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FINAL REPORT

Nillumbik Major Activity Centres Sustainable Transport Study and Strategy

Melbourne

Adopted by Nillumbik Shire Council - November 2010

This report was prepared for the Nillumbik Shire Council and the Department of Plannning and Community Development through the Melbourne 2030 Activity Centres Expert Assistance Program.

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Executive Summary

The Nillumbik Major Activity Centres Sustainable Transport Study and Strategy (STSS), undertaken by Booz & Company, was commissioned by Nillumbik Shire Council, the Department of Planning and Community Development (DPCD) and Department of Transport (DOT). The project was partially funded by a DPCD Expert Assistance Program grant.

The objective of the *Nillumbik Major Activity Centres STSS* is to:

- Assist in implementing some aspects of the structure plan actions;
- Provide more detailed analysis and strategy beyond what is provided in the structure plans for the two activity centres;
- To collect data necessary to evaluate transport options and parking within the Eltham and Diamond Major Activity Centres;
- To recommend a series of actions to encourage sustainable forms of transport as well as managing car parking demands over a twenty-five year period; and
- To determine whether a parking precinct plan is required in either activity centre.

With the above objectives in mind, the project has a particular focus on car parking future requirements and management.

This report determines the existing situation in Diamond Creek and Eltham by examining policy, infrastructure and travel patterns. Using this 'baseline' information a number of findings and gaps are identified.

There is significant scope for a modal shift towards more sustainable access practices in Diamond Creek and Eltham. In Diamond Creek 73% of access to the Activity Centre is by car and in Eltham 33% of access is by car. Eltham traders are significantly more reliant on cars with 93% accessing the centre by car. Traders are more likely to come from within walking distance but also have a variety of reasons for needing access to a private vehicle during the day (see section 2.4.1). Across both Activity Centres 28% of drivers said they would walk if there was better walking infrastructure and 25% said they would cycle with better cycling infrastructure.

The walking and cycling environment are compromised. There are minimal points at which pedestrians can safely and conveniently cross the main roads going through each Activity Centre (see section 2.3.2). For cyclists, there are few cycling routes connecting local people to each Activity Centre even though there is a good regional cycling routes along Diamond Creek (see section 2.3.5).

Additional car parking is not required in either centre at this point in time, as better management of existing parking resources would improve the availability of existing car parking supply. All possible parking management solutions should be exhausted before additional car parking is provided.

A significant portion of Diamond Creek car parking is under-utilised. Higher occupancies only occur at the IGA supermarket for a short period and the commuter car park at the station (see section 2.3.9). In Eltham parking around the middle of the Activity Centre is well utilised however spaces beyond a small central core have low occupancies (see section 2.3.9).

Eltham experiences a high demand for commuter car parking on weekdays, yet this problem is exaggerated by 16% of traders arriving using these spaces (see section 2.3.11). Similarly, Eltham experiences high occupancy of its 'Trader Permit' parking spaces. Managing trader parking to capitalise on those local-traders who could walk to Eltham on some days will see

reduced demand in this location. If each trader travels by other modes 1 day per fortnight there will be a 10% reduction in trader parking demand.

Significant development is planned for each of the centres over the next two decades. It is not possible to accurately predict potential parking demands over this period (particularly given the potential for peak oil and carbon charging to significantly alter demand). New development may have an impact on parking demand and supply.

Both centres need to become less car dependant (to reduce the risk to their economies from Peak Oil). Council needs to make changes in an incremental manner so there is not one "large scale" change that results in customers finding it easier to shop elsewhere.

To do this Council (and traders) need to monitor the parking demand changes over time. Council should partner with the traders in each centre to establish an annual budget allocation for access surveys to be undertaken regularly.

The report also considers future growth projections for the area and how additional trips can be accomodated. A transport management framework to achieve a desired future state is provided.

Structure plans for Diamond Creek and Eltham emphasise the need for convenience and attractiveness. How growth is managed will impact upon these desires. The road network around both Activity Centres does not have the capacity to accommodate 51% and 36% growth in trips to Diamond Creek and Eltham respectively (the estimates for trip growth to the centres by 2024). Congestion already occurs, particularly around Main Hurstbridge Road, Diamond Creek and Main Road, Eltham. Construction or expansion of the road network to cope with additional trips is not desirable, given such developments would impact on the attractiveness of these townships and their surrounds. Additional growth will therefore have to be managed by:

- Increased walking, cycling and public transport trips; or
- Increased car trips resulting in road and parking congestion (impacting convenience and attractiveness).

