Off path on straight	0	3	3
180-189 Off path on curve	0	0	0
190-199 Passengers	0	1	1
Total	1	29	97

Source: VicRoads CrashStats

Figure 25 shows the number of crashes at specific sites within the study area, and if the crash involved cyclists and pedestrians. The key finding is clearly the number of crashes that involved pedestrians. Primary locations where pedestrian crashes occurred were:

- Whitehorse Road where a pedestrian fatality occurred on the eastern edge of the study area
- Station Street most notably between Bank Street and Harrow Street
- Nelson Road and Elgar Road.

Key locations where cyclist crashes occurred were Whitehorse Road and Nelson Road. Whitehorse Road / Station Street and Whitehorse Road / Elgar Road intersections both recorded six or more crashes within the preceding five-year period. As shown in Appendix F pedestrian and cyclist activity are high along these road corridors as they provide access to several educational, health, public transport and shopping precincts. Hence, it is important to improve safety along these roads by adopting measures that follow safe systems principles.

38 pedestrian crashes including one fatality and 12 serious injuries in the last five-year period

Source: VicRoads CrashStats

Figure 25 Crashes between December 2013 and December 2018 within Box Hill

4.9 Parking

4.9.1 Statutory parking requirements

A key recommendation within the Box Hill Central Activities Area Car Parking Strategy completed in 2014 was to reduce parking rates within the central area of Box Hill. In December 2015, the Minister for Planning approved Amendment C158 which introduced an amendment to Clause 45.09 Parking Overlay into the Whitehorse Planning Scheme, applied Schedule 1 to the Parking Overlay to the Box Hill Activity Centre, and made consequential changes to Clause 21.08 Infrastructure, Clause 22.07 Box Hill Central Activities.

Table 25 shows the current statutory parking rates for the Box Hill MAC for residential and office land uses, relative to Footscray, Springvale and Melbourne CBD activity centres. The key findings from the comparison of parking rates include:

- Box Hill has no maximum parking rate unlike Footscray and Melbourne CBD, meaning developers can provide greater rates, potentially encouraging private vehicle access to Box Hill;

- Box Hill minimum parking rate is similar to Footscray and less than Springvale for both residential and office land uses;
- residential and office developments must provide some level of parking (albeit reduced) unlike Melbourne CBD where parking provision is optional with a set cap; and
- since it was recommended to have a reduction in parking rates, the State Government has committed to implement North East Link and Suburban Rail Loop. These projects are anticipated to impact travel patterns on key roads within the study area and how commuters access Box Hill. Further details on these projects are discussed in Section 4.10.

Additional 6,800 dwellings | 7,300 car spaces | more than 1 space per dwelling highlighting the importance of maximum parking rates

Table 25 Minimum and maximum statutory parking rates for Box Hill relative to Footscray, Springvale and Melbourne CBD

Land use	Unit	Activity centre parking rates							
		Box Hill		Footscray		Springvale		Melbourne CBD	
		Min	Max	Min	Max	Min	Max	Min	Max
Residential	Spaces per 1-bedroom dwelling	0.5	-	0.5	1.0	1.0	-		
	Spaces per 2-bedroom dwelling	0.75	-	0.8	1.0	1.0	-	0.0*	1.0*
	Spaces per 3-bedroom or more dwelling	1.0	-	1.0	1.5	1.5	-		
Office	Spaces per 100 sqm	2.0	-	1.5	2.0	3.0	-	0.0	0.5

Source: Schedule 1 to Clause 45.09 (Melbourne, Whitehorse, Greater Dandenong and Maribyrnong Planning Scheme)
*Note: * denotes spaces per dwelling*

4.9.2 Parking supply and demand

A summary of parking supply and demand information within the Box Hill MAC is outlined below:

- **Parking supply:** 8,872 total parking spaces of which 4,304 (48.5 percent) are on-street and 4,568 (51.5 percent) are off-street
- **Parking duration:** 2 percent less than one hour, 35 percent between one and three hours, 59 percent four or more hours, and 4 percent private, disabled and permit zone parking
- **Parking occupancy:** The peak time of parking activity (between Thursday and Saturday) was Thursday at 1 pm on 15 March 2018 when 66 percent of parking spaces within Box Hill CAA were occupied. On-street and off-street parking occupancy was 53 percent and 78 percent respectively. Parking occupancy was above 75 percent at the Box Hill Hospital, Epworth Hospital, Box Hill RSL, Box Hill Institute and above 85 percent at the Box Hill Transport and Retail Precinct.

59 percent of all parking is long term

Refer to Appendix H for further details on parking, including information for the Box Hill MAC study area.

4.10 Future transport infrastructure

4.10.1 North East Link

North East Link (NEL) is an 11-kilometre proposed managed motorway between the Eastern Freeway in Bulleen and the M80 in Watsonia. NEL is currently in the planning stages with construction expected to start in 2020 and finish by 2027.

The NEL impacts for the transport network within Box Hill are summarised below:

- Traffic increases are forecast for Elgar Road, Station Street and Middleborough Road
- Travel times (including for public transport), intersection performance, safety, noise and air quality may be impacted by the change in volume along these roads
- No changes to the prioritisation of buses along these roads are proposed. Impacts to tram services along Whitehorse Road are not predicted.
- There are forecast increases in truck volumes south of the Eastern Freeway, particularly Elgar Road and Middleborough Road.
- No projects that would add to the walking and cycling network within the City of Whitehorse are proposed as part of the NEL project.

4.10.2 Suburban Rail Loop

The Suburban Rail Loop (SRL) is a proposed new rail network forming a circle around Melbourne's suburbs and connecting every major rail line from the Frankston line to the Werribee line via Melbourne Airport. The project is forecast to take around 200,000 vehicle trips off major roads by 2051.

Box Hill has been identified as a potential new interchange station in the strategic assessment undertaken by Development Victoria, which emphasises the importance of Box Hill MAC. The strategic assessment also states that the Cheltenham to Box Hill section will be the first stage of the project with construction to commence by the end of 2022. Given this, it is unlikely the first stage will be operational until the early 2030s.

While there are many unknowns to this project, if it proceeds it is anticipated to:

- increase population and employment forecasts beyond current projections
- make Box Hill MAC an even more attractive proposition for developers
- increase pedestrian activity within Box Hill MAC
- increase station patronage, train mode share and train to train interchange
- potentially reduce vehicle demands along north-south roads such as Elgar Road and Station Street, potentially freeing up capacity for more sustainable travel modes or greater public space.

A conceptual map of the SRL is shown in Figure 26.

Population and employment forecasts are anticipated to increase beyond current projections with SRL

Source: Strategic Assessment: Suburban Rail Loop, Development Victoria

Figure 26 Suburban Rail Loop

5.0 Conclusions

The purpose of this background study is to provide an evidential foundation and starting point for the upcoming Box Hill ITS. The report is intended to be used as a resource to inform stakeholders and decision-making during the ITS development process.

The top five key findings of this background study are outlined below.

1. ***Box Hills population density in 20 years' time is forecast to be comparable to Melbourne CBD today. With Suburban Rail Loop, this is anticipated to increase beyond current projections.***

2. ***Additional 6,800 dwellings under consideration, approved or under construction, with 7,300 additional car spaces (currently 3,400 registered motor vehicles) increasing car use and congestion within Box Hill.***

3. ***Most people who work in Box Hill live locally, yet active transport usage is low. Over 100 male cyclists and only one female cyclist was recorded in the Super Tuesday Survey within Box Hill, highlighting gender inequality in cycling infrastructure.***

4. ***Historical data shows Whitehorse Road has slightly reduced in traffic volumes, other roads show negligible growth, forecast growth to 2031 shows a similar trend with little growth anticipated.***

5. ***VicRoads draft movement & place assessment shows most of the existing problems are pedestrian related. Over 7,600 commuters walk to Box Hill train station each weekday highlighting the importance of walking infrastructure.***

Other conclusions of note include:

- **Population:** The number of people residing in Box Hill MAC is expected to double by 2036 relative to 2016 population.
- **Significant development sites:** 24 develop sites are under consideration, approved or under construction that have 13 storeys or more.
- **Employment:** Employment within Box Hill MAC is anticipated to grow up to 11,100 people by 2036. This represents 50 percent growth on 2016 levels.
- **Education:** Approximately 39 percent of residents living within Box Hill in 2016 were undertaking some form of education with the majority of these being tertiary students. This is expected given its proximity to Box Hill Institute (750 m), Deakin University (3.5 km) and Swinburne University (7.5 km).
- **Age:** Minor (<18) and elderly population (65+) will increase from 1,165 in 2016 to 6,090 by 2041. These age brackets are typically the most vulnerable when it comes to road safety. Given this, it is essential to consider VicRoads' safe system philosophy which underpins Victoria's strategic approach to road safety.
- **Mode share:** Travel to work by private vehicle was the preferred option (43 percent mode share) for residents of Box Hill, followed by train (27 percent mode share). A relative low proportion of residents walk or cycle to work (12 percent combined mode share) in comparison to the City of Melbourne (30 percent combined mode share). As Box Hill's population and employment grows into the future, mode share is likely to follow a similar trend to City of Melbourne with lower private vehicle mode share and a greater share of active and public transport.

- **Key origins of those that work in Box Hill:** The key origin is Box Hill itself with over 1,100 people, followed by Box Hill North with over 600 people. Half the people who both live and work within Box Hill drive their private vehicles despite the furthest trip being less than three kilometres. More than 60 percent of work-related trips to Box Hill were carried out in private vehicles by workers living within seven kilometres.
- **Key destinations from Box Hill:** The key destination of people who travel to work from Box Hill is Box Hill itself with over 1,100 people, followed by Melbourne (~900) and Docklands (~200). A high proportion (83 percent mode share) takes public transport to Melbourne and Docklands. Only 30 percent of people travel by active or public transport to Burwood despite it only being three kilometres away. Data does not indicate that anyone cycles to Clayton or Southbank despite these suburbs being an equal or less distance from Box Hill than Melbourne.
- **Movement and Place:** The SFS movement results shows most of the problems that need to be addressed with the MAC are pedestrian related. Station Street is categorised as a key walking and cycling road (W1 and C1 classifications) with a lower general traffic function (GT3). Whitehorse Road is categorised as a key walking and bus road (W1 and B1). Whitehorse Road is also classified as a GT3 road.
- **Pedestrians:** Thousands of pedestrian access Box Hill North and Box Hill South shopping centres every day with high pedestrian activity along Carrington Road, Main Street, Market Street, Station Street (between Ellingworth Parade and Whitehorse Road), and Whitehorse Road (between Station Street and Clisby Court). While pedestrian mode share to the station is high, pedestrian mode share to work for Box Hill residents is relatively low as highlighted above. Regarding pedestrian safety, 38 of the 127 casualty crashes in the preceding five years were pedestrian related which included one fatality on Whitehorse Road and 12 serious injury crashes. Long delays at signals, high vehicle demand, and high traffic speeds are also a challenge regarding pedestrian access within the MAC, especially along Whitehorse Road and Station Street. VicRoads has classified pedestrian movements as the top (with buses) priority mode along Whitehorse Road.
- **Cyclists:** Bicycle volumes are relatively low given the Box Hill MAC consists of key attractors such as the shopping centre, public transport stops and stations, and medical and educational institutes. This is reflected in the journey to work cycling mode share of less than one percent. Part of the reason may be attributed to the lack of safe cycling infrastructure and busy arterial roads. Six bicycle crashes have been recorded in the last five years, primarily along Whitehorse Road and Nelson Road.
- **Rail:** Excluding the five train stations within Melbourne CBD, only South Yarra, Footscray and Caulfield stations exceed weekday patronage levels at Box Hill station within Melbourne's metropolitan rail network. Train service headways at Box Hill station are generally every few minutes during peak weekday periods and every 15 minutes during inter-peak periods for citybound services. Outbound services to Belgrave and Lilydale are less frequent with typical headways every 12 minutes during peak weekday periods. The PTV Network Development Plan states there are no plans to improve train headways between now and 2030 during peak and off-peak periods. This means the railway line will not be a 'turn up and go' metro service with trains every 10 minutes through-out the day until at least 2030. Train load surveys in May 2018 along the Ringwood corridor show two services breached the crowding benchmark in both the AM and PM peaks. If no additional services are planned before 2030, crowded trains may become a more frequent occurrence into the future. Management of rail crowding levels plays an important role in encouraging sustainable public transport options among local residents and those who work within the MAC. If train services operate above the benchmark standard, it can lead to poor passenger experience and potentially a loss in rail commuters.
- **Bus:** Approximately 2,100 commuters arrived at the train station by bus making it the fourth busiest bus interchange across all stations in Melbourne's metropolitan rail network. This emphasises the importance of the bus interchange and its key role for Box Hill commuters. Weekday bus patronage levels are relatively high with 13 out of 18 bus services in Box Hill ranked in the top 100 out of the 260 in metropolitan Melbourne. Bus routes 903, 732, 733 and 767 were consistently ranked in the top 15 for average weekday, Saturday and Sunday bus

patronage. However, other bus routes with lower patronage levels had more frequent service. Additionally, some weekend bus services carried more passengers than weekday bus services yet were more infrequent. Despite this, limited bus priority infrastructure is in operation in vicinity of Box Hill. VicRoads has classified bus movements as the top (with pedestrians) priority mode along Whitehorse Road.

- **Tram:** Box Hill tram 109 terminus is located along the median strip of Whitehorse Road, approximately 200 metres from the bus interchange and train station. Although tram 109 runs all the way to Port Melbourne via Melbourne CBD and competes with train services, most tram trips observed were for relatively short local trips. Tram 109 provides a 'turn up and go' service with six-minute headways during peak periods and typically 10-minute headways during other times.
- **Private vehicles:** Forecast growth to 2031 shows little growth is anticipated. Private vehicle speeds along Whitehorse Road with a posted speed limit of 60 km/hr are relatively low with average weekday 85th percentile speed of 53 km/hr to 56 km/hr. There were 127 casualty crashes recorded in the study area in the latest five-year period. Whitehorse Road / Station Street and Whitehorse Road / Elgar Road intersections both recorded six or more crashes within the preceding five-year period.
- **Parking:** Following a recommendation within the Box Hill Central Activities Area Car Parking Strategy, a reduction in the minimum residential and office parking rates was approved in December 2015. The new rates have no maximum parking provision, unlike Footscray and Melbourne CBD, meaning developers can provide greater levels of parking, potentially encouraging a greater share of private vehicle access to Box Hill. Over 8,800 parking spaces are provided within the Box Hill Central Activity Area of which about 4,300 are on-street and 4,500 are off-street. Peak mid-week surveys showed on-street and off-street parking occupancy was 53 percent and 78 percent respectively. This indicates that over 3,400 parking spaces are vacant during weekday peak periods. An additional 7,300 car parking spaces are planned for upcoming developments.
- **Suburban Rail Loop:** Box Hill has been identified as a potential new interchange station in the strategic assessment undertaken by Development Victoria, which emphasises the importance of Box Hill MAC. The strategic assessment also states the Cheltenham to Box Hill section will be the first stage of the project with construction to commence by the end of 2022. Given this, it is unlikely the first stage will be operational until the early 2030s. While this project is still in early planning stages, if it proceeds it is anticipated to increase population and employment forecasts beyond current projections and increase pedestrian activity within Box Hill MAC.

6.0 Next steps

The intention is to use this foundational work as a building block to develop the Box Hill MAC Integrated Transport Strategy, so it will serve as a roadmap to achieve agreed outcomes into the future. While this background study has provided significant evidential transport and demographic findings, there are several data gaps still outstanding which requires additional investigations prior to or during early stages of the ITS development, including:

- reviewing, modifying and confirming the Movement and Place classifications with the Department of Transport (DoT). This will assist with the ITS development to ensure agreed initiatives aligns with the Movement and Place approach
- engaging the DoT and the Department of Jobs, Precincts and Regions (DJPR), specifically the Suburban Rail Loop Precincts team to:
    - share information including current and upcoming investigations within the next 12 months
    - understand their vision for Box Hill based on preliminary findings from the SRL project. This may include a high-level discussion on how they anticipate the SRL project may impact on population and employment forecasts, traffic forecasts and sustainable transport
    - discuss risks of work duplication and ways to mitigate these risks by creating a working group to include Whitehorse City Council, DoT, DJPR and potentially the Victorian Planning Authority (VPA)
- engaging the community to hear their concerns and transport needs
- development of the vision, objectives and key performance indicators. This could be developed as part of the ITS or led and developed by Council for inclusion in the tender documentation

This background study has been prepared to provide a robust and consolidated set of transport related information for use during ITS development. This is to assist with developing the transport vision, set of objectives, achievable performance measures and targets, transport strategy and the creation of initiatives that focuses on people, place and movement within Box Hill MAC.

Appendix B

Stakeholder Engagement Workshop Minutes

AECOM Imagine it. Delivered.

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Minutes of Meeting

Box Hill Metropolitan Activity Centre (MAC) Integrated Transport Strategy (ITS)

Subject	Issues and Opportunities Workshops	Page	1
Venue	Box Hill Town Hall	Time	10am and 11:30am

Participants

Workshop 1
Olive Aumann – Carrington Health
Josh Chivers – RACV
Chris Trueman – WATAG
John Edis – ATO
Tim De Young – GTA
Peter Funder – Vicinity Centres
Garry Brennan – Bicycle Network
Winnie Blackwell – Box Hill Institute
Peter Redden – Deakin University

Workshop 2
Michael Bayley – DoT/VicRoads

Workshops 1 and 2
John Nikas – Whitehorse City Council
Vanessa McLean – Whitehorse City Council
Chris Hui – Whitehorse City Council
Lucy Menzies – Whitehorse City Council
Callan Jones – AECOM
Frank Jaskiewicz – AECOM
Adeana Khoo – AECOM
Aditya Malshe – Place Score

Apologies

Sasha Yarwood – DoT/VicRoads
Pirakan Pirakalathanan – DoT/VicRoads
Knowles Tivendale – Movement and Place
Adele McCarthy – Suburban Rail Loop
Daniel Vincent-Smith – Whitehorse City Council
Jeff Green – Whitehorse City Council
Ilias Kostopoulos – Whitehorse City Council
Kylie Legge – Place Score
Cindy Plowman – Conversation Caravan

File/Ref No.	60611526	Date	05-Sep-2019
Distribution	As above		

It is noted that the Issues and Opportunities Workshops were held over two sessions. Participants from AECOM-Place Score and Whitehorse City Council attended both sessions.

The workshops included interactive sessions where participants were split into groups to discuss issues and opportunities under a number of topics. As such, these minutes do not provide a transcript of the workshops, but are instead intended to provide a summary of the key points and main outcomes captured from both workshops.

The presentation slides used in the workshop are attached to these minutes.

