



Glen Eira Transport Analysis and Forecasting

Discussion Paper: Bentleigh Activity Centre

Glen Eira City Council

Prepared by
MRCagney Pty Ltd

30 October 2017



MRCagney

Document Information

Project Name	Glen Eira Transport Analysis and Forecasting
Document Name	Discussion Paper: Bentleigh Activity Centre - Draft Report
Client	Glen Eira City Council
Job Number	6307
Prepared by	MRCagney Pty Ltd Melbourne

Quality Assurance Register

Issue	Description	Prepared by	Reviewed by	Authorised by	Date
1	First Draft Issue	KB, MW, LA	KB	KB	11 August 2017
2	Additions to Section 4.3.3 and 6.2 following receipt of parking surveys	MW	KB	KB	11 September 2017
3	Final Issue	KB	TL	KB	30 October 2017

© 2017 MRCagney Pty Ltd ABN 11 093 336 504

This document and information contained herein is the intellectual property of MRCagney Pty Ltd and is solely for the use of MRCagney's contracted client. This document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied, without the written consent of MRCagney. MRCagney accepts no responsibility to any third party who may use or rely upon this document.

www.mrcagney.com

Contents

1	Introduction.....	1
1.1	Purpose.....	1
1.2	Scope.....	1
1.3	Approach.....	2
2	Bentleigh's transport network and urban environment.....	5
2.1	Transport network.....	5
2.2	Land-use.....	6
2.3	Forecast growth and implications for transport demand.....	7
3	Policy context.....	9
3.1	Overview of policy landscape.....	9
3.2	Bentleigh Draft Concept Plans and implications for the transport sector.....	11
4	Transport performance assessment.....	13
4.1	Approach to performance assessment.....	13
4.2	Assessment: putting walking first.....	14
4.3	Assessment: parking management.....	16
4.4	Assessment: intensification of development around rapid transit.....	29
4.5	Assessment: ensuring cycling plays its role.....	32
4.6	Assessment: working toward vision zero road deaths and serious injuries.....	33
4.7	Assessment: attractive congestion-free networks.....	36
5	Key challenges and opportunities.....	41
6	Potential interventions.....	43
6.1	Potential interventions: putting walkability first.....	43
6.2	Potential interventions: managing car parking.....	44
6.3	Potential interventions: intensifying activity around rapid transit.....	47
6.4	Potential interventions: cycling.....	50
6.5	Potential interventions: road safety.....	52
6.6	Potential interventions: congestion-free networks.....	53
6.7	Summary of interventions.....	54

List of Figures

Figure 1-1: Bentleigh Activity Centre study area.....	2
Figure 2-1: Bentleigh's transport network	6
Figure 2-2: Existing planning scheme provisions and recent higher-density residential development, Bentleigh Activity Centre	7
Figure 3-1: Policy framework relevant to transport and land-use planning at Bentleigh	9
Figure 3-2: Planned future land-use, Bentleigh Activity Centre	12
Figure 4-1: Bentleigh retail strip's 10-minute walking catchment.....	15
Figure 4-2: Crossing spacing along Willoughby Road, Crows Nest, New South Wales (not to scale)	15
Figure 4-3: Location of parking surveys	20
Figure 4-4: Surveyed parking occupancy – Bentleigh, Tuesday 25 July 2017.....	22
Figure 4-5: Surveyed parking occupancy – Bentleigh, Saturday 29 July 2017	23
Figure 4-6: Average peak occupancy across carpark locations, Bentleigh Activity Centre	24
Figure 4-7: Aisle of parking behind shops south of Centre Road	25
Figure 4-8: Large expanse of surface parking north of Centre Road	25
Figure 4-9: Households without a car (2011 Census).....	29
Figure 4-10: Planning permits (3 or more storeys) from 23/08/2013 to 08/06/2017	30
Figure 4-11: Multi-unit dwelling representative of recent development adjacent to Bentleigh Rail Station	30
Figure 4-12: Draft Building Transitions Plan	32
Figure 4-13: Existing cycling infrastructure network.....	33
Figure 4-14: Heat map of crashes causing injury and death (all street users) in Bentleigh, 2012-2017.....	34
Figure 4-15: Heat map of number of pedestrians involved in crashes causing fatalities or serious injuries in Bentleigh, 2012-2017	35
Figure 4-16: Heat map of number of cyclists involved in crashes causing fatalities or serious injuries in Bentleigh, 2012-2017	35
Figure 4-17: Existing PT services in Glen Eira.....	37
Figure 4-18: Weekday entries by access mode - Bentleigh Rail Station.....	38
Figure 4-19: Upgraded Bentleigh Rail Station	39
Figure 4-20: Bus stop with poor amenity and lack of shelter (Centre Road, adjacent Campbell Street).....	39
Figure 4-21: Number of AM Peak services below and above benchmark levels – Frankston Line.....	40
Figure 6-1: Potential walking interventions, Bentleigh activity centre	43
Figure 6-2: Potential money raised from cash-in-lieu schemes – Non-residential development in Bentleigh	50
Figure 6-3: Potential cycling network interventions	52
Figure 6-4: Traffic speed and risk of death from vehicle-pedestrian collision. Source: World Resources Institute (2015).	53

List of Tables

Table 1-1: Six key policy directions and examples of connections with established policy	3
Table 2-1: Retail and hospitality businesses in Glen Eira activity centres	6
Table 2-2: Jobs and population in three Glen Eira activity centres	7
Table 3-1: Key policy documents and implications for transport and land-use change in Bentleigh	9
Table 4-1: Approach to assessing transport system performance	13
Table 4-2: Publicly-accessible car parking supply, Bentleigh activity centre	16
Table 4-3: Notional non-residential parking requirements, based on Glen Eira Planning Scheme parking rates ..	17
Table 4-4: TOD Guidelines – Maximum Parking Rates	18
Table 4-5: Complete Streets Maximum Parking Rates	19
Table 4-6: Benchmark parking requirements – Bentleigh Activity Centre	19
Table 4-7: Parking survey results – Tuesday 25 July 2017	20
Table 4-8: Parking survey results – Saturday 29 July 2017	21
Table 4-9: Potential additional future non-residential parking needs	26
Table 4-10: Potential total future parking needs	28
Table 4-11: Population and employment density within walkable catchment of transit stops – Bentleigh	31
Table 4-12: Summary of crashes in Bentleigh 2012-2017 by street user type	34
Table 4-13: Annual train patronage (millions) by financial year	37
Table 4-14: Metropolitan bus patronage – Financial year 2014 to 2015	38
Table 4-15: AM Peak services above benchmark levels and percentage of passengers travelling on services above benchmark levels – Frankston Line	40
Table 5-1: Key challenges and opportunities for the transport sector, Bentleigh Activity Centre	41
Table 6-1: Opportunities identified for repurposing of Council-owned off-street carparks, Bentleigh activity centre	44
Table 6-2: Summary of potential recommendations and contributions to achieving policy directions	55

1 Introduction

1.1 Purpose

The purpose of this report is to provide an independent and expert view on transport-sector interventions that can support planned land-use change and development within the Bentleigh Activity Centre.

Glen Eira City Council is currently preparing structure plans for the Bentleigh Centre, alongside plans for the Carnegie and Elsternwick centres. These structure plans establish a vision, policy objectives, planned building typologies to guide future development and identify public sector interventions such as public realm projects to support the desired function and vision for each activity centre.

This report identifies potential transport sector interventions that can support planned land-use change at the Bentleigh Activity Centre during the next 10-15 years. This discussion paper will be used by the Glen Eira City Council to inform development of their Structure Plan for the centre. The discussion paper will be used internally by Council staff and will also be made publicly available as part of community consultation on the ITS.

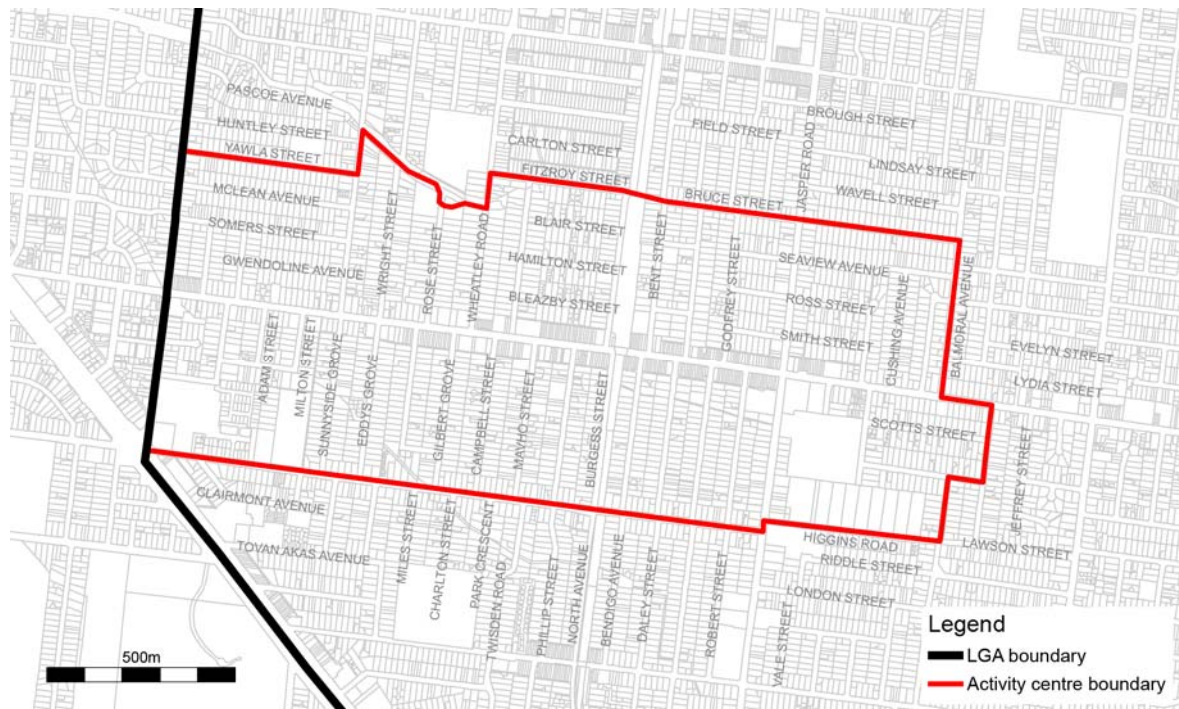
1.2 Scope

This report considers transport-sector performance and interventions across all land transport modes operating within the Bentleigh Activity Centre (walking, cycling, public transport and motor vehicle traffic). The focus of recommended interventions, however, is on actions that are within the Council's jurisdiction. This means a focus on the Glen Eira City Council's role in influencing the physical street environment that it manages in partnership with VicRoads, walking and cycling networks, car parking management that is directly controlled by Council and opportunities for advocating improvements to public transport operations delivered by PTV within the area.

The report focuses on transport-sector performances and interventions. While land-use planning policy and transport outcomes are closely inter-related this report generally avoids recommendations on land-use planning policy. The land-use approach is taken 'as given' and is based on Glen Eira City Council's *Bentleigh: Draft Concept Plans* (July 2017 for consultation). This report identifies how this planned approach to land-use change and development can be effectively supported by the local transport system.

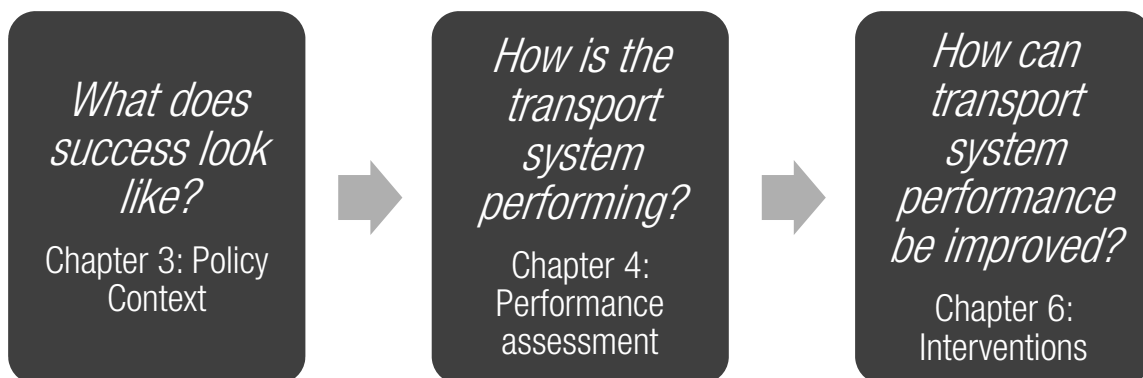
The study area considered in this report is illustrated below in Figure 1-1. It focuses on the Bentleigh Activity Centre area, as defined by Glen Eira City Council.

Figure 1-1: Bentleigh Activity Centre study area



1.3 Approach

The approach used to guide this study follows a three-part structure as illustrated below. A review of existing local and state transport, urban growth and land-use policy is used to establish 'what success looks like' for the Bentleigh activity centre's transport system. This understanding of desired objectives for the transport system provides a framework for assessing 'how the system is performing' during both the recent past and into the future if current trends continue. From the assessment, a set of key challenges and opportunities are identified which provide a framework for identifying 'how performance can be improved'. A set of potential interventions that address key challenges and opportunities are included to prompt discussion.



The performance assessment and recommended interventions chapters are structured around a set of indicative policy directions that were established during the preparation of the accompanying *Glen Eira Transport Analysis and Forecasting Discussion Paper* for the overall municipality. These policy themes summarise desirable directions for transport sector performance and provide an organising device for structuring the assessment and identification of interventions.

These six policy directions are consistent with the directions provided by existing local and state-level policy and are:

- **Put walkability first** – providing good conditions for walking improves the safety of the overall transport system, supports public transport use and local amenity while reducing traffic congestion.
- **Manage parking for streetscape amenity, town centre vitality and to support mode shift** – parking management can play a major role in changing transport behaviour.
- **Intensify development around rapid transit** – public transport works best in locations with dense walk-up catchments and excellent walking facilities to stations and stops.
- **Ensure cycling plays its role** – cycling can play a significant role in providing for short-medium distance trips, extending the range of trips that can use active transport.
- **Work toward 'vision zero' road deaths and serious injuries** – improving the safety of the transport system is a critical component of encouraging walking and cycling.
- **Plan for attractive congestion-free networks rather than reducing congestion** – prioritising congestion reduction with road capacity expansion risks making the environment for other modes less attractive. Public transport and cycling networks can provide congestion-free networks which is a more financially viable and effective measure.

These six policy directions draw on common themes that are prioritised in the four core policy documents that need to inform transport policy for Glen Eira:

- Plan Melbourne 2017-2050 (2017)
- Glen Eira Draft Council and Community Plan 2017-21 (2017)
- Glen Eira Activity Centre, Housing, and Local Economy Strategy (2017)
- Glen Eira Planning Scheme (2017).

Across the core policy documents the following are key common themes relevant to the transport sector:

- Providing for significant growth in transport demand – and doing so by prioritising sustainable transport modes including walking, cycling and public transport.
- Managing increased transport demand by promoting distributed employment across Melbourne activity centres with 'local jobs for local residents'.
- Ensuring good transport accessibility to activity centres – particularly by sustainable modes.
- Promoting good local accessibility, with the concept of the '20-minute neighbourhood' and a particular emphasis on highly walkable neighbourhoods.
- Encouraging increased cycling.
- Managing the potential impacts of increased traffic and parking demand associated with land-use change and intensified development.

Table 1-1 summarises examples of connections between objectives established by existing core policy documents and the six key policy directions established for this study.

Table 1-1: Six key policy directions and examples of connections with established policy

Policy direction	Relevant supporting statement/ theme in core existing policy document
<i>Put walkability first</i>	<p>"A city that is easy to move around: full of safe travel options and walkable neighbourhoods" (Long Term Community Goal from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).</p> <p>"We will construct five per cent of our missing link footpaths" (Target from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).</p> <p>"We will achieve a five per cent improvement in the 'Walk Score' across the municipality" (Target from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).</p>

Policy direction	Relevant supporting statement/ theme in core existing policy document
<i>Manage parking for town centre vitality and to support mode shift</i>	"Address the community's parking needs to minimise impacts on community wellbeing, and improve the connections and the vibrancy of the city" (Objective from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).
<i>Intensify development around rapid transit</i>	<p>"A greater percentage of people (compared to 2017 numbers) will live within walking distance of a major transport node" (Target from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>)</p> <p>Reduce car congestion by encouraging greater local employment, health, education and shopping opportunities close to home and public transport networks (Objective from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).</p> <p><i>Plan Melbourne</i> prioritises 20-minute neighbourhoods including promoting increased employment closer to where people live and increased proportion of new housing in established areas and in activity centres.</p>
<i>Ensure cycling plays its role</i>	<p>"We will increase bicycle usage by 10 per cent from 2017 figures" (Target from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>)</p> <p><i>Plan Melbourne</i> aims for cycling to become a more important transport mode.</p>
<i>Work toward 'vision zero' road deaths and serious injuries</i>	"Enhance road user safety with particular focus around schools and activity centres" (Objective from the <i>Draft Glen Eira Council and Community Plan 2017-21</i>).
<i>Plan for attractive congestion-free networks rather than reducing congestion</i>	<p><i>Plan Melbourne</i> aims for increased use of public transport.</p> <p><i>Glen Eira Activity Centre, Housing, and Local Economy Strategy (2017)</i> aims for activity centres to be highly accessible by sustainable transport modes; walking, cycling and public transport – reducing car dependency.</p>

2 Bentleigh's transport network and urban environment

This section provides a brief descriptive overview of the transport networks available within the Bentleigh Activity Centre, outlining major elements of the road, public transport, walking and cycling networks, transport user groups and the land-use context within which the transport system operates.

2.1 Transport network

Bentleigh activity centre is located approximately 13km south east from Melbourne's CBD. It is serviced by an extensive road network, Bentleigh Station on the Frankston passenger rail line, and multiple bus routes (see Figure 2-1). The transport networks generally follow a grid structure that provides good connectivity for all transport modes throughout the activity centre and to adjacent residential neighbourhoods and wider metropolitan networks. The railway introduces a barrier to east-west road and pedestrian connectivity, particularly to the north of the activity centre where there is a distance of 800m between east-west road or pedestrian crossings of the railway.

Centre Road is the major arterial road running east-west through the activity centre. It is the major shopping street and has the highest level of pedestrian activity as well as carrying high volumes of traffic and public transport bus routes. Jasper Road provides an important north-south road connection, to the east of the shopping strip. Car parking is extensively provided with on-street parking and surface off-street carparks, mainly to the north of the Centre Road shopping strip.

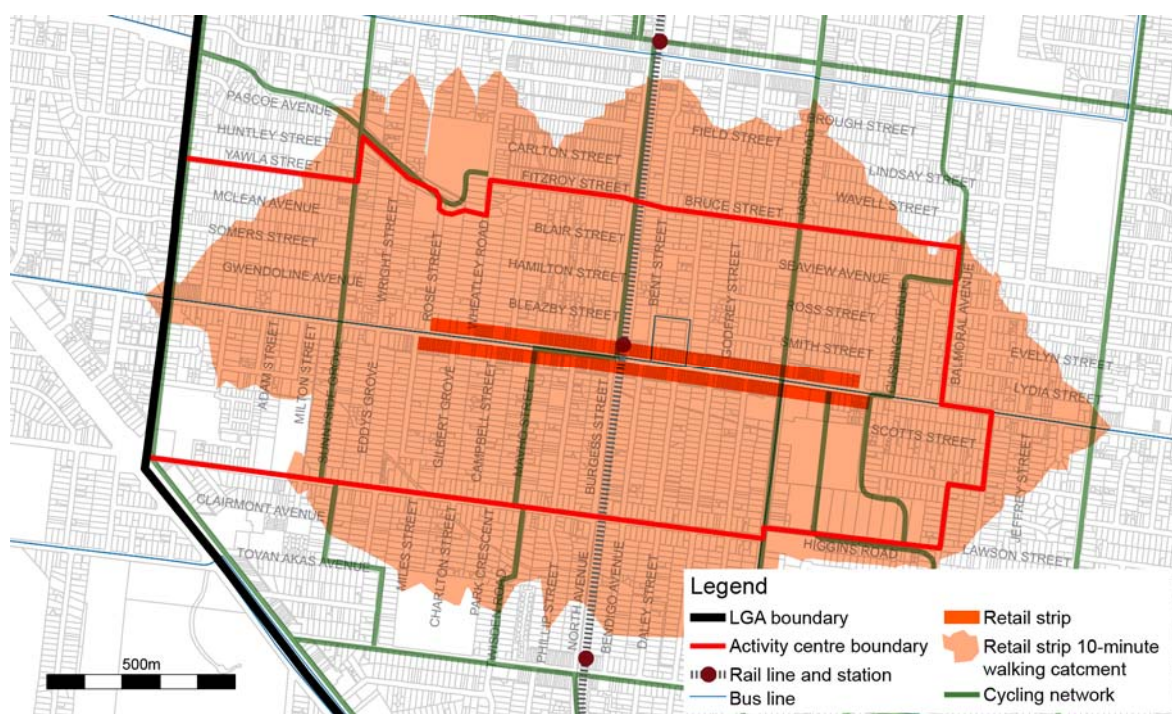
The Frankston rail line provide frequent passenger services between Glen Eira and the Melbourne CBD and runs south to Frankston. Two bus routes, the 701 and 703 provide east-west connectivity along Centre Road.