The Strategies and Actions set out in this document are designed to increase walking, cycling and public transport trips. A summary of all Strategies and Actions is shown in Table 0-1 below. Actions shown with an asterisk (*) next to them are also shown in maps in the main body of this report.

Table 0-1 Summary of Strategies and Actions

Strategies	Actions
Walking and Cycling	
Enhance pedestrian access through infrastructure improvements	▪ Enhance existing laneways and pedestrian arcades*; ▪ Seek opportunities for additional pedestrian crossings of railway tracks*; ▪ Improve signalised pedestrian crossings including additional arms at existing crossings and identifying opportunities for shorter wait times (Figure 5-2 gives an example)*; ▪ Provide additional opportunities to cross main roads in accordance with pedestrian desire-lines*; ▪ Develop heads-up[1] pedestrian way-finding signage, which provides concise information for accessing a destination by walking; ▪ Install weather protected street furniture and other pedestrian facilities at 60m intervals[2]; ▪ Reduce speed and calm traffic in locations where pedestrian demands are high*; ▪ In new developments provide weather protection of footpaths; and ▪ Ensure that new developments have active frontages and are constructed abutting the street.
Provide local cycling routes and infrastructure	▪ Investigate and implement the priority improvements shown in Figure 5-5 and Figure 5-6;* ▪ Use the priority cycling routes detailed in Figure 5-5 and Figure 5-6 on which to concentrate infrastructure improvements focussing on the following possible treatments: – Installation of safe on-road cycling lanes; – Seek opportunities for additional cycling crossings of railway tracks*; – Develop cycling-oriented signage, which provides concise information for accessing a destination by cycling; and ▪ Intersections should accommodate cyclists either through signal phasing, bike lanes or appropriate kerbing.
Parking and Driving	
Respond strategically to parking needs with Parking Precinct Plans	▪ Develop a Parking Precinct Plan for Diamond Creek ▪ Develop a Parking Precinct Plan for Eltham
Support shared car parking opportunities	▪ Where appropriate partially or wholly waive car parking requirements on site in favour of Section 173 Agreement on title indicating shared parking arrangement: – Assist planning applicants to engage in shared parking arrangements by gauging interest from owners of private parking facilities in offering spaces (times of day and days of week). – Advise potential applicants of planning permit applications which cannot provide appropriate levels of parking[3] of opportunity for them to negotiate Shared Parking Plan.
Enable car parking to be on separate titles	▪ Reduce parking requirements for buildings with parking able to be sold separately to other floor space (unbundled parking). ▪ Subdivide buildings/land with unbundled parking so that titles of car parking spaces and other floor area may be sold separately. ▪ Additional regulation for nearby on-street parking to avoid spill-over problems from occupants parking off site.

[1] "Heads up" mapping has been used successfully in Bristol, UK and Bendigo. This style of mapping shows what the pedestrian sees at that location. Rather than a traditional aerial view of a location the map shows what the person sees in front of them "above" their location on the map and what is behind them is "below" their location on the map.

[2] This is a Disability Discrimination Act Standard (AS1428.2, Clause 7)

[3] An appropriate level of car parking may still be below the Nillumbik Planning Scheme prescribed rate.