No	Item	Action	Date
1.	Chris Hui (CH) welcomed participants and opened the session with an acknowledgement of country. Attendees introduced themselves. CH noted that AECOM together with Place Score have been engaged to prepare the ITS.		
2.	Callan Jones (CJ) ran through the agenda for the workshop.		
3.	CH explained the background and purpose of the project: • The timeframe for the ITS is generally the next 10 years and beyond, with significant growth in Box Hill expected over the next 10-20 years. • The ITS is intended to guide the future direction and development of transport, to ensure the infrastructure and provisions supports and caters for the significant growth expected. • Transport is key to liveability and the ITS is intended to guide WCC on what it can do to advocate and improve transport for all users.		
4.	CJ ran through the project timeline and current stage of the project, explaining this was still at an early stage of understanding the issues and opportunities from all stakeholders and the community. CJ highlighted in the timeline that there will be several opportunities to provide comment throughout the project.		
5.	Aditya Malshe (AM) from Place Score, working with AECOM to conduct engagement throughout the project, gave a brief summary of the Care Factor and Street Place Experience PX) Assessments undertaken over the past 2 weeks: • Quantitative and qualitative data has been collected at this stage • Data is still being collected on the Council's OurSay platform, with a full report of findings to be completed in a couple of weeks. • 200 people completed the Care Factor surveys, with a good mix of respondents in terms of age, gender and ancestry • Respondents were asked what they cared about the most. • The top 10 Care Factors have a mix of social and physical attributes - CF ranking is based on level of alignment within respondents • In a list of 50 attributes, "Ease of walking around" is the only transport attribute in top 10 at #2 – which means several respondents select this to be important to them – this is highly valued across various demographic groups • This is followed by 'Walking, cycling and public transport options' at #14 and Car Accessibility and Parking at #40 – very low in comparison. Even respondents who drove to the centre, ranked "ease of walking around" very high – therefore a clear emerging theme. • Although people tend to complain about parking, the data from 200 respondents shows that people care more about ease of walking around than car parking • Priorities are those attributes that are highly valued but performing poorly at present • According to your community, the top priorities mostly include attributes related to place/space for human interaction - but movement has an impact on place - and hence it determines other priorities • Making the centre walkable is currently the top transport priority for Box Hill users • Quantitative findings are supported by qualitative data which is being collected on OurSay – so far, some of the topics for which people are discussing the most are walkability (adding crossings, improving safety, street pedestrianisation, etc.) and improving the transport interchange.		

No	Item	Action	Date
6.	CJ noted that AECOM undertook a background study for this project earlier in the year. CJ ran through the key findings from this study		
7.	CJ explained the format of the interactive sessions. Attendees split into 3 groups to discuss each topic in the session. The key points are summarised below, grouped into similar themes/ideas as much as possible. It is noted that parts of the topics overlap to some extent, therefore some points noted by attendees may fit under more than one topic or theme. <u>Transport interchange</u> • Interchange location o Bus operational activities (layover, amenities etc.) should not be in the town centre – bus station should be relocated so buses do not have to go through the middle of the MAC to get there o Some people alight on Whitehorse Road already (due to delays to buses entering interchange) o Not the right place for a commuter car park / commuter car park not necessary here o 'Destination' not 'interchange' • Bus network o Bus network needs to be redesigned o Potential consolidation of bus services (local vs regional services)? o Rationalise bus route and number of buses • Facility quality/standard o Poor accessibility for people with disability o Substandard design for people using it o Wayfinding not transparent • Miscellaneous o Poor surveillance o Effect of work hours and peak pricing o Need staged approach – timeframe for transport interchange redevelopment is likely to be 10-15 years o Potential on-street bus solution could be considered <u>Road space allocation</u> • Laneways o Local laneways do not encourage walking / do not attract peds / Agree on laneways not being conducive for active transport – this can be altered with relevant ease, community involvement and potential art space creation • Whitehorse Road o Whitehorse Rd – public space is inaccessible and not user-friendly – too much space for cars – divides north and south o Whitehorse Road – 1 lane to the west, 2 lanes to the east, but 3 through Box Hill o Change Whitehorse Road to 1 lane each way through MAC – remove parking on north lane – convert south lane to pedestrian mall • Roads for loading/service access o Logistics and delivery / pick-up plan needed o Role of Hopetoun and Carrington to provide car and loading access to retail centre		

No	Item	Action	Date
	o Specific freight-friendly areas / times to encourage overnight loading. • Walking/cycling routes o Pedestrian environment reflects a suburban outcome not a MAC o No legible bike network to or through Box Hill o In 20 years, you need parking for 1000 bikes at station – how do they get there? o New tech if legislated (e-scooters/cycling) o Footpaths are narrow o Box Hill city centre – PT infrastructure to health & education precincts – not a pleasant environment and does not encourage walking o Encourage people to walk from town centre to health and education areas o Pedestrians through, to health and education precinct. • Hierarchy / role of streets o Each end of Carrington could be 2-way. o Elgar, Middleborough – traffic routes o All roads (except one or two major highways e.g. Elgar, Middleborough and Canterbury) should be safe and welcoming bike routes • Miscellaneous o Perspective of managing the kerb o Parking is a VERY HIGH COST use of road space. Within MAC, road space should be used for visitors to MAC and residents, and banned for through traffic. o Station St between Whitehorse Road and Harrow St o Periodically changing road uses o Road space is congested <u>Active transport</u> • Walking/cycling environment o The environment is not supportive for walking and cycling – not obvious. o Public realm does not encourage active transport o Pedestrian access and road not attractive and does not feel safe / comfortable. o Potential opportunity for ped-only streets? Closure of Station St from Whitehorse Rd to Bank St. o Built form influence – active frontages on car parks, shopping centre and commercial. o Building canopies – sun and rain protection / Shade o Constrained space / busy roads / small footpaths o Education about sharing space: peds-bikes-cars o If we get the road conditions right, dedicated bike infrastructure isn't needed. o Reduced speed environment o Roads – straight, fast, congested, car parking o All roads into and around MAC need to be made safe for cycling and walking. • Network o Not enough bike lanes within Box Hill City Centre and at major institutions e.g. education, health o Lack of cycling lanes – an increase would encourage cyclists o Allocated road space for cyclists		

No	Item	Action	Date
	o Need to reduce conflict between peds/cyclists/vehicles o Cars have thousands of route options through streets to and in Box Hill. Walkers and cyclists need similar options and not limited to just a few 'designated' routes. o More options across train line o Map existing infrastructure for active transport – Proposed-SLC etc. o Bike Network – "to" vs "thru" o Really good walking options especially via parkland- is safety at night through these areas a consideration? • Bike parking o Cycling facilities not sufficient for cyclists o End of trip – audit for bike parking – showers / lockers o Management of bike parking (abandoned bikes) • Wayfinding o Good wayfinding required o Lack of pedestrian and bike legibility to and through town centre o Creation of Box Hill digital walking apps • Accessibility / standard o DDA Access – generally but also specifically the transport interchange and underpass o Equitable access at station (prams, mobility, cyclists) • Miscellaneous o Very different needs for each mode o "Living locally" – what does that mean? – majority of people who work in Box Hill live locally i.e. within 3km? o Better signal timing priority for peds o Innovative vehicles, e-scooters / new tech o Respond to the changing 'delivery' economy o A lot of people cross through Box Hill – poor public transport options – slow buses mean people drive – increasing traffic congestion o Peds – high volumes at crossings. Capacity on footpaths? Interchange. o Major attractors – education, station, others? <u>Safety</u> • Safety / personal security o Hospital shift workers and safety at night o Improve lighting and accessibility of laneways o Casual surveillance = creating a 24/7 economy o Improve lighting / public realm o Perceptions of safety • Construction disruptions o Safety around construction – roadworks, both vehicles and pedestrians o Timing of road works / construction – to avoid peak active transport times • Crossings o Peds unsafely crossing Station St o Wider crossing points o Road network layout – crossings not where they need to be- resulting in people taking chances o Provide crossings at appropriate locations o Traffic flow to reduce conflict with crossing peds		

No	Item	Action	Date

	• Footpath capacity
	  o Can Box Hill handle the projected amount of pedestrians?
	  o Widen footpaths
	• Speeds
	  o Reduce speeds – local and main roads
	  o All roads except Elgar / Middleborough should be 40 max, with those closest to the MAC 30.
	  o Lower speeds
	• Bus stops
	  o Bus stops near safe crossing points
	  o Amenity at bus stops (more seating)
	  o Location of bus stops
	• Walking environment
	  o Environment not conducive to walking and cycling
	  o Low stress / low traffic environment needed
	  o Prioritised active transport routes
	  o Road design and choice of materiality to provide perception of 'safe' environment
	  o Active Street levels on new developments
	• Miscellaneous
	  o Parking on Station St blocking visibility
	  o Freight – have deliveries off-peak to avoid conflict
	
	<u>Car parking</u>
	• Safety / personal security
	  o Personal safety for people who walk or use buses
	  o Adequate light/security
	• Parking rates
	  o Possible maximum parking rates / reduce car parking rates for office buildings
	  o Decouple car parking from development
	  o Less car parks in residential development – but reserve for car share
	  o With autonomous vehicles, the need for public car parking may reduce in future. However private car parking may increase.
	  o Staging of parking provision reductions (key challenge)
	• Car park locations
	  o Appropriate car park entry locations to minimise impact on pedestrian outcomes
	  o Get rid of virtually ALL on-street parking, traders do much better from passing pedestrians and cyclists. Car visitors to Box Hill should have access to off-street parking on the outside of MAC. Car should not have to access centre of MAC for parking.
	  o Centralised parking space over dispersed parking space – outer locations of key precinct.
	  o Need to consolidate spaces around edges of MAC.
	  o Access to adjacent station – not enough car parking – so they can't ride the train to Box Hill
	  o
	• Equitable parking (parking for those who need it)
	  o Affordable supply for 'needs'-based parking e.g. hospital, health services.
	  o Equitable access (limited mobility, low income)
	  o Box Hill is a service hub with lots of health/community services. Often access/mobility issues mean some people need to use		

No	Item	Action	Date
	cars to travel. Low disabled parking around these facilities. Such things as NDIS has numbers coming to Box Hill for services. • Use of car parks / parking spaces o Flexible car parking spaces o Allocated car-share spaces o Car parks only used at certain times of the day o Kerb space – making more productive use of space – while still ensuring convenient parking is provided for necessary uses (e.g. drop-off) o Shared use of car parking – art exhibitions etc o Multi-use facilities – integrate use (car parking, commercial etc.) o Active frontages on ground floor of car parks o Space used by car parking • Miscellaneous o EV charging infrastructure o Improve wayfinding / use technology o Flexibility to encourage development (work-zone allocations) o Provide other transport modes o Location, Availability o Big emphasis by all to car parking: where is similar emphasis on convenient and large-scale bike parking? o Costs <u>Other</u> • Schools o Active transport for students o Reduce school drop-offs o No parking along school frontages o Need to accommodate vulnerable users (children, but also the elderly) • Service/loading/freight o Freight/loading movements / shopping delivery services are important and must be accommodated o Introduce delivery time zones for large loading o Cargo bikes could be considered for small, short trip deliveries • Suburban Rail Loop (SRL) o Uncertainty surrounding SRL (timing, station location) needs to be considered in this ITS o Need to consider connection between bus, SRL and interchange • Miscellaneous o Illegal parking is impacting bus operations o Multi-lingual / bi-lingual wayfinding and digital wayfinding (mobile apps etc.) o Stagger working hours in large organisations o Land use considerations – planning scheme parking requirements o Transport outcomes need to support both community and economic outcomes – needs to be deliverable o Different function for roads/spaces at different times of the day o Trams also important function which hasn't been considered in other topics		

No	Item	Action	Date
8.	CJ reiterated there will be further consultation opportunities, including on the Our Say platform. Further workshops will include feedback on discussion papers and the draft strategy. The AECOM project team will use outcomes from this workshop session, other consultation, including online comments, as inputs into an Issues and Opportunities Report to be prepared in the next month.		

Attached: Issues and Opportunities Workshop – Presentation Slides

Appendix C

Community Insight Reports

ISSUES AND OPPORTUNITIES
COMMUNITY ENGAGEMENT AND RESEARCH FINDINGS

BOX HILL METROPOLITAN ACTIVITY CENTRE
INTEGRATED TRANSPORT STRATEGY

V1 19.09.2019

PROJECT OVERVIEW

Place Score has been engaged by AECOM to undertake community and stakeholder engagement at Box Hill, VIC. The findings of this research with inform the preparation of the 'Box Hill Metropolitan Activity Centre (MAC) Integrated Transport Strategy (ITS)' for Whitehorse City Council (WCC).

This Issues and Opportunities Report synthesises past engagement report findings with the results of a range of engagement activities undertaken face-to-face and online between 20th August and 14th September 2019.

A total of over 510 people participated in this stage of the research.

Engagement Activity	**Participant number**
Review of past engagement conducted by WCC as a part of the Strategic Visioning process for Box Hill MAC (Jan, Feb 2019)	n=93
Town Centre Care Factor Survey	n=200
Street PX Assessment (Observation Study)	n=281
Our Say Forum	n=21 (29 ideas)
Our Say Mapping Tool	n=09 (23 ideas)

This Issues and Opportunities Report summarises the community's inputs against 5 key themes identified by AECOM:

1. Public Transport (incl. Transport interchange)
2. Streets and Public Spaces (Road space allocation)
3. Walking and Cycling
4. Safety
5. Car parking

It should be noted that quantitative evidence has been collected using Place Score's Place Experience (PX) Assessment tool, Care Factor (CF) tool and aggregated priorities based on PX and CF data. Qualitative evidence has been collected using Online Mapping and Forum tools on Council's OurSay platform.

Please refer to Appendix 1 to view the OurSay participation details and summary.

THEME 1 – PUBLIC TRANSPORT (INC TRANSPORT INTERCHANGE)

This theme includes references to public transport generally, DDA compliance, transfer/wayfinding, capacity of PT services, general interchange layout, etc. The community engagement revealed the following areas of concern:

ISSUE 1: Inadequate management

Lack of adequate place management in terms of availability of signage or information, and presence of street cleaners is noted to be an issue at Whitehorse Road and Prospect Street.

Quantitative Evidence

- **Place Score's PX Assessments** at Whitehorse Road and Prospect Street reveal that '*Evidence of management (signage, information, street cleaners etc.)* is ranked 36 and 41 out of 50 respectively, indicating room for improvement.

ISSUE 2: Dissatisfaction with Interchange/Depot

Size and layout of the interchange facility is not equipped for the volume of passengers Box Hill now services. Public transport users are forced to connect to the station through the shopping centre.

Qualitative Evidence

- In **OurSay Mapping Activity** and **Online Forum**, participants identified that the single escalator within the depot creates an unsafe bottleneck. Connection between the station platforms and other modes of transport was found to be inconvenient. Participants noted the need to navigate street furniture and street traders in an already crowded environment. Location of the lift was stated to be difficult to identify.
- **Past engagement conducted by WCC** had several comments related to the ease of access for parents with prams and/or people using a mobility aid. Some respondents noted the unreliability of the single escalator. Respondents also stated the difficulty with entering and exiting from the commuter carpark.
- In **Mapping Activity** and **Online Forum**, the issue of train commuters requiring to travel through the centre to go between the train or bus was raised. Access was noted to be challenging given the number of centre stalls and volume of shoppers. Accessing the station before the centre opens at 8am was considered difficult as commuters were required to walk around the centre.

ISSUE 3: The Interchange does not reflect Box Hill identity or culture

Look and feel of the depot does not seem to reflect the vibrancy and direction of Box Hill.

Qualitative Evidence

- In **OurSay Mapping Activity** and **Online Forum,** the smell and wet, cold feeling of the depot was raised on repeated occasions. The unsavoury experience was noted to be an issue particularly at night and in Winters.

- **Past engagement conducted by WCC** reveals that in addition to the stark appearance of the interchange, respondents noted that the only colour used is in the form of advertisement. Existing seating and bins were found to be coated in gum or bird poo.

The community engagement revealed the following areas of opportunity:

OPPORTUNITY 1: Investment in public transport options
The community would support an increase in alternatives to private vehicle usage.

Quantitative Evidence:
- **Place Score's Care Factor Surveys** inform that more than 40% residents living outside Box Hill suburb (except Burwood) value '*Walking, cycling or public transport options*', which is higher than residents living in Box Hill. This indicates a need to invest in sustainable transport modes for getting them to the centre.

Qualitative Evidence:
- **Past engagement conducted by WCC** reveals that respondents provided an idea to create a shuttle service that connects nearby workers to the centre during lunch time, allowing them to leave their cars at work, thus reducing road congestion.
- In **Mapping Activity** and **Online Forum**, a desire to see improvements to the bus service, particularly its connectivity into the centre and station is revealed. Respondents also mention the need for better connections between Box Hill and Doncaster Shopping Centre on weekends, and more late-night bus services across the weekday and weekends.

OPPORTUNITY 2: Potential to change travel behaviour
There is an opportunity to support people across various demographics to change from private vehicles to public transport in Box Hill MAC.

Quantitative Evidence:
- **Place Score's Care Factor Surveys** inform that more private vehicle users care about '*Walking, cycling or public transport options*' compared to respondents using other modes - this is an indication that this group is likely to change travel behavior.
- **Place Score's Care Factor Surveys** inform that Box Hill associates care much lesser about *'Car accessibility and parking'* across all demographics compared to the National Benchmark. This attribute is also the least cared about of all primary and secondary movement-related attributes.

Qualitative Evidence
- **Past engagement conducted by WCC** reveals that many respondents considered availability of all-day car parking within close proximity to public transport to be rare, resultantly leading to car spaces being filled with traders

or centre staff. Ideas thus looked at creating a system that supports public transport use and encourages people to shop after work in the centre.

OPPORTUNITY 3: Improved connections between destinations and transport modes

The community would support improved pedestrian connectivity between destinations and different forms of transport to create a seamless experience.

Quantitative Evidence

- **Place Score's Care Factor Surveys** inform that *'Ease of walking around'* is the most valued movement attribute and has an overall Care Factor rank #2.
- **Place Score's priorities (aggregated PX and CF data)'** reveals '*Ease of walking around'* to be a high priority for improvement across all surveyed locations except Whitehorse Road (North side) and Carrington Road.

Qualitative Evidence

- In **OurSay Mapping Activity** and **Online Forum,** participants stated their preference to see a better-connected transportation system with ease of access to bus, tram and train services and facilities to support this use (toilets, parking, lighting, information).

OPPORTUNITY 4: Increase information to support public transport use

The community would value improvements to the overall place management of the area, in order to facilitate better wayfinding and navigation through the centre and interchange.

Quantitative Evidence

- **Place Score's Care Factor Surveys** inform that twice the number of respondents over 65 years care about *'Evidence of management (signage, information, street cleaners etc.)'* compared to the average for Box Hill associates.

Qualitative Evidence

- **Past engagement conducted by WCC** informs that some respondents would like to see advertisements replaced with transit information and technology used to directly notify them of services.

OPPORTUNITY 5: The Interchange as a hub connecting the community

There is an opportunity to make the interchange the heart of the centre, which would include creation of facilities that support and encourage repeated use.