Walking networks are primarily comprised of footpaths that are near-universally provided on all streets within the activity centre. Major road intersections include signalised pedestrian crossings. Cyclists use the road network and some dedicated cycling facilities including the off-street Elster Creek Trail which connects Bentleigh with wider metropolitan cycling infrastructure networks.

Figure 2-1 illustrates the area within a 10-minute walk from the Centre Road retail strip. The 10-minute catchment extends approximately 700m distance from the retail strip. The relatively regular shape of the walking catchment reflects the good pedestrian connectivity enabled by the regular street grid.

Recent changes to the transport network within the Bentleigh activity centre have included an upgrade to the rail station accompanying level-crossing removal on Centre Road, completed in 2016. The rail line now travels beneath the road in a trench with a below grade station platform.

Figure 2-1: Bentleigh's transport network



2.2 Land-use

The Bentleigh activity centre comprises a local shopping strip along Centre Road of generally two-storey buildings, surrounded by predominantly residential land-uses. Some larger-scale retail buildings including supermarkets are located behind the Centre Road shopping strip and at the corner of Centre Road and Jasper Road to the east of the shopping strip.

The centre is a vibrant retail and hospitality location with a total of 165 businesses within the activity centre area, mostly clustered on the Centre Road strip (see Table 2-1). The centre has a particularly strong food retail offer. The centre serves a local catchment, with the majority of users from the surrounding suburbs within a 3km radius (BWEK 2017). For context, Table 2-1 compares the retail and hospitality offer in Bentleigh with two other major activity centres in Glen Eira; Carnegie and Elsternwick.

Table 2-1: Retail and hospitality businesses in Glen Eira activity centres

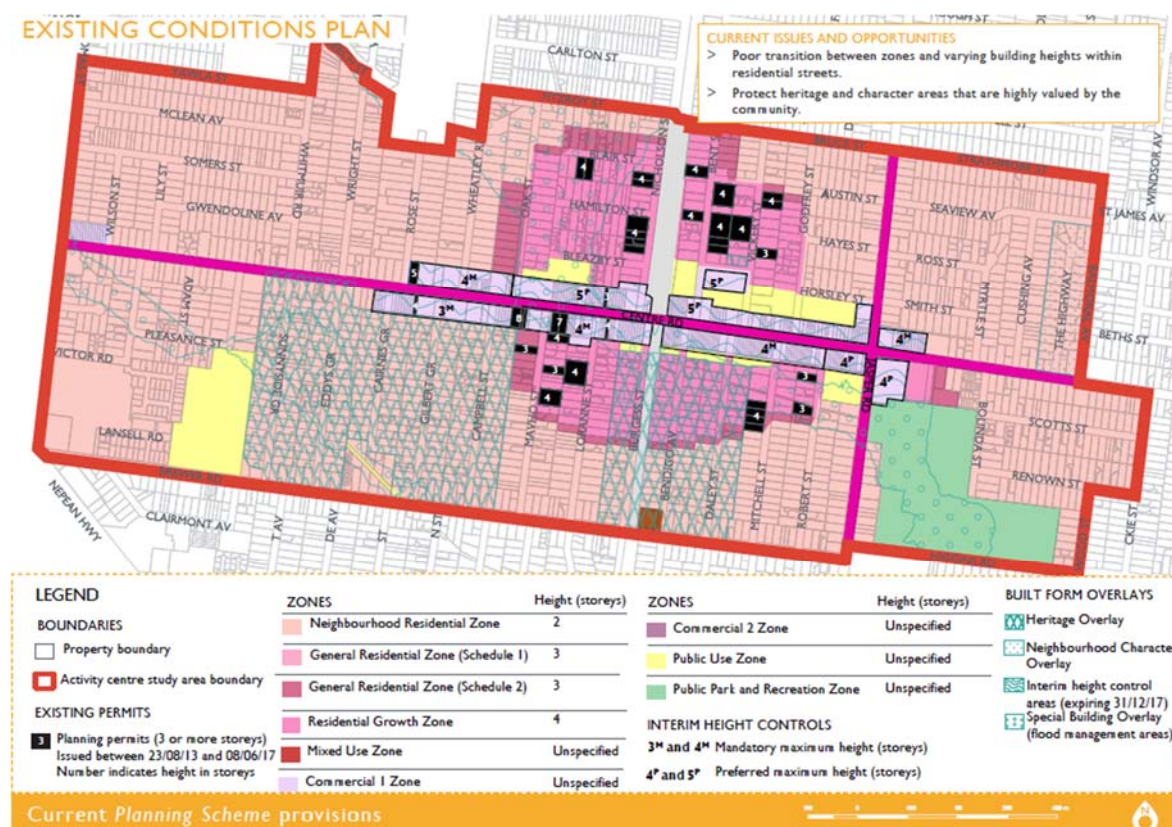
	Food retailing		Non-food retailing		Hospitality		Total	
	Floorspace (m2)	Number of businesses	Floorspace (m2)	Number of businesses	Floorspace (m2)	Number of businesses	Floorspace (m2)	Number of businesses
Bentleigh	12600	32	15500	77	7200	56	35300	165
Carnegie	11900	25	8000	30	8200	55	28100	110
Elsternwick	6000	18	13700	65	9300	71	29000	154

Source: BWEK (2017) Glen Eira Economic Analysis and Forecasting Study.

Residential land is generally occupied by suburban building typologies with single or double storey attached and detached houses. Recently, a number of higher-density residential buildings of 3-4 storeys have been developed, particularly immediately to the north of the railway station (see Figure 2-2 for locations of recent planning permits for buildings of 3 or more storeys).

Employment-related land uses are mostly limited to the retail shops on Centre road and some shoptop office space. There are some civic uses including the Bentleigh library within the activity centre area.

Figure 2-2: Existing planning scheme provisions and recent higher-density residential development, Bentleigh Activity Centre



Source: Glen Eira City Council (2017) *Bentleigh: Draft Concept Plans* (July 2017 for consultation).

The resident population of the activity centre area is over 6,000 people, while there are around 1,800 jobs in the area (see Table 2-2). Both population and job density are lower than in Glen Eira's other major activity centres, reflecting the more suburban character of the centre.

Table 2-2: Jobs and population in three Glen Eira activity centres

	Jobs	Job density (jobs/Ha)	Population	Population density (people/ Ha)
Bentleigh	1813	11	6080	35
Carnegie	1113	12	4899	52
Elsternwick	2730	18	6563	42

Source: MRCagney analysis of ABS 2011 Census data.

2.3 Forecast growth and implications for transport demand

The population of the Bentleigh activity centre has recently grown and is expected to continue doing so, alongside forecast growth across the Glen Eira municipality.¹ A total of 689 new dwellings were approved for construction in the past decade (2006-2016) within the activity centre area.² Recent assessment of the potential for further growth in dwellings found potential for adding just over 1,500 new dwellings within the

¹ Across the Glen Eira municipality, annual population growth is forecast to average 1.3% between 2011-21 and 0.9% between 2021-31. See: The State of Victoria Department of Environment, Land, Water and Planning (2016) *Victoria in Future 2016: Population and household projections to 2051*.

² Id Consulting (2017) City of Glen Eira – Housing id – analysis of housing consumption and opportunities

activity centre area and over 1,000 new dwellings within the Bentleigh suburb outside the activity centre area.³

This assessment of new dwelling potential is not a forecast for future growth but rather an assessment of development opportunities. Whether development opportunities are taken up, and over what time period will be subject to various market and policy factors. Nevertheless, the assessment highlights that there is significant potential for further residential growth in the area. For example, if all opportunities for additional dwellings within the activity centre area were to be built out this could result in approximately 4,800 additional residents (1,500 dwellings*average 2.7 people/ dwelling⁴) or a 68% increase in the local population.

Additional population will have implications for transport demands. It will increase demands for commute travel, particularly to major service-sector jobs centres such as the CBD. The municipality has a relatively low level of employment self-containment, with the fourth-lowest level of locally-employed working residents among the 31 Melbourne local government areas.⁵ High levels of employment outside Glen Eira for its residents reflects the absence of any major employment centre within the municipality and the dominant 'white collar', service-sector occupations of Glen Eira residents that tend to be concentrated in central Melbourne. While some additional local jobs may be created, there will likely be continuing high demands for commute movements in and out of Bentleigh, the bulk of which will need to be provided for with private vehicles or public transport due to trip distances of 10km+ that are beyond the range of walking and cycling for most users.

A growing local population in the activity centre will also be accompanied by increased walking and cycling demands for short-distance local trips. With recent population growth concentrated around the retail strip and rail station and future growth oriented toward these areas through planning policy, there is likely to be increasing demand for walking and cycling access to local shops and services.

With regard to growth in employment and retail and local services, the Glen Eira Economic Analysis and Forecasting Study⁶ suggests there are several opportunities for growth in commercial or retail space in the Bentleigh Activity Centre:

Coles supermarket site:	~800m ² additional GFA
Woolworths supermarket site:	1,500m ² additional GFA (assumed)
Car wash site corner Centre and Jasper Roads:	1,000 m ² GFA (assumed)
1 Nicholson Street corner of Centre Road:	1,000 m ² GFA (assumed)
9-17 Nicholson Street:	2,000 m ² GFA (assumed)
Bentleigh Post Office site:	800 m ² GFA (assumed).
Total:	~7,100 m² GFA

The transport implications of intensification or changes of land use at these sites will depend on development outcomes. However, development could result in additional demands on roads, parking, public transport and local walking and cycling.

³ Ibid.

⁴ Average people/ dwelling for the Greater Melbourne Statistical Area,
http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/2GMEL?opendocument

⁵ For further analysis see: BWEC (2017) *Glen Eira Economic Analysis and Forecasting Study*.

⁶ Ibid.

3 Policy context

This section reviews the policy context relevant to transport and land-use planning for the Bentlyigh activity centre. It identifies recently proposed changes to land-use planning policy for the activity centre that future transport sector interventions will need to support.

3.1 Overview of policy landscape

Figure 3-1 illustrates the key policy documents guiding future development of the Bentlyigh activity centre. At a high-level, Plan Melbourne provides the overarching framework within which Glen Eira's policy documents fall. Glen Eira City Council's Bentlyigh Structure Plan (currently in preparation) will translate the principles of the *Activity Centre, Housing and Local Economy Strategy* to the Bentlyigh local context. The Council's Planning Scheme will provide the detailed planning provisions that allow implementation of the vision developed by the Structure Plan.

Figure 3-1: Policy framework relevant to transport and land-use planning at Bentlyigh

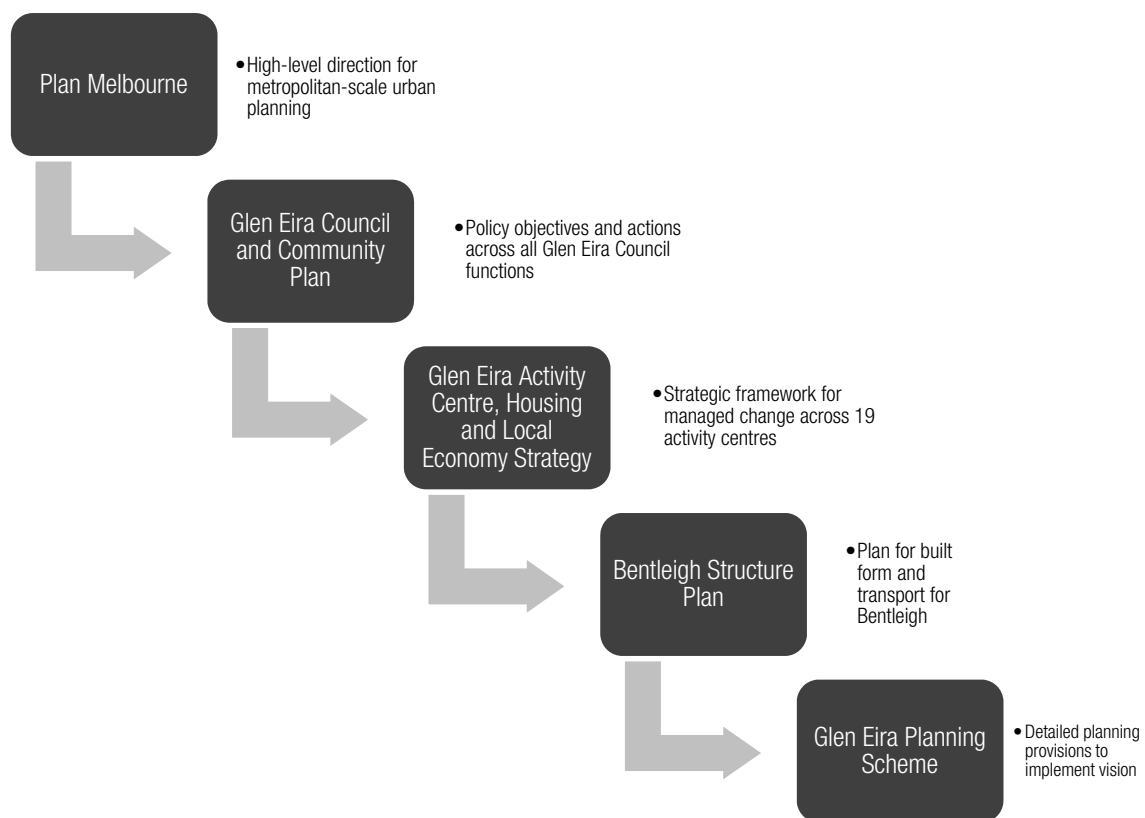


Table 3-1 summarises these key relevant policy documents, describing the relevant policy directions from each document and how these translate to the Bentlyigh context.

Table 3-1: Key policy documents and implications for transport and land-use change in Bentlyigh

Policy document	Role of document and summary of key relevant policy directions	Implications for Bentlyigh: 'what does success look like for transport and land-use in Bentlyigh?'
<i>Plan Melbourne 2017-2050 (2017)</i>	High-level direction for metropolitan-scale urban planning and managing strong growth in forecast transport demand and housing needs.	Good local transport connectivity to the Bentlyigh activity centre, particularly walking and cycling connections.

Policy document	Role of document and summary of key relevant policy directions	Implications for Bentleigh: 'what does success look like for transport and land-use in Bentleigh?'
	<p>Prioritises 20-minute neighbourhoods including promoting increased employment closer to where people live, and local walking and cycling connections.</p> <p>Promotes increased proportion of new housing in established areas and in activity centres.</p>	<p>Public transport, walking and cycling become more important transport modes.</p> <p>Transport capacity across all modes is sufficient to cater to growth in demand.</p> <p>New housing is concentrated within the activity centre.</p>
<i>Glen Eira Draft Council and Community Plan 2017-21 (2017)</i>	Five themes guiding policy objectives across all Glen Eira Council functions: Liveable and well designed, Accessible and well connected, Safe healthy and inclusive, Clean and sustainable, Informed and engaged.	<p>Increased walkability in the Bentleigh neighbourhood.</p> <p>Increased levels of cycling.</p> <p>Parking and traffic demands accompanying growth are well-managed.</p>
<i>Glen Eira Activity Centre, Housing, and Local Economy Strategy (2017)</i>	<p>Establishes a long-term strategic framework for 'managed change' in Glen Eira's activity centres – covering place-making, local economy and housing.</p> <p>Three policy themes: Well-connected and distinctive neighbourhoods, Vibrant activity centres with a thriving local economy, Quality housing and buildings for the future.</p>	<p>Bentleigh is highly accessible by sustainable transport modes; walking, cycling and public transport – reducing car dependency.</p> <p>Neighbourhoods are highly walkable and safe.</p> <p>Parking and traffic demands accompanying growth are well-managed.</p>
<i>Bentleigh Draft Concept Plans (2017) - consultation document to inform structure plan</i>	<p>Establishes a vision for Bentleigh and place-making, housing, economy and transport objectives.</p> <p>Identifies opportunity areas for public sector interventions.</p> <p>Provides an outline of desired built form; 'the right buildings in the right locations'.</p>	<p>"Bentleigh will be an accessible local shopping destination with a vibrant café and restaurant culture".</p> <p>High levels of walking, cycling and public transport.</p>
<i>Glen Eira Planning Scheme (2017)</i>	<p>Provides a framework for land-use and development in Glen Eira, consistent with State-level policy – though objectives, zoning and planning provisions.</p> <p>Plan-enabled capacity for housing and employment growth is focused on activity centres – particularly designated 'urban villages' which include Elsternwick, Carnegie and Bentleigh.</p>	Population and employment growth and land-use development is accompanied by and well-coordinated with sufficient transport facilities and infrastructure.

The five policy documents have been prepared to be deliberately coordinated. As such, there are a considerable number of shared policy directions. We identify the following key common directions across the documents for the transport sector:

- Providing for significant growth in transport demand – and doing so by prioritising sustainable transport modes including walking, cycling and public transport.
- Managing increased transport demand by promoting distributed employment across Melbourne activity centres with 'local jobs for local residents'.

- Ensuring good transport accessibility to activity centres – particularly by sustainable modes.
- Promoting good local accessibility, with the concept of the '20-minute neighbourhood' and a particular emphasis on highly walkable neighbourhoods.
- Encouraging increased cycling.
- Managing the potential impacts of increased traffic and parking demand associated with land-use change and intensified development.

With regard to the role of activity centres such as Bentleigh, these policy documents emphasise the following objectives:

- Making activity centres 'work hard' in accommodating the bulk of increased housing demand and employment space.
- Promoting activity centres as vibrant, attractive, mixed-use areas.
- Encouraging high-quality design of built form in activity centres.
- Encouraging activity centres to accommodate growing housing needs with a diverse range of well-designed housing options.
- Ensuring activity centres are well supported by transport links, particularly public transport, walking and cycling.

These transport and land-use planning policy directions provide a basis for identifying 'what success looks like' from a policy perspective the Bentleigh activity centre. It provides a basis for assessing performance and identifying interventions in the later chapters of this paper.

3.2 Bentleigh Draft Concept Plans and implications for the transport sector

The Glen Eira City Council's *Bentleigh: Draft Concept Plans* (July 2017 for consultation) provides the most detailed level of policy direction specific to the Bentleigh activity centre. The performance assessment and proposed interventions seek to respond to this policy direction and improve understanding of the transport implications of realising this vision.

The *Concept Plan* establishes the following vision for the centre:

Bentleigh will be an accessible local shopping destination with a vibrant café and restaurant culture. It will maintain its community feel with open space, places for people to meet and gather and a broad range of local businesses, which meet the needs of a diverse community.

It also details a set of objectives across place-making, housing, economy and transport topics. For the transport sector the two objectives are:

Encourage walking, cycling and use of public transport

Explore innovative approaches to car parking and traffic management.