Strategies	Actions
Manage public parking with a hierarchy of use	▪ Council endorse the proposed hierarchy of kerbside use in Table 6-3; ▪ Review existing parking management and revise in cases where the uses described allocations and in the case of uses where current demand is not being reasonably meet; ▪ Requests for allocation outside the adopted hierarchy will be dealt with on a case by case basis through officer recommendations to council. **Specific Actions for Park and Ride spaces are:** ▪ Ensure Park & Ride signage clearly states who can use these facilities; ▪ In partnership with DOT, enforce use of Park & Ride car parking spaces by spot checking public transport tickets of those using the car parks*.
Price high-demand parking	▪ A priority of any parking charges strategy must be to improve the customer accessibility and increase the number of people able to shop in the centre easily. This is achieved through a strategy that includes clear information to all drivers about where they can park for free (as an alternative). In addition, information about what the fees charged are funding may raise awareness of amenity improvements that reinforce the attractiveness of the centre. ▪ Introduce per-day fees applied for trader parking permits in consideration of the cost of providing parking spaces*: ▪ Introduce fees in parking spaces that are occupied more than 85% for 3 or more hours of the day (initially introduce at $1.00 per hour and measure effect, increasing fee if necessary)[4]: – At the moment, this action only apply to Safeway car park (underground level) – 1/2P, 2P and 3P spaces[5].
Improve access to underutilised car parks	▪ Ensure visitors who drive to the centre know that these car parking spaces are there (through signage or other information) *; ▪ Concentrate urban improvement efforts on making pedestrian experience convenient and attractive to these under-utilised car parking spaces*.
Enhance viability of Activity Centre through 'anchor' car parking	▪ Locate future Park and Ride facilities to facilitate convenience and incidence of multi-purpose trips (for example see Figure 6-6).
Regularly review and install Accessible Parking Bays	▪ Increase allocations of accessible parking bays in locations where accessible parking bay occupancy reaches over 85% at any point in the day. Initially this will be applicable in: – Main Hurstbridge Road (Coles Supermarket), Diamond Creek; – Main Hurstbridge Road (IGA Supermarket), Diamond Creek.* ▪ Annually review occupancy levels of accessible car parking to determine if a greater number are required.
Public Transport	
Use the Transport Connections Program to	▪ Focus the Nillumbik Transport Connections Program on assisting isolated residents to access facilities and services; ▪ Improve usability, amenity and connections to Diamond Creek Station
Land Use and Transport	
Mixed land use to facilitate local and multi-purpose trips	▪ Improve likelihood of local visitations to the Diamond Creek Major Activity Centre by increasing variety of land uses; ▪ Identify potential sites for higher-intensity activities; ▪ Encourage high-intensity land use within each Major Activity Centre

[4] *Displacement of cars is likely where car parking fees are introduced. This is an intended result of fee-introduction as high demand spaces are available to those who are willing to pay for the parking most convenient. After introduction of paid parking a wider surveying of area is required to determine the impacts.*

[5] *With the exception of the Trader Car Park and the Safeway carpark there are currently no parking spaces which trigger the need for introduction of paid parking (over 85% occupied for 3 or more hours). Some spaces achieve over 85% occupancy regularly (Diamond Creek, IGA Car Park) however this peak is for less than 3 hours.*

Furthermore, whilst Park and Ride facilities are currently well over 85% occupied there is no plan for State Government to start introducing paid parking for Park and Ride facilities. This may not be ruled out in the future however, analysis would have to be undertaken to understand impacts on commuter's overall travel choices.

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1 Introduction

This is the Strategy and Options Report for the second stage of the Nillumbik Major Activity Centre Sustainable Transport Study and Strategy (STSS) project. It has been prepared by consultants Booz & Company.

The client group is led by Nillumbik Shire Council and comprises of representatives from Department of Planning and Community Development (DPCD) and Department of Transport (DOT). The project has been made possible with funding from the DPCD through the Expert Assistance Program. This program has been established to provide specialist expert advice to assist councils finalise and implement structure plans for Principal and Major Activity Centres

1.1 Objectives

The objective of the *Nillumbik STSS* is to:

- Assist in implementing some aspects of the structure plan actions;
- Provide more detailed analysis and strategy beyond what is provided in the structure plans for the two activity centres;
- To collect data necessary to evaluate transport options and parking within the Eltham and Diamond Major Activity Centres;
- To recommend a series of actions to encourage sustainable forms of transport as well as managing car parking demands over a twenty-five year period; and
- To determine whether a parking precinct plan is required in either activity centre.

1.2 Scope

In order to achieve *Nillumbik STSS* objectives, the project includes the following tasks:

- Identify the transport network to the centre for each transport mode;
- Quantify the use of these networks;
- Forecast future needs (based on demographics, key developments and land use changes);
- Discuss in context of drivers of change (such as peak oil and global warming) and regulatory responses to these changes;
- Estimate and comment on modal split, trip origin and purpose for both of the centres; and
- Develop short and long term (25 year) initiatives to improve sustainable transport.