Qualitative Evidence

- In **OurSay Mapping Activity** and **Online Forum,** participants stated their preference to see upgraded toilets and the installation of bike parking to support those riding to a tram, train or bus. Current toilets are found to be limited to Centro, which when closed are not available for use.
- In **past engagement conducted by WCC,** participants stated their preference for the interchange to be far more integrated into the community, with community uses (community meeting room, library services) embedded within the facility. Many respondents believed that the volume of foot traffic could also support cafes and restaurants, providing the area was cleaned up.

THEME 2 – STREETS AND PUBLIC SPACES

This theme looks at general road cross-sections and how these impact movement of private vehicles, through-traffic and sustainable transport modes as well as the impacts on 'place' or function of the MAC. The community engagement revealed the following areas of concern:

ISSUE 1: Delays to public transport services and impacted traffic flows
Congestion created by cars is believed to delay public transport services. Likewise, merging lanes and reduced lanes of traffic are found to create bottlenecks, thus impacting overall flow of traffic.

Qualitative Evidence:

- In **Mapping Activity, Online Forum** and **past engagement conducted by WCC,** a key concern for public transport users was the delays created by road congestion. Particularly, Bus Route 903 was stated to be service requiring priority access through centre. Many respondents felt that delays discouraged people from using these services.
- **Past engagement conducted by WCC** reveals that the flow of traffic in peak hours from Whitehorse Road to Elgar Road is found to be impacted by the merging lane which is too short (needs to continue to Prospect St) to be effective.

The community engagement revealed the following areas of opportunity:

OPPORTUNITY 1: Reprioritisation of road space
The community identified the opportunity of reprioritising the way road space is allocated, in order to reduce congestion and improve traffic flow.

Qualitative Evidence:

- **Mapping Activity, Online Forum** and **past engagement conducted by WCC** reveal a few comments on congestion created by cars and the impacts of the same on Box Hill. Suggestions included introducing more one-way streets (Nelson Street to Young Street) with wider footpaths; prioritising bikes and buses and removing the cars on Carrington Road. Removing car parking along on Elgar Road between Hopetoun Parade and Carrington Road was considered as an opportunity to improve traffic flow.
- In **Mapping Activity** and **Online Forum,** ideas related to dedicating bus lanes along major roads including Carrington Road have been shared, to increase the use and improve the service of public transport.

OPPORTUNITY 2: Investment in improving place outcomes
There would be significant support in improving the overall place experience within the centre, which what a majority of Box Hill associates prioritise.

Quantitative Evidence:

- **Place Score's Care Factor Surveys** inform that 10% more respondents under the age of 25 care about '*Amount of public space (footpaths and public spaces)*' compared to the average.
- **Place Score's priorities (aggregated PX and CF data)** reveal that high priority investment is needed in *'Interesting things to look at (people, shops, views etc.)*', *'Outdoor restaurant, cafe and/or bar seating'* and *'Unique mix or diversity of people in the area'* in order to improve place experience. If these 'place' and 'people' related attributes are to be improved, road space needs to be appropriately allocated as 'public' space for use by people.
- **Place Score's priorities (aggregated PX and CF data)** reveal secondary improvement priorities for the centre to be uniqueness attributes such as *'Landmarks, special features or meeting places'*, *'Local history, heritage buildings or features'*, *'Evidence of public events happening here (markets, street entertainers etc.)'*, *'One of a kind, quirky or unique features'* and *'Public art, community art, water or light feature'*. Streetscape design should incorporate and provide for the same in order to enhance place experience.

Qualitative Evidence:

- **Mapping Activity and Online Forum** reveals an idea to better use the train line which currently disconnects Box Hill. Some respondents would like to see this converted into a public space and a place for pedestrians and cyclists to enjoy.
- **Past engagement conducted by WCC** reveals ideas such as conversion of car parks and underused areas into green spaces or event spaces. Locations for removal of car parks as discussed by respondents include Market Street (public space) and Carrington Road (bike laneway).
- **Mapping Activity and Online Forum** inform that in addition to repurposing car parking, participants want to see congested streets and roads converted into public space. Bank Street, Station Street and Rutland Road were provided as examples of where this could be possible.
- In **Mapping Activity** and **Online Forum,** creating smoke free areas was suggested to increase the number of pedestrians using the area and create a more pleasant environment.

OPPORTUNITY 3: Diversion of transit traffic

Diversion of transit or through traffic out of Box Hill is seen as an opportunity to improve the place outcomes.

Qualitative Evidence:

- **Mapping Activity and Online Forum** suggested creating a bypass that took transit traffic out of Box Hill.

THEME 3 – WALKING AND CYCLING

This theme aims to address active transport infrastructure generally, and its potential impact on Box Hill as a key destination/MAC. The community engagement revealed the following areas of concern:

ISSUE 1: Difficulty in walking around
This issue relates to the challenge of walking between destinations, a particular problem at Nelson Road.

Quantitative Evidence:

- **Place Score's PX Assessments** reveal that *'Ease of walking around'* performs the lowest of all primary movement attributes.
- **Place Score's PX Assessments** reveal that *'Ease of walking around'* and *'Walking paths that connect to other places'* perform the worst at Nelson Road, with PX Scores 4.2 points and 2.7 points lower than the average for those attributes respectively.

ISSUE 2: Challenges for cyclists
Moving between destinations by bicycle has been identified as an issue in Box Hill MAC.

Qualitative Evidence:

- In **past engagement conducted by WCC,** connectivity of cycling paths was raised as a concern, particularly in terms of connectivity between Box Hill Trail and Ringwood Trail. Cyclists were forced into the streets and onto busy roads.

ISSUE 3: Impact of delivery vehicles on pedestrians and cyclists
Lack of planning and consideration of delivery drivers and riders is found to be an issue in Box Hill MAC.

Qualitative Evidence:

- In **Mapping Activity** and **Online Forum,** increase in the number of food delivery drivers and riders has been noted; as well as the impact of the same on pedestrians and cyclists. Particularly parking on footpaths and blockage of access has been considered an issue.

The following opportunities related to this theme were identified through the community engagement.

OPPORTUNITY 1: Improving and encouraging walking
There lies an opportunity to improve and encourage walking around the centre by investing in walking paths that connect to various destinations, extending pedestrian crossing times and enforcing regulations for improving the physical environment.

Quantitative Evidence:

- **Place Score's Care Factor Surveys** inform that *'Ease of walking around'* is the most valued movement attribute and has an overall Care Factor rank #2.
- **Place Score's Care Factor Surveys** inform that apart from respondents over 65 years, *'Ease of walking around'* is the most valued movement attribute for all Box Hill users, including those accessing the centre by private vehicles.
- **Place Score's priorities (aggregated PX and CF data)** reveal *'Ease of walking around'* to be a high priority for improvement across all surveyed locations except Whitehorse Road (North side) and Carrington Road).
- **Place Score's Care Factor Surveys** inform that 10% more residents selected '*Walking paths that connect to other places'* to be more important to them compared to the average for Box Hill Associates.

Qualitative Evidence:

- In **Mapping Activity, Online Forum** and **past engagement conducted by WCC**, a desire to increase the amount of time given for people to cross roads was expressed, thus encouraging people to walk and making it safer for older people.
- In **Mapping Activity** and **Online Forum,** ideas to encourage walking to school through installation of signage, designation of safe routes and perhaps policing of routes were shared, with the intention being to reduce congestion created during school pick up and drop off times.

OPPORTUNITY 2: Improving bike connectivity and infrastructure

There is an opportunity to increase the amount of bike parking at the interchange and areas across Box Hill and improve bike connectivity from Box Hill to the city and beyond.

Qualitative Evidence:

- **Mapping Activity, Online Forum** and **past engagement conducted by WCC** reveal a desire for more bike parking, particularly within the train station and at other key transport services (tram and bike). A concern that abandoned bikes were overcrowding bike parking was also raised.
- In **past engagement conducted by WCC**, some respondents expressed the desire to have bike paths that can be used to travel into Melbourne. This would need connecting up varied bike paths to take in points of interest and key transit area.

THEME 4 – SAFETY

This theme includes community input regarding personal and physical safety of the centre for walkers, cyclists, and drivers well as DDA compliance and construction associated with safety. The community engagement revealed the following areas of concern:

ISSUE 1: It can be dangerous to walk around

The general safety of the area is performing poorly according to the community, and it is a topic that is very important to them.

Quantitative Evidence:

- **Place Score's PX Assessments** reveal that *'Physical safety (paths, cars, lighting etc.)'* is one of the worst performing attributes at Prospect Street and Whitehorse Road.

Qualitative Evidence:

- In **Mapping Activity, Online Forum** and **past engagement conducted by WCC,** walking around Box Hill at night was considered to be unsafe. Underpass areas near Main Street and areas near the train station were stated to have this issue by a few respondents. Surrey Drive was also identified.

ISSUE 2: People don't feel safe

Areas in Box Hill are considered to be unsafe for pedestrians and commuters to walk around, particularly at night, with primary reasons being dumped bikes and trolleys and perception of Illegal activity near the train station.

Quantitative Evidence

- **Place Score's PX Assessments** reveal *'Sense of safety (for all ages, genders, day/night etc.)'* to be very poorly rated by young respondents (PX Rank #49/50) and public transport users (PX Rank #44/50) at Carrington Road.
- **Place Score's PX Assessments** reveal *'Sense of safety (for all ages, genders, day/night etc.)'* to be poorly rated by respondents between 45 and 64 years of age (PX Rank #32/50) at Whitehorse Road.

Qualitative Evidence

- In **Mapping Activity** and **Online Forum,** the illegal dumping of shopping trolleys and bikes were noted as a problem, creating an unsafe impression of the area, while also impacting pedestrian movement.
- In **Mapping Activity** and **Online Forum,** unsavory activities were raised as a concern for train users near the train station. Activities witnessed at night included nudity, drinking alcohol and perception that drug use was occurring. This was believed to deter train use.

The following opportunities related to Safety were identified through the community engagement.

OPPORTUNITY 1: Make it a safe place to move around on foot or by bike

The community supports the improved physical safety of the centre by means of interventions such as signage installation, better lighting and painting, separation of modes of travel and enforcement of speed limits.

Quantitative Evidence

- **Place Score's priorities (aggregated PX and CF data)** reveal *'Physical safety (paths, cars, lighting etc.)'* to be a secondary priority for improvement at Prospect Street, Station Street and Whitehorse Road.

Qualitative Evidence

- In **Mapping Activity** and **Online Forum,** anti-pedestrian barriers along Station Street were noted as a reminder that car use is favoured in the area. Recommendations included consideration of a different treatment to create a shared environment.
- In **Mapping Activity, Online Forum** and **past engagement conducted by WCC**, a need for signage to better separate pedestrians and cyclists was mentioned.
- In **Mapping Activity, Online Forum** and **past engagement conducted by WCC,** the underpass was highlighted as being overcrowded, lacking separation of pedestrians and cyclists and being uncomfortable to spend time in. Ideas included brightening it with lighting and paint and creating pathways for all users.
- In **past engagement conducted by WCC,** there was a concern regarding drivers speeding throughout the centre. Ideas to curb this behaviour included reducing the speed from 60km/h to 40km/h in the centre and installing a speed camera at the corner of Nelson Road and Whitehorse Road.
- In **Mapping Activity** and **Online Forum,** many respondents stated the need of creating a nice and safe experience to access Box Hill, with more pedestrian crossings across Station Street and Albion Road. Ideas such as reclaiming Station Street for cyclists and pedestrians and increasing planting across the whole of Box Hill were shared.

OPPORTUNITY 2: Make it feel safe to spend time in – day and night

There is an opportunity to make the centre feel safer for all through various interventions.

Quantitative Evidence

- **Place Score's priorities (aggregated PX and CF data)** reveal '*Sense of safety (for all ages, genders, day/night etc.)'* to be a secondary priority for improvement at Market street, Prospect Street and Carrington Road.

THEME 5 – CAR PARKING

This theme addresses topics such as cohesive parking supply/strategy/management, as well as parking rates for new developments. The community engagement revealed the following areas of concern:

ISSUE 1: Conflicted community – for and against parking

Quantitative Evidence

- **Place Score's Care Factor** indicates that '*Car accessibility and parking'* is the 40th most important place attribute (out of 50 attributes) while *'Walking, cycling and public transport options'* are #14.
- **Only 13% of respondents who drove to Box Hill** selected **'***Car accessibility and parking'* as being most important to them, while 27% selected *'Walking, cycling and public transport options'*.

Qualitative Evidence

- **Past engagement conducted by WCC** reveals respondents' feedback around shortage in the amount of car parking causing illegal use of disabled parking facilities. A need for better enforcement of parking permits has been discussed.
- **Past engagement conducted by WCC** reveals concerns that increased density in the area does not recognise the need for personal car use. Many respondents noted the number of cars on side streets at night time as an evidence of this need.
- **Past engagement conducted by WCC** reveals the high cost of parking as an issue noted by many participants, with areas around the TAFE and the hospital being particularly difficult for workers, patients and students to access.

The following opportunities related to this theme were identified through the community engagement:

OPPORTUNITY 1: Shift investment to active and public transport, and other place improvements

The community would support increased investment of space and funding to diversify choice away from private vehicle dominance and improve the social aspects of place.

Quantitative Evidence

- **Place Score's PX Assessments** reveal that amongst all primary movement attributes*, 'Walking, cycling or public transport options*' has the most impact on place experience whereas *'Car accessibility and parking'* has the least.
- **Place Score's Care Factor Surveys** inform that Box Hill associates care much less about *'Car accessibility and parking'* across all demographics compared to the National Benchmark. This is also the least-cared about attribute of all primary and secondary movement-related attributes.
- **Place Score's priorities (aggregated PX and CF data)'** reveal that *'Car accessibility and parking'* is not even close to being an improvement priority for the centre and its streets.

OPPORTUNTY 2: Creating a park-and-ride precinct

The community would support consideration of a park-and-ride precinct/ commuter parking area outside of Box Hill MAC to take cars out of the centre, also using technology to guide drivers to car parking spots.

Qualitative Evidence

- In **Mapping Activity** and **Online Forum,** participants noted the need to provide commuter car parking in nearby suburbs to reduce the need for parking at Box Hill (Nunawading and Blackburn Stations were identified).
- **Past engagement conducted by WCC** reveals the idea to create a park and ride location outside of Box Hill to reduce congestion caused by commuters' cars.
- **Past engagement conducted by WCC** reveals ideas such as use of parking sensors and signage to notify drivers about available car parking, thus reducing the number of cars circling in the centre.

APPENDIX 1: OURSAY ISSUES AND OPPORTUNTIES PARTICIPATION DETAILS

Conversation Caravan was engaged by Place Score to support the community and stakeholder engagement for the Integrated Transport Strategy (ITS) for Whitehorse City Council (WCC).

Methodology

This section summarises participation online using the City of Whitehorse online engagement platform OurSay.

This stage, Stage 1 was focused on understanding the issues and opportunities associated with personal transportation preferences. The online engagement was conducted between 26th August and 14th September 2019. Two engagement methods were used:

- Online mapping tool, for participants drop a pin that related to an idea or an improvement that needed to be made. Four pin choices were provided – walking, cycling, public transport use and car use.
- Online forum, four questions (forums) were created:
    - Q1 When walking to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience for pedestrians?
    - Q2 When riding to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience for cyclists?
    - Q3 When travelling to Box Hill centre by public transport, what issues do you experience? What are the opportunities to improve the experience of travelling to the centre by public transport?
    - Q4 When driving to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience of driving to the centre?

Participation

The OurSay project platform attracted 1199 unique visitors, of this number 30 people made a comment or contribution, representing 2.5% conversion. A further 80 people voted, or like a comment or idea. This conversion rate is significantly lower than the desired industry standard of 10% conversion. In addition to this 217 people viewed a comment, or a vote made by the 110 people.

Participation by tool

Online mapping: tool attracted the following:

- 57 unique visitors (4.7% of total visitation).
- 9 people engaged (3.8% of all engaged).
- 23 ideas.

Online forum: here we break participation across the forum questions:

Q1

- 60 unique visitors (5% of total visitation).
- 6 people engaged (8.7% of all engaged).
- 4 ideas.

Q2

- 42 unique visitors (3.5% of total visitation).
- 0 people engaged.
- 0 ideas.

Q3

- 97 unique visitors (8% of total visitation).
- 11 people engaged (10.6% of all engaged).
- 22 ideas.

Q4

- 35 unique visitors (2.9% of total visitation).
- 4 people engaged (3.8% of all engaged).
- 3 ideas.

OPPORTUNITIES AND CHALLENGES

1. Online Mapping

Summarised below are the key opportunities and challenges by the online method type.

Opportunities

- Opportunity to improve and enhance the interchange through improved connections to other modes of transport.
- Improve pedestrian access across Box Hill through dedicated pathways, improved traffic signally and nicer streetscapes.

Challenge

- Encouraging public transport use particularly when the connectivity, reliability and service levels are low (bus particularly).
- Provision of carparking in an increasingly developed area. Poor planning and limited supply of carparking is creating pressure on existing carparking places.

2. Forum Tool

Summarised below are the key opportunities and challenges by each forum.

Q1 When walking to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience for pedestrians?

Opportunities

- Creating a safer environment for pedestrians, particularly by widening the footpaths and reducing the amount of infrastructure on footpaths and enforcing the collection of trolleys and abandoned bikes.
- Introducing smoke free zones to improve the pedestrian environment and encourage walking through the centre.

Challenges

- Cleaning up the area, including the unsavory activities that are happening around the train station and within the underpass areas.
- Managing the congestion and traffic in the area to improve the pedestrian environment.

Q2 When riding to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience for cyclists?
No comments made.

Q3 When travelling to Box Hill centre by public transport, what issues do you experience? What are the opportunities to improve the experience of travelling to the centre by public transport?

Opportunities

- Upgrade the interchange to create a pleasant environment for commuters, including toilets, better signage, seating and a colourful environment.
- Create dedicated bus lanes along major roads to reduce the wait times and delays on bus services.

Challenges

- Encouraging public transport use particularly when the connectivity, reliability and service levels are low (bus particularly). Lack of weekend and evening services.
- Lack of connectivity between various transport modes, physical and structural improvements are needed to make these improvements.

Q4 When driving to Box Hill centre, what issues do you experience? What are the opportunities to improve the experience of driving to the centre?

Opportunities

- Increase the number of families walking to school and choosing to leave their car at home for short trips.
- Repurposing roads and streets to reduce or remove cars from these environments.

Challenges

- Increasing the size and availability of carparking spaces to cope with the current and future demand.
- Policing carparking that is allocated to commuters and people with a disability.

PLACESCORE™

BOX HILL METROPOLITAN ACTIVITY CENTRE

TOWN CENTRE COMMUNITY INSIGHTS REPORT

Oct 2019

CITY OF WHITEHORSE

REPORT CONTENTS

ABOUT PLACE SCORE AND THIS RESEARCH

Place Score has been engaged by AECOM to conduct community engagement at various stages of preparation of Box Hill Integrated Transport Strategy. This report includes findings from on-site engagement conducted during Stage 1.