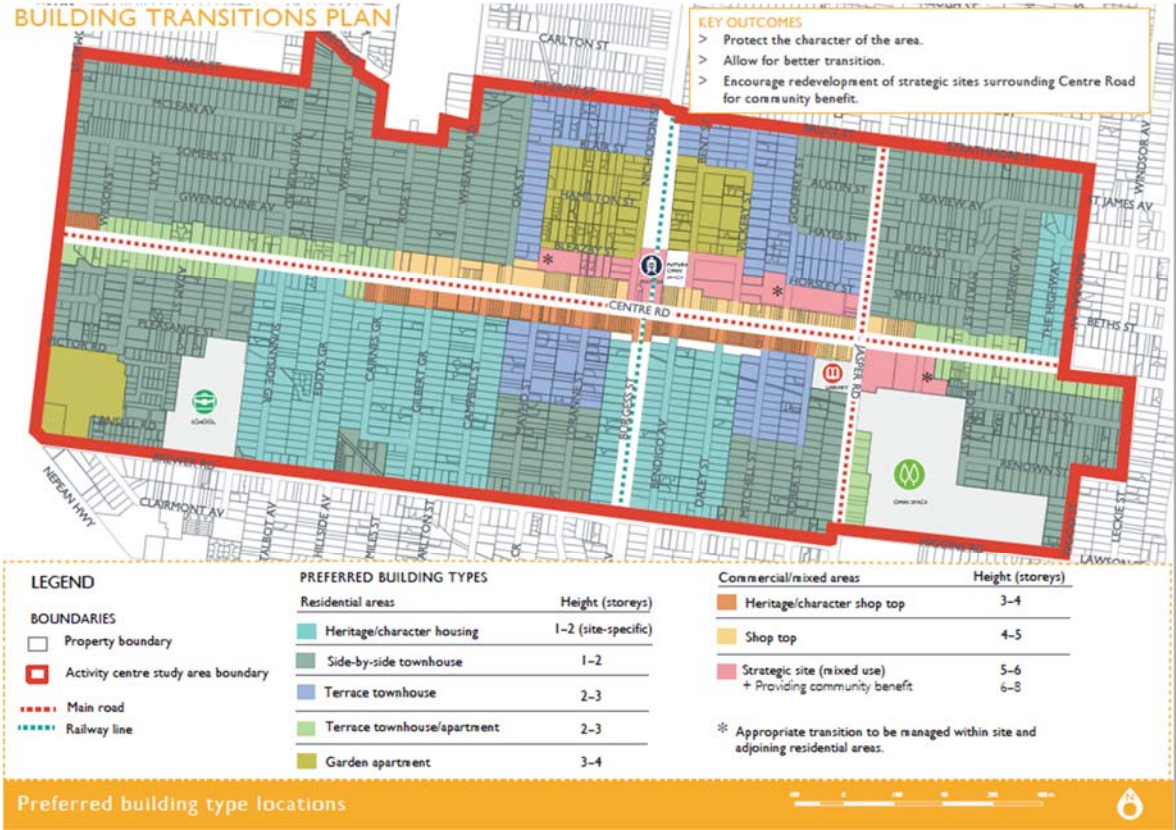
The Plan outlines a set of potential interventions or 'transformation concepts'. Interventions with particular relevance for transport include:

- Replacing some existing surface car parking lots with mixed use buildings, while consolidating parking in a new multi-storey parking building
- Creating a new cycling link across Centre Road connecting existing facilities
- Activating the laneway to the rear of the Centre Road shopping strip and improving pedestrian amenity.

The Plan finally specifies a proposed 'building transitions plan' that could form the basis of revised Planning Scheme provisions for building height and bulk in the activity centre (see Figure 3-2). Key features of the plan

are to concentrate higher density development around the station area, preserve some housing areas as heritage/ character housing and develop selected strategic development sites for community benefit.

Figure 3-2: Planned future land-use, Bentleigh Activity Centre



Source: Glen Eira City Council (2017) *Bentleigh: Draft Concept Plans* (July 2017 for consultation).

4 Transport performance assessment

4.1 Approach to performance assessment

The performance assessment aims to identify the extent to which current and forecast future performance of the transport sector is likely to be in line with the desired directions expressed by policy. This highlights policy goals that may be particularly difficult to achieve under 'business-as-usual' trends and opportunities for interventions that can shift these trends.

In general, performance assessment requires definition of what is meant by 'desirable' performance. Current performance can then be compared with a benchmark to identify gaps between desired performance and current and forecast future performance. We take desirable performance to be summarised by the six policy directions established in the previous chapter.

The performance assessment for Bentleigh has use the following sources of data and information:

- Quantitative indicators of recent transport activity (eg counts, surveys, government statistics)
- Network connectivity assessment
- Qualitative 'design assessment' of current ground conditions against best-practices standards.

Table 4-1 summarises the approach used for assessment under each of the six policy directions. A mix of quantitative key performance indicators are reported on, alongside network connectivity assessment and qualitative assessment of design performance.

Table 4-1: Approach to assessing transport system performance

Policy direction	What does success look like?	Key performance indicators	Other tools for performance assessment
<i>Put walkability first</i>	High levels of walking for a range of trip purposes. Excellent walking environment.	Walking commute mode share Walking access to Activity Centres	Design assessment of infrastructure: comparison with international best practice 'complete streets' design guidance. Assessment of walking network connectivity.
<i>Manage parking for streetscape amenity, town centre vitality and to support mode shift</i>	Peak-period parking occupancy of 70-90% (reflecting sufficient supply but not oversupply of parking spaces). High turnover of parking spaces allowing accessibility by high number of users. Parking does not detract from streetside amenity or reduce attractiveness of walking, cycling environment.	Parking turnover Parking occupancy Parking revenue	Assessment on suitability of current parking management regime. Assessment of allocation of road space to parking vs other uses and impact of parking on other uses.
<i>Intensify development around rapid transit</i>	Residential and commercial development is concentrated within 800m walking catchment of high quality public transport (rail and trams). New development is well integrated with public transport through provision of good walking links to stations.	% of recent development within walking catchment of high quality PT	Assessment of development potential enabled by Planning Scheme. Development feasibility forecasting/modelling

Policy direction	What does success look like?	Key performance indicators	Other tools for performance assessment
<i>Ensure cycling plays its role</i>	High levels of cycling for a range of trip purposes. Excellent cycling environment.	Cycling commute mode share Cycle counts	Assessment of cycling network connectivity. Assessment of network infrastructure quality against best-practice guidelines.
<i>Work toward 'vision zero' road deaths and serious injuries</i>	Low level of road crashes, all modes. Road infrastructure conforms to best-practice design standards for safety.	Number of road crashes, by mode	Assessment of road speed limits.
<i>Plan for attractive congestion-free networks rather than reducing congestion</i>	Provision of high-quality public transport (spatial extent, temporal span of service, vehicle and facility quality, etc).	PT commute mode share % of population/jobs within 800m of high quality PT station.	Assessment of spatial extent and connectivity of PT network.

4.2 Assessment: putting walking first

4.2.1 Recent trends in walking activity

Walking is a reasonably popular mode of transport to access Bentleigh and for movement within the activity centre, although many people access the town centre by car.

A recent Shopping Strip Survey⁷ of Glen Eira residents indicated that while a significant proportion of trips to Bentleigh are made on foot (43%), the highest proportion of trips is made by car (46%).

The high proportion of access by car is emphasised by the results of car park surveys of Bentleigh⁸, which indicate that around half (52%) of people who visit the town centre by car reside in the immediately surrounding and adjacent suburbs of Bentleigh, McKinnon and Ormond and Bentleigh East. When overlaid with the 10-minutewalking catchment of the retail strip of Centre Road, it is clear that many journeys to Bentleigh that could easily be made on foot by most people are currently made by car (see Figure 4-1).

As a proportion of Bentleigh train station users, people who walked all the way comprised 60% in 2013-2014⁹. In addition, 10% arrived by bus, 4% by train and 1% by bicycle, leaving that 25% of train passengers accessed the station by car. Public transport trips to the station and even trips by car (assuming the driver leaves the car parked at or nearby the station) result in some distance being covered on foot (point of origin to vehicle and vehicle to station entrance).

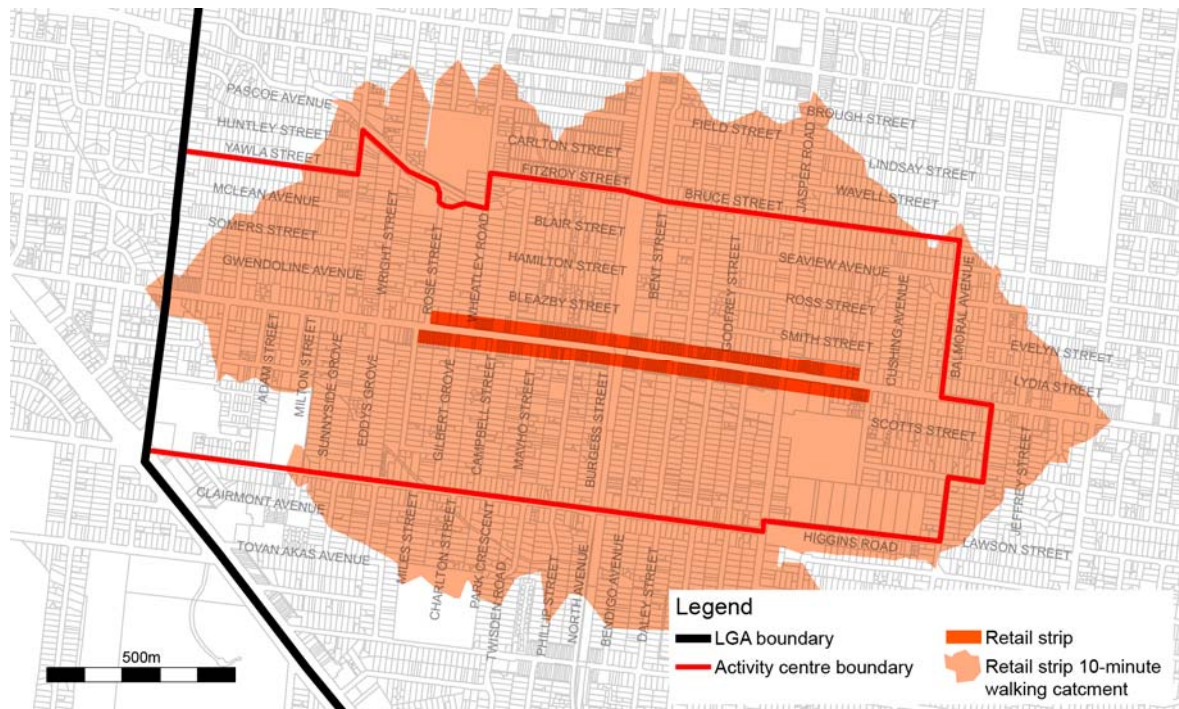
These figures compare moderately favourably with other Melbourne stations that have similar levels of patronage (place 91 of 198 stations with between 500,000 and 1.5 million annual boardings for 2013-2014). Among stations within Glen Eira, Bentleigh is toward the lower end of the range of access by walking only (range: 51 to 79%).

⁷ Shopping Strip Survey (2017) Glen Eira City Council.

⁸ BWEC (2017) *Glen Eira Economic Analysis and Forecasting Study*. Melbourne: Glen Eira City Council.

⁹ Public Transport Victoria Train Station Patronage fact sheet. Available at: <https://www.ptv.vic.gov.au/about-ptv/ptv-data-and-reports/research-and-statistics/>. Accessed 27 July 2017.

Figure 4-1: Bentleigh retail strip's 10-minute walking catchment



4.2.2 Current state of walking facilities

Walking facilities in Bentleigh are generally good, with the centre benefitting from a recent streetscape upgrade of Centre Road. Footpaths are generally 3.0-3.5m wide with kerb build-outs in places. Pedestrian amenity is provided with bespoke paving, street tree and low planting and a suite of street furniture. The most important issues are the lack of crossings of Centre Road, variable side street treatments and major barriers to pedestrian network connectivity.

The lack of crossings on main street can be demonstrated using a precedent street. Willoughby Road in Crows Nest, New South Wales provides a good example of frequent pedestrian crossings along a suburban activity centre main street (see Figure 4-2). The retail frontage of the street is around 500m long and zebra crossings and signalised crossings are spaced at an average of 100m. In comparison, Centre Road is far longer than Willoughby Road with around 1,100m of retail frontage and has just three crossing facilities, an average crossing spacing of 282m.

Figure 4-2: Crossing spacing along Willoughby Road, Crows Nest, New South Wales (not to scale)



Many of the side street treatments along Centre Road have not been designed to best practice standards despite the recent streetscape upgrade. On many streets, pedestrian refuges are provided at intersections

with Centre Road. While this provides a level of (perceived) protection for pedestrians and goes some way to facilitating easy crossing, a lack of continuity of the footpath level and materials denotes vehicle priority. Pedestrian refuges do not encourage low speeds for turning vehicles to the same extent that, for example, raised pedestrian crossings. Additionally, turning radii at several of the intersections with Centre Road are over-dimensioned, encouraging higher speeds and lengthening the distance over which crossing pedestrians are exposed to traffic danger and stress.

Aside from Centre Road, which acts as a barrier as well as the area's main attraction, the main barriers to pedestrian network connectivity in Bentleigh are the rail line and the Nepean Highway. In and around Bentleigh's retail centre, the rail line can be crossed by pedestrians using Centre Road, McKinnon Road 800m to the north or Brewer Road 400m to the south. The recent level crossing removal at Bentleigh station has improved pedestrian safety and connectivity. A case could be made for an additional rail line crossing (possibly allowing a northern platform access), particularly in the context of intensification of residential development around the station. Given the scale of the level crossing works, however, the addition of further pedestrian crossings in the vicinity are unlikely in the near future. The Nepean Highway, while outside of the study area, creates a barrier to pedestrian movement due to the hostile environment generated by the high speed and volume of traffic and the scale of the road and the intersections at which signalised crossing facilities are provided. It effectively creates a hard edge to the pedestrian catchment of the centre.

4.2.3 Providing for future walking needs

Increased residential density is planned to be located along Centre Road, with accommodation of buildings up to eight storeys proposed around the train station in the Bentleigh Draft Concept Plans (for consultation). This pattern of development will increase pedestrian traffic on the main street, placing further importance on the level of provision made for pedestrians with regard to crossing opportunities, side street treatments and signal phasing.

4.3 Assessment: parking management

4.3.1 Current parking supply

The Bentleigh Activity Centre has a high level of parking provision primarily in the form of expansive at-grade public parking facilities provided behind the established shopping strip on Centre Road. There are over 1,300 publicly-accessible parking spaces in the activity centre, with 87% of these controlled by Council (see Table 4-2).

Table 4-2: Publicly-accessible car parking supply, Bentleigh activity centre

Council Owned Car Parks		% of total
On Street	218	17%
Off Street	915	70%
Total	1,133	87%
Private Owned Public Car Parks		
Coles	62	5%
Woolworths	106	8%
Total	168	13%
Grand Total	1,301	100%

Source: Glen Eira City Council.

Recent upgrades to Bentleigh Railway Station completed as part of the State Government's level crossing removal project includes 205 commuter parking spaces (including 6 PWD spaces) in a reinstated car park on Nicholson Street.

The following provides an analysis of how current parking supply for commercial uses in the Bentleigh activity centre compares with parking supply guidance provided by Victorian standard parking rates and by best-practice guidance for appropriate levels of parking supply in centres well-served by public transport.

Using data on non-residential floorspace within the activity centre, an approximation of statutory parking supply requirements based on the Glen Eira Planning Scheme has been made to help contextualise the extent of existing non-residential parking supply in the precinct. This assessment is summarised in Table 4-3 below.

Table 4-3: Notional non-residential parking requirements, based on Glen Eira Planning Scheme parking rates

Type of Tenancy	Number of Tenancies ^a	Total Gross Floor Area ^a	Corresponding Land Use (Cl. 52.06)	Adopted Parking Rate (Cl. 52.06) ^b	Stipulated Parking Supply
Furniture Retailing	3	925	Warehouse	1	15
Manchester and other textile good retailing	2	203	Shop	3.5	7
Electrical, electronic and gas appliance	3	717	Shop	3.5	25
Computer and computer peripheral	1	112	Shop	3.5	4
Hardware building and garden supplies	3	442	Warehouse	1	10
Sport and camping equipment	1	158	Shop	3.5	6
Toy and game	2	274	Shop	3.5	10
Newspaper and book	3	543	Shop	3.5	19
Clothing retail	12	1,960	Shop	3.5	69
Footwear retail	5	640	Shop	3.5	22
Watch and jewellery	2	337	Shop	3.5	12
Department stores	1	1,468	Shop	3.5	51
Pharmaceutical, cosmetic and toiletry	6	1,504	Shop	3.5	53
Other store based retailing	33	6,258	Shop	3.5	219
Cafes and restaurants	42	5,359	Restaurant	3.5	188
Takeaway Food Services	14	1,879	Convenience Restaurant	3.5	66
Bakery Product Manufacturing	4	741	Food and drink, other	3.5	26
Supermarket and grocery stores	7	7,103	Supermarket	5	355
Fresh meat, fish poultry	4	507	Food and drink, other	3.5	18
Fruit and vegetable retailing	5	1,526	Food and drink, other	3.5	53
Liquor	4	1,473	Shop	3.5	52
Other specialised food retailing	8	1,243	Food and drink, other	3.5	44

Type of Tenancy	Number of Tenancies ^a	Total Gross Floor Area ^a	Corresponding Land Use (Cl. 52.06)	Adopted Parking Rate (Cl. 52.06) ^b	Stipulated Parking Supply
Total					1,322

^a Source: BWEC (2017) *Glen Eira Economic Analysis and Forecasting Study*. Melbourne: Glen Eira City Council.

^b Reduced Column B rates have been adopted for the Activity Centre.

As detailed above, parking for non-residential uses is approximately consistent with (if slightly less than) Glen Eira Planning Scheme requirements when adopting reduced Column B rates from Clause 52.06, however this does not consider that peak demand periods for different land uses occur at different times of day. In practice, different uses with different peak parking demand periods tend to complement each other such that less parking is needed to satisfy the peak parking demand of the precinct, compared to a simple assessment of individual parking requirements. It is also noted that all on-street parking is assumed to be available to cater to this non-residential parking demand.

While this analysis suggests parking is sufficiently or perhaps slightly undersupplied in Bentleigh, consideration of some additional best practice benchmarks for parking supply is instructive, and highlights the extent to which parking may in fact be oversupplied in Bentleigh. The *Transit Oriented Development: Guide for Practitioners in Queensland*,¹⁰ is designed to build understanding of the transit oriented development (TOD) concept and provides guidance covering urban density, community diversity and various technical standards and specifications, including parking rates.

Rather than minimum rates, the TOD Guidelines support the adoption of *maximum* parking rates, in addition to a suite of demand reduction measures including unbundling parking from dwelling sales, consolidation and sharing of parking between different developments and land uses, introduction of car share schemes, and priced parking. Table 4-4 outlines the suggested maximum parking rates for different TOD precinct types. The varying rates recognise the different functions, demand for parking, density and supply of transit in different precinct types. The guideline suggests that parking should not exceed the base maximums, and adoption of the preferred maximums is strongly encouraged. An additional key feature of the TOD Guidelines is the simplification of land uses to residential and retail and office, preventing the transition to different uses being stifled by onerous and complex parking requirements.

Table 4-4: TOD Guidelines – Maximum Parking Rates

Precinct Types	Residential (Car Spaces per Unit)		Retail and Office (Square Metres per Car Space)	
	Base Maximum	Preferred Maximum	Base Maximum	Preferred Maximum
City Centre	0.75	0.5	400	600
Activity Centre	1	0.75	100	200
Specialist Activity Centre	1.25	0.75	100	150
Urban	1	0.75	200	300
Suburban	1.25	1	75	100
Neighbourhood	1.25	1	50	100

*Complete Streets*¹¹ provides an additional set of benchmark parking rates with which to compare parking supply in Bentleigh. Similar to the TOD Guidelines, adoption of maximum rates is recommended throughout,

¹⁰ Queensland. Dept. of Infrastructure and Planning 2010, Transit oriented development guide, Dept. of Infrastructure and Planning, Brisbane

¹¹ Institute of Public Works Engineering Australia. Queensland Division Inc & Parsons Brinckerhoff 2010, *Complete streets : guidelines for urban street design (based on the standards presented in the IPWEAQ Queensland streets)*, [New ed.], Institute of Public Works Engineering Australia - Queensland Division, Fortitude Valley, Qld

particularly in areas where alternative transport options such as public transport, walking and cycling exist. Recommended maximum parking rates are derived from a review of parking rates from planning schemes throughout Queensland and from extensive research on urban mixed-use areas.

Table 4-5 provides an overview of the suggested maximum parking rates from *Complete Streets*.