1.3 Study Area

Nillumbik is in the north of the metropolitan area. Diamond Creek and Eltham are the only two Major Activity Centre's in Nillumbik as much of the municipality comprises of non-urban areas. Larger Principal Activity Centre's within the region are located at Greensborough and Doncaster. A new Principal Activity Centre will be established at South Morang as this growth area develops over coming decades. The location of each of the centres is shown in Figure 1-1 below.

Figure 1-1 Nillumbik and Surrounding Activity Centres

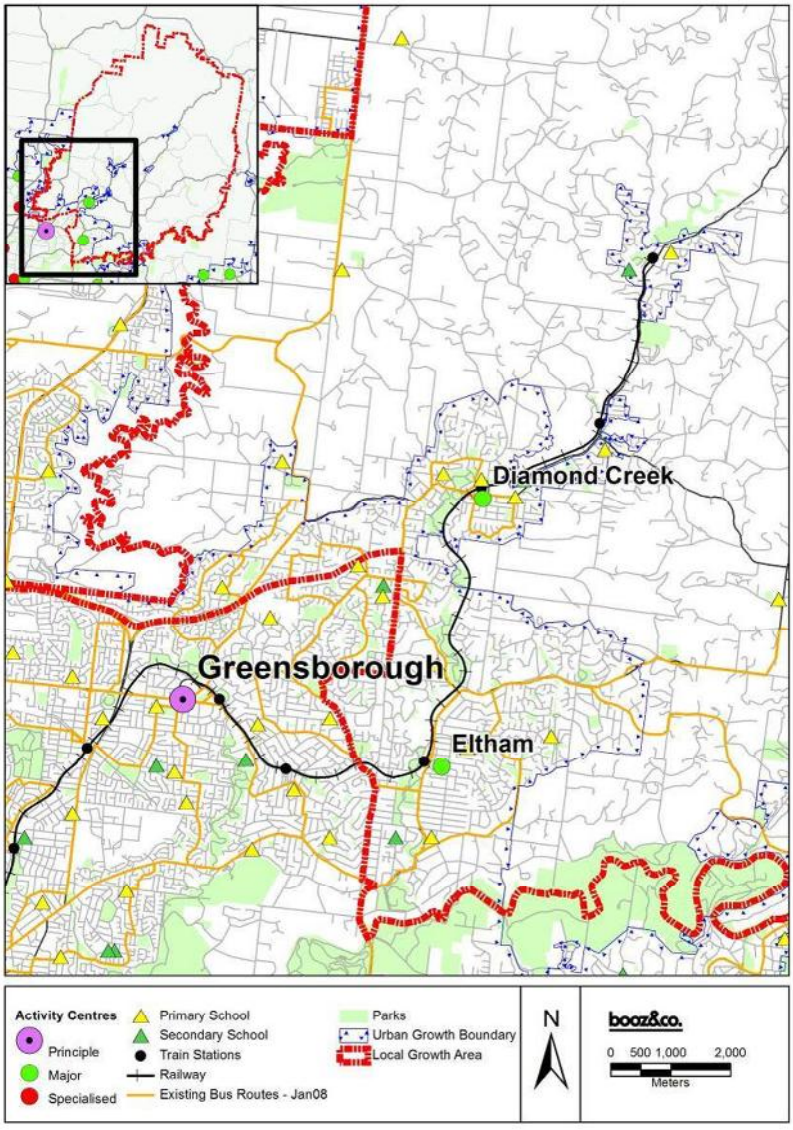
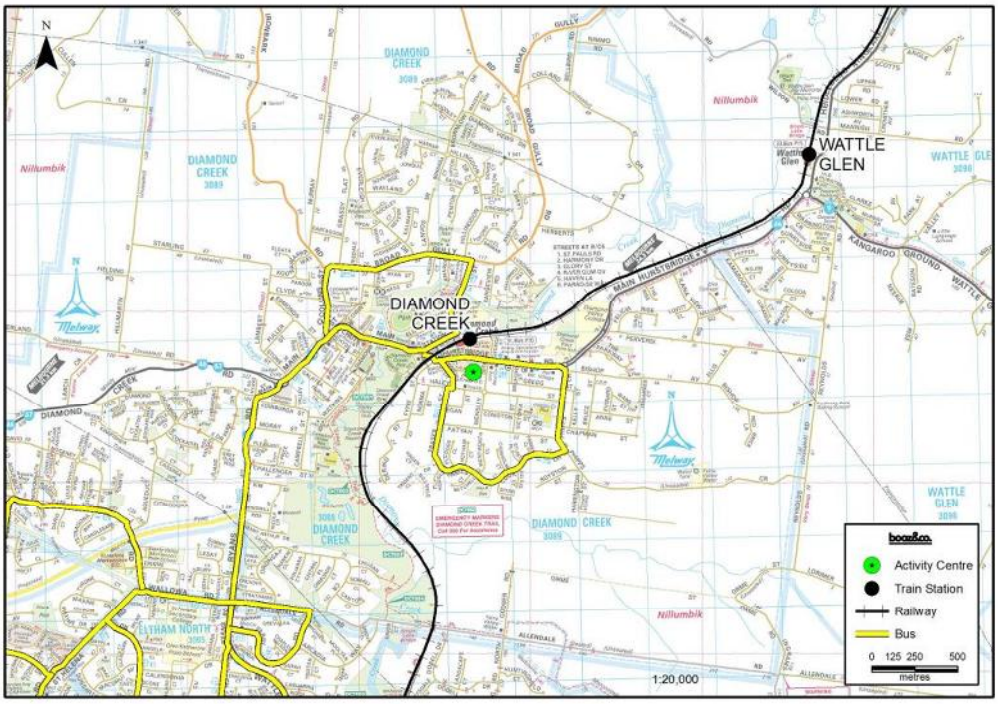