Place Score offers two sophisticated data collection tools, Care Factor and Place Experience (PX) Assessments. Like a 'place census', Care Factor captures what your community really values, while PX Assessments measure the community's lived experience.

Together they help you identify what is important, how a place is performing and what the focus of change should be. An attribute with a high Care Factor but a low PX Assessment should be a priority for investment.

There are many benefits in using Place Score for your project research:

- Community segmentation; geographic and demographic
- Insights that can be used for strategic planning and implementation projects
- Quantitative data for evidence based planning to measure the impact of investment over time
- Identification of place attributes that the community all cares about as well as potential conflicts to minimise risk

HOW THE PLACE SCORE SYSTEM WORKS:

Care Factor
captures *what* attributes your community **'values'...**

PX Assessment
captures *how* your community **'rates'** each attribute...

A place attribute with a high Care Factor but a low PX Score should be prioritised.

WHERE AND WHEN WAS THIS DATA COLLECTED?

Between the 20th and the 27th of August 2019 Place Score collected Town Centre Care Factor surveys and PX Assessments within Box Hill Metropolitan Activity Centre (MAC) for AECOM (on behalf of Whitehorse City Council). This data is the basis for your Town Centre Community Insights Report.

TOWN CENTRE CARE FACTOR SURVEY

Which place attributes are most important to you in your ideal town centre?

- 200 respondents
- Face-to-face data was collected between the 20th and 27th of August 2019.

STREET PX ASSESSMENTS

How is each place attribute impacting your personal enjoyment of this place?

- 6 main street environments in Box Hill MAC
- 281 local residents, workers and visitors completed a PX Assessment
- 40+ respondents per PX location
- Face-to-face data was collected between the 20th and 27th of August 2019.

A total of 481 responses were collected during the research.

HOW ARE PLACE SCORE ATTRIBUTES CODED?

Place Score's Care Factor and PX Assessments include 50 attributes which cover a wide range of themes. For this project, Place Score has closely looked at 9 movement-related attributes, having primary or secondary association with the topics considered by AECOM for the Integrated Transport Strategy.

Primary attributes include 4 attributes associated with walking, cycling, public transport options and private vehicular transport whereas secondary attributes are 5 attributes that potentially influence the different modes of travel, such as safety, quality and amount of public space, and evidence of management.

ABOUT THE RESPONDENTS

Place Score aimed to collect a representative sample of your population as reflected by the 2016 Census.

DEMOGRAPHIC	Target*	Actual
CF Overall	n=200 for ±6.93% at 95% Confidence	n=200
15-24 yrs	17.4% ±5%	20.6%
25-44 yrs	33.0% ±5%	49.7%
45-64 yrs	28.6% ±5%	21.6%
65+ yrs	21.0% ±5%	8.0%
Male	48.2% ±5%	46.5%
Female	51.8% ±5%	53.5%
PX Overall	n=240 for ±3.2pts. at 95% Confidence	n=281
15-24 yrs	17.4% ±5%	23.9%
25-44 yrs	33.0% ±5%	46.8%
45-64 yrs	28.6% ±5%	22.9%
65+ yrs	21.0% ±5%	6.4%
Male	48.2% ±5%	45.9%
Female	51.8% ±5%	54.1%

CONFIDENCE LEVEL:

For Box Hill, a 95% confidence level can be assumed for all data included in this report with a margin of error of 6.93% for all Care Factor data and a margin of error of 3.5pts for all PX data.

At a street and town centre level, all PX data has a standard error of less than 4.7pts.

CARE FACTOR DATA

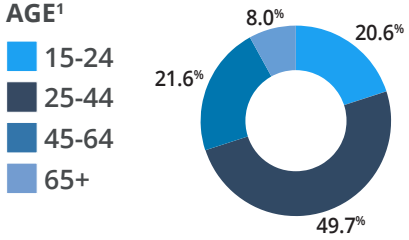
Data was collected via face-to-face surveys during the period of the 20th and the 27th of August 2019. A total of 200 people participated.

n=200

GENDER

46.5% 53.5% 0.0%

AGE[1]



BIRTHPLACE

Australia	39%
India	17%
China	16%
Malaysia	4%
Vietnam	4%

PX DATA

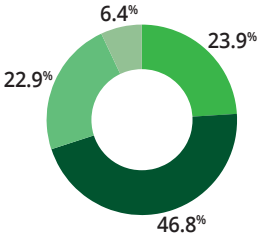
Data was collected via face-to-face surveys during the period of the 20th and the 27th of August 2019. A total of 281 people participated.

n=281

GENDER

54.1% 45.9% 0.0%

AGE[1]



BIRTHPLACE

Australia	33.5%
China	33.5%
India	17.8%
New Zealand	3.9%
United Kingdom	2.5%

2013 CENSUS DATA

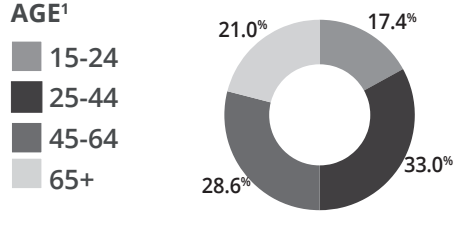
This column captures the make-up of your population in accordance with the 2016 census.

N=162,078

GENDER

48.2% 51.8% N/A%

AGE[1]



BIRTHPLACE

Australia	57.2%
China	11.5%
India	3.0%
Malaysia	2.7%
England	2.4%

Notes: *[1]Place Score does not actively collect surveys from people aged under 15. When collecting face to face data, Place Score are unable to survey people under the age of 15 years without parental consent. The ABS percentage of people aged 0-15 have been redistributed across other age groups.*

EXECUTIVE SUMMARY

THIS SECTION PROVIDES AN EXECUTIVE SUMMARY OF KEY FINDINGS FOR BOX HILL METROPOLITAN ACTIVITY CENTRE (MAC).

KEY FINDINGS OVERVIEW

This Executive Summary provides an overview of key findings from on-site engagement conducted by Place Score in Box Hill Metropolitan Activity Centre (MAC). It includes findings for the centre as a whole and those specifically related to movement, Place Score's Care Factor and PX data at a glance, and priorities for the centre and various streets. Lastly, a comparison of attributes with metropolitan Melbourne has been included.

WHAT DID WE LEARN?

The following gives an overview of what's working well and what needs to improve in Box Hill MAC. Highly valued attributes which perform well are considered as the strengths of the centre, whereas those which are not performing well are considered as priorities for improvement.

WHAT'S WORKING?

- Respondents consider Box Hill MAC to be generally welcoming, clean and having an overall neat visual look and character.
- The diversity of retail choices and particularly the presence of grocery and fresh food businesses is considered as a strength of the centre.
- Attributes such as '*Interesting things to look at*' and '*Ease of walking around*' are improvement priorities for all locations in Box Hill MAC except Whitehorse Road and Carrington Road where they are performing well and considered as strengths. Outdoor dining is also found to be performing well at Carrington Road.

WHAT NEEDS TO IMPROVE?

- According to your community, Box Hill MAC requires the most improvement in terms of 'place' related attributes such as interesting things to look at and outdoor dining.
- Improving the uniqueness of the centre in terms of presence of landmarks, unique features, public art and a diverse mix of people are secondary priorities for improvement.
- Improving the walkability of the centre is the only high priority investment required in terms of movement for Box Hill MAC.

OTHER CONSIDERATIONS

- Your community values the presence of a clean, walkable and unique centre that offers food retail and outdoor dining options.
- The 6 street main streets in Box Hill MAC are performing on average 7 points higher than Melbourne metropolitan average[1].
- Market Street is your best performing street, while Nelson Road performs the lowest.

Notes: [1]*Based on data collected from 43 locations in Melbourne Metropolitan area*

MOVEMENT FINDINGS OVERVIEW

A majority of Box Hill associates[1] value a walkable town centre. The 6 street main streets are performing on average 7 points higher than Melbourne metropolitan average[2]. The only movement related attribute that is considered a priority is improving the '*Ease of walking around*'.

ACTIVE TRANSPORT

- '*Ease of walking around*' is identified as a high priority for improvement across all surveyed locations except Whitehorse Road (North side) and Carrington Road).
- Apart from respondents over 65 years, '*Ease of walking around*' is the most valued movement attribute for all Box Hill users, including those accessing the centre by private vehicle.
- Of all locations, Carrington Road performs the best in terms of '*Ease of walking around*' whereas Nelson Road performs the worst.

PUBLIC TRANSPORT

- '*Walking, cycling or public transport options*' is not a priority at present.
- Private vehicle users care more about '*Walking, cycling or public transport options*' compared to respondents using other modes. This indicates that this group is likely change travel behaviour
- '*Walking, cycling or public transport options*' is more valued by residents of suburbs just outside Box Hill, and respondents over 45 years.
- '*Walking, cycling or public transport options*' performs well across all locations (PX Score>80) and contributes the most to place experience compared to other primary movement attributes.

PRIVATE VEHICULAR TRANSPORT

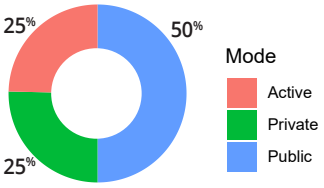
- '*Car accessibility and parking*' is neither a strength nor an improvement priority across the surveyed locations.
- Box Hill associates care much less about '*Car accessibility and parking*' across all demographics compared to the National Benchmark.
- This attribute performs the best at Market Street and the lowest at Nelson Road.
- It contributes the least to place experience compared to other primary movement attributes.

OTHER CONSIDERATIONS

- Apart from primary movement attributes, improving the physical safety of the centre and an overall sense of safety for different users is a secondary improvement priority.
- Primary movement attributes are generally found to impact place experience the most, compared to secondary attributes and non-movement attributes.
- Investment towards improving movement (for example, road space allocation) would potentially impact 'place' attributes which are among the broader priorities for the centre.

WHAT IS RESPONDENTS' STATED MODE OF TRAVEL[3]?

Place Score asked respondents of Care Factor Surveys and PX Assessments regarding their usual mode of travel to Box Hill MAC. Half of the surveyed respondents stated their usual mode to be public transport only (train/tram/bus). This is followed by an equal proportion of users travelling only by private vehicle (car/motorbike) and walking/cycling to the centre.



Notes:
[1]*All respondents associated with Box Hill as residents, visitors, workers or students*
[2]*Based on data collected from 43 locations in Melbourne Metropolitan area*
[3]*Based on 481 responses*

MOVEMENT AND PLACE RECOMMENDATIONS

This section provides high-level recommendations for investing into improving the movement and place experience of Box Hill MAC. Each recommendation is supported by data collected by Place Score for this project.

IMPROVE WALKABLE CONNECTIONS INTO AND WITHIN THE CENTRE

- '*Ease of walking around*' is a high priority for improvement across all locations except Whitehorse Road (North side) and Carrington Road).
- *'Ease of walking around'* is the most valued movement attribute and has an overall Care Factor rank #2.
- '*Walking paths that connect to other places*' has Care Fcator rank #5 as per Box Hill residents.

IMPROVE THE PHYSICAL AND SOCIAL SAFETY OF THE CENTRE

- Improving the '*Sense of safety*' and '*Physical safety*' are secondary priorities for improving the movement experience of Box Hill streets except Nelson Road.
- A high percentage of respondents are found to care about '*Sense of safety*' and '*Physical safety*' (Care Factor rank within top 20).

CONSIDER A CAR DRIVER EDUCATION AND INCENTIVE PROGRAM TO ENCOURAGE CHANGE OF TRAVEL BEHAVIOUR

- '*Car accessibility and parking*' is the least valued (Care Factor rank #40) of all movement attributes, even by respondents using private vehicles for accessing Box Hill.
- Respondents using private vehicles care more about '*Walking, cycling or public transport options'* compared to those travelling to the centre by other modes.

INCREASE PUBLIC OPEN SPACE ADJACENT TO ROADS TO ACCOMMODATE OUTDOOR TRADING AND COMMUNITY SOCIAL ACTIVITIES

- '*Outdoor restaurant, cafe and/or bar seating*' is one of the topmost improvement priorities across the centre.
- Respondents highly value the presence of '*Outdoor restaurant, cafe and/or bar seating*'. This attribute has a Care Factor rank #4.

CONSIDER INTEGRATION OF UNIQUE STREETSCAPE FEATURES IN THE STREET DESIGN

- '*Interesting things to look at*' is the topmost overall improvement priority for Box Hill MAC. This attribute has a Care Factor rank #5.
- Other uniqueness attributes related to presence of landmarks, unique features and public art are among the secondary priorities for the centre.

BOX HILL MAC PLACE DATA AT A GLANCE

carefactor town centre

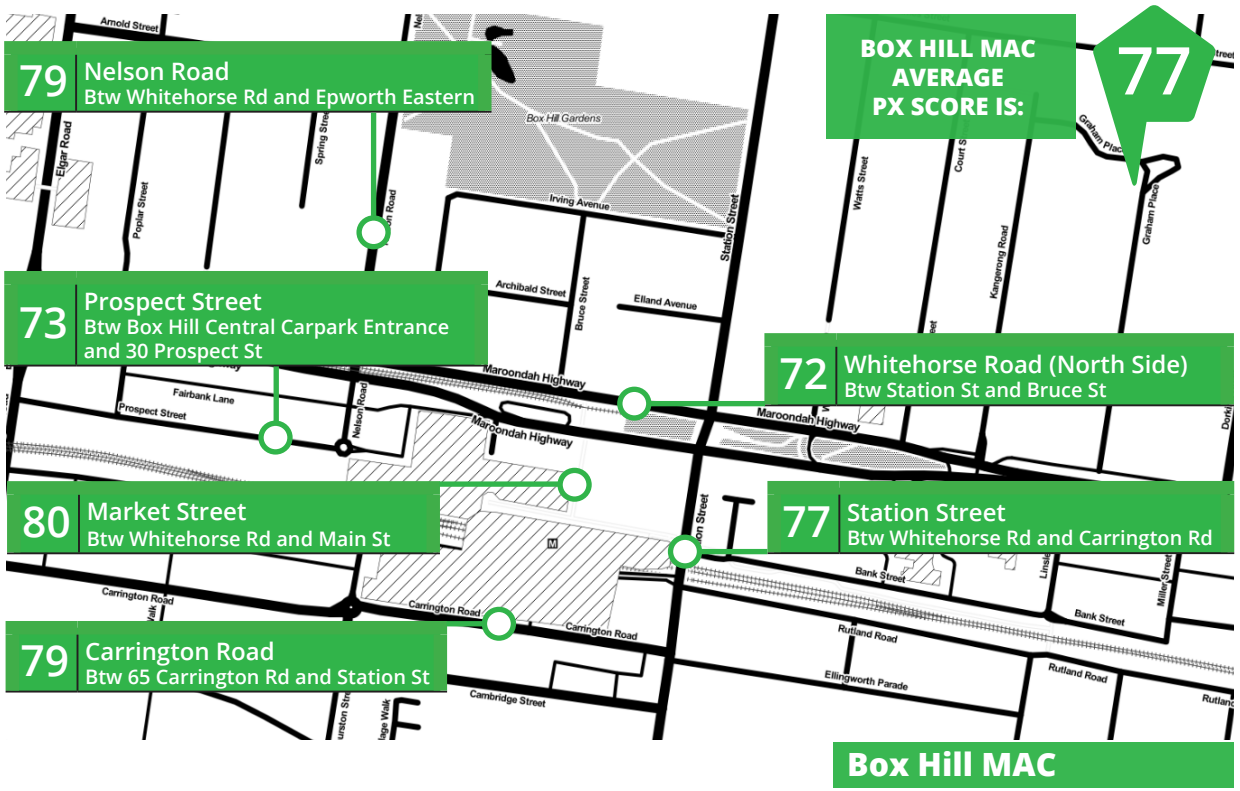
The Care Factor survey invites respondents to prioritise the place attributes that are most important to them in their ideal main street or town centre environment.

The following 5 attributes were select by the majority of your community as being important to them in their ideal town centre:

RANK	ATTRIBUTE	% OF n
#1	**Cleanliness of public space**	55%
#2	**Ease of walking around** (including crossing the street, moving between destinations)	52%
#3	**Grocery and fresh food businesses**	50%
#4	**Outdoor restaurant, cafe and/or bar seating**	48%
#5	**Interesting things to look at** (people, shops, views etc.)	45%

PXassessment street

A PX (Place Experience) Assessment is an observation study that asks respondents to rate how different aspects of a street are performing, resulting in a PX Score. The PX Score provides you with a number between 0 and 100 that captures your community's place experience. PX Assessments were undertaken at 6 main street locations in Box Hill MAC between the 20th and 27th of August 2019.



Notes: *Care Factor percentages are based on the percentage of respondents that selected an attribute (n=584).*
PX Scores vary between 0 and 100. Scores above 70 are very good, 50-70 there is room for significant improvement, <50 urgent investment required. Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

BOX HILL MAC STRENGTHS AND PRIORITIES

carefactor town centre
PXassessment street

PRIORITIES FOR THE BOX HILL TOWN CENTRE

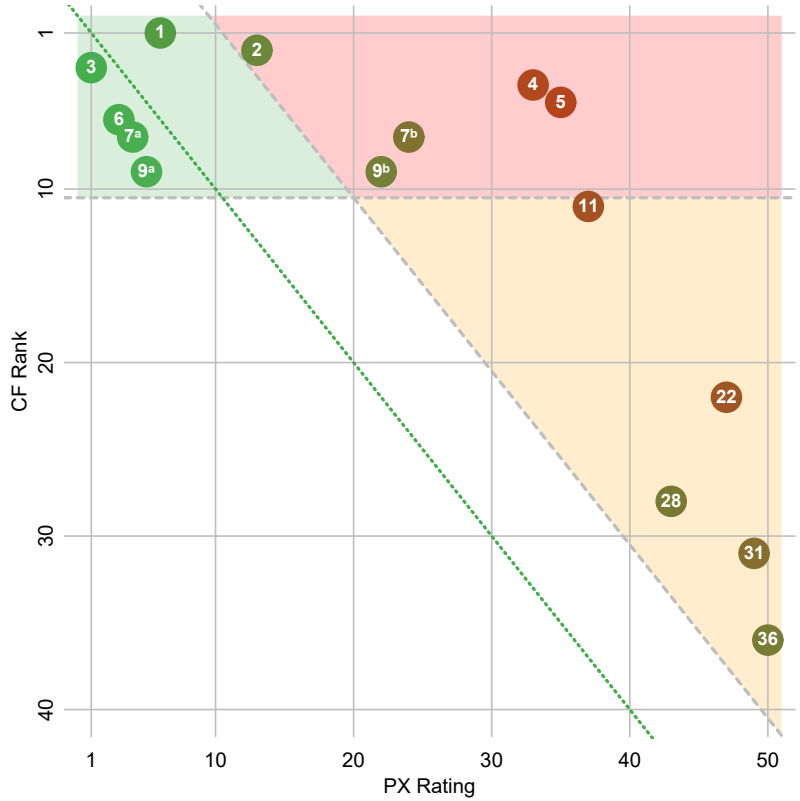
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
9ª	Welcoming to all people
7ª	Overall look and visual character of the area
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)
3	**Grocery and fresh food businesses**
1	**Cleanliness of public space**



CF	IMPROVEMENT PRIORITIES
5	**Interesting things to look at** (people, shops, views etc.)
4	**Outdoor restaurant, cafe and/or bar seating**
7ᵇ	**Unique mix or diversity of people in the area**
9ᵇ	**Maintenance of public spaces and street furniture**
2	**Ease of walking around** (including crossing the street, moving between destinations)

CF	SECONDARY PRIORITIES
11	**Landmarks, special features or meeting places**
22	**Local history, heritage buildings or features**
31	**Evidence of public events happening here** (markets, street entertainers etc.)
28	**One of a kind, quirky or unique features**
36	**Public art, community art, water or light feature**

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

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Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF.*

BOX HILL MAC STREET IMPROVEMENT PRIORITIES

carefactor town centre

PXassessment street

TOWN CENTRE PX SCORES AND PRIORITIES

PX Assessments were undertaken in 6 main street locations. The highest PX Score was achieved at Market Street (80/100) while Whitehorse Road (North side) received the lowest score (72/100). The average of the 6 PX Scores is 77/100 while the current Metropolitan Melbourne average is 70/100.