Table 4-5: Complete Streets Maximum Parking Rates

Location	Commercial (Locations with Quality PT Access)	Commercial	Residential (Locations with Quality PT Access)	Residential
Capital CBD	1 space / 500m ²	1 space / 200m ²	0.5 spaces per unit	1 spaces per unit
Regional CBD	1 space / 150m ²	1 space / 100m ²	1 spaces per unit	1.25 spaces per unit
Capital Suburb	1 space / 100m ²	1 space / 75m ²	0.75 spaces per unit	1 spaces per unit
Regional Suburb	1 space / 75m ²	1 space / 50m ²	1 spaces per unit	1.25 spaces per unit

Adopting appropriate rates from Table 4-4 and Table 4-5 provides a basis for an assessment of existing parking supply in comparison to best practice benchmarks, as outlined in Table 4-6.

Table 4-6: Benchmark parking requirements – Bentleigh Activity Centre

Total Commercial Floor Area	Existing Supply	Glen Eira Planning Scheme	Complete Streets 1 / 100 (max)	TOD Guidelines 1 / 200 (max)
35,370m ² GFA	1301 (see Table 4-2)	1,322 (minimum)	354 (maximum)	177 (maximum)

Table 4-6 demonstrates that the Bentleigh activity centre has a significant oversupply of car parking, relative to best practice guidance on appropriate parking supply for centres well-served by public transport.

4.3.2 Current parking management tools

Existing parking management regimes in Bentleigh include time limits, however parking is not priced. In addition, there are a number of marked loading zones and equal access parking spaces. Time limits for off-street parking in Bentleigh are generally 2 hours, while on-street parking is generally a mix of 1P and 2P restrictions, with some 2 minute on-street spaces marked on Centre Road. Time restrictions are enforced manually by parking officers without assistance from parking bay occupancy sensors.

4.3.3 Current parking demand

Parking occupancy surveys have been undertaken at Council car parks within the Bentleigh Activity Centre to audit existing parking supply and demand for public off-street spaces. Surveys were conducted by O'Brien Traffic on Tuesday 25 July and Saturday 29 July 2017 from 8:00am - 10:00pm and 9:00am – 2:00pm, respectively. A map of the surveyed parking areas is provided below.

Figure 4-3: Location of parking surveys



Source: O'Brien Traffic

Table 4-7 below presents the parking occupancy recorded across the Tuesday survey period. Results highlighted green represent recorded parking occupancies of less than one third, while results highlighted red represent recorded occupancies of greater than 85%.

The results indicate that total weekday parking occupancy throughout the Activity Centre is reasonably low, with total peak parking demand only reaching a maximum of 72%, albeit with some instances of localised high parking demand of up to 94%. Only two parking areas (CP05 and CP12) recorded weekday parking demand exceeding 85% across consecutive time periods, and it is noted that:

1. CP12 is a relatively small parking area of minor significance in the context of the greater Activity Centre; and
2. Adjacent parking areas retained significant capacity during periods of high localised demand at CP05.

Three other parking areas (CP01, CP08 and CP11) recorded high (>85%) parking occupancy for one period, however it is noted that these parking facilities are relatively small in the context of the activity centre.

Peak parking demand across the Tuesday survey period occurred from around 10 am – 1 pm, while consistently low parking demand was recorded after 4 pm and prior to 9 am.

Table 4-7: Parking survey results – Tuesday 25 July 2017

Area	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM
CP01	12%	55%	79%	91%	76%	52%	76%	58%	67%	52%	48%	30%	12%	3%	0%
CP02	29%	37%	58%	64%	56%	54%	52%	44%	40%	26%	22%	27%	25%	16%	13%
CP03	33%	50%	59%	66%	63%	72%	75%	60%	60%	28%	26%	15%	9%	5%	2%
CP04	28%	55%	78%	79%	81%	81%	78%	79%	79%	57%	48%	40%	38%	36%	14%
CP05	17%	25%	46%	88%	85%	85%	85%	74%	75%	30%	26%	17%	12%	8%	5%
CP06	32%	48%	54%	79%	75%	71%	67%	59%	55%	53%	46%	38%	30%	21%	12%
CP07	18%	22%	21%	82%	79%	77%	78%	67%	55%	37%	27%	21%	18%	12%	4%
CP08	0%	25%	44%	63%	63%	94%	81%	69%	56%	13%	6%	25%	19%	13%	0%
CP09	18%	22%	35%	31%	27%	47%	49%	47%	45%	27%	27%	20%	8%	12%	6%
CP10	34%	38%	47%	43%	41%	79%	72%	31%	31%	24%	19%	14%	5%	3%	2%

CP11	36%	43%	86%	71%	68%	54%	46%	54%	50%	25%	18%	14%	7%	7%	4%
CP12	50%	57%	87%	87%	93%	73%	73%	73%	80%	37%	27%	17%	7%	3%	0%
Total	27%	39%	54%	72%	69%	71%	70%	60%	58%	35%	30%	24%	18%	13%	7%

Green highlighted cells indicate occupancy below one third; Red highlighted cells indicate >85% occupancy

Table 4-8 below presents the parking occupancy recorded across the Saturday survey period, and highlights that Saturday parking demand is notably higher than recorded weekday demand. Recorded parking demand was consistently high across all surveyed parking areas, with total parking demand across the Activity Centre reaching 91%, while three parking areas reached 100% capacity. Recorded parking demand ramped up markedly after 10 am, peaking from 11 am – 12 noon, before gradually falling from 1 pm – 2 pm.

Table 4-8: Parking survey results – Saturday 29 July 2017

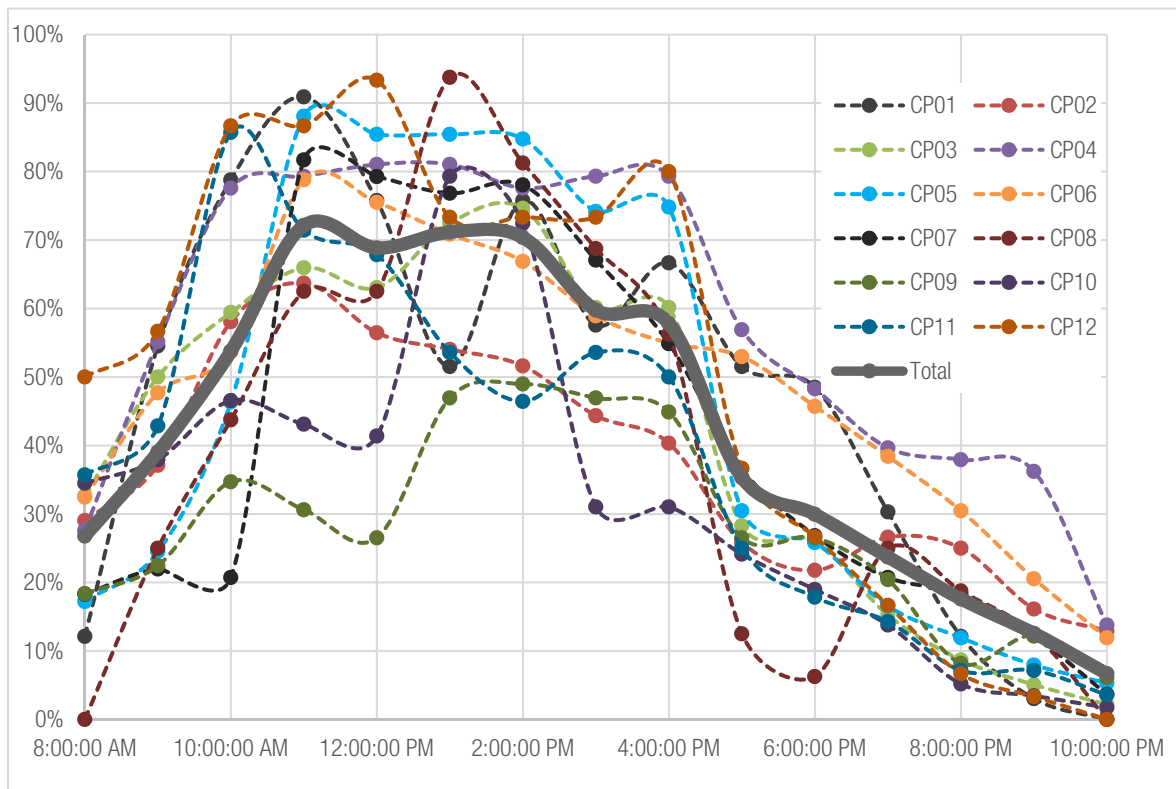
	9:00:00 AM	10:00:00 AM	11:00:00 AM	12:00:00 PM	1:00:00 PM	2:00:00 PM
CP01	64%	79%	79%	97%	94%	88%
CP02	60%	68%	83%	87%	85%	76%
CP03	31%	56%	64%	76%	73%	59%
CP04	57%	91%	88%	97%	93%	95%
CP05	66%	79%	99%	99%	85%	78%
CP06	46%	53%	98%	98%	88%	83%
CP07	39%	49%	98%	95%	83%	77%
CP08	31%	44%	100%	100%	75%	69%
CP09	41%	53%	100%	96%	98%	88%
CP10	36%	48%	100%	90%	81%	69%
CP11	54%	50%	82%	93%	71%	61%
CP12	50%	40%	47%	63%	50%	43%
Total	49%	62%	88%	91%	83%	75%

Green highlighted cells indicate occupancy below one third; Red highlighted cells indicate >85% occupancy

Figure 4-4 and Figure 4-5 below provide a clearer picture of variance in parking demand across the day and between different car parking areas for the Tuesday and Saturday survey period, respectively.

Figure 4-4 highlights that Tuesday parking demand ramps up steeply until 10 am and remains relatively steady until 2 pm, before falling away steeply again after 4 pm. The results clearly show that while some parking areas exceed 90% occupancy, multiple alternative parking areas are always available with upwards of 40% spare capacity.

Figure 4-4: Surveyed parking occupancy – Bentleigh, Tuesday 25 July 2017



In comparison, Figure 4-5 illustrates a consistent pattern of parking demand across almost all parking areas during the Saturday survey period. The only exception is CP12, however this parking area is small and of minor significance in the context of the operation of all off-street parking facilities in the Activity Centre.

Figure 4-5: Surveyed parking occupancy – Bentleigh, Saturday 29 July 2017

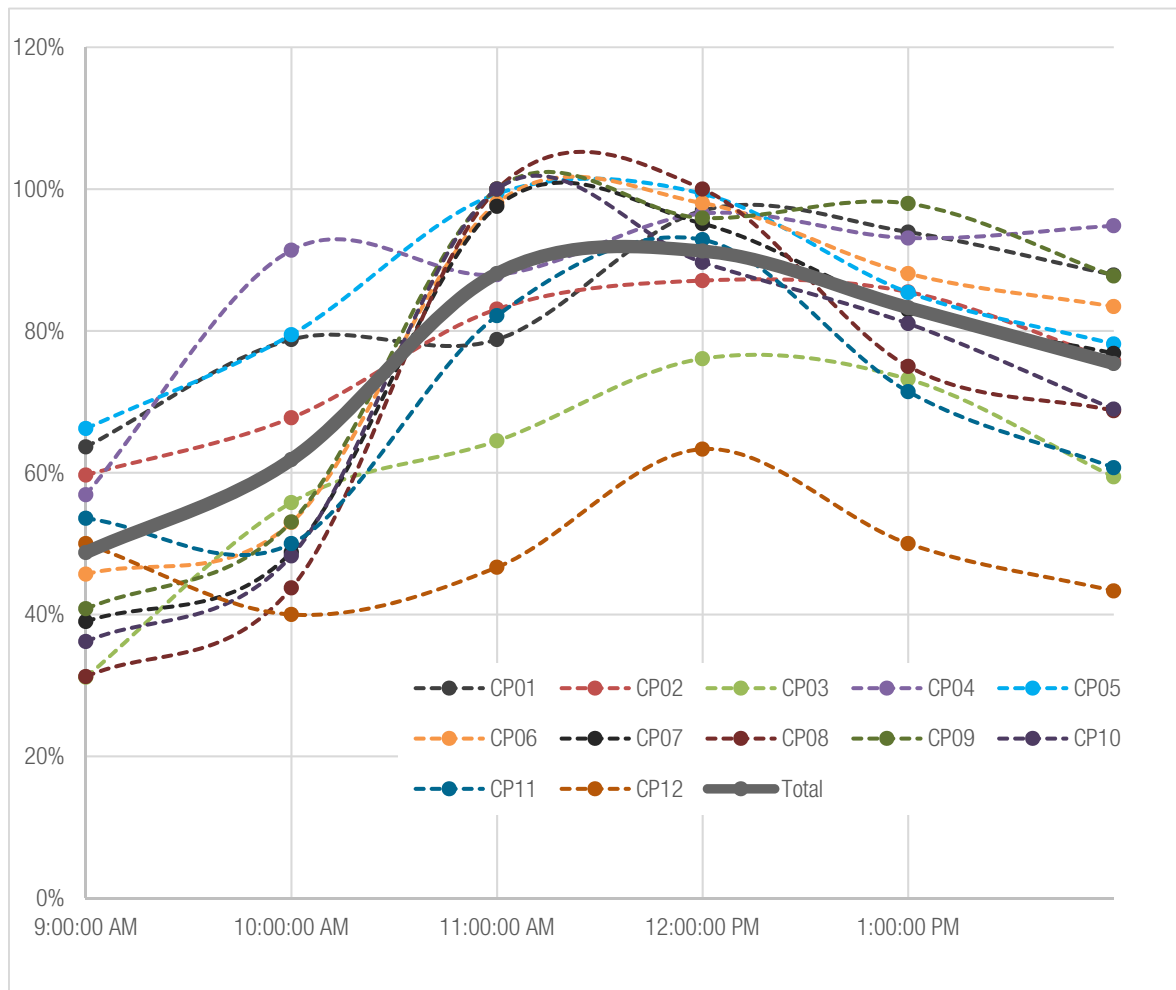


Figure 4-6 outlines the average 4-hour peak parking occupancy for the Tuesday and Saturday survey periods. The average 4-hour peak occupancy is a metric that is often used as a reference to judge whether additional parking management strategies, including priced parking, are warranted. The average 4-hour peak occupancy represents the average of the four highest hourly parking occupancies recorded across the day. The four highest parking occupancies do not have to occur across consecutive hours. Generally, if the average 4-hour peak occupancy is greater than 85%, then further parking management strategies should be considered.

Figure 4-6: Average peak occupancy across carpark locations, Bentleigh Activity Centre

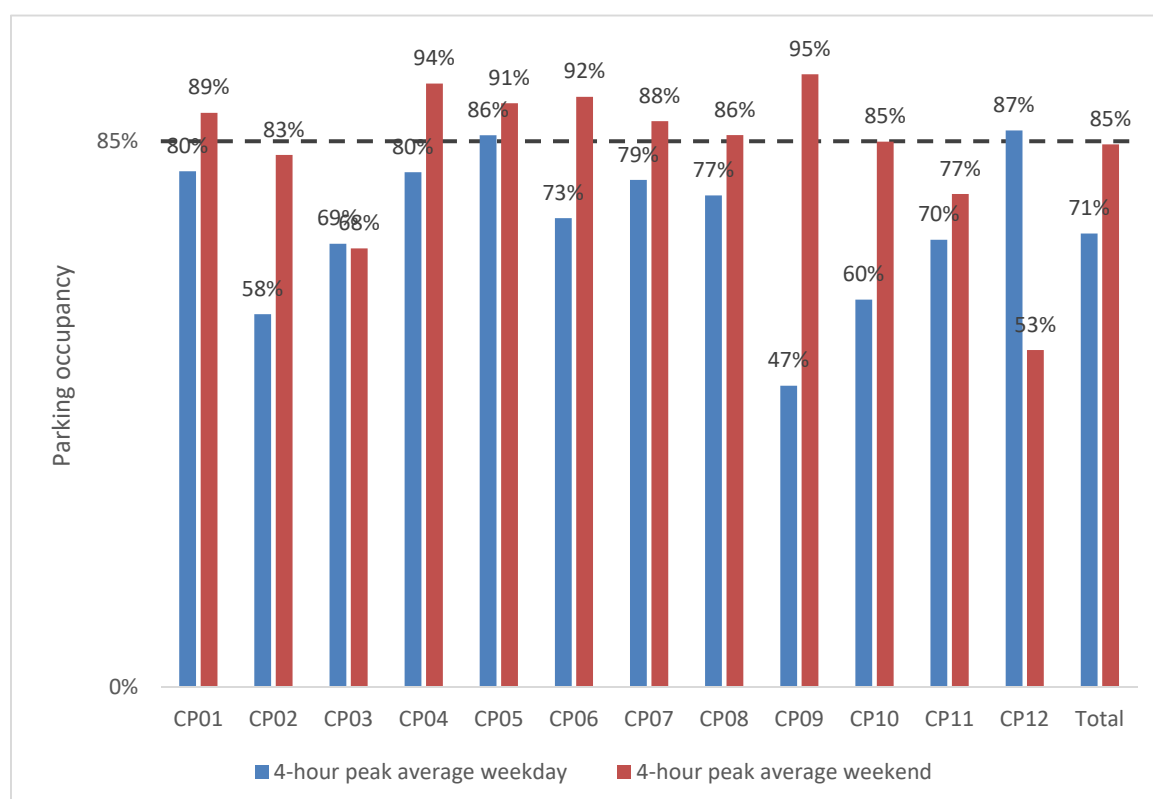


Figure 4-6 shows that Tuesday parking occupancy at 71% is comfortably with the 85% threshold, suggesting that there may not be a strong rationale for introducing management tools such as pricing if current levels of supply are maintained. However, based on analysis of occupancy alone, average 4-hour peak weekday and weekend occupancy exceeds 75% at sites 1,4,5,7 and 8, suggesting there may be benefits in reforms to the management regime. However, because weekday parking occupancy is generally within acceptable limits this would likely only entail revisions to time restrictions.

Other observations worth noting from the parking survey results include:

- Parking demand at the major car park sites (CP02 – CP06) is highest at CP04 and CP05, located to the east of the rail line, and adjacent to a supermarket. Notwithstanding the possibility that the supermarket changes location or a competitor opens elsewhere in the Activity Centre, this appears to be the most valued location for parking.
- Parking occupancy is consistently low at some sites, particularly CP02, CP03, CP09 and CP10, suggesting that some reduction in overall parking space provision across the town centre area may be manageable.
- Parking surveys do not cover on-street locations. Demand for on-street parking spaces in town centres is generally than off street locations due to convenience, and as such this may mean that survey results somewhat under-represent true demand for parking.

4.3.4 Impacts of parking facilities on public realm quality

Parking provision in the activity centre is having a significant negative impact on the quality of the public realm. Excessive space is devoted to surface parking in areas with very high public transport accessibility and high levels of pedestrian and commercial activity. This contributes to a disjointed main street environment that is disconnected from the surrounding residential catchment.

The aisle of parking behind the established shop on the southern side of Centre Road (between Jasper Road and the railway line) forms somewhat of a barrier to the adjoining residential area, contributing to reduced

visual amenity for pedestrian connections between the main street precinct and their residential catchments, as shown in Figure 4-7.

Figure 4-7: Aisle of parking behind shops south of Centre Road



The expanse of parking to the north of Centre Road, however, has a much greater negative impact on the public realm, as shown in Figure 4-8. The space allocated to parking is disproportionate to the size of the public space available on Centre Road, and significantly reduces the potential residential catchment within a walkable distance to local retail, restaurants and public transport. Additionally, the large carpark dominated environs lack quality shaded footpath links, 'eyes on the street' and visual variation, further reducing the safety and appeal of active travel.

Figure 4-8: Large expanse of surface parking north of Centre Road



The impact of these parking facilities is at odds with several aspects of Council's Building Transition Plan Background Report for Bentleigh, in particular:

- Policy Direction, Transport: "Due to broader catchment, driving to the centre is required, however aim for majority of visits to be accessible by public transport, foot or bike.
- Objective, Placemaking: Support a network of active streets and shared community and open spaces
- Objective, Placemaking: Support safe, accessible and friendly streets
- Objective, Transport: Encourage walking, cycling and use of public transport
- Objective, Transport: Explore innovative approaches to car parking and traffic management.

4.3.5 Providing for future parking needs

Non-Residential Parking

Quantifying future parking needs is somewhat difficult as it requires balancing various factors including demand, ability to provide supply, support for pricing and management mechanisms, and broader transport, movement, urban form and character considerations.