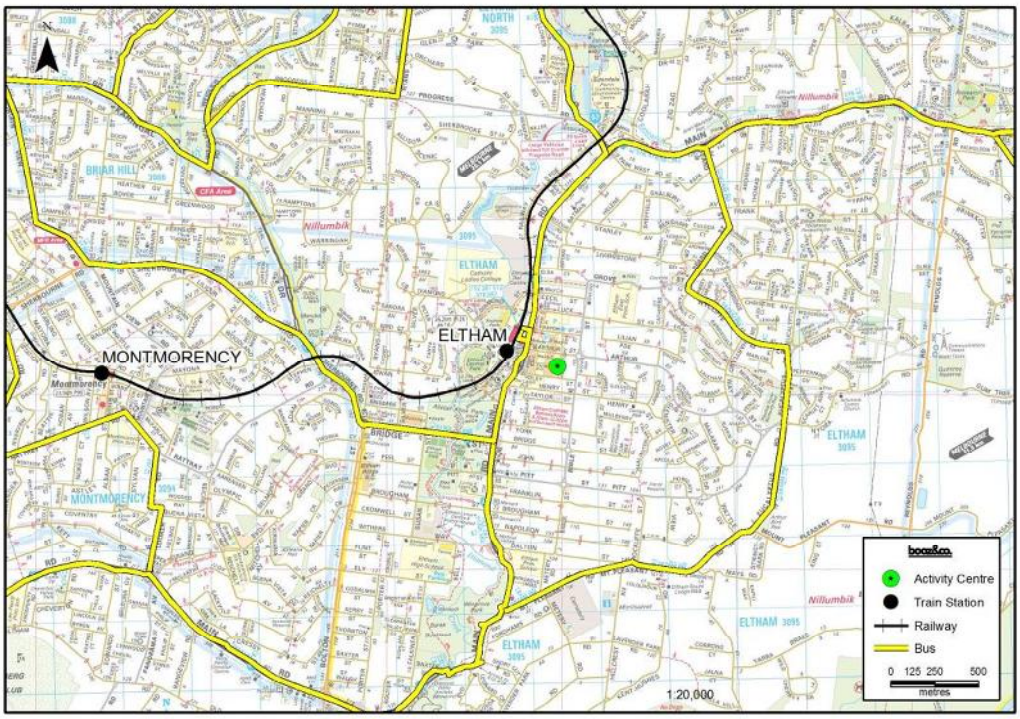
Figure 1-2 shows Diamond Creek and Eltham Activity Centres and their surrounds. Diamond Creek has about half the frequency of train services as Eltham (see 2.3.7 for more) and for this reason the role of public transport in the two centres is quite different. The Eltham train station and bus interchange area has more significant facilities available including Park and Ride commuter parking spaces. It appears as though some commuters favour Eltham Station for the higher level of service standards even though it may be a further distance from their home.