Priorities for each location, and for the centre as a whole, are determined by aggregating the Care Factor data with the PX Assessment scores. The top 3 priorities for each location are those attributes with the highest Care Factor that are also performing poorly.

LOCATION NAME	AREAS INCLUDED	PX	PRIORITY 1	PRIORITY 2	PRIORITY 3
OVERALL AVERAGE	All surveyed locations reported on in this report	77	Interesting things to look at (people, shops, views etc.)	Outdoor restaurant, cafe and/or bar seating	Unique mix or diversity of people in the area
MARKET STREET	Btw Whitehorse Rd and Main St	80	Interesting things to look at (people, shops, views etc.)	Outdoor restaurant, cafe and/or bar seating	Grocery and fresh food businesses
PROSPECT STREET	Btw Box Hill Central Carpark Entrance and 30 Prospect St	73	Outdoor restaurant, cafe and/or bar seating	Interesting things to look at (people, shops, views etc.)	Unique mix or diversity of people in the area
STATION STREET	Btw Whitehorse Rd and Carrington Rd	77	Outdoor restaurant, cafe and/or bar seating	Interesting things to look at (people, shops, views etc.)	Unique mix or diversity of people in the area
WHITEHORSE ROAD (NORTH SIDE)	Btw Station St and Bruce St	72	Unique mix or diversity of people in the area	Maintenance of public spaces and street furniture	Outdoor restaurant, cafe and/or bar seating
CARRINGTON ROAD	Btw 65 Carrington Rd and Station St	79	Cleanliness of public space	Maintenance of public spaces and street furniture	Unique mix or diversity of people in the area
NELSON ROAD	Btw Whitehorse Rd and Epworth Eastern	79	Ease of walking around (including crossing the street, moving between destinations)	Maintenance of public spaces and street furniture	Interesting things to look at (people, shops, views etc.)

Notes: *PX Scores vary between 0 and 100. Scores above 70 are very good, 50-70 there is room for significant improvement, <50 urgent investment required. Priorities have a high Care Factor and a low PX Score - People care highly about them, but they are perceived as performing poorly. Grayed cells identify the overall priorities, while green cells identify a location's priorities that differ from the overall top three priorities.*

MELBOURNE BENCHMARK COMPARISON

PXassessment street

BOX HILL MAC PLACES ARE PERFORMING BETTER THAN THE MELBOURNE METRO AVERAGE

Your PX Scores act as a benchmark to track place performance over time and allows for comparison against other locations.

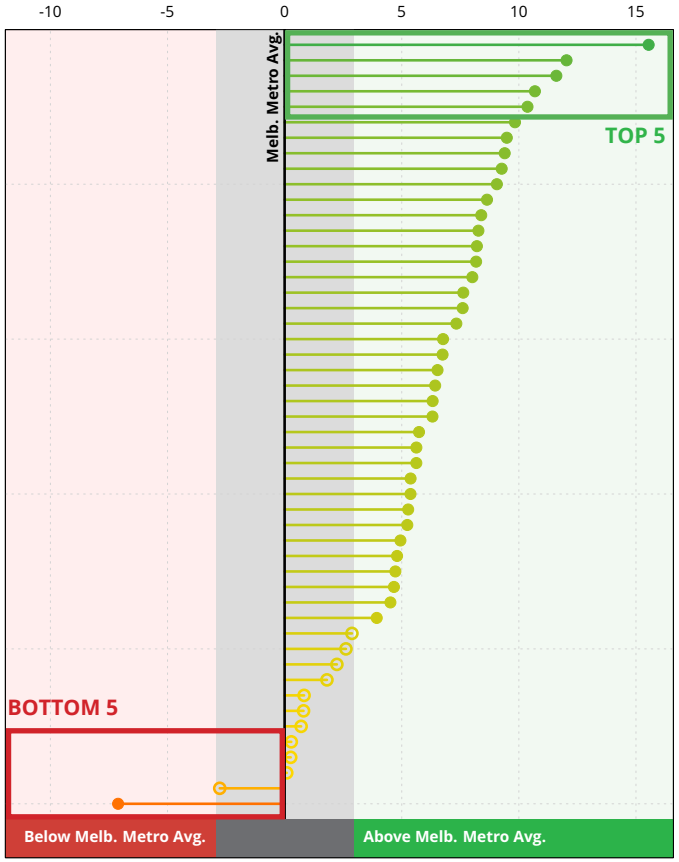
PX Scores:

- 77 Box Hill MAC Average
- 77 Boroondara LGA Average
- 75 Little Malop Street, Geelong
- 70 Melbourne Metro Average
- 70 Hampshire Road, Sunshine
- 56 Alfreida Street, St Albans

YOUR TOP 5 ATTRIBUTES COMPARED TO THE MELBOURNE METRO AVERAGE ARE:	DIFFERENCE FROM MELBOURNE METRO AVERAGE
Amenities and facilities (toilets, water bubblers, parents rooms etc.)	+15.5
A cluster of similar businesses (food, cultural traders, fashion etc.)	+12.0
Grocery and fresh food businesses	+11.6
Street furniture (including benches, bins, lights etc.)	+10.7
Cleanliness of public space	+10.4

YOUR BOTTOM 5 ATTRIBUTES COMPARED TO THE MELBOURNE METRO AVERAGE ARE:	DIFFERENCE FROM MELBOURNE METRO AVERAGE
Local history, heritage buildings or features	-7.1
Evidence of public events happening here (markets, street entertainers etc.)	-2.8
Interesting things to look at (people, shops, views etc.)	+0.1
Outdoor restaurant, cafe and/or bar seating	+0.3
Public art, community art, water or light feature	+0.3

PX Scores of all 50 attributes of Box Hill Average compared with Melbourne Metro Average.



Notes: *Follow this link to see how all 50 Place Score attributes are performing compared to the national average. Each attribute is scored out of 100. *Within the margin of error. The grey area illustrates attributes that are within the margin of error, meaning you should be cautious as they could be a bit lower, higher or the same as the national average. Melbourne metro average sample used n=2,482 (Sept 2019)*

MOVEMENT AND PLACE

THIS SECTION PROVIDES INSIGHTS AND RECOMMENDATIONS REGARDING MOVEMENT AND PLACE FOR BOX HILL MAC.

MOVEMENT FINDINGS OVERVIEW

A majority of Box Hill associates[1] value a walkable town centre. The 6 street main streets are performing on average 7 points higher than Melbourne metropolitan average[2]. The only movement related attribute that is considered a priority is improving the '*Ease of walking around*'.

ACTIVE TRANSPORT

- '*Ease of walking around*' is identified as a high priority for improvement across all surveyed locations except Whitehorse Road (North side) and Carrington Road).
- Apart from respondents over 65 years, '*Ease of walking around*' is the most valued movement attribute for all Box Hill users, including those accessing the centre by private vehicle.
- Of all locations, Carrington Road performs the best in terms of '*Ease of walking around*' whereas Nelson Road performs the worst.

PUBLIC TRANSPORT

- '*Walking, cycling or public transport options*' is not a priority at present.
- Private vehicle users care more about '*Walking, cycling or public transport options*' compared to respondents using other modes. This indicates that this group is likely change travel behaviour
- '*Walking, cycling or public transport options*' is more valued by residents of suburbs just outside Box Hill, and respondents over 45 years.
- '*Walking, cycling or public transport options*' performs well across all locations (PX Score>80) and contributes the most to place experience compared to other primary movement attributes.

PRIVATE VEHICULAR TRANSPORT

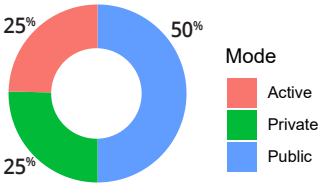
- '*Car accessibility and parking*' is neither a strength nor an improvement priority across the surveyed locations.
- Box Hill associates care much less about '*Car accessibility and parking*' across all demographics compared to the National Benchmark.
- This attribute performs the best at Market Street and the lowest at Nelson Road.
- It contributes the least to place experience compared to other primary movement attributes.

OTHER CONSIDERATIONS

- Apart from primary movement attributes, improving the physical safety of the centre and an overall sense of safety for different users is a secondary improvement priority.
- Primary movement attributes are generally found to impact place experience the most, compared to secondary attributes and non-movement attributes.
- Investment towards improving movement (for example, road space allocation) would potentially impact 'place' attributes which are among the broader priorities for the centre.

WHAT IS RESPONDENTS' STATED MODE OF TRAVEL[3]?

Place Score asked respondents of Care Factor Surveys and PX Assessments regarding their usual mode of travel to Box Hill MAC. Half of the surveyed respondents stated their usual mode to be public transport only (train/tram/bus). This is followed by an equal proportion of users travelling only by private vehicle (car/motorbike) and walking/cycling to the centre.



Notes:
[1]*All respondents associated with Box Hill as residents, visitors, workers or students*
[2]*Based on data collected from 43 locations in Melbourne Metropolitan area*
[3]*Based on 481 responses*

MOVEMENT AND PLACE RECOMMENDATIONS

This section provides high-level recommendations for investing into improving the movement and place experience of Box Hill MAC. Each recommendation is supported by data collected by Place Score for this project.

IMPROVE WALKABLE CONNECTIONS INTO AND WITHIN THE CENTRE

- '*Ease of walking around*' is a high priority for improvement across all locations except Whitehorse Road (North side) and Carrington Road).
- *'Ease of walking around'* is the most valued movement attribute and has an overall Care Factor rank #2.
- '*Walking paths that connect to other places*' has Care Fcator rank #5 as per Box Hill residents.

IMPROVE THE PHYSICAL AND SOCIAL SAFETY OF THE CENTRE

- Improving the '*Sense of safety*' and '*Physical safety*' are secondary priorities for improving the movement experience of Box Hill streets except Nelson Road.
- A high percentage of respondents are found to care about '*Sense of safety*' and '*Physical safety*' (Care Factor rank within top 20).

CONSIDER A CAR DRIVER EDUCATION AND INCENTIVE PROGRAM TO ENCOURAGE CHANGE OF TRAVEL BEHAVIOUR

- '*Car accessibility and parking*' is the least valued (Care Factor rank #40) of all movement attributes, even by respondents using private vehicles for accessing Box Hill.
- Respondents using private vehicles care more about '*Walking, cycling or public transport options'* compared to those travelling to the centre by other modes.

INCREASE PUBLIC OPEN SPACE ADJACENT TO ROADS TO ACCOMMODATE OUTDOOR TRADING AND COMMUNITY SOCIAL ACTIVITIES

- '*Outdoor restaurant, cafe and/or bar seating*' is one of the topmost improvement priorities across the centre.
- Respondents highly value the presence of '*Outdoor restaurant, cafe and/or bar seating*'. This attribute has a Care Factor rank #4.

CONSIDER INTEGRATION OF UNIQUE STREETSCAPE FEATURES IN THE STREET DESIGN

- '*Interesting things to look at*' is the topmost overall improvement priority for Box Hill MAC. This attribute has a Care Factor rank #5.
- Other uniqueness attributes related to presence of landmarks, unique features and public art are among the secondary priorities for the centre.

BOX HILL MAC MODAL CHOICE

WHO CARES ABOUT WHAT?

- '*Ease of walking around*' is the most valued movement attribute for all Box Hill users except respondents over 65 years. '*Car accessibility and parking*' is valued the least.
- Generally males, 45-64 aged respondents, Australian-born respondents and residents care more about being able to move around on foot, by bicycle and public transport compared to the average for all associates.
- Surprisingly, private vehicle users care more about '*Walking, cycling or public transport options*' compared to respondents using other modes.

The following table illustrates Care Factor percentages of different movement attributes for Box Hill users.

LEGEND
More valued than average for MAC
Less valued than average for MAC

	TOTAL (n=200)	Gender		Age				Country of birth		Association				Transport Mode		
		Men (n=93)	Women (n=107)	Under 25 (n=42)	25-44 (n=99)	45-64 (n=43)	65+ (n=16)*	Born in Australia (n=78)	Born Overseas (n=122)	Residents[1] (n=90)	Visitors (n=36)	Workers (n=34)	Students (n=45)	Only Active Transport Users (n=60)	Only Public Transport Users (n=92)	Only Private Vehicle Users (n=31)
Primary Alignment																
Ease of walking around (including crossing the street, moving between destinations)	**52%**	54%	50%	52%	47%	63%	44%	58%	48%	53%	47%	50%	49%	52%	49%	48%
Walking, cycling or public transport options	**36%**	37%	36%	26%	31%	49%	56%	47%	29%	39%	39%	29%	33%	27%	38%	45%
Walking paths that connect to other places	**31%**	31%	31%	33%	27%	40%	25%	40%	25%	41%	25%	26%	27%	32%	29%	35%
Car accessibility and parking	**19%**	22%	17%	19%	23%	16%	0%	17%	20%	18%	25%	18%	16%	13%	22%	23%
Secondary Alignment																
Sense of safety (for all ages, genders, day/night etc.)	**37%**	38%	36%	36%	41%	35%	19%	35%	39%	37%	36%	35%	42%	32%	38%	45%
Physical safety (paths, cars, lighting etc.)	**35%**	29%	39%	26%	37%	28%	56%	28%	39%	38%	36%	32%	29%	40%	37%	29%
Amount of public space (footpaths and public spaces)	**30%**	37%	23%	40%	24%	28%	38%	33%	27%	29%	25%	35%	29%	30%	28%	29%
Quality of public space (footpaths and public spaces)	**29%**	24%	33%	26%	29%	35%	13%	32%	26%	31%	17%	26%	33%	28%	29%	23%
Evidence of management (signage, information, street cleaners etc.)	**19%**	20%	17%	14%	19%	14%	38%	17%	20%	20%	22%	12%	18%	18%	18%	16%

Notes: **Small dataset*
[1]Respondents self-identified as residents of Box Hill area. This may include residents of suburbs living outside Box Hill (suburb).

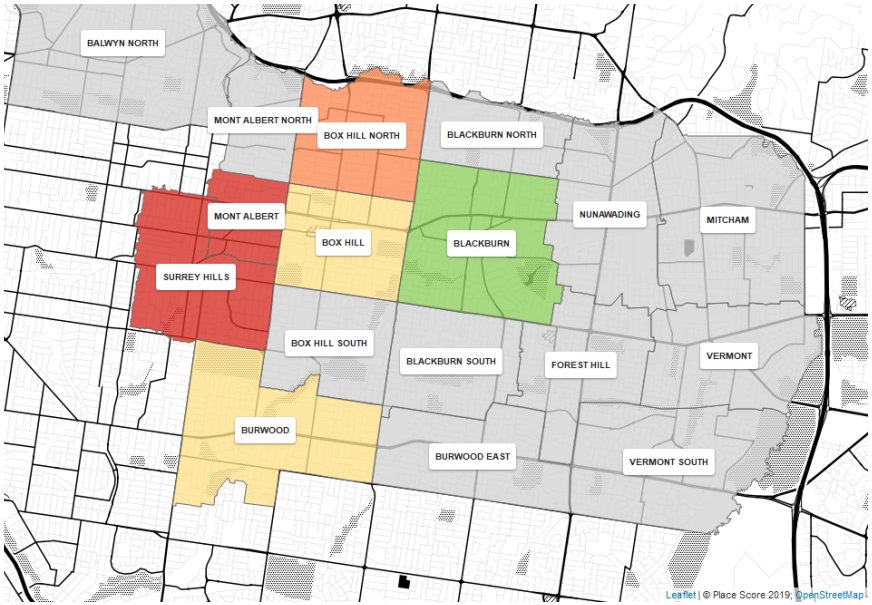
BOX HILL MAC MODAL CHOICE

WHO CARES ABOUT WHAT?

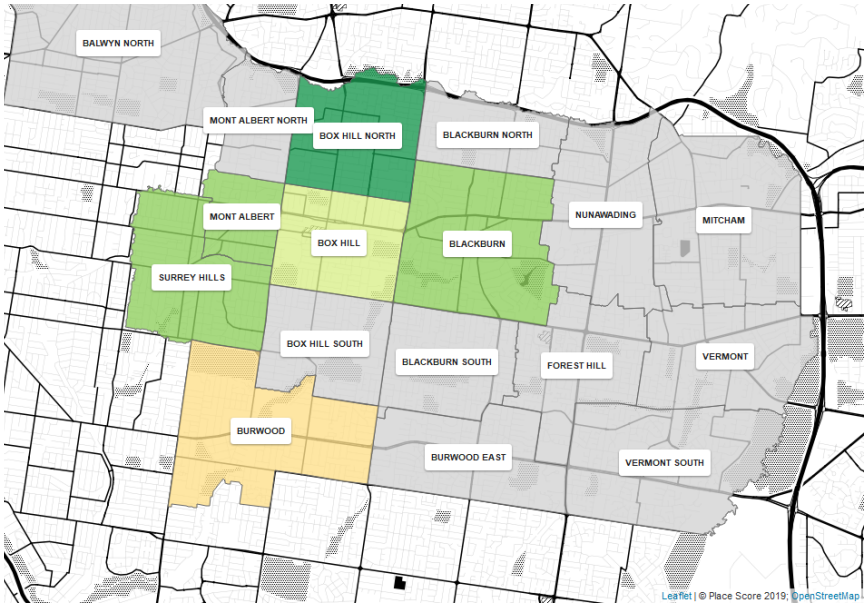
- A majority of Box Hill North residents value '*Walking, cycling or public transport options*' while less than 20% care about '*Car accessibility and parking*'. Mont Albert and Surrey Hills have a similar trend, however, even less residents of these suburbs value cars (under 10%). Residents of Blackburn and Burwood generally care equally about the two attributes.
- '*Walking, cycling or public transport options*' is valued by more respondents living just outside Box Hill (except Burwood) compared to the suburb itself. Investment should focus on improving walkable connections to the centre for these users.
- More Blackburn residents care about '*Car accessibility and parking*' compared to residents of other suburbs. Fewer residents living in Surrey Hills and Mont Albert consider this attribute to be of high value to them.