It will be necessary to maintain an appropriate level of parking supply in Bentleigh to support accessibility for people who genuinely rely on travel by private vehicle, however more broadly, parking policy should be treated as a tool that must support the urban form, sustainable transport and public realm visions for the precinct.

The Glen Eira Economic Analysis and Forecasting Study¹² suggests there are several opportunities for retail growth in the Bentleigh Activity Centre:

- Coles supermarket site: ~800m² additional GFA
- Woolworths supermarket site: 1,500m² additional GFA (assumed)
- Car wash site corner Centre and Jasper Roads: 1,000 m² GFA (assumed)
- 1 Nicholson Street corner of Centre Road: 1,000 m² GFA (assumed)
- 9-17 Nicholson Street: 2,000 m² GFA (assumed)
- Bentleigh Post Office site: 800 m² GFA (assumed).
- **Total:** ~7,100 m² GFA

Adopting the above 7,100m² GFA as an approximation of the Activity Centre's capacity to support additional retail floor space in the future provides a basis to estimate the potential increase in future parking supply required. Table 4-9 below provides an assessment of potential future non-residential parking needs based on Council's Cl. 52.06 parking rates, and maximum parking rates outlined in Complete Streets and the TOD Guidelines.

Table 4-9: Potential additional future non-residential parking needs

Site	Potential Increase in GFA (m ²)	Corresponding Land Use (Cl. 52.06)	Parking Rate			Parking Supply		
			Council Cl. 52.06	Complete Streets	TOD Guidelines	Cl. 52.06	Complete Streets	TOD Guidelines
Coles supermarket site	800	Supermarket	Minimum 5 spaces / 100 m ²	Maximum 1 space / 100 m ²	Maximum 1 space / 200 m ²	40	8	4
Woolworths supermarket site	1,500	Supermarket				75	15	8

¹² Add full reference

Site	Potential Increase in GFA (m²)	Corresponding Land Use (Cl. 52.06)	Parking Rate			Parking Supply		
			Council Cl. 52.06	Complete Streets	TOD Guidelines	Cl. 52.06	Complete Streets	TOD Guidelines
Car wash site	1,000	Restaurant/Shop	Minimum 3.5 spaces / 100 m²			35	10	5
1 Nicholson Street	1,000	Restaurant/Shop				35	10	5
9-17 Nicholson Street	2,000	Restaurant/Shop				70	20	10
Bentleigh Post Office site	800	Restaurant/Shop				28	8	4
Total						283 (min)	71 (max)	36 (max)

Combining data from Table 4-6 and Table 4-9 provides an overview of the total future parking needs compared to existing supply based on the three approaches to parking provision.

Table 4-10: Potential total future parking needs

	Cl. 52.06	Complete Streets	TOD Guidelines
Existing Parking Requirement	1,322 (minimum)	354 (maximum)	177 (maximum)
Additional Future Parking Needs	283 (minimum)	71 (max)	36 (max)
Total Future Parking Needs	1,605	425	213
Existing Parking Supply	1,301		

Table 4-10 clearly highlights the disparity between existing parking provision regulations and best practice approaches to parking supply in Activity Centres.

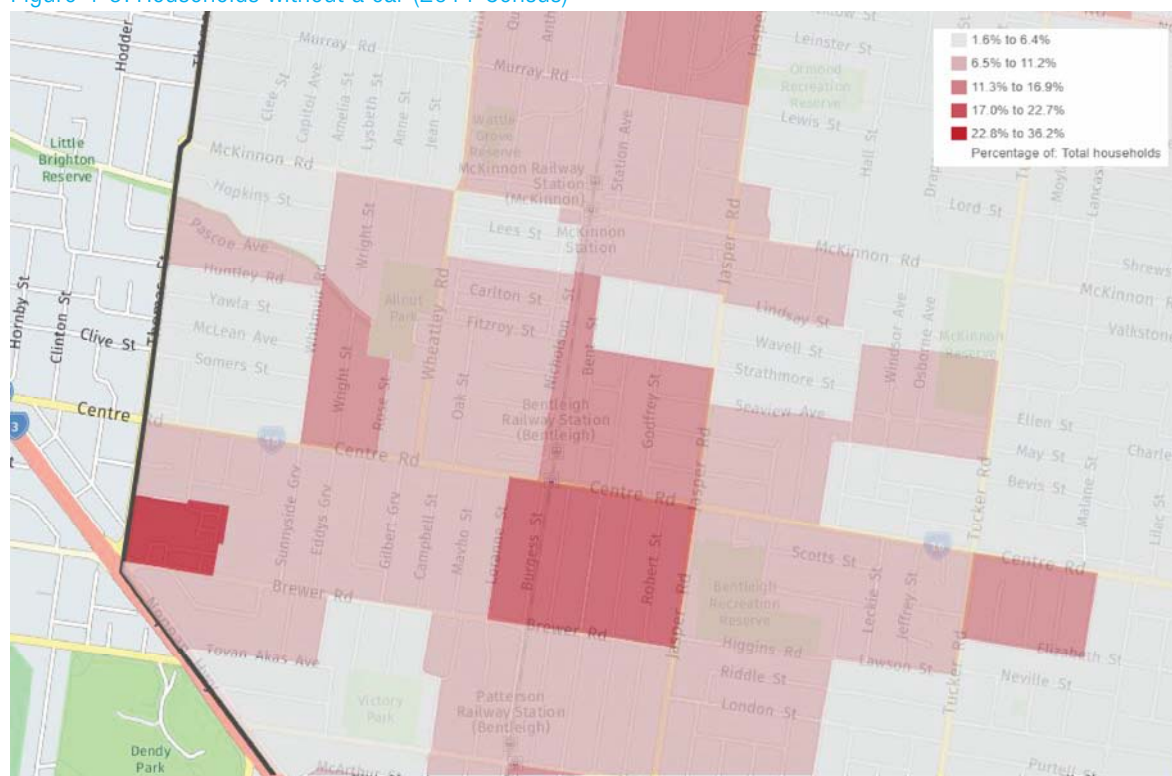
Reconciling this with observations that existing parking supply is generally well utilised requires consideration of the policy intent behind these differing rates of parking provision. Minimum parking rates such as Council's Cl. 52.06 rates are designed to provide parking supply that matches demand, essentially ensuring parking does not become a scarce resource. This however removes a potential signal to encourage people to alter parking behaviour and travel choices. The unintended consequence of this is that the extent of parking supplied in adherence to minimum parking rates significantly detracts from the vibrancy and quality of the public realm, and excessive space allocated to parking can crowd out the potential for greater active travel participation.

Conversely, maximum parking rates such as those adopted within Complete Streets and the TOD Guidelines do not necessarily seek to fully cater to unmanaged parking demand, but rather seek to provide an appropriate level of parking that is congruent with desired outcomes for walkability, active travel, mode share and footpath activity. A suite of demand management initiatives such as priced parking, car share schemes, unbundled parking, and shared parking are generally employed to manage demand in conjunction with the adoption of maximum parking rates.

Residential Parking

Recent Census data (2016) shows that 8.2% of households in Bentleigh do not own a car, compared to 8.9% across the whole of Glen Eira and 8.5% across Greater Melbourne. However, review of available 2011 Census data mapping for Bentleigh shows car-free households are notably more prevalent in the activity centre precinct, as shown in Figure 4-9, with the proportion of car-free households reaching 20% in some areas. This suggests there is an appreciable appetite for housing options without bundled parking (and the associated cost) within activity centre precinct given the available services, PT provision, social infrastructure and retail activity.

Figure 4-9: Households without a car (2011 Census)



Source: atlas.id

The Glen Eira Planning Scheme requires a minimum of 1 spaces for every dwelling/unit, even where an overlay applies. As intensification and redevelopment of the activity centre occurs, there is likely to be some demand for car-free housing options. Planning policy that does not cater to this demand will impose unnecessary costs on housing provision and may encourage higher car ownership and usage.

4.4 Assessment: intensification of development around rapid transit

4.4.1 Recent development trends

Recent infill development in the Activity Centre can generally be characterised as small-medium scale, medium-high density development. Planning approval data presented by id Consulting¹³ from 2006-2016 shows new permits are generally clustered around Bentleigh Railway Station, with yields of between 10 and 40 dwellings. Between 28 August 2013 and 8 June 2017, 24 planning permits were issued for buildings of 3 or more storeys in the Bentleigh Activity Centre, as outlined in Figure 4-10 below, including a number that are now under construction. Most approvals relate to buildings of 3-4 levels, and some of these permits relate to multiple blocks.

Figure 4-11 provides an example of a recently completed multi-unit dwelling near Bentleigh Rail Station that is representative of new development in the activity centre.

¹³ Id Consulting (2017), *Analysis of housing consumption and opportunities*.

Figure 4-10: Planning permits (3 or more storeys) from 23/08/2013 to 08/06/2017

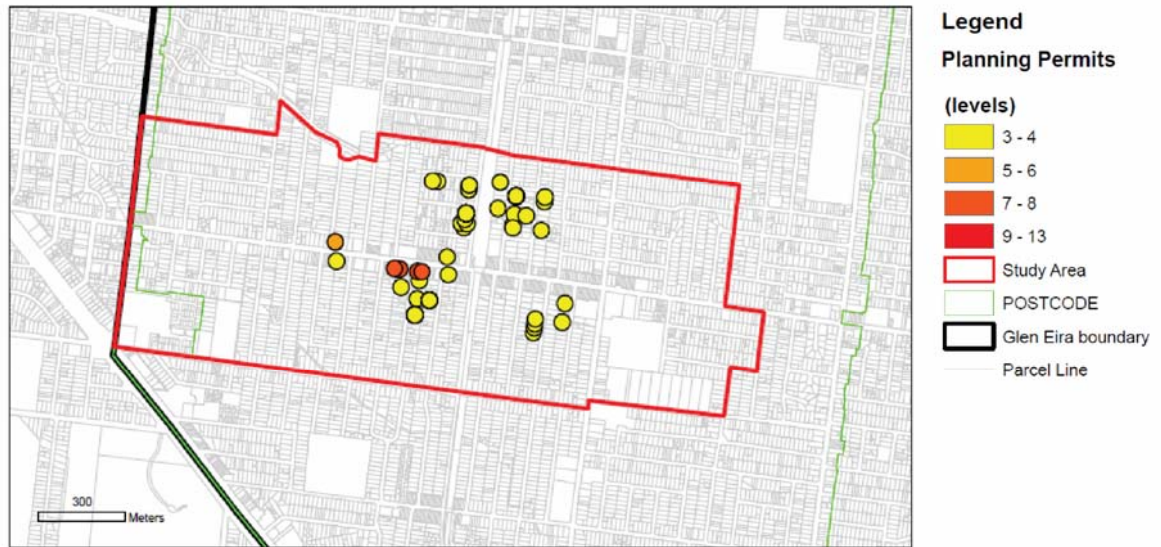


Figure 4-11: Multi-unit dwelling representative of recent development adjacent to Bentleigh Rail Station



Further infill development within the Bentleigh activity centre, and particularly within walkable distances from quality public transport, will be beneficial in terms of fostering main street activity and capitalising on investment in public transport improvements.

A 2006 study¹⁴ by Newman and Kenworthy provides some context to inform an assessment of activity density within Bentleigh, and to what extent further infill development is required in order to realise Council's and the community's vision for the precinct. The study reviews the relationship between population density, job density and motor vehicle use in various Australian and international cities, and concludes that there is a fundamental threshold density of approximately 35 persons per hectare plus 35 jobs per hectare where motor vehicle dependence is significantly reduced. That is, once this threshold urban intensity is reached, viable public transport and diversity of land uses within a walkable distance tend to result in reduced car use in urban areas. This is an instructive minimum benchmark that should inform plans for the intensification of the Bentleigh Activity Centre.

Table 4-11 outlines the existing population and job density within a walkable distance to quality public transport in the Bentleigh Activity Centre. The data highlights that while population density is approaching requisite levels to support local activity and a reduction in car dependency, employment density is significantly lagging. The substantial drop in population density with a 5-minute walkable catchment in comparison to a 10-minute catchment is also of concern, and suggests some additional main street shop top housing options would be welcome, as well as some infill development of existing surface car parking sites.

Table 4-11: Population and employment density within walkable catchment of transit stops – Bentleigh

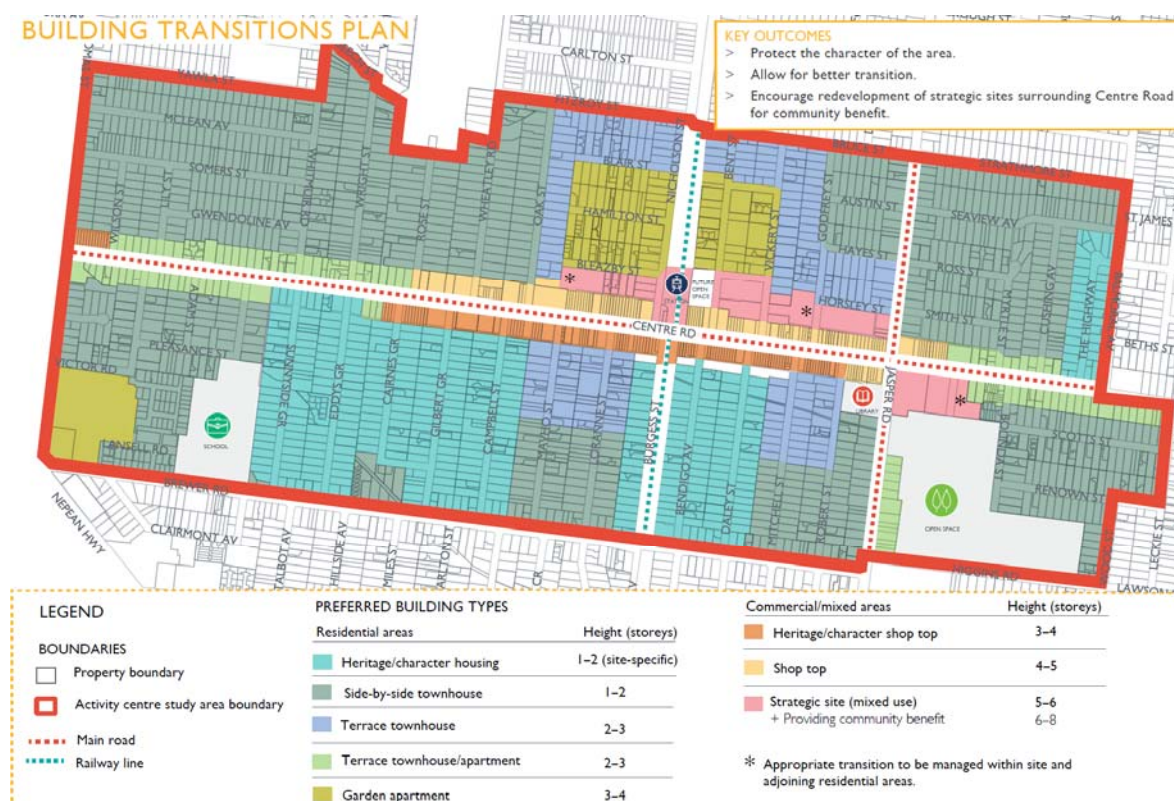
Catchment	Walk Time	Jobs # (% of total activity centre)	Population # (% of total activity centre)	Area (sqm)	Population Density (person / Ha)	Job Density (jobs / Ha)
Bentleigh Rail Station	5 min	349 (19%)	408 (7%)	161,571	25	22
Bentleigh Rail Station	10 min	1,185 (65%)	2,307 (38%)	726,910	32	16
Bentleigh Activity Centre Area (as defined by Glen Eira City Council)	-	1,813 (100%)	6,080 (100%)	1,723,146	35	11

4.4.2 Future development trends

Council's draft Building Transition Plan shown in Figure 4-12 outlines desired future building forms, and identifies key strategic sites for development. The plan identifies the existing Woolworths site (and adjoining blocks) on the corner of Centre Road and Jasper Road, the expanse of surface parking north of Centre Road, and the space above the rail corridor immediately north of the station as key strategic sites for development. The Glen Eira Economic Analysis and Forecasting Study also identifies the Woolworths as a key opportunity for development, provided quality pedestrian linkages can be provided on and across Jasper Road.

¹⁴ Peter Newman and Jeffrey Kenworthy (2006) "Urban Design to Reduce Automobile Dependence", *Opolis: An International Journal of Suburban and Metropolitan Studies*: Vol. 2: No. 1, Article 3.

Figure 4-12: Draft Building Transitions Plan



4.5 Assessment: ensuring cycling plays its role

4.5.1 Recent trends in cycling activity

Cycling is a minority mode of transport to access Bentleigh, despite the flat topography and an orthogonal street pattern of the centre and its surrounding suburbs, which is conducive to cycling. Most people accessing the town centre by car and on foot. The low cycling activity is demonstrated by a number of surveys.

The recent Shopping Strip Survey¹⁵ of Glen Eira residents indicated that around 11% of people access Bentleigh by cycling or using public transport. The results did not distinguish between these two modes. This figure is reiterated by the results of the car park survey of Bentleigh¹⁶ show that around half (52%) of people who drive to the town centre reside in surrounding suburbs which are within easy cycling distance of the Centre Road retail strip and train station.

As a proportion of Bentleigh train station users, people who cycle are a very small minority of around 1%¹⁷. This is similar to most other Melbourne stations that have similar levels of patronage (with between 500,000 and 1.5 million annual boardings for 2013-2014), and also similar to stations within Glen Eira. Most Melbourne stations have a cycle access mode share of 2% or below. 14 stations have numbers above 2%, including Patterson within Glen Eira at around 4%.

Super Tuesday cycle counts sites in and around activity centre also show low numbers of cyclists when compared with the busiest sites in Glen Eira. At the site at the corner of Centre Road and Jasper Road 47

¹⁵ Shopping Strip Survey (2017) Glen Eira City Council.

¹⁶ BWEC (2017) *Glen Eira Economic Analysis and Forecasting Study*. Melbourne: Glen Eira City Council.

¹⁷ Public Transport Victoria Train Station Patronage fact sheet. Available at: <https://www.ptv.vic.gov.au/about-ptv/ptv-data-and-reports/research-and-statistics/>. Accessed 27 July 2017.

cyclists were counted over the two-hour morning peak in the 2016 survey. Two nearby sites recorded 108 and 40 cyclists respectively, while over 200 were counted at the busiest sites in the north west of the municipality.

4.5.2 Current state of cycling facilities

Cycling facilities in Bentleigh are limited, with most facilities not meeting best practice standards to facilitate all ages and abilities cycling for transport. There are three lengths of shared paths through open space and rail corridors which allow connections for people on bicycles in a low stress environment. The most significant route is the Elster Creek Trail which connects Bentleigh with the wider cycling infrastructure network as well as suburbs and destinations to the west. The other two shared paths run north-south, providing useful shortcuts away from the street network, though they have limited network function. The existing cycling infrastructure network is summarised in Figure 4-13.

Figure 4-13: Existing cycling infrastructure network



4.5.3 Providing for future cycling needs

The planned increase in residential density along Centre Road could lead to increased demand for cycling trips around and to/from Bentleigh, especially if other planning and design measures are taken to encourage reduced car dependence. Key destinations for cyclists include the train station, the retail strip including anchor stores such as the supermarkets and local schools.

4.6 Assessment: working toward vision zero road deaths and serious injuries

4.6.1 Recent trends in road crashes

A total of 70 road crashes were recorded within the Bentleigh study area between 2012 and 2017, causing a total of 18 deaths and serious injuries, as detailed in Table 4-12. Of the deaths and serious injuries 7 were pedestrians and 11 were motor vehicle occupants.