Figure 1-2 Eltham, Diamond Creek and surrounds

Diamond Creek



Eltham

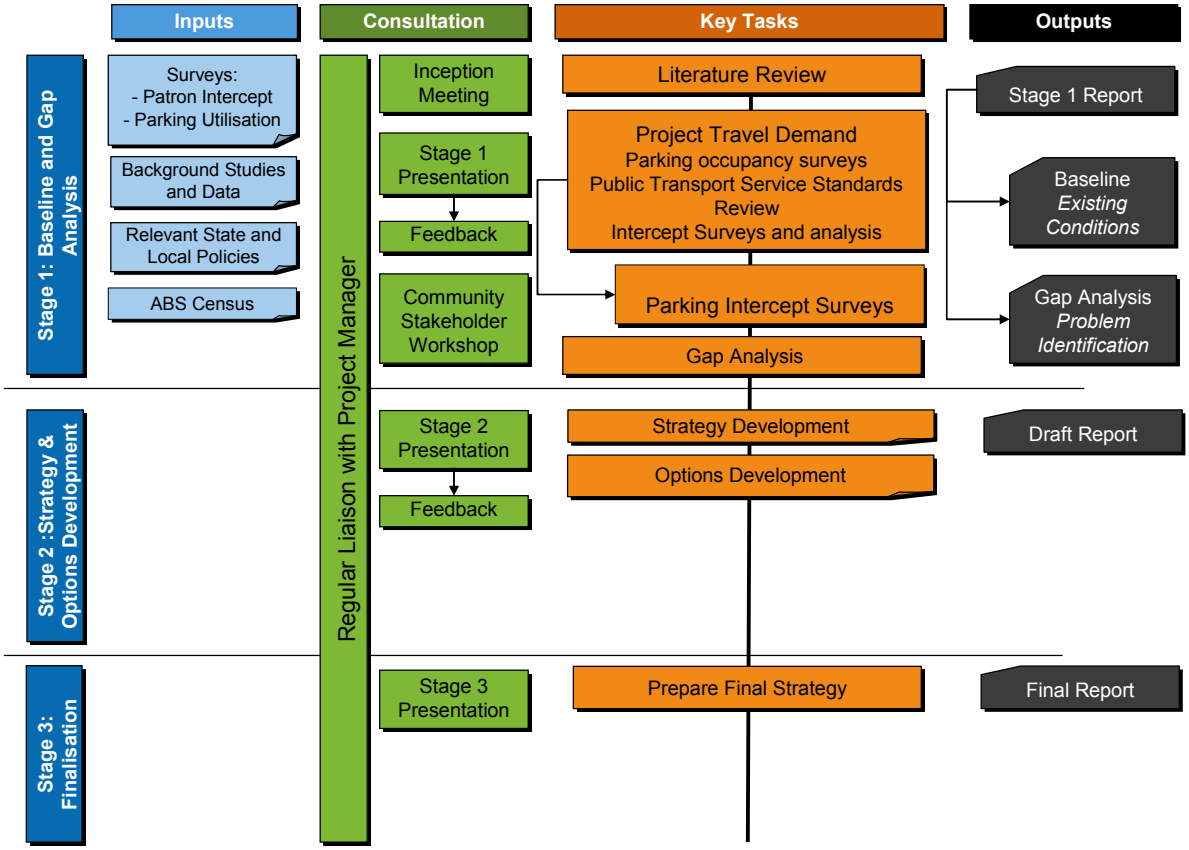


Source: Booz & Company Analysis, 2009

1.4 Method

Figure 1-3 shows the method used to develop this study and strategy.

Figure 1-3 Method



This Strategy and Options Report presents the results from a review of transport policy, current network provisions, safety standards, predicted future developments and demographic changes which are expected to impact upon transport requirements. The project also uses primary data analysis. Primary data was collected using the following methods:

- **Council survey of traders:** The Nillumbik Shire Council has conducted two surveys of traders over the last year in Diamond Creek and Eltham respectively.

  The Eltham survey was conducted in April 2009 and the Diamond Creek survey was conducted in August 2007. The survey was completed in each area as follows:

Location	Responses	No.
Eltham Survey	Respondents	189
	Organisations/Businesses	49
Diamond Creek	Respondents	39
	Organisations/Businesses	39

  The two surveys asked slightly different questions. Appendix 1 shows a copy of all survey responses.