The following graphs compare Care Factor percentages of '*Car accessibility and parking*', and '*Walking, cycling or public transport options*' for residents of different suburbs in the LGA.

How much we value '*Car accessibility and parking*' by suburb



How much we value '*Walking, cycling or public transport options*' by suburb



LEGEND
% of respondents
- *0-10%*
- *10-20%*
- *20-30%*
- *30-40%*
- *40-50%*
- *50-60%*

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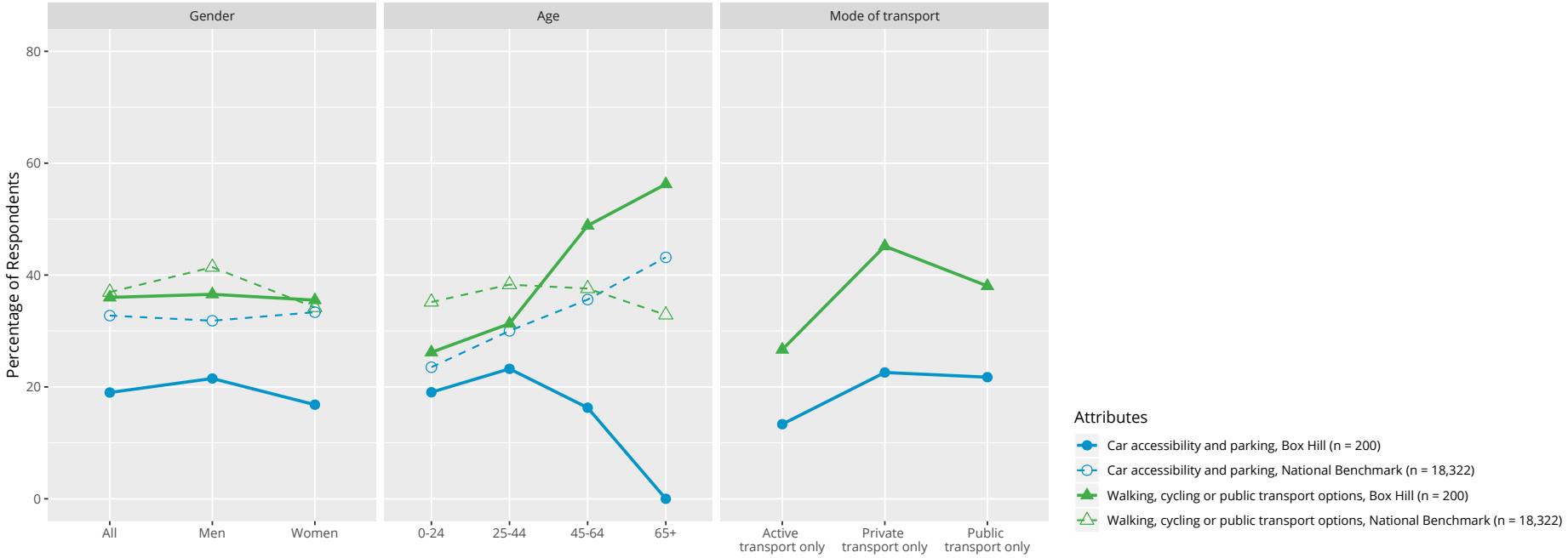
Notes: *These maps use data from the Care Factor Survey, based on suburb of residence of respondents. Respondents selected the top 3 attributes they cared the most about from 10 attributes. Suburbs with less than 5 respondents have been greyed out for legibility.*

NATIONAL BENCHMARK MOVEMENT COMPARISON

BOX HILL MAC VS NATIONAL BENCHMARK MODAL CHOICES CARE FACTOR

- For Box Hill associates[1], both genders value '*Car accessibility and parking*' almost equally, but significantly lower than the National Benchmark.
- Older respondents are more likely to value '*Walking, cycling or public transport options*' than '*Car accessibility and parking*', which is a different trend compared to that across Australia. On the other hand, younger respondents in Box Hill are found to care less about '*Walking, cycling or public transport options*' compared to the National Benchmark.
- Any investment in Box Hill should ensure that the elderly population gets easy access to the centre by walking, cycling and public transport options.

The following graph compares the Care Factor percentages of two movement attributes, namely '*Car accessibility and parking*', and '*Walking, cycling or public transport options*' for associates of Box Hill MAC and across Australia.



Notes: [1]*Respondents associated with Box Hill as a resident, visitor, worker or student*
CF data per mode was collected only for this project, hence is not a part of the National Benchmark data

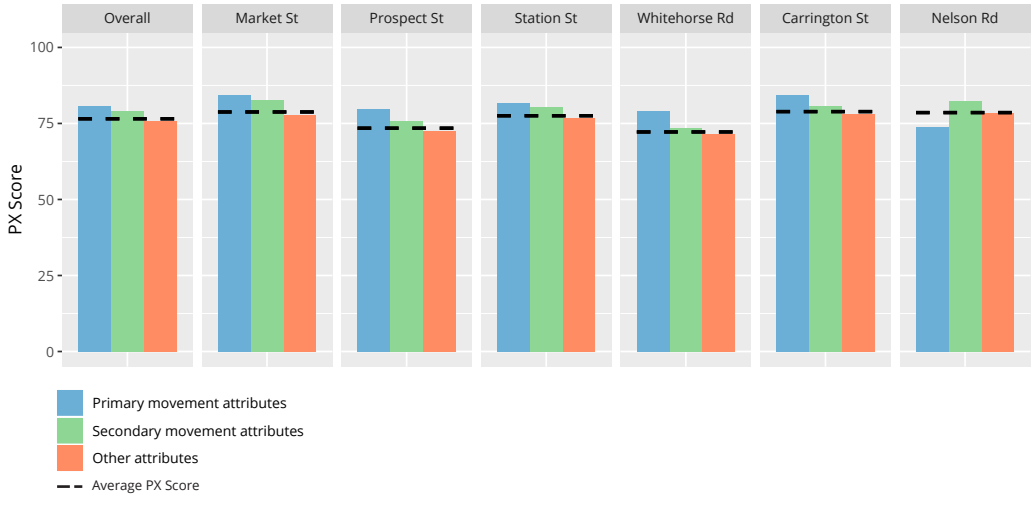
BOX HILL MAC MOVEMENT PERFORMANCE

HOW ARE THE MOVEMENT ATTRIBUTES IMPACTING PLACE EXPERIENCE?

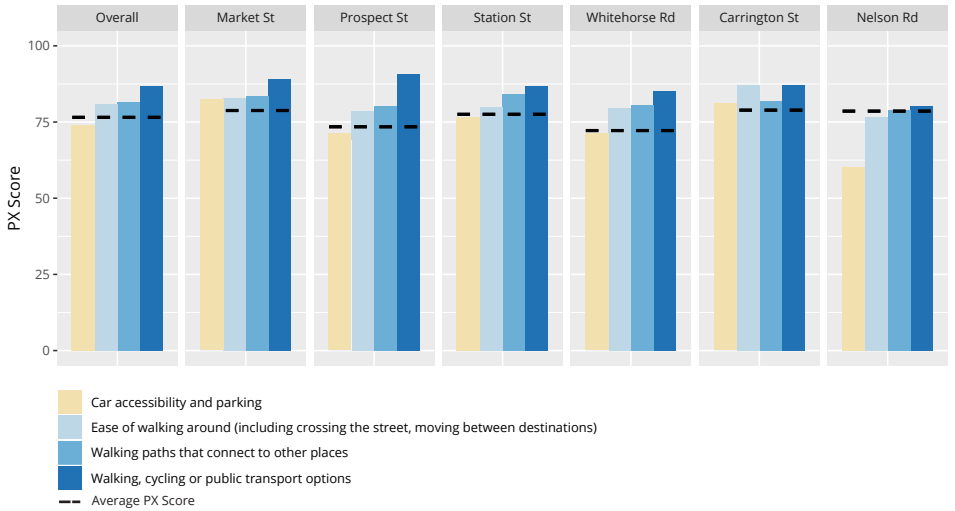
- Of all attributes impacting place experience, primary movement attributes are the most influential across all locations except Nelson Road where secondary movement attributes are more dominant.
- Amongst the primary movement attributes, '*Walking, cycling or public transport options*' has the most impact on place experience compared to the other attributes. It is one of the top 3 best performing attributes across different locations, with Prospect Street performing having the highest score for that attribute.
- '*Car accessibility and parking*' is found to have the least influence on place experience.
- For all primary movement attributes, Nelson Road has the lowest scores compared to other locations.

The following graphs compare the contribution of various movement attributes to the overall place experience of the centre and its streets.

PX Score Contribution by Theme



PX Score Contribution by Primary Movement Attributes



Notes: *AT includes respondents only walking/cycling to the centre, PT includes respondents taking the train/tram/bus for accessing the centre, PV includes respondents using private vehicles for accessing the centre*
**Order of attributes is based on Box Hill overall CF ranking.*

BOX HILL MAC MOVEMENT AND PLACE PRIORITIES

This page illustrates which movement related attributes are rated by the community as either strengths or priorities. The green bars indicate attributes that are strengths of the surveyed location, whereas red bars indicate attributes requiring high priority improvement (Attributes with CF #1-10). The yellow bars indicate attributes that are considered as secondary priorities for improvement (Attributes with CF #10-20). Length of the bar determines the extent to which the attribute is a strength or priority.

- In Box Hill MAC, investment should start with improving the '*Ease of walking around*' at all streets except for Whitehorse Road and Carrington Road where this attribute is performing well and should be protected and built upon.
- Improving physical safety of the centre and an overall sense of safety for different users is a secondary improvement priority.
- Other movement related attributes are performing better compared to the extent they are valued. Hence they are not priorities for improvement at present.

LEGEND
- *Strengths*
- *High priority*
- *Secondary priority*

Movement Attributes	Market St	Prospect St	Station St	Whitehorse Rd	Carrington Rd	Nelson Rd
Car accessibility and parking						
Ease of walking around (including crossing the street, moving between destinations)						
Walking paths that connect to other places						
Walking, cycling or public transport options						
Amount of public space (footpaths and public spaces)						
Evidence of management (signage, information, street cleaners etc.)						
Physical safety (paths, cars, lighting etc.)						
Quality of public space (footpaths and public spaces)						
Sense of safety (for all ages, genders, day/night etc.)						

Notes: *Strengths have a high CF and high PX. Priorities are the poorest performing attributes with CF ranked in the overall top 10 and a rank gap of less than -10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. Table cells that are not highlighted show the rank gap of attributes which are either performing well compared to the extent they are valued or are not within the top 20 Care Factors.*
**Order of attributes is based on Box Hill overall CF ranking.*

TOWN CENTRE CARE FACTOR

YOUR CARE FACTOR DATA ACTS AS A ‘PLACE CENSUS’, IDENTIFYING WHAT IS MOST IMPORTANT TO YOUR COMMUNITY REGARDING THEIR IDEAL TOWN CENTRE. THE DATA IS VALID FOR 3-5 YEARS AND CAN BE USED FOR A VARIETY OF STRATEGIC AND TACTICAL PROJECTS.

TOWN CENTRE PLACE VALUES

carefactor town centre

THE BOX HILL COMMUNITY VALUES A TOWN CENTRE THAT IS:

CLEAN

Having a clean and well maintained town centre is important to your community. 'Cleanliness of public space' is the number one Care Factor.

WALKABLE

'Ease of walking around (including crossing the street, moving between destinations)' is the only transport related attribute in your community's top 10 Care Factor.

OFFERING RETAIL CHOICES AND ALFRESCO DINING

Your community values a town centre that has a cluster of similar businesses, including grocery and fresh food businesses as well as outdoor dining options.

WELCOMING AND DIVERSE

Your community's ideal town centre is one that has a diversity of people and feels welcoming.

INTERESTING

The opportunity to look at interesting things and the overall look and visual character of the area are important aspects of your community's ideal town centre.

DEMOGRAPHIC DIFFERENCES IN TOWN CENTRE VALUES	
25-44 YEARS OLD	67% of people aged 25-44 care about 'Cleanliness of public space' compared to only 37% of people aged 45-64.
45-64 YEARS OLD	44% of people aged 45-64 care about 'General condition of businesses and shopfronts' compared to only 26% of people aged 25-44.
MEN	37% of Men care about 'Amount of public space (footpaths and public spaces)' compared to only 23% of Women.
WOMEN	46% of Women care about 'Welcoming to all people' compared to only 31% of Men.
RESIDENTS	28% of Residents care about 'Evidence of community activity (community gardening, art, fundraising etc.)' compared to only 9% of Students.
STUDENTS	58% of Students care about 'Grocery and fresh food businesses' compared to only 43% of Residents.
AUSTRALASIAN ANCESTRY	45% of people with Australasian ancestry care about 'Walking, cycling or public transport options' compared to only 20% of people with Asian ancestry.
ASIAN ANCESTRY	55% of people with Asian ancestry care about 'Outdoor restaurant, café and/or bar seating' compared to only 38% of people with Australasian ancestry.

Notes: *Care Factor percentages are based on the percentage of respondents that selected an attribute (n=200).*

TOWN CENTRE PLACE VALUES

carefactor town centre

The Care Factor survey asks respondents to select what is most important to them in each of five Place Dimensions.

The Place Dimensions and their associated ten Place Attributes reveal what attracts and attaches people to a town centre or main street environment, as well as the barriers to entry or connection.

BOX HILL TOP 10 CARE FACTORS

Box Hill top 10 Care Factors are ranked based on how many people selected each attribute as being important to them.

n=200

RANK	ATTRIBUTE	% OF PEOPLE
#1	**Cleanliness of public space**	55% CARE
#2	**Ease of walking around** (including crossing the street, moving between destinations)	52% LOOK & FUNCTION
#3	**Grocery and fresh food businesses**	50% SENSE OF WELCOME
#4	**Outdoor restaurant, cafe and/or bar seating**	48% THINGS TO DO
#5	**Interesting things to look at** (people, shops, views etc.)	45% THINGS TO DO
#6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)	41% UNIQUE
=#7	**Unique mix or diversity of people in the area**	40% UNIQUE
=#7	**Overall look and visual character of the area**	40% LOOK & FUNCTION
=#9	**Maintenance of public spaces and street furniture**	39% CARE
=#9	**Welcoming to all people**	39% SENSE OF WELCOME

THE FIVE PLACE DIMENSIONS ARE:

CARE
How well a place is managed, maintained and improved. It considers care, pride, personal and financial investment in the area.

LOOK & FUNCTION
Physical characteristics of a place: how it looks and works, the buildings, public space and vegetation.

SENSE OF WELCOME
The social characteristics of a place, and how inviting it feels to a range of people regardless of age, income, gender, ethnicity or interests.

THINGS TO DO
Activities, events and inviting spaces to spend time in a place that might lead to a smile or a new friend.

UNIQUENESS
Physical, social, cultural or economic aspects of an area that make a place interesting, special or unique.

Notes: *Care Factor percentages are based on the percentage of respondents that selected an attribute (n=200).*

TOWN CENTRE PLACE VALUES

carefactor town centre

DEMOGRAPHIC BREAKDOWN

The following tables illustrate the differences in values between demographic groups. The circled numbers refer to the top 10 Care Factor, while the colour identifies a demographic's top three attributes.

DEMOGRAPHIC BREAKDOWN[1]		#1	#2	#3	#4	#5	#6	=#7	=#7	=#9	=#9	Highest rated attributes if not in the overall top ten
ALL	200											
Male	93	52%	54%	52%	52%	45%	39%	37%	34%	38%	31%	
Female	107	57%	50%	48%	46%	45%	43%	44%	45%	40%	46%	
Age												
0-24	42	36%	52%	57%	45%	50%	31%	52%	43%	33%	48%	
25-44	99	67%	47%	49%	53%	43%	44%	35%	38%	43%	36%	
45-64	43	37%	63%	44%	44%	51%	42%	42%	42%	42%	30%	Walking, cycling or public transport options(49%)
65+	16	75%	44%	44%	44%	25%	44%	38%	38%	19%	56%	Physical safety (paths, cars, lighting etc.)(56%), Walking, cycling or public transport options(56%)
Country of birth (Top 3)												
Australia	78	46%	58%	47%	42%	46%	37%	40%	35%	38%	36%	Walking, cycling or public transport options(47%)
India	34	76%	44%	53%	65%	35%	38%	32%	56%	50%	32%	
China	32	50%	56%	50%	56%	53%	47%	38%	28%	34%	44%	
Ancestry (Top 3)												
Asian	74	55%	54%	53%	55%	46%	38%	42%	39%	43%	49%	
Australasian	55	47%	58%	49%	38%	45%	44%	36%	36%	38%	33%	
European (including United Kingdom)	30	40%	47%	33%	40%	40%	37%	37%	40%	33%	40%	General condition of vegetation, street trees and other planting(53%), Walking, cycling or public transport options(50%), Local history, heritage buildings or features(47%)

DEMOGRAPHIC BREAKDOWN[1]		#1	#2	#3	#4	#5	#6	=#7	=#7	=#9	=#9	Highest rated attributes if not in the overall top ten
ALL	200											
Identity												
Residents	90	51%	53%	43%	41%	41%	32%	42%	40%	38%	39%	
Visitors	36	67%	47%	47%	58%	47%	61%	44%	36%	33%	36%	
Workers	34	53%	50%	53%	53%	35%	35%	35%	32%	35%	38%	
Students	45	58%	49%	58%	49%	56%	42%	38%	49%	49%	47%	
Neighbourhood Type												
Inner-urban (Medium-high density)	196	55%	52%	51%	48%	45%	41%	40%	40%	39%	39%	

LEGEND

- *#1 attribute*
- *#2 attribute*
- *#3 attribute*

Notes: *[1]Demographic breakdown should be used as a 'snapshot' as smaller samples (n=<80) do not meet the 95% confidence level.*
[2]Respondents were allowed to select more than one identity (Resident, visitor, worker, student)

TOWN CENTRE PLACE VALUES

carefactor town centre

DEMOGRAPHIC BREAKDOWN

The following tables illustrate the differences in values between demographic groups based on their connection to the town centre.