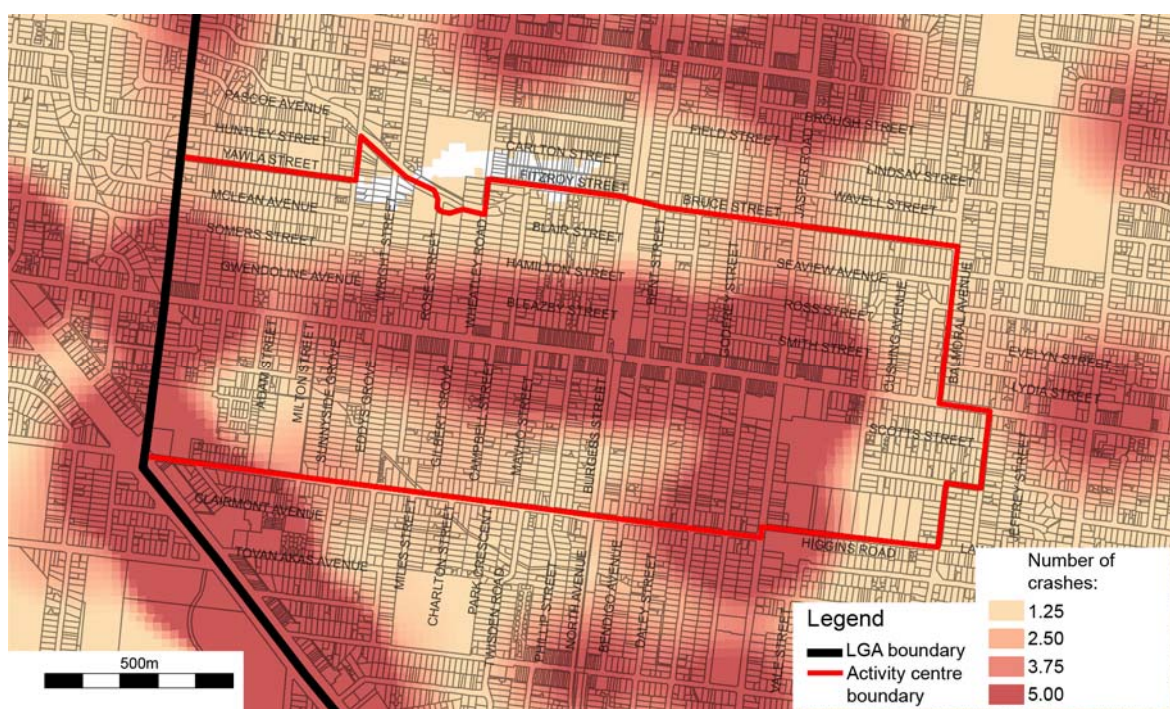
Table 4-12: Summary of crashes in Bentleigh 2012-2017 by street user type

Street users type	Number of crashes	Number of people killed or seriously injured
Pedestrian	19	7
Cyclist	4	0
Motor vehicle occupant	47	11
Total	70	18

Source: VicRoads CrashStats

Crashes causing injury and fatalities in the study area are clustered along Centre Road, Nepean Highway and Jasper Road, where traffic volumes for all modes are highest, particularly at intersections (refer Figure 4-14). Centre Road's 85th percentile traffic speed does not exceed the speed limit at 45km/h in a 50km/h zone¹⁸, however more detailed analysis would be required to establish whether speed is an important factor in crashes locally.

Figure 4-14: Heat map of crashes causing injury and death (all street users) in Bentleigh, 2012-2017

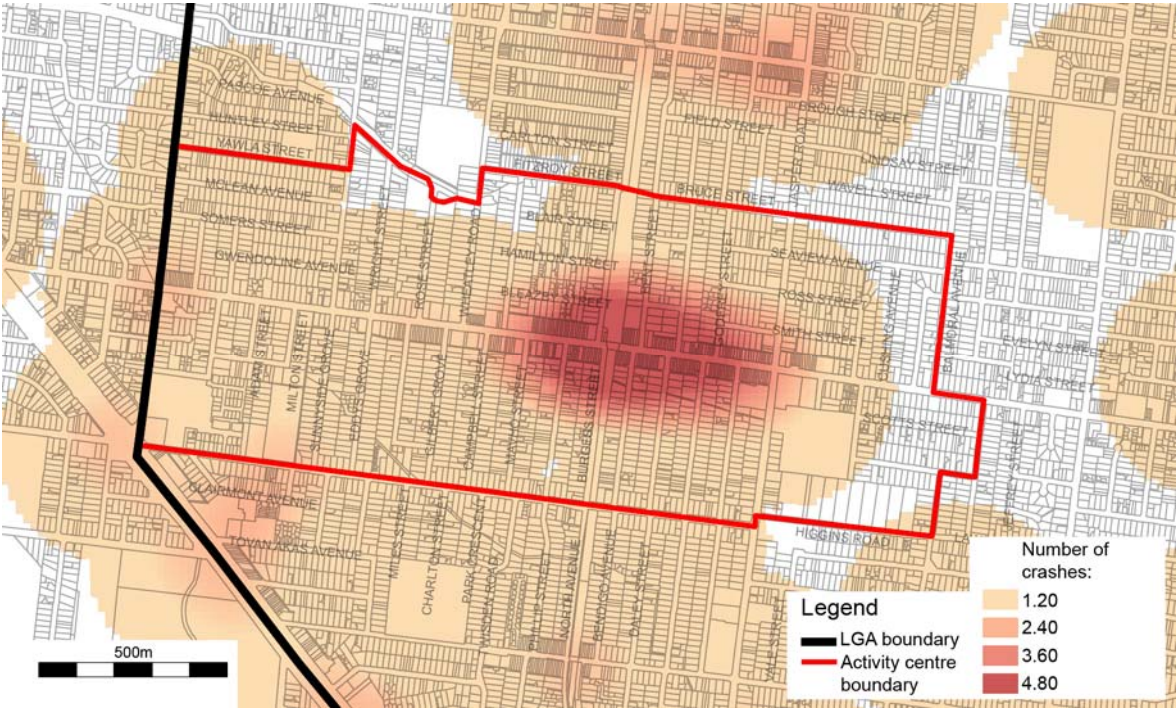


Source: VicRoads CrashStats

Crashes involving pedestrians are clustered along Centre Road around the train station (refer Figure 4-15).

¹⁸ Glen Eira City Council (2014) Vehicle Volumes database.

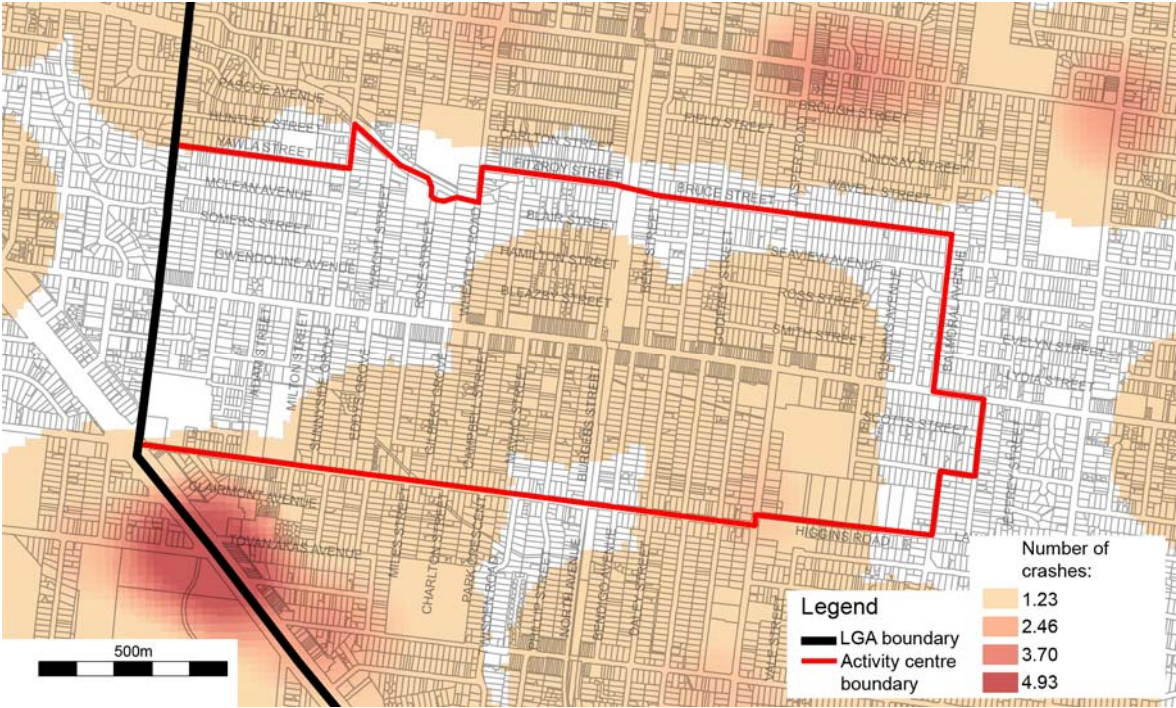
Figure 4-15: Heat map of number of pedestrians involved in crashes causing fatalities or serious injuries in Bentleigh, 2012-2017



Source: VicRoads CrashStats

Cycle-related crashes are more common along Nepean Highway immediately south of the study area (refer Figure 4-16).

Figure 4-16: Heat map of number of cyclists involved in crashes causing fatalities or serious injuries in Bentleigh, 2012-2017



Source: VicRoads CrashStats

4.6.2 Current safety of the street network

Speed limits on Bentleigh's streets are mostly 50km/h regardless of the street function. The exception is Centre Road within the activity centre, which has a 40km/h speed limit between 7:00 AM and 7:00 PM. High compliance rates of all posted speed limits are recorded, suggesting that changes to infrastructure design and reductions in speed limits may induce changes in driving behaviour¹⁹. The street network accommodates private vehicles, public transport and walking and cycling, although the balance of priority is tilted toward private vehicles. This is evident in various design parameters, including street geometry, signal phasing, streetscape design and the provision of parking. Public transport, walking and cycling is marginalised in places, diminishing safety for all street users and discouraging the use of alternative modes which have a low impact on their surroundings and contribute positively to public life.

4.6.3 Future road safety outcomes

Glen Eira City Council actively reviews and lowers speed limits on selected streets, which could lead to improvements in road safety. For example, the speed limit of Patterson Road in Bentleigh was reduced from 60 to 50km/h in 2016 and a further lowering to 40km/h in the Patterson shopping precinct is being consulted on in mid-2017. Ongoing improvements to road infrastructure including improved walking and cycling facilities may lead to improved road safety outcomes, particularly for vulnerable road-users.

4.7 Assessment: attractive congestion-free networks

4.7.1 Recent trends in public transport patronage

The Bentleigh Activity Centre is well serviced by public transport in the form of bus and train routes, as illustrated in Figure 4-17. Existing PT provision includes:

- Bentleigh Rail Station (Frankston Line)
- Bus Routes
 - 701 Bentleigh – Oakleigh
 - 703 Middle Brighton - Blackburn via Bentleigh, Clayton, Monash University (SmartBus)
 - 979 Elsternwick – Dandenong via Bentleigh (Night Bus)

¹⁹ Glen Eira City Council (2017) Vehicle Volumes database.

Figure 4-17: Existing PT services in Glen Eira



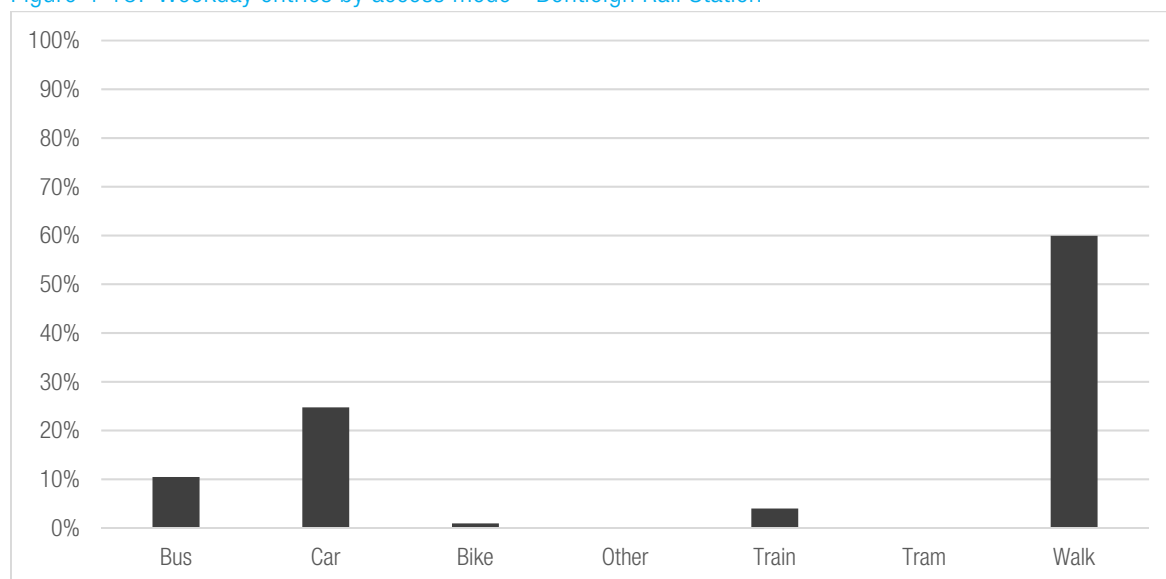
Patronage data for rail stations in Glen Eira is provided in Table 4-13 below. Patronage at Bentleigh Station is strong, however there has been a slight downward trend in patronage between 2010-2014. Council should continue to monitor patronage data to assess the impact of recently completed upgrades of the station as part of the State Government's level crossing removal project.

Table 4-13: Annual train patronage (millions) by financial year

Station	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Bentleigh	0.990	1.029	1.006	0.898	N/A	0.785
Carnegie	0.831	0.860	0.894	0.829	N/A	0.951
Elsternwick	1.008	1.047	1.069	1.004	N/A	1.075

Public Transport Victoria conducted passenger behaviour surveys in 2013-14 determining how passengers access transit stops. Figure 4-18 below shows results of the survey for Bentleigh Train Station. The survey results indicate a high proportion (60%) of passengers arriving at Bentleigh Station do so by walking. It also shows that rail services are somewhat integrated with bus services running on Centre Road, with 10% of passengers arriving at the station through transfer from bus.

Figure 4-18: Weekday entries by access mode - Bentleigh Rail Station



Source: PTV Passenger Behaviour Survey, 2013-2014

In addition to feeding the rail service, bus services provide useful coverage to augment the rail service and provide east-west connections to key destinations such as Monash University. Patronage data for bus routes servicing the activity centre is shown in Table 4-14 below. The 701 service provides important coverage and accessibility, albeit with relatively low patronage, however patronage on the 703 service is strong.

Table 4-14: Metropolitan bus patronage – Financial year 2014 to 2015

Route Number	Route Name	Annual Patronage 2014 to 2015	Average Weekday 2014 to 2015	Average Saturday 2014 to 2015	Average Sunday 2014 to 2015
701	Oakleigh to Bentleigh via Mackie Road, Brady Road	156,386	536	167	148
703	Middle Brighton to Blackburn via Bentleigh, Clayton, Monash University (SmartBus Service)	2,248,222	7,631	3,090	1,844

4.7.2 Current state of public transport networks and facilities

Bentleigh Rail Station has recently undergone significant upgrades as part of the State Governments level crossing removal initiative. The new Bentleigh Station includes high quality facilities, bike storage, service information, toilets and upgraded Myki readers (see Figure 4-19).

Figure 4-19: Upgraded Bentleigh Rail Station



Bus stops along Centre Road are only of average quality and generally lack amenity, quality shelter and clear service information (see Figure 4-20). All bus services are however wheelchair accessible. Service frequencies are generally good, with SmartBus service 703 approaching 'timetable free' frequencies of 10-15 minutes throughout the day, although the 701 runs half-hourly.

Figure 4-20: Bus stop with poor amenity and lack of shelter (Centre Road, adjacent Campbell Street)



4.7.3 Providing for future public transport needs

Public transport in the activity will need to provide quality service consistent with Council's vision for increased local activity and vibrancy coupled with reduced car dependence as intensification of the activity centre occurs. Planned growth in the centre will require supporting public transport that may require improvements to bus and train service capacity and quality.

Metropolitan Train Load Standard Surveys are conducted once a year in May by Public Transport Victoria to measure passenger loads against benchmark standards of capacity. The survey helps identify times and locations where passenger loads exceed benchmark standards. The results are used to determine when and where extra services may be needed to reduce crowding. Results from 2016 are outlined in Figure 4-21 and Table 4-15 below. As shown below, AM peak train services are generally within passenger capacity ranges, however there is a notable proportion of passengers travelling on services below benchmark standards. This may have some discouraging effect on increased patronage growth in the future.

Figure 4-21: Number of AM Peak services below and above benchmark levels – Frankston Line

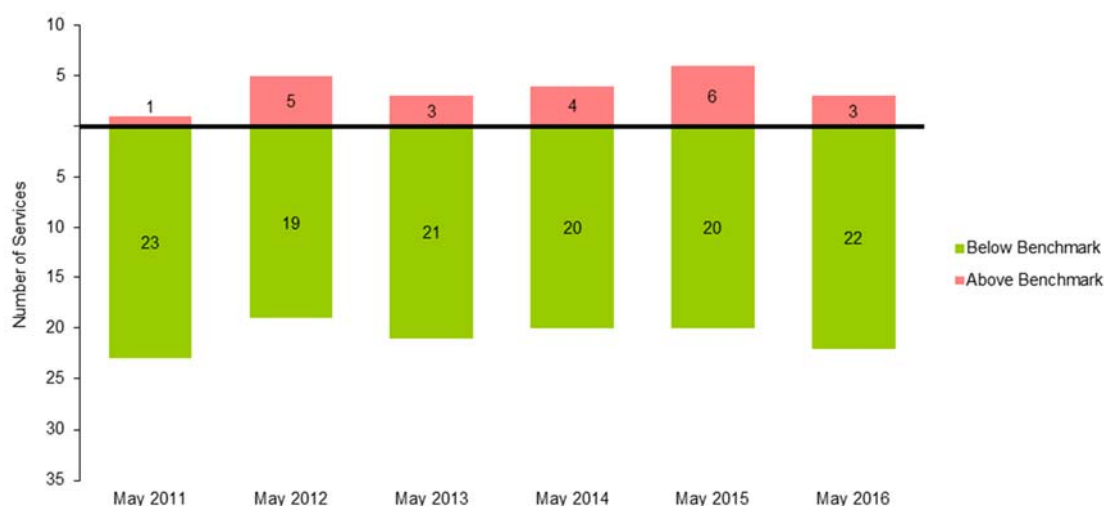


Table 4-15: AM Peak services above benchmark levels and percentage of passengers travelling on services above benchmark levels – Frankston Line

	May 2011	May 2012	May 2013	May 2014	May 2015	May 2016
Number of AM Peak services above benchmark	1	5	3	4	6	3
% of AM Peak services above benchmark	4.2%	20.8%	12.5%	16.7%	23.1%	12.0%
% of AM Peak passengers on services above benchmark	5.4%	25.9%	16.7%	21.6%	32.0%	17.4%

5 Key challenges and opportunities

The assessment in the previous chapter highlights several key challenges for working toward the six policy directions and opportunities to build off current successes. Table 5-1 summarises challenges and opportunities across the six policy directions that were used to structure the assessment in the previous chapter:

- Challenges notes factors that will make it difficult to achieve policy goals and that are realities that will need to be addressed in developing interventions that shift current trends
- Opportunities notes areas where relatively small-scale or low-cost interventions may result in significant change or where Bentleigh can build off existing good conditions.

These challenges and opportunities are used to develop a series of recommended interventions in the following chapter.