- **Intercept Surveys** took place on a Thursday and a Saturday in Diamond Creek and Eltham. The number and location of surveys is show below:

Diamond Creek	Eltham
Thurs 11/12/08 880 surveyed	Thurs 11/12/08 605 surveyed
Sat 13/12/08 506 surveyed	Sat 20/12/08* 815 surveyed
TOTAL 1386	**TOTAL 1520**

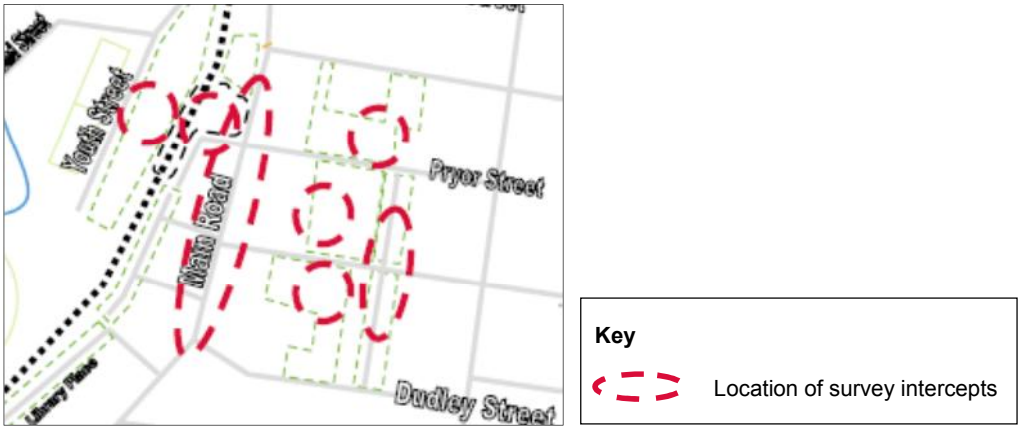
Due to rain the scheduled survey on 13/12 had to be postponed to 20/12/08.

The intercept surveys were conducted throughout each of the Activity Centres by roving interviewers. The location of the intercepts is shown in Figure 1-4 below.

Figure 1-4 Intercept survey locations

Diamond Creek

Eltham

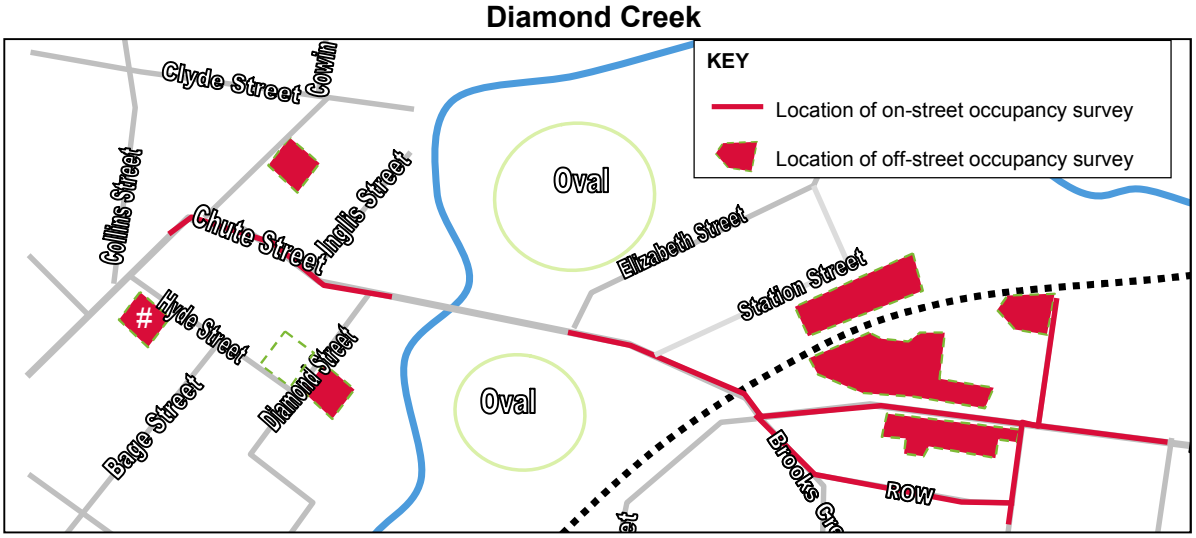


- **Parking Occupancy Surveys** took place on Thursday 11 and Saturday 13 December 2008 between 7am-7pm. These surveys included key on-street and off-street car parks in both the Activity Centres. The surveys were conducted hourly on the hour during this period. This method is common practice used across the Transport Planning industry.

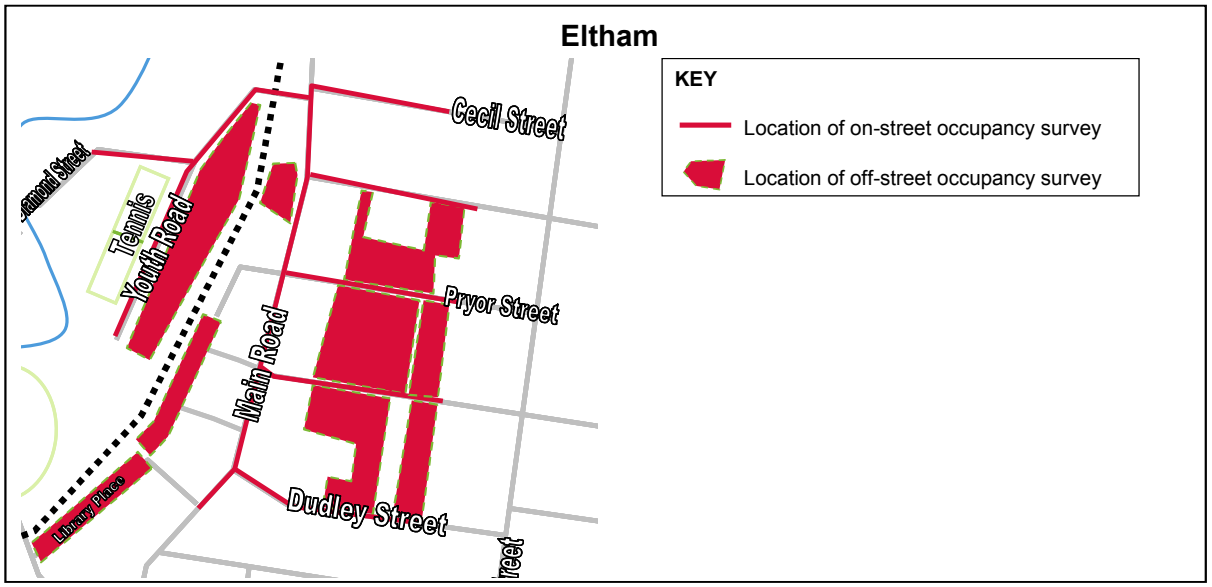
Figure 1-5 shows the location of on and off-street car parks in which occupancy surveys were taken.

A copy of the parking survey questionnaire is provided in Appendix 4. The parking survey results are provided in Appendix 5.

Figure 1-5 Car Parking Occupancy Survey Locations



 # These carparks are privately owned but have been included in this sample for further analysis.



- **A Note about Survey Days:** A weekday and a weekend day were chosen to undertake the Intercept Surveys and the Parking Occupancy Surveys.

  Firstly, in the case of the Intercept Surveys this was done to be able to see whether there were significant differences in results over both days. An analysis showed similar results between both days, with a slightly higher public transport mode-share on weekdays compared to weekends (which experienced higher driving rates). Given the similar results over the weekday and weekend the results have been combined in this report unless otherwise stated.

In the case of the Parking Occupancy Surveys the use of a weekday and weekend survey date was done as some parking demands change significantly depending on day of the week. Most notably in this study area there are significant differences between car parking demands in the Park and Ride commuter spaces between a weekday and weekend (less demand on the latter). Where notable differences in weekday to weekend parking demands occur it has been shown in the body of this report.

1.5 Report Structure

This report is the culmination of Stage's 1 and 2 of the project and is structured as follows:

- **Chapter 1 Introduction** sets the report context by outlining the objective, scope, study area and study method.
- **Chapter 2 Baseline Situation** describes the current transport network and usage patterns in Diamond Creek and Eltham. The chapter provides an outline of the:
  - State and local policy relating to the Activity Centres;
  - Record of infrastructure projects already planned in the Activity Centres;