LEGEND

#1 *Different from Box Hill Associates top 10 Care Factors*

BOX HILL ASSOCIATES[1]
n=200

RANK	ATTRIBUTE	% OF n
#1	Cleanliness of public space	55%
#2	Ease of walking around (including crossing the street, moving between destinations)	52%
#3	Grocery and fresh food businesses	50%
#4	Outdoor restaurant, cafe and/or bar seating	48%
#5	Interesting things to look at (people, shops, views etc.)	45%
#6	A cluster of similar businesses (food, cultural traders, fashion etc.)	41%
=#7	Unique mix or diversity of people in the area	40%
=#7	Overall look and visual character of the area	40%
=#9	Maintenance of public spaces and street furniture	39%
=#9	Welcoming to all people	39%

RESIDENTS[1]
n=90

RANK	ATTRIBUTE	% OF n
#1	Ease of walking around (including crossing the street, moving between destinations)	53%
#2	Cleanliness of public space	51%
#3	Grocery and fresh food businesses	43%
#4	Unique mix or diversity of people in the area*	42%
=#5	Interesting things to look at * (people, shops, views etc.)	41%
=#5	Outdoor restaurant, cafe and/or bar seating*	41%
=#5	Things to do in the evening * (shopping, dining, entertainment etc.)	41%
=#5	Walking paths that connect to other places*	41%
#9	Overall look and visual character of the area*	40%
#10	General condition of buildings*	39%

STUDENTS[1]
n=45

RANK	ATTRIBUTE	% OF n
=#1	Cleanliness of public space	58%
=#1	Grocery and fresh food businesses	58%
#3	Interesting things to look at (people, shops, views etc.)	56%
#4	Landmarks, special features or meeting places	51%
=#5	Ease of walking around (including crossing the street, moving between destinations)	49%
=#5	Maintenance of public spaces and street furniture	49%
=#5	Outdoor restaurant, cafe and/or bar seating	49%
=#5	Overall look and visual character of the area	49%
#9	Welcoming to all people*	47%
#10	A cluster of similar businesses * (food, cultural traders, fashion etc.)	42%

WORKERS[1]
n=34

RANK	ATTRIBUTE	% OF n
=#1	Cleanliness of public space	53%
=#1	Grocery and fresh food businesses	53%
=#1	Outdoor restaurant, cafe and/or bar seating	53%
=#4	Ease of walking around * (including crossing the street, moving between destinations)	50%
=#4	Point of difference from other similar streets of places*	50%
#6	General condition of buildings*	47%
#7	Free and comfortable places to sit alone*	44%
#8	Interaction with locals/ other people in the area * (smiles, customer service etc.)	41%
=#9	General condition of businesses and shopfronts*	38%
=#9	Welcoming to all people*	38%

Notes: *[1]Respondents were allowed to select more than one identity. 'Associates' are people that identified Box Hill as their town centre. *Confidence level for this attribute is below the 95% threshold due to small sample.*

PX ASSESSMENTS

THE PX SCORE IS A NUMBER BETWEEN ZERO AND 100 THAT MEASURES YOUR COMMUNITY'S LIVED PLACE EXPERIENCE. IT ALLOWS YOU TO IDENTIFY WHAT ATTRIBUTES ARE CONTRIBUTING POSITIVELY AND NEGATIVELY TO HOW YOUR TOWN CENTRE IS PERFORMING.

HOW ARE YOUR STREETS PERFORMING?

PXassessment street

PEOPLE IDENTIFIED YOUR STREETS AS:

OFFERING A CHOICE OF RETAIL

Surveyed respondents rate '*Grocery and fresh food businesses*' to be the best performing attribute of your main streets. '*A cluster of similar businesses (food, cultural traders, fashion etc.)*' is also rated highly by the surveyed respondents.

OFFERING A CHOICE OF MOVEMENT OPTIONS

Your community perceives that '*walking, cycling or public transport options*' are performing well in the surveyed main streets.

NEEDING MORE ART AND ACTIVATION

Surveyed respondents rate '*Public art, community art, water of light feature*' as the worst performing attribute of your main streets. '*Evidence of public events happening here (markets, street entertainers festivals etc.)*' is also found to be poorly contributing to the place experience.

IN NEED OF PUBLIC INVESTMENT

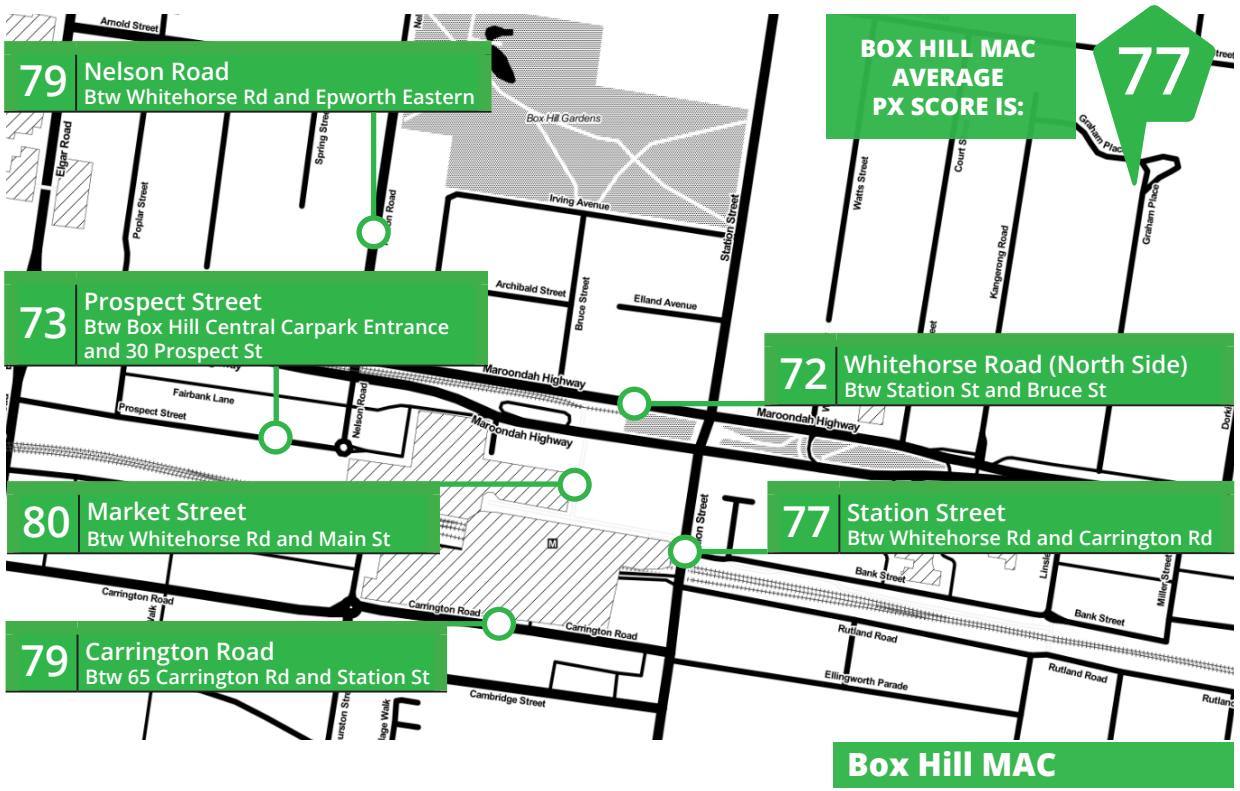
Your community perceives that there is not much evidence of recent public investment across the surveyed main streets.

ALIGNED

PX Scores of surveyed main streets in Box Hill MAC are relatively high, with a difference of only 8 points between the best and worst performing streets.

PXassessment street

A PX (Place Experience) Assessment is an observation study that asks respondents to rate how different aspects of a street are performing, resulting in a PX Score. The PX Score provides you with a number between 0 and 100 that captures your community's place experience. PX Assessments were undertaken at 6 main street locations in Box Hill MAC between the 20th and 27th of August 2019.



HOW ARE YOUR STREETS PERFORMING?

PXassessment street

BREAKING DOWN YOUR PX SCORES

Your PX Score provides you with a measure of place performance from a representative sample of main street users. In addition it can be further analysed to reveal the scores of different demographic groups.

LEGEND
- *Under 10 respondents*
- *PX 70+ Performing well*
- *PX 50-69 Room for improvement*
- *PX <50 Urgent care needed*

Interesting findings:

- Older respondents were more likely to rate places positively compared to other age groups
- Resident perceptions are generally more positive than workers for all streets except Prospect Street

Location	n=	Total PX Score	Men	Women	0-24	25-44	45-64	65+	Resident[1]	Visitor[1]	Worker[1]	Student[1]
BOX HILL MAC AVERAGE	281	**77**	77	76	79	74	78	80	77	77	73	77
MARKET STREET	52	**80**	79	79	83	73	83	80	80	78	74	80
PROSPECT STREET	48	**73**	73	73	80	69	77	83	69	68	75	79
STATION STREET	45	**77**	80	76	76	77	79	79	78	78	75	76
WHITEHORSE ROAD	48	**72**	73	71	76	71	66	75	78	69	59	72
CARRINGTON ROAD	47	**79**	79	79	78	76	83	91	78	84	77	78
NELSON ROAD	41	**79**	78	79	78	81	75	77	79	85	67	78

Notes: *PX Scores vary between 0 and 100. Scores above 70 are very good, 50-70 there is room for significant improvement, <50 urgent investment required.*
[1]Respondents were allowed to select more than one identity (Resident, visitor, worker, student)

HOW ARE YOUR STREETS PERFORMING?

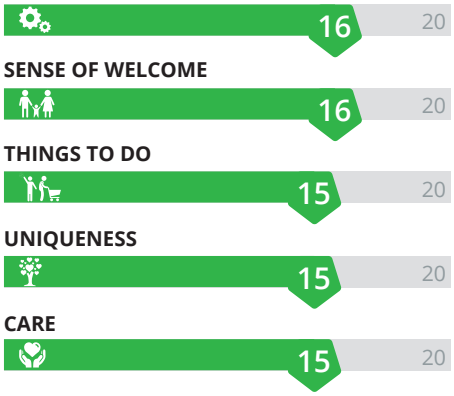
PXassessment street

MARKET STREET HAS THE HIGHEST PX OF 80
WHITEHORSE ROAD HAS THE LOWEST PX OF 72

This page identifies how each Place Dimension is performing as well as the best and worse performing attributes for each main street. Each Place Dimension is scored out of 20 with a total PX Score out of 100

BOX HILL MAC AVERAGE

77 / 100



YOUR HIGHEST RATED PLACE ATTRIBUTES

The following place attributes rated highest overall:

- #1 Grocery and fresh food businesses
- #2 Walking, cycling or public transport options
- #3 A cluster of similar businesses (food, cultural traders, fashion etc.)

YOUR LOWEST RATED PLACE ATTRIBUTES

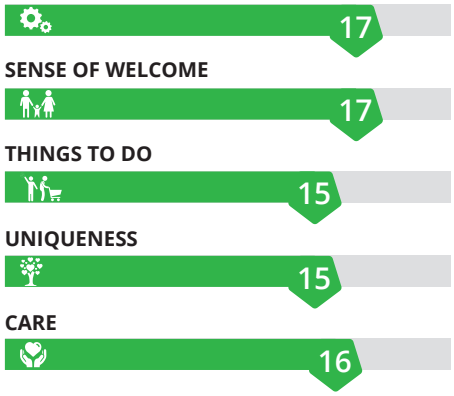
The following place attributes rated most poorly overall:

- #50 Public art, community art, water or light feature
- #49 Evidence of public events happening here (markets, street entertainers, festivals etc.)
- #48 Evidence of recent public investment (new planting, paving, street furniture etc.)

MARKET STREET

BTW WHITEHORSE RD AND MAIN ST

80



YOUR HIGHEST RATED PLACE ATTRIBUTES

The following place attributes rated highest overall:

- #1 Walking, cycling or public transport options
- #2 Diversity of price points ($ to $$$)
- #3 Cleanliness of public space

YOUR LOWEST RATED PLACE ATTRIBUTES

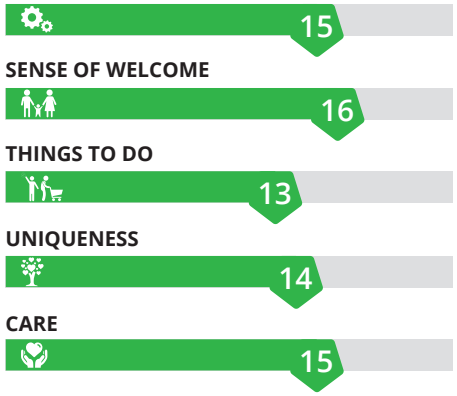
The following place attributes rated most poorly overall:

- #50 Evidence of public events happening here (markets, street entertainers, festivals etc.)
- #49 Evidence of recent public investment (new planting, paving, street furniture etc.)
- #48 Public art, community art, water or light feature

PROSPECT STREET

BTW BOX HILL CENTRAL CARPARK ENTRANCE AND 30 PROSPECT ST

73



YOUR HIGHEST RATED PLACE ATTRIBUTES

The following place attributes rated highest overall:

- #1 Walking, cycling or public transport options
- #2 Grocery and fresh food businesses
- #3 A cluster of similar businesses (food, cultural traders, fashion etc.)

YOUR LOWEST RATED PLACE ATTRIBUTES

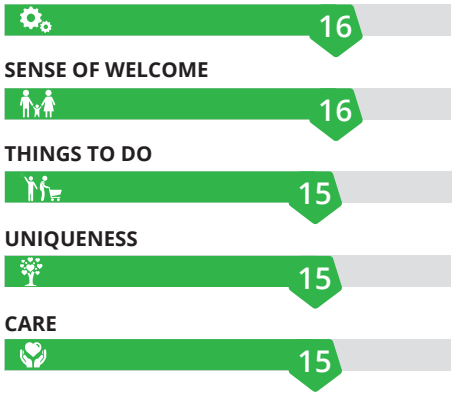
The following place attributes rated most poorly overall:

- #50 Evidence of public events happening here (markets, street entertainers, festivals etc.)
- #49 Local history, heritage buildings or features
- #48 Public art, community art, water or light feature

STATION STREET

BTW WHITEHORSE RD AND CARRINGTON RD

77



YOUR HIGHEST RATED PLACE ATTRIBUTES

The following place attributes rated highest overall:

- #1 Physical comfort (including noise, smells, temperature)
- #2 Welcoming to all people
- #3 Walking, cycling or public transport options

YOUR LOWEST RATED PLACE ATTRIBUTES

The following place attributes rated most poorly overall:

- #50 Evidence of recent public investment (new planting, paving, street furniture etc.)
- #49 Evidence of recent private investment (new buildings, painting etc.)
- #48 Unusual or unique businesses/shops

Notes: *PX Scores vary between 0 and 100. Scores above 70 are very good, 50-70 there is room for significant improvement, <50 urgent investment required.*

HOW ARE YOUR STREETS PERFORMING?

PXassessment street

WHITEHORSE ROAD
BTW STATION ST AND BRUCE ST

72

LOOK & FUNCTION 15

SENSE OF WELCOME 15

THINGS TO DO 15

UNIQUENESS 13

CARE 14

YOUR HIGHEST RATED PLACE ATTRIBUTES
The following place attributes rated highest overall:

- #1 Grocery and fresh food businesses
- #2 Walking, cycling or public transport options
- #3 A cluster of similar businesses (food, cultural traders, fashion etc.)

YOUR LOWEST RATED PLACE ATTRIBUTES
The following place attributes rated most poorly overall:

- #50 Public art, community art, water or light feature
- #49 Physical comfort (including noise, smells, temperature)
- #48 Interaction with locals/ other people in the area (smiles, customer service etc.)

CARRINGTON ROAD
BTW 65 CARRINGTON RD AND STATION ST

79

LOOK & FUNCTION 16

SENSE OF WELCOME 16

THINGS TO DO 16

UNIQUENESS 15

CARE 16

YOUR HIGHEST RATED PLACE ATTRIBUTES
The following place attributes rated highest overall:

- #1 Grocery and fresh food businesses
- #2 A cluster of similar businesses (food, cultural traders, fashion etc.)
- #3 Things to do in the evening (shopping, dining, entertainment etc.)

YOUR LOWEST RATED PLACE ATTRIBUTES
The following place attributes rated most poorly overall:

- #50 One of a kind, quirky or unique features
- #49 Evidence of community activity (community gardening, art, fundraising etc.)
- #48 Evidence of recent public investment (new planting, paving, street furniture etc.)

NELSON ROAD
BTW WHITEHORSE RD AND ARNOLD ST

79

LOOK & FUNCTION 16

SENSE OF WELCOME 16

THINGS TO DO 16

UNIQUENESS 15

CARE 16

YOUR HIGHEST RATED PLACE ATTRIBUTES
The following place attributes rated highest overall:

- #1 Grocery and fresh food businesses
- #2 Welcoming to all people
- #3 Quality of public space (footpaths and public spaces)

YOUR LOWEST RATED PLACE ATTRIBUTES
The following place attributes rated most poorly overall:

- #50 Car accessibility and parking
- #49 Landmarks, special features or meeting places
- #48 Public art, community art, water or light feature

BOX HILL MAC PLACE PRIORITIES

THIS SECTION DEFINES THE PLACE PRIORITIES PER LOCATION BASED ON AGGREGATED PX SCORES AND CARE FACTOR DATA FOR BOX HILL MAC.

BOX HILL MAC - MARKET STREET

carefactor town centre
PXassessment street

PRIORITIES FOR MARKET STREET (BTW WHITEHORSE RD AND MAIN ST)

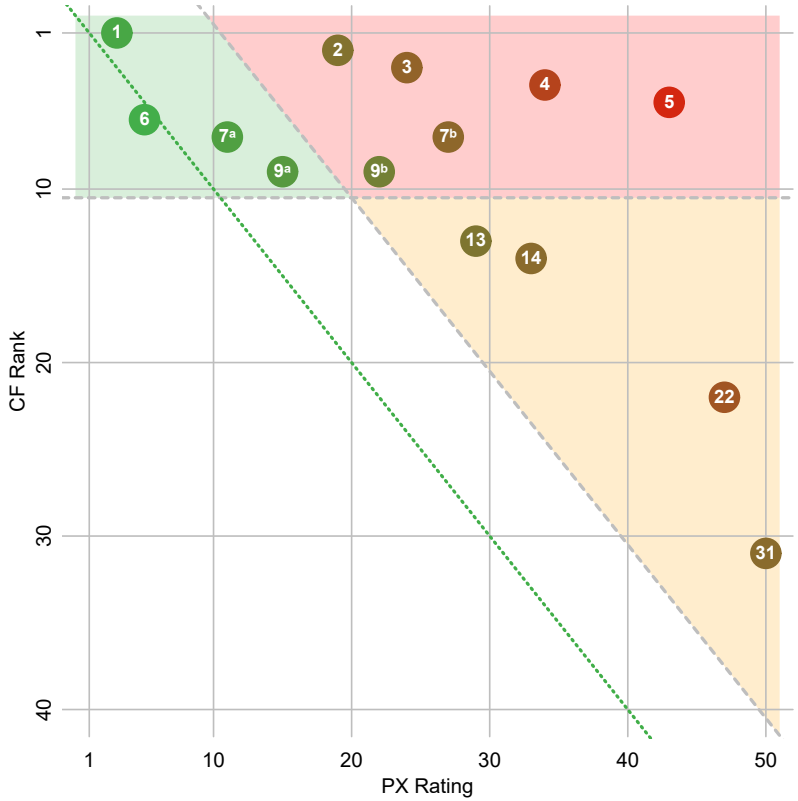
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)
1	**Cleanliness of public space**
7ª	**Overall look and visual character of the area**
9ª	**Welcoming to all people**



CF	IMPROVEMENT PRIORITIES
5	**Interesting things to look at** (people, shops, views etc.)
4	**Outdoor restaurant, cafe and/or bar seating**
3	**Grocery and fresh food businesses**
7ᵇ	**Unique mix or diversity of people in the area**
2	**Ease of walking around** (including crossing the street, moving between destinations)
9ᵇ	**Maintenance of public spaces and street furniture**

CF	SECONDARY PRIORITIES
22	**Local history, heritage buildings or features**
14	**Things to do in the evening** (shopping, dining, entertainment etc.)
31	**Evidence of public events happening here** (markets, street entertainers etc.)
13	**Sense of safety** (for all ages, genders, day/night etc.)