Table 5-1: Key challenges and opportunities for the transport sector, Bentleigh Activity Centre

Policy direction	Key challenges	Key opportunities
<i>Put walkability first</i>	<p>Long trip distances to major employment centres results in limited use of walking for commuting trips.</p> <p>Presence of some major barriers that reduce the connectivity of the walking network; Nepean highway and Frankston rail line.</p> <p>High existing use of cars for short, local trips may mean encouraging behaviour change toward increased walking may be challenging.</p>	<p>High levels of existing walking to the activity centre for accessing shops and rail station (40-60% mode share).</p> <p>Intensification of population and employment will provide a greater diversity of local services for more people, make walking a more viable choice.</p> <p>Consistent and connected street grid means good network connectivity for walking.</p>
<i>Manage parking for town centre vitality and to support mode shift</i>	<p>Managing increased demand for parking accompanying residential and commercial development and population growth.</p> <p>Making trade-offs between kerbside space for parking and other uses such as cycling lanes, PT priority and extended footpaths.</p> <p>Ensuring parking is not 'over-supplied' through application of minimum parking regulations accompanying new development, or through over-supply of public off-street parking facilities.</p> <p>Managing community expectations about parking availability, given current relatively high levels of parking provision.</p>	<p>Potential to consolidate parking supply at Council-owned with multi-story parking buildings.</p> <p>Potential to reduce council land devoted to off-street parking.</p> <p>Potential to reduce parking demand through increasing use of walking, cycling and PT.</p> <p>Potential to use new parking management tools such as pricing to manage demand.</p>
<i>Intensify development around rapid transit</i>	<p>Ensuring intensification is accompanied by improvements to local amenity and is not accompanied by congestion on local transport networks.</p> <p>Encouraging increased job density alongside residential population density.</p>	<p>High market demand for residential development around rapid transit reflected in recent concentration of development around Bentleigh activity centre.</p> <p>Council-owned land adjacent to high quality public transport presents opportunities for strategic Council-led intensification.</p>

Policy direction	Key challenges	Key opportunities
<i>Ensure cycling plays its role</i>	<p>Limited provision of a connected, safe cycling network limits uptake of cycling to a niche user group.</p> <p>Low levels of cycling, relative to top-performing Melbourne areas.</p> <p>Reallocation of kerbside space for improved cycling facilities will require trade-offs with provision of on-street parking and other potential uses such as extended footpaths.</p>	<p>Low existing cycle mode share means major opportunities for growth.</p> <p>Flat terrain supports increased cycling uptake.</p> <p>Reasonably high levels of activity density means a diversity of destinations are available with short trips, well-suited to cycling.</p> <p>Provision of high quality infrastructure can lead to major increases in cycling demand.</p>
<i>Work toward 'vision zero' road deaths and serious injuries</i>	<p>Reducing road crash deaths and serious injuries, particularly on Centre Road.</p> <p>Lowering speed limits will require trade-offs with other goals for high speed vehicle movement.</p>	<p>Walking and cycling facility upgrades can improve safety.</p>
<i>Plan for attractive congestion-free networks rather than reducing congestion</i>	<p>Major mode shift to public transport depends on the quality and connectivity of broader metropolitan-scale networks.</p> <p>Increasing demands on metropolitan rail network may lead to future overcrowding reducing the appeal of rail.</p>	<p>Opportunities for increasing frequencies and bus priority on key bus routes.</p>

6 Potential interventions

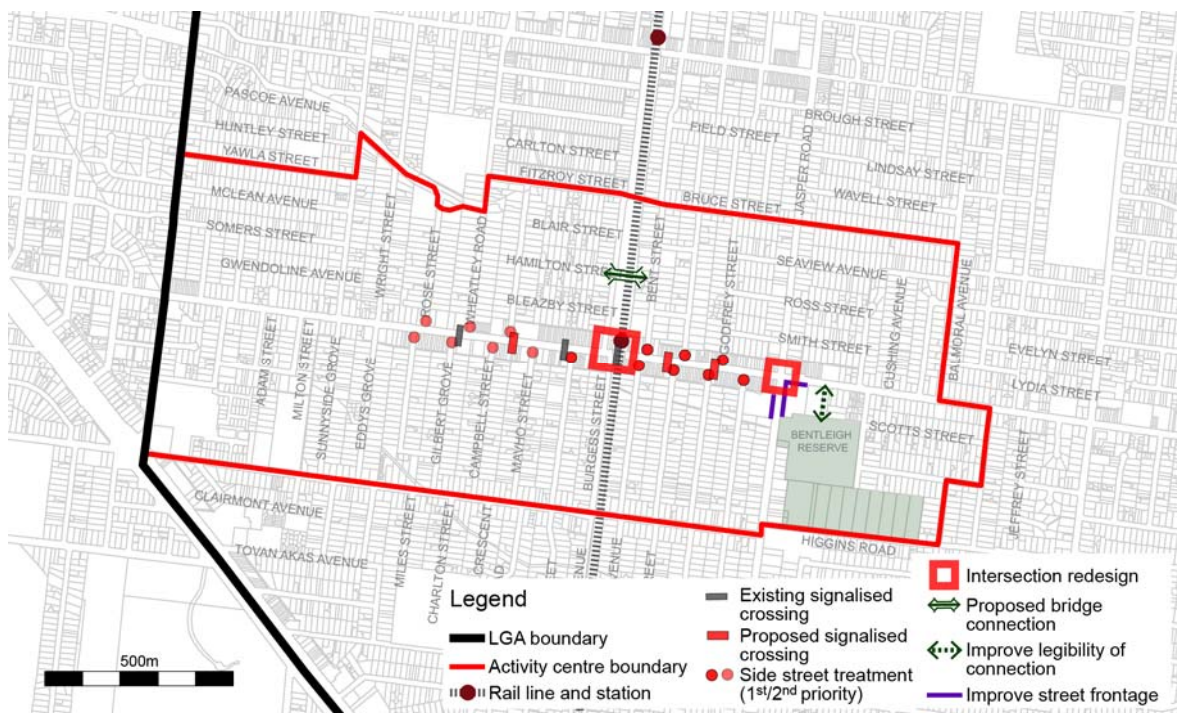
This section addresses the key challenges and opportunities identified in the previous section by proposing a set of potential interventions that address deficiencies and respond to opportunities accompanying planned growth in the activity centre.

6.1 Potential interventions: putting walkability first

Improving conditions for walking is central to the liveability and functioning of Bentleigh, particularly in the context of demographic and land use change. The requirement to complete at least part of every journey on foot and the vulnerability of pedestrians in the street environment mean that walking should maintain the highest position when prioritising modes. A safe, convenient, comfortable and attractive walking environment results in improved safety for all street users. With appropriate network and street design, it will also result in improved levels of service for cycling and public transport and a reduction in car use and dependence locally.

Interventions in Bentleigh focus on improving pedestrian safety and connectivity through pedestrian rail line overbridge, side street treatments, new pedestrian crossings and improved street frontages and legibility. Potential interventions are summarised in Figure 6-1.

Figure 6-1: Potential walking interventions, Bentleigh activity centre



A new pedestrian overbridge to the north of the station should be considered linking Hamilton and Bent Streets. This should allow universal access and be integrated with the planned urban renewal development to provide an additional east-west pedestrian connection and divide the elongated blocks north of Centre Road. This link could provide a second point of platform access.

Side street treatments should be implemented at most intersections along Centre Road and comprise the following:

- Raised tables which allow pedestrians to cross flush with kerb level.
- Zebra crossings to communicate pedestrian right-of-way.

- Reduced turning radii to minimise the crossing distance for pedestrians and lower turning vehicle speeds.
- Continuity of footpath materials to indicate a continuous path of travel for pedestrians.

New signalised pedestrian crossings should be introduced in three locations along Centre Road to reduce the spacing of crossing opportunities along the retail strip. The potential locations identified will serve the increased pedestrian traffic resulting from intensified residential development in this part of Bentleigh. Additionally, more frequent crossings may result in lower traffic speeds.

To the east of the study area, opportunities exist to make changes to streetscape and site design which would benefit walkability. The Woolworths supermarket site and Bentleigh Library have poor street frontages due to the building facades being recessed behind large surface car parks. While the Woolworths site has been identified as a strategic site for redevelopment, the Library will require a specific design intervention to improve its address to the street. To the east of the junction of Centre Road and Jasper Road, an improved connection through to Bentleigh Hodgson Reserve would improve legibility for pedestrians and encourage access to the public open space and its associated facilities.

6.2 Potential interventions: managing car parking

The assessment of current approaches to parking management in the Bentleigh activity centre (see Section 4.3) found that the centre is potentially over-supplied with parking, relative to guidance on appropriate parking supply levels for locations with high levels of public transport accessibility. This may contribute to increased car use, local congestion and negative impacts on pedestrian and public realm amenity. Reforms to parking management in the centre present opportunities to contribute to multiple transport and urban development goals for Glen Eira.

There are opportunities for reforms to:

- Provision of off-street, Council-owned parking
- Provision of on-street parking
- Management regimes for both on- and off-street parking
- Planning regulations for parking provision.

Off-street parking

Glen Eira City Council have identified a number of opportunities for re-purposing and consolidating existing off-street surface parking areas owned and managed by the Council (see Table 6-1).

Table 6-1: Opportunities identified for repurposing of Council-owned off-street carparks, Bentleigh activity centre

Carpark	Opportunity identified by Council for redevelopment
Bleazby Street	Multi-story carpark (3-4 levels)
Horsley Street	Multi-story carpark (3-4 levels)
Vickery Street	Mixed use building
Bent Street	Public green space and Sunday market site

Consolidating current surface parking into a more limited number of multi-story carparking buildings will provide a more efficient use of land at locations with high value for alternative uses. In considering redevelopment of surface carparking lots, we note the following:

- Multi-storey parking buildings do not always provide the same functionality as surface lots. Multi-story buildings can introduce additional barriers to potential users (e.g. increased time to find a space) and are

likely to be more useful for long-stay rather than short-stay parking. This may reduce demands for parking relative to existing surface lots.

- Ahead of development of multi-story parking buildings or other replacement uses, Council should improve its understanding of the current use of existing parking facilities. Replacement of parking spaces on a like-for-like basis may not be required, depending on occupancy of current facilities and the future use of management tools such as pricing that may reduce parking demands. Benchmarking of parking supply at Bentleigh against best-practice guidelines (see Section 4.3.1) suggests parking supply may be significantly higher than levels that are appropriate in locations such as Bentleigh with high levels of public transport accessibility. Review of occupancy data further suggests that like-for-like replacement of parking spaces would be unnecessary and probably inappropriate.
- New multi-storey parking buildings should be designed and managed for the widest possible range of uses, including integration with new residential development sites. These car parking buildings should be treated as 'shared' public parking facilities that enable efficiencies in parking supply by providing for complementary demands (e.g. shopping during the day and residents at night).

Review of occupancy data suggests that parking is generally oversupplied in Bentleigh, with some facilities particularly underutilised. Such underutilised car parks, particularly the CP02, CP03, CP09 and CP10 survey areas, should be considered priority sites to redevelop on the basis of their minimal existing utility.

Conversely, more well utilised parking areas such as CP04 and CP05, are suitable locations for consolidated parking facilities. This recommendation should however not necessarily override broader urban design considerations, and it is essential that such facilities are well integrated into urban form of the Activity Centre as much as possible.

On the basis of the above, the following recommendations are provided with respect to Council's identified opportunities for car park re-purposing:

- Bleazby Street – Mixed Use Building: Current parking demand in this area is low, suggesting the current facility is of little utility, there is minimal demand for parking in this area, and that this space may be better utilised for other purposes.
- Horsley Street – Multi-storey car park: Parking occupancy suggests a preference to park in this vicinity, suggesting this a logical area to locate consolidated parking
- Vickery Street – Multi-storey car park: Parking occupancy suggests a preference to park in this vicinity, suggesting this a logical area to locate consolidated parking
- Bent Street – Mixed Use Building: Current parking demand in this area is low, suggesting the current facility is of little utility, there is minimal demand for parking in this area, and that this space may be better utilised for other purposes. This site also represents a key opportunity for infill development adjacent to the rail station.

On-street parking

Opportunities for provision of on-street parking are generally fully exploited within the Bentleigh activity centre. While on-street parking provides valuable access to shops within the centre, parking demand management may enable on-street parking at some locations to be re-purposed for expanded footpaths or cycling facilities.

The most substantial potential for re-purposing existing on-street, kerbside parking with the Bentleigh activity centre is on Centre Road where pedestrian and on-street dining activity is highest and where a section of the 'Principal Bicycle Network' has been designated by VicRoads:

- **Re-purposing on-street parking for cycling facilities:** Centre Road is designated as a Principal Bicycle Network Corridor (an important, but secondary corridor to 'Strategic Cycling Corridors'), providing an east-west connection within a grid of major cycling facilities. As discussed in Section 6.4 below, the preferred treatment for a cycling facility on this road with high traffic volumes would be a separated

cycle lane. This would require re-purposing existing on-street parking on at least one side of Centre Road.

Such a treatment and replacement of on-street parking facilities may be appropriate on Centre road on sections outside of the town centre proper (i.e. to the east of Jasper Road and to the west of Cairnes Grove/ Rose Street). In these locations on-street parking demands are lower than in the town centre and there are few existing kerb built outs or street trees within the on-street parking lane, meaning relatively simple implementation of on-street cycle facilities.

However, within the town centre proper, re-purposing of existing on-street parking for a separated cycle lane is likely to be complex to implement and involve significant trade-offs with recently implemented street tree planting and kerb built outs that improve pedestrian amenity. The street width is insufficient to allow for both existing kerb built outs and a separated cycle lane, even on only one side of the road. We recommend that on-street parking is not repurposed for this use and that alternative cycle facility treatments are considered for this road section (e.g. shared cycle traffic road with a low speed limit of 30km/h and other traffic calming devices).

- **Re-purposing on-street parking for expanded footpaths:** Centre Road is the main retail strip within the Benteigh activity centre. While existing footpaths are of comfortably adequate width, there may be opportunities for selected 'parklet' – type treatments involving re-purposing on-street parking space to expanded footpath/ alfresco dining space. While some restaurant tenancies may benefit from some additional footpath space for alfresco dining, there is generally insufficient footpath activity to warrant widespread adoption of such treatments along Centre Road. As intensification and infill development occurs, demand for parklet treatments will begin to increase, which should be supported by Council. However, these treatments should respond to increases in activity and demand for space, rather than being pursued as a catalyst to promote more footpath activity, as there is a risk that the creation of more underutilised footpath only further hinders the cultivation of a vibrant and authentic main street atmosphere.

Parking management

Aside from reforms to off-street and on-street parking supply, there is also potential for changes to the parking management regime to better support policy objectives. On- and off-street parking in the activity centre is currently managed using:

- Time restrictions (e.g. 1P and 2P restrictions)
- Reserved parking (e.g. reserving spaces for particular users such as loading zones, people with disabilities, local residents)
- Accompanying enforcement by council officers of these restrictions.

The major opportunities for reforming the parking management regime at Benteigh activity centre are:

- **Increased enforcement activity.** If compliance rates are found to be low, additional enforcement can increase parking turnover and ensure that reserved spaces are being used by intended high-value users.
- **Changes to time restrictions.** Parking occupancy data suggests there may be opportunities to extend time restrictions to increase flexibility in the use of parking spaces in some locations. Parking areas CP02, CP03, CP09 and CP10 are locations where relaxing time restrictions from 2P to 3P or 4P should be considered. On street parking occupancy data is not available, however it would be expected that on-street spaces would be more utilised than off-street spaces. It is therefore suggested that current 1P restrictions should generally be maintained, however the possibility of introducing some shorter stay (e.g. 30 min) on-street spaces should be reviewed in conjunction with on-street occupancy data, when available.

- **Introduction of pricing.** Current parking occupancy suggests that the introduction of priced parking is generally not warranted in Bentleigh. While Saturday parking occupancy appears to exceed the warrants for increased parking management, the prevailing weekday parking demand does not, suggesting that the warrants for priced parking are not met for a sufficient proportion of a typical week. Priced parking should however be considered in the future, particularly in conjunction with any consolidated parking provision and repurposing of underutilised facilities.

Planning regulations for parking provision

Glen Eira City Council's Planning Scheme specifies minimum off-street, on-site parking requirements accompanying development of various types of land-uses. These rates are consistent with standard Victorian rates mandated by the State. However, at Bentleigh these rates may be having negative impacts on:

- Residential and commercial development activity – minimum parking rates can reduce development activity by enforcing a higher rate of parking provision than would otherwise be delivered by market actors in the absence of regulation. This can increase development costs and reduce the feasibility of residential or commercial development.
- Housing affordability – minimum parking rates can increase the cost of residential development, increasing the cost of housing.
- Transport behaviour – minimum parking rates can encourage higher car ownership and use.

At Bentleigh activity centre, a location with good public transport accessibility and local walking and cycling accessibility to a range of services there is an opportunity for the Council to develop a 'Parking Overlay' covering the activity centre areas that changes the standard State-mandated parking rates. The Parking Overlay may:

- Reduce minimum rates for all or specific types of land uses
- Introduce maximum rates for all or specific types of land uses
- Allow for special provisions such as cash in-lieu payments that allow developers to contribute to development of shared parking facilities rather than private on-site parking.

The accompanying *Re-thinking Parking* Discussion Paper provides further detail on opportunities for reforms to regulation of on-site parking provision.

6.3 Potential interventions: intensifying activity around rapid transit

The assessment of recent development activity (see Section 4.4) found that recent residential development in Bentleigh has been highly concentrated around the rail station. This is positive, as population growth is occurring in location with high levels of public transport accessibility to regional employment markets, and local walking and cycling accessibility to shops and services. This should assist in minimising additional vehicle transport demands accompanying growth. Analysis of activity density suggests the activity centre area is reaching benchmark levels of residential population density, although could benefit from increased employment density.

Interventions that can influence further intensification around Bentleigh rail station are most importantly land-use planning regulations that influence the bulk and form of potential development. However, transport-sector interventions that are the subject of this paper can indirectly encourage further concentration of growth around the activity centre. In particular:

- Improving walking access and public realm quality around Bentleigh rail station and particularly around key strategic development sites may contribute to increased development activity by ensuring a legible, safe and attractive town centre environment
- An effective public transport system, including fast trains with sufficient capacity can support intensification

- Appropriate parking management policy tools, including land-use planning regulations for on-site parking provision, can encourage further high-density development.

These type of interventions interact with other interventions considered in other sub-sections of this chapter.

Improved walkability and public realm

The Bentleigh Draft Concept Plan (Glen Eira City Council, July 2017) identifies major areas for intensification at the activity centre as:

- Existing Council carparks immediately to the north of the Centre Road retail strip – envisaged as mixed use buildings of 5-8 storeys
- Properties on the south-eastern corner of the Centre Road/ Jasper Road intersection, including the Woolworths site – envisaged as mixed use buildings of 5-8 storeys
- An area to the north of centre road around the rail line – envisaged as garden apartments of 3-4 storeys (see Figure 3-2 in previous Section 3).

Walking connectivity and public realm quality at these locations will be particularly important for incentivising residential and commercial development and ensuring development is supported by effective transport infrastructure. Specific recommended interventions are:

➤ Improve pedestrian connectivity across the railway

The rail line running through Bentleigh creates a barrier for east-west pedestrian movements within the neighbourhood. Given planned residential intensification to the north of Centre Road, reducing the impact of the rail barrier on pedestrian connectivity in this area is particularly important for creating a walkable environment and improving access to the rail station.

As noted in Section 6.1 on interventions for improved walkability, a new pedestrian overbridge to the north of the station should be considered linking Hamilton and Bent Streets. This should allow universal access and be integrated with the planned urban renewal development to provide an additional east-west pedestrian connection and divide the elongated blocks north of Centre Road. This link could provide a second point of rail station platform access.

➤ Improve laneway and side street connections on the north side of Centre Road

With intensive development planned to the north of Centre Road, pedestrian links between the Centre Road shopping strip and these areas are important for ensuring an inviting walking environment that connects new residential and commercial premises with the existing station, shops and other services on Centre Road.

Attractive and legible pedestrian environments that link with Centre Road should be created on Oak Street, Nicholson Street, Bent Street, Vickery Street and Godfrey Street. The recent works to narrow the road carriage way and provide parklet-type treatments on Godfrey Street offer a good precedent for interventions on these other north-south connections.

The Council's planned activated east-west laneway to the rear of the Centre Road shopping street will also improve pedestrian connectivity. Planned redevelopment of the Bent Street and surface carparks should allow for improved legibility and quality of north-south pedestrian connections at these locations.

➤ Improve walkability and public realm on Centre Road

As the major shopping strip within Bentleigh centre, the attractiveness and quality of the walking environment on Centre Road is vital for enhancing the attractiveness of the centre for further development. Walking interventions such as increased crossing points, kerb build outs and side road

treatments as described in Section 6.1 will assist in encouraging intensification throughout the activity centre.

➤ **Improve pedestrian amenity at the Centre Road/ Jasper Road intersection**

As noted in Section 6.1, there are opportunities for improving the pedestrian and public realm environment at this intersection to the east of the activity centre. The Woolworths and neighbouring sites are planned for more intensive development while the library on the west side of the road is indicatively planned for expansion. These developments should be integrated with improved street design that reduces the current dominance of vehicle traffic and encourages walking for new residents.

Public transport

Public transport interventions are discussed in more detail in Section 6.6. The most important potential action that can support further intensification is ongoing advocacy for increased service frequencies and passenger capacity on the Frankston line. Passenger crowding is already common during peak periods and rail capacity may become a limiting factor for further intensification in the future.

Parking management

The most important aspect of parking management that will impact on intensification outcomes at Bentleigh is land-use planning regulations that specify minimum rates of on-site parking provision accompanying development. Current parking regulations may be hindering some types of residential or commercial development due to onerous and costly requirements for providing excessive levels of parking (see also parking regulation interventions in Section 6.2).

At Bentleigh activity centre, a location with good public transport accessibility and local walking and cycling accessibility to a range of services, parking provision may not need to be as high as standard rates set by the State of Victoria. There is an opportunity for the Council to develop a 'Parking Overlay' covering the activity centre areas that changes the standard State-mandated parking rates. The Parking Overlay may:

- Reduce minimum rates for all or specific types of land uses
- Introduce maximum rates for all or specific types of land uses
- Allow for special provisions such as cash in-lieu payments that allow developers to contribute to development of shared parking facilities rather than private on-site parking.

In addition, as noted in Section 6.2, planned multi-storey parking buildings at Bentleigh should be designed and managed for the widest possible range of uses, including integration with new residential development sites. These car parking buildings should be treated as 'shared' public parking facilities that enable efficiencies in parking supply by providing for complementary demands (eg shopping during the day and residents at night).

In Bentleigh, a cash-in-lieu provision requiring financial contribution to be paid in place of providing car parking spaces on-site may provide a funding mechanism for a consolidated public parking facility. The required financial contribution should relate to the actual cost of providing a car parking space such that the public are not simply excessively subsidising developers' responsibilities to fulfil planning scheme requirements (i.e. when contributions are significantly lower than the real cost of providing parking), nor are developers offered no incentive to reduce on-site parking provision (i.e. when contributions are higher than the real cost of providing parking on-site). Given the significant benefits associated with consolidated parking facilities identified in Bentleigh, a reduced rate of contribution may be prudent to incentivise contribution to the cash-in-lieu scheme rather than compliance with on-site minimum parking rates.

The amount of money that can be leveraged from cash-in-lieu schemes depends on four factors:

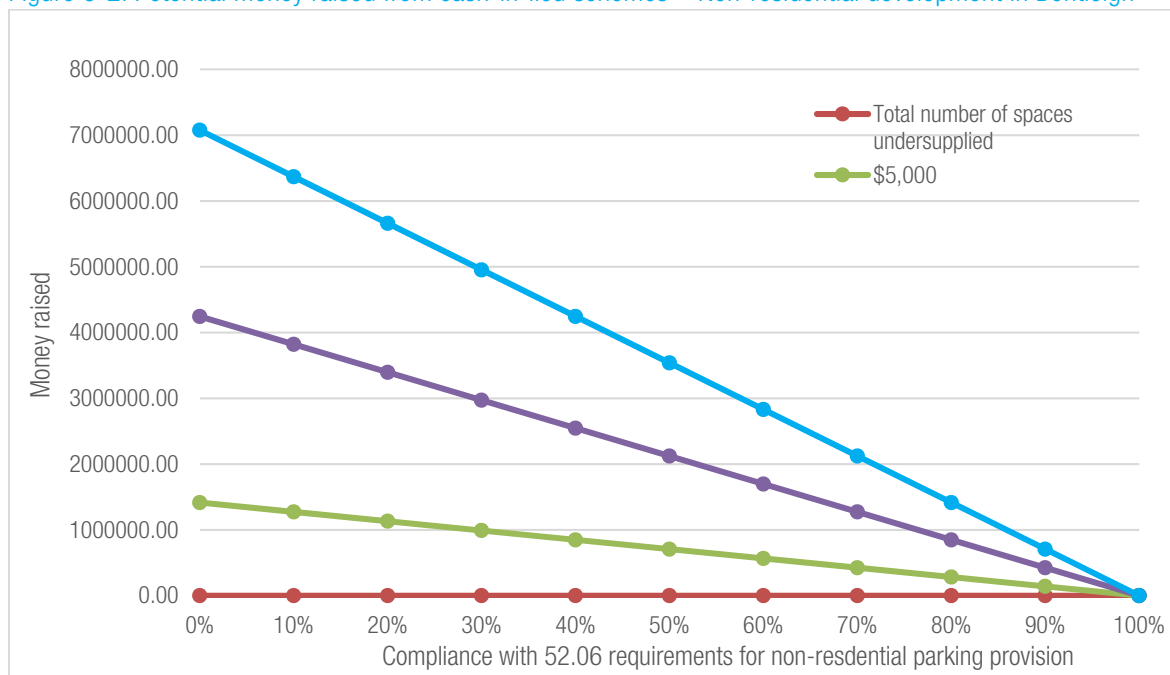
- The per space rate charged for parking shortfalls compared to Council's minimum requirement
The rate charged should ideally match the cost for Council supply commensurate parking provision in a consolidated public facility, however without an appreciable discount, developers may opt to simply comply with minimum parking requirements on-site.
- The minimum rate of parking provision required by Council
Cash-in-lieu schemes generate higher contributions in conjunction with higher minimum parking rates, however this must be weighed against the broader benefits of reduced minimum parking rates (or for that matter the complete removal minimum parking rates)
- The extent of future development
- The extent to which developers comply with minimum parking provisions.

The following provides a picture of the potential range of cash-in-lieu revenue that may be generated by non-residential development in Bentleigh assuming future non-residential development will require 283 additional parking spaces based on the analysis of future parking requirements outlined in Table 4-9, which assumes current Council minimum parking rates will continue to apply.

Figure 6-2 below presents the range of potential total contributions raised based on various cash-in-lieu rates and various levels of developer compliance with minimum parking rates for non-residential development. The below is provided as a guide only, and Council must consider how cash-in-lieu rates charged may:

1. Incentivise on-site parking provision rather contribute cash-in-lieu that the market considers poor value; and
2. Discourage development in the activity centre.

Figure 6-2: Potential money raised from cash-in-lieu schemes – Non-residential development in Bentleigh



Note 1: Insufficient data on future residential yield is available for inclusion in this analysis.

Note 2: Typical cash-in-lieu rates charged by Australian LGAs are in the order of \$5,000 - \$15,000

6.4 Potential interventions: cycling

Interventions to improve the safety and attractiveness of cycling in Bentleigh is important to offer a viable, low impact travel option for Glen Eira residents in the context of demographic shifts and planned changes to land use. Increased levels of cycling have the potential contribute to transport goals by improving accessibility for

local people and reducing congestion and transport emissions, while simultaneously improving people's health, enhancing place and liveability outcomes and helping to sustain the local economy.

Improvements to the cycling infrastructure in Bentleigh should work in with the municipality-wide network, incorporating the Strategic Cycling Corridors (SCC) and Principal Bicycle Network (PBN) (as proposed by Vic Roads²⁰) and local routes (as proposed in the Glen Eira Transport Analysis and Forecasting Discussion Paper²¹). The proposed network and specific interventions in Bentleigh are shown in Figure 6-3. Cycle facilities should be designed according to specific conditions, but will comprise the following types:

- Separated cycle lanes (on-street) or dedicated cycle paths (off-street locations) for SCC and PBN routes
- Mixed user, traffic calmed streets and shared paths for local routes and on some town centre main streets.

All works within the street corridor in Glen Eira should be designed and implemented with reference to the cycling infrastructure network. In the case of Bentleigh, Centre Road plays a crucial role as all SCC and PBN routes except for the Elster Creek Trail either follow or cross this main street. Implementing the proposed cycling network includes intersection as well as mid-block treatments along Centre Road.

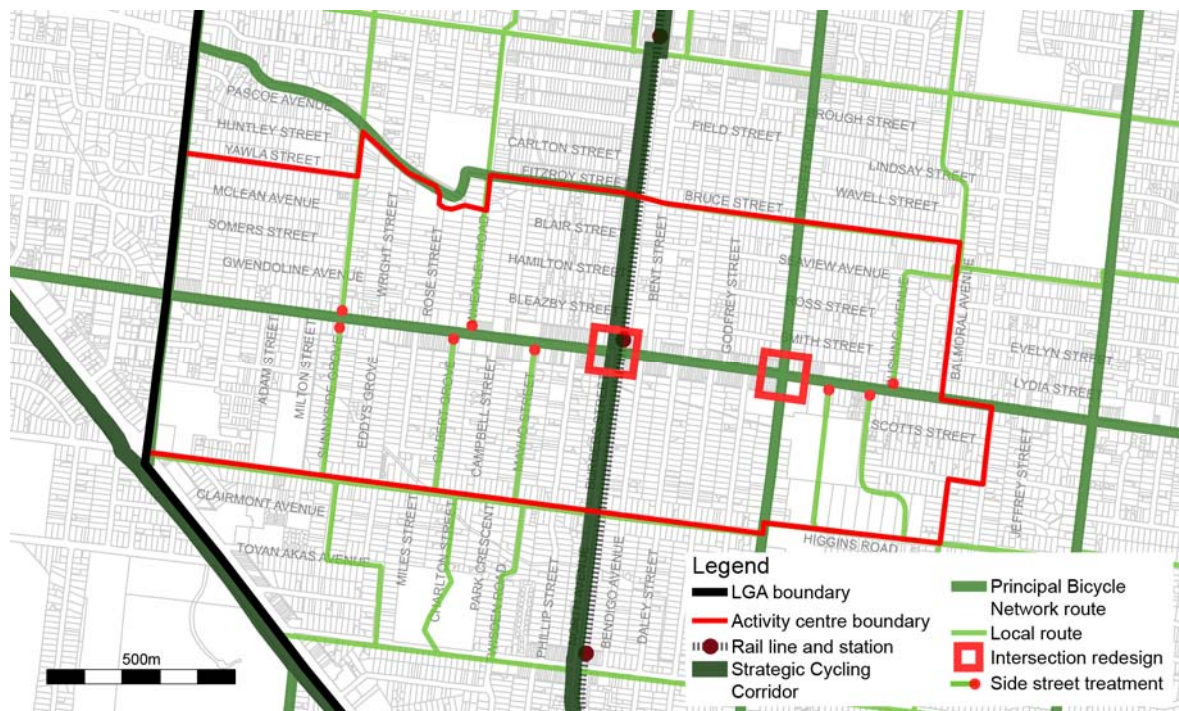
Due to the number of uses of Centre Road and its narrow width - approximately 18m between building frontages - the best approach to providing for cyclists is to design for a low-speed, mixed traffic environment in mid-block sections. This could be achieved by, for example, introducing more frequent street trees planted in kerb build-outs with small groups of one to three parallel car parking spaces in between.

The Centre Road/Jasper Road intersection should be prioritised for best practice cycle facility designs, including physical protection for people on bicycles and cycle phasing and detection. A similar treatment should be considered for the Nicholson Street/Centre Road/Burgess Street intersection, which would require signalisation incorporating the existing signalised pedestrian crossing outside the station entrance. Side street treatments that benefit people walking commonly also benefit people on bicycles and should incorporate bicycle-specific measures where relevant.

²⁰ VicRoads (2016) Bicycle Network Planning. Available at: <https://www.vicroads.vic.gov.au/traffic-and-road-use/cycling/bicycle-network-planning>.

²¹ Glen Eira City Council (2017) *Glen Eira Transport Analysis and Forecasting Discussion Paper*.

Figure 6-3: Potential cycling network interventions

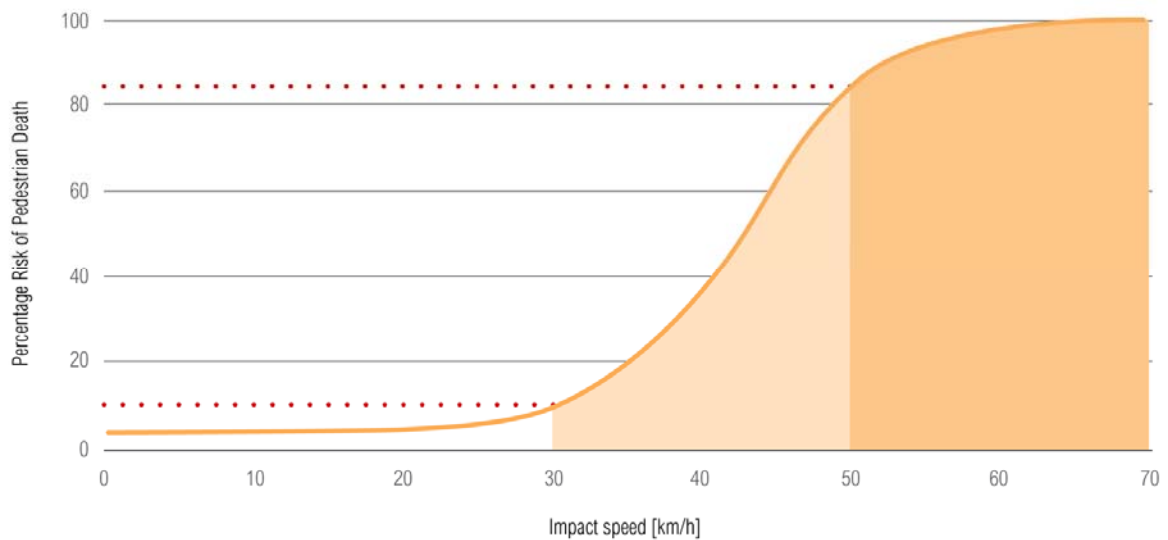


6.5 Potential interventions: road safety

Improvements in road safety should focus on protecting vulnerable road users, which are overrepresented in crash statistics in Bentleigh. Prioritising the safety of pedestrians and cyclists through strategies to reduce traffic speeds and improve walking and cycling infrastructure will result in enhanced safety for all road users. While Bentleigh's pattern of streets and development is well suited to active mobility, the infrastructure within street reserves needs redesigning in places to prioritise the safety and convenience of vulnerable road users.

Road safety improvements within the study area in Bentleigh will be contributed to by improving conditions for walking and cycling, as outlined above. Interventions should be focused on Centre Road, particularly at the station (where collisions with pedestrians are most common) and at the intersection with Jasper Road, where collisions involving all street users are common). A review of traffic speeds on Centre Road should be conducted to consider whether a further reduction to 30km/h will achieve added safety benefits. Figure 6-4 illustrates that substantial safety benefits are likely to be achieved with the 40km/h speed limit, however further reduction to 30km/h will further reduce risk of pedestrian deaths from vehicle collisions.

Figure 6-4: Traffic speed and risk of death from vehicle-pedestrian collision. Source: World Resources Institute (2015).



6.6 Potential interventions: congestion-free networks

The assessment (see Section 4.7) found that Bentleigh activity centre is well served by congestion-free transport options, specifically the regular rail service on the Frankston line. In addition, a frequent bus service provides supplementary east-west public transport connectivity. Within Bentleigh, buses do not have dedicated bus lanes and so are subject to road congestion delays.

Interventions for improving public transport quality and service levels for the Bentleigh activity centre will be particularly important for catering to residential growth in the area and increased commuting travel demands to major employment centres such as the Melbourne CBD. Potential interventions include:

- Advocating to State agencies for ongoing capacity and service frequency upgrades for the Frankston rail line
- Installing bus priority measures within the activity centre.

Rail

The assessment found that during the period 2012-2016 between 5% - 32% of rail passengers travelling at peak times on the Frankston line were on services where passenger loadings exceeded benchmark standards. While there is no clearly discernible trend for worsening crowding levels, for the most recent year, 2016, 17% of AM peak period rail passengers were on crowded services. This indicates that there is some degree of crowding on the Frankston line at peak period that may be impacting on the attractiveness of rail for users at Bentleigh.

Rail service provision is outside the jurisdiction of Glen Eira City Council. Nevertheless, the Council can continue to play a role in advocating to State agencies for improved rail frequencies and passenger capacity on the Frankston line. It is recommended that Council continue to monitor PTV data on crowding levels. Heavy overcrowding on this line will impact on the travel options available to a growing population at the Bentleigh activity centre and may have indirect impacts on the attractiveness of further residential intensification at the activity centre.

Bus

Bentleigh is currently served by the 703 Smart Bus (15 minute all day service), the 701 service (30 minute frequency) and the 979 night bus. These services provide an adequate level of east-west public transport

connectivity that complements the north-south axis of the rail line. Service frequencies are considered to be suitable for the current low- medium-density suburban residential context. However, Glen Eira City Council continue to communicate with PTV on patronage monitoring and whether increased frequencies on the 701 or 703 route are warranted.

Glen Eira City Council has some potential to influence the quality of bus services travelling through the Bentleigh activity centre due to its role in managing the road network. Bus services within the activity centre currently are not currently supported by any priority measures on the Centre Road route. As buses can be caught in road congestion, journeys have potential to be slow and unreliable for passengers while operating efficiency can be low, adding costs for operators. Further investigation should be undertaken to quantify the magnitude of any bus passenger delays on Centre Road. If delays are found to be significant, the following types of interventions should be considered to improve bus speeds and reliability:

- **In-lane bus stops:** most bus stops on Centre Road within the Bentleigh activity centre are indented bays or behind kerbside parking. These stop configurations can create delays for buses when exiting a stop if buses need to wait for traffic. In-line stops involve buses stopping in the live traffic lane and can be accompanied by a kerb build-out for a bus stop. This avoids bus delays from exiting a stop but can increase delays for general traffic.
- **Signal priority:** there are various tools for prioritising buses at traffic signals. The most effective techniques involve hardware and software systems that detect buses arriving at a signal and provide green time for the bus.
- **Intersection priority lanes:** while dedicated bus lanes on centre road are not considered to be an appropriate treatment in this context due to relatively low frequency bus service and competing demands for kerbside space, dedicated lanes at key intersections could be investigated. In particular, at the Jasper Road/ Centre Road intersection, provision for a bus 'queue jump' lane could be investigated as part of a multi-modal intersection re-design to improve provision for pedestrians and cyclists. This could involve a dedicated lane at the intersection and accompanying bus advance signal to allow buses to 'jump' ahead of waiting traffic. There are however, likely to be trade-offs with pedestrian and cyclist provision by dedicating further road space for buses and existing bus frequencies and levels of delay may not warrant such an intervention.

6.7 Summary of interventions

Table 6-2 summarises the potential interventions discussed in the previous sub-sections into a consolidated list. Some interventions have been discussed previously under multiple headings but are listed only once in the table. The table provides an indicative assessment of the degree to which implementation of the interventions will positively contribute to achieving the six policy directions that structure this discussion paper.

The table highlights that all proposed interventions contribute to at least two of the six policy directions and some interventions have wide-ranging impacts across almost all policy themes. A large number of interventions contribute to improving walkability, encouraging intensification in the activity centre and improving road safety. These interventions generally involve upgrades to the pedestrian environment and public realm. Interventions for improving parking, cycling and public transport require more targeted, mode-specific projects.

Table 6-2: Summary of potential recommendations and contributions to achieving policy directions

Potential Intervention	Put walkability first	Manage parking for streetscape amenity, town centre vitality and to support mode shift	Intensify development around rapid transit	Ensure cycling plays its role	Work toward 'vision zero' road deaths and serious injuries	Plan for attractive congestion-free networks rather than reducing congestion
Improve side-road treatments along Centre Road	✓✓✓		✓		✓	
Install new signalised pedestrian crossings on Centre Road	✓✓✓		✓		✓✓	
New pedestrian bridge across railway– north of Station	✓✓		✓			
Consolidate Council-owned off-street parking	✓	✓✓✓	✓✓			
Re-purpose selected on-street parking on Centre Road and side streets	✓✓	✓✓	✓			
Revise parking management regime (TBC)		✓✓✓	✓			
Review Planning Scheme provisions for on-site parking requirements		✓✓✓	✓✓✓			
Upgrade pedestrian amenity on side streets on north side of Centre Road	✓✓✓		✓		✓	
Improve pedestrian amenity of laneway at rear of Centre road shops (north side)	✓✓✓		✓			

Upgrade Centre Road/ Jasper Road intersection for walking, cycling and buses	✓✓		✓	✓✓	✓✓	✓
Upgrade Centre Road/ Nicholson Street/ Burgess Street intersection for cycling.	✓			✓✓	✓✓	
Reduce speed on Centre Road to 30km/h	✓		✓	✓✓✓	✓✓✓	
Upgraded cycle facility on Jasper Road				✓✓	✓✓	
Advocate for increased service frequency and capacity on Frankston rail line			✓✓			✓✓✓
Investigate bus priority measures on Centre road						✓✓

(✓✓✓ - major impact, ✓✓ - moderate impact, ✓ - minor or indirect impact)