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

PLACESCORE™

Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. [1]A threshold difference of 10 pts between the CF rank and PX rating is used to assure that displayed priorities are not within the margin of error. Care Factor ranking is based on Box Hill ranking.*

BOX HILL MAC - PROSPECT STREET

carefactor town centre
PXassessment street

PRIORITIES FOR PROSPECT STREET (BTW BOX HILL CENTRAL CARPARK ENTRANCE AND 30 PROSPECT ST)

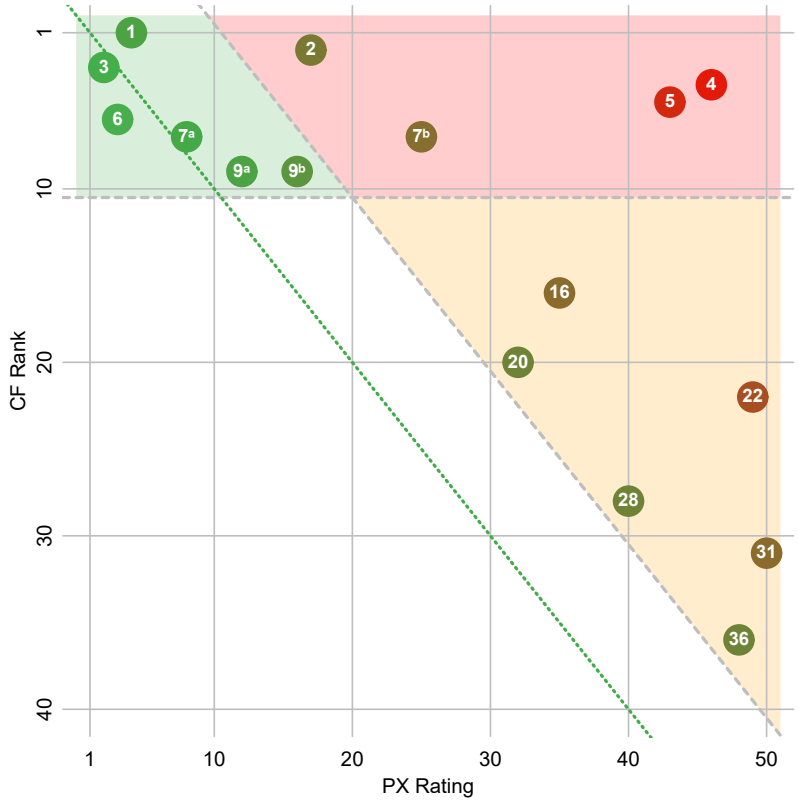
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)
3	**Grocery and fresh food businesses**
7ª	**Overall look and visual character of the area**
9ª	**Maintenance of public spaces and street furniture**
1	**Cleanliness of public space**
9ᵇ	**Welcoming to all people**



CF	IMPROVEMENT PRIORITIES
4	**Outdoor restaurant, cafe and/or bar seating**
5	**Interesting things to look at** (people, shops, views etc.)
7ᵇ	**Unique mix or diversity of people in the area**
2	**Ease of walking around** (including crossing the street, moving between destinations)

CF	SECONDARY PRIORITIES
22	**Local history, heritage buildings or features**
16	**Physical safety** (paths, cars, lighting etc.)
31	**Evidence of public events happening here** (markets, street entertainers etc.)
20	**Free and comfortable places to sit alone**
28	**One of a kind, quirky or unique features**
36	**Public art, community art, water or light feature**

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. [1]A threshold difference of 10 pts between the CF rank and PX rating is used to assure that displayed priorities are not within the margin of error. Care Factor ranking is based on Box Hill ranking.*

BOX HILL MAC - STATION STREET

carefactor town centre
PXassessment street

PRIORITIES FOR STATION STREET (BTW WHITEHORSE RD AND CARRINGTON RD)

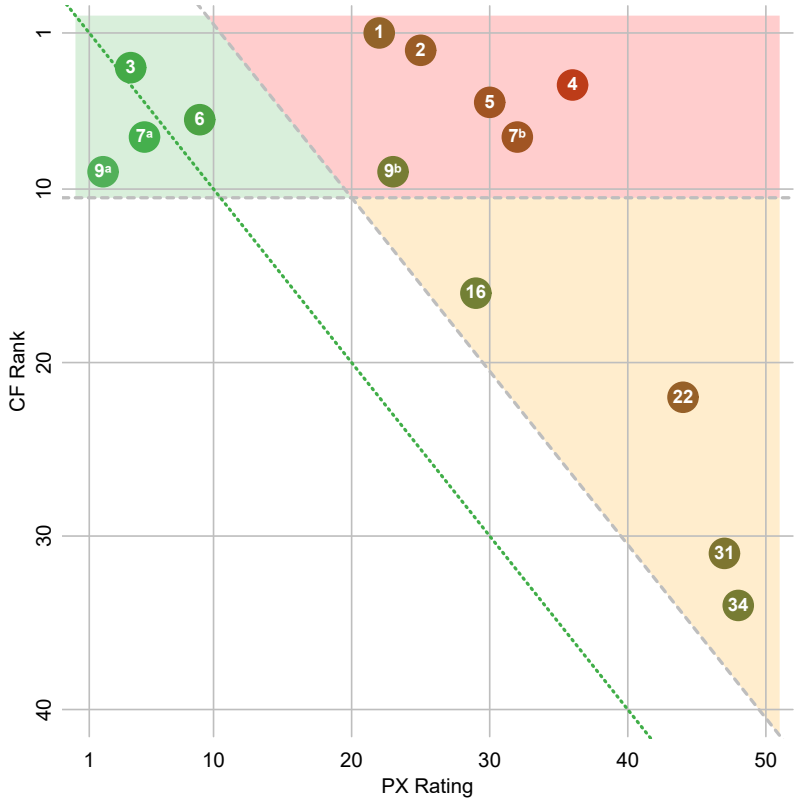
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
9ª	Welcoming to all people
7ª	Overall look and visual character of the area
3	Grocery and fresh food businesses
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)



CF	IMPROVEMENT PRIORITIES
4	Outdoor restaurant, cafe and/or bar seating
5	**Interesting things to look at** (people, shops, views etc.)
7ᵇ	**Unique mix or diversity of people in the area**
2	**Ease of walking around** (including crossing the street, moving between destinations)
1	**Cleanliness of public space**
9ᵇ	**Maintenance of public spaces and street furniture**

CF	SECONDARY PRIORITIES
22	**Local history, heritage buildings or features**
31	**Evidence of public events happening here** (markets, street entertainers etc.)
34	**Unusual or unique businesses/shops**
16	**Physical safety** (paths, cars, lighting etc.)

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

PLACESCORE™

Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. [1]A threshold difference of 10 pts between the CF rank and PX rating is used to assure that displayed priorities are not within the margin of error. Care Factor ranking is based on Box Hill ranking.*

BOX HILL MAC - WHITEHORSE ROAD (NORTH SIDE)

carefactor town centre
PXassessment street

PRIORITIES FOR WHITEHORSE ROAD (NORTH SIDE) (BTW STATION ST AND BRUCE ST)

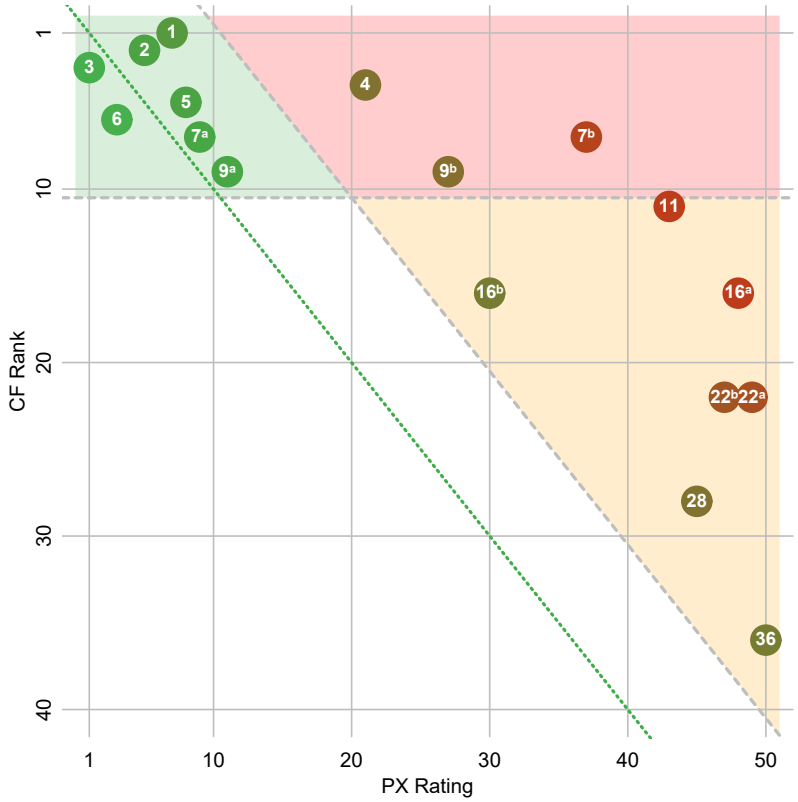
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)
3	**Grocery and fresh food businesses**
7ª	**Overall look and visual character of the area**
9ª	**Welcoming to all people**
2	**Ease of walking around** (including crossing the street, moving between destinations)
5	**Interesting things to look at** (people, shops, views etc.)
1	**Cleanliness of public space**



LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

CF	IMPROVEMENT PRIORITIES
7ᵇ	**Unique mix or diversity of people in the area**
9ᵇ	**Maintenance of public spaces and street furniture**
4	**Outdoor restaurant, cafe and/or bar seating**

CF	SECONDARY PRIORITIES
11	**Landmarks, special features or meeting places**
16ª	**Interaction with locals/ other people in the area** (smiles, customer service etc.)
22ª	**Physical comfort** (impacts from noise, smells, temperature)
22ᵇ	**Local history, heritage buildings or features**
28	**One of a kind, quirky or unique features**
16ᵇ	**Physical safety** (paths, cars, lighting etc.)
36	**Public art, community art, water or light feature**

PLACESCORE™

Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. [1]A threshold difference of 10 pts between the CF rank and PX rating is used to assure that displayed priorities are not within the margin of error. Care Factor ranking is based on Box Hill ranking.*

BOX HILL MAC - CARRINGTON ROAD

carefactor town centre
PXassessment street

PRIORITIES FOR CARRINGTON ROAD (BTW 65 CARRINGTON RD AND STATION ST)

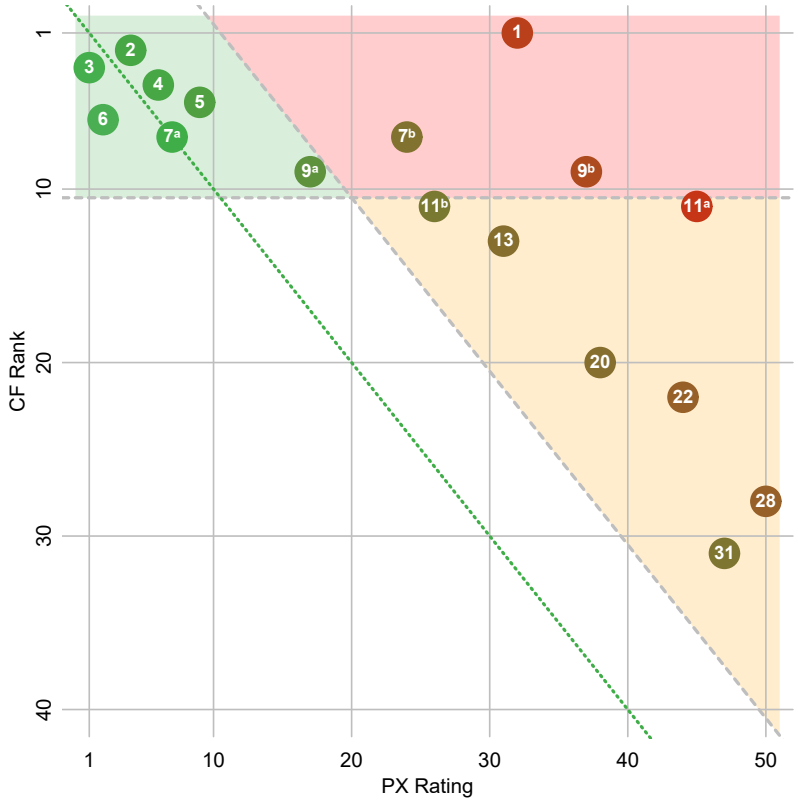
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
6	**A cluster of similar businesses** (food, cultural traders, fashion etc.)
3	**Grocery and fresh food businesses**
7a	**Overall look and visual character of the area**
2	**Ease of walking around** (including crossing the street, moving between destinations)
4	**Outdoor restaurant, cafe and/or bar seating**
5	**Interesting things to look at** (people, shops, views etc.)
9a	**Welcoming to all people**



CF	IMPROVEMENT PRIORITIES
1	Cleanliness of public space
9b	Maintenance of public spaces and street furniture
7b	Unique mix or diversity of people in the area

CF	SECONDARY PRIORITIES
11a	Landmarks, special features or meeting places
28	One of a kind, quirky or unique features
22	Local history, heritage buildings or features
13	**Sense of safety** (for all ages, genders, day/night etc.)
20	Free and comfortable places to sit alone
31	**Evidence of public events happening here** (markets, street entertainers etc.)
11b	General condition of buildings

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

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Notes: *CF - Care Factor ranking out of 50 - the lower the number the higher the number of people who think this attribute is important. Strengths have a high CF and high PX. Priorities are the poorest performing CF ranked in the overall top 10. Secondary Priorities are the worst performing overall outside of the Top 10 CF. [1]A threshold difference of 10 pts between the CF rank and PX rating is used to assure that displayed priorities are not within the margin of error. Care Factor ranking is based on Box Hill ranking.*

BOX HILL MAC - NELSON ROAD

carefactor town centre
PXassessment street

PRIORITIES FOR NELSON ROAD (BTW WHITEHORSE RD AND EPWORTH EASTERN)

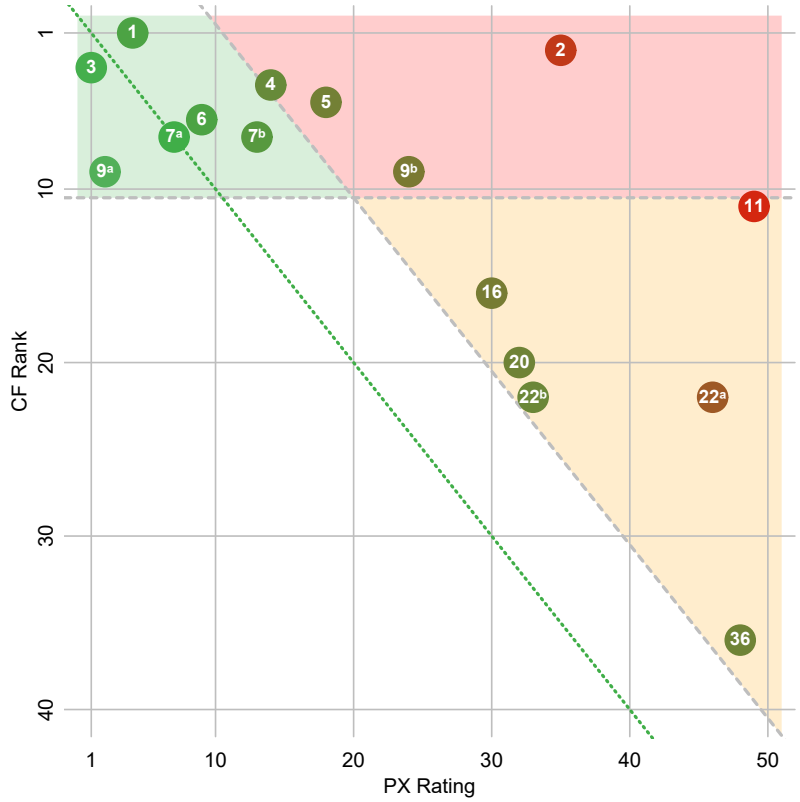
These tables and graph illustrate your town centre strengths, improvement priorities and secondary priorities.

STRENGTHS should be celebrated and protected.

IMPROVEMENT PRIORITIES identify the aspects of your town centre that are important to people but are currently under-performing. Improving these attributes will have the most significant impact on your community.

SECONDARY PRIORITIES identify attributes to look-out for, they are negatively affecting your town centre and can become more significant issues if more people start caring about them.

CF	STRENGTHS
9ᵃ	Welcoming to all people
3	Grocery and fresh food businesses
7ᵃ	Unique mix or diversity of people in the area
6	A cluster of similar businesses (food, cultural traders, fashion etc.)
1	Cleanliness of public space
7ᵇ	Overall look and visual character of the area



CF	IMPROVEMENT PRIORITIES
2	Ease of walking around (including crossing the street, moving between destinations)
9ᵇ	Maintenance of public spaces and street furniture
5	Interesting things to look at (people, shops, views etc.)
4	Outdoor restaurant, cafe and/or bar seating

CF	SECONDARY PRIORITIES
11	Landmarks, special features or meeting places
22ᵃ	Local history, heritage buildings or features
16	Interaction with locals/ other people in the area (smiles, customer service etc.)
20	Free and comfortable places to sit alone
36	Public art, community art, water or light feature
22ᵇ	Physical comfort (impacts from noise, smells, temperature)

LEGEND

- - - *Horizontal: Top 10 CF threshold Diagonal: Threshold showing attributes which PX rating is performing 10 pts worse than their CF ranking[1] (PX=CF+10)*

····· *Equal CF rank and PX Score (PX=CF)*

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THANK YOU

FOR MORE INFORMATION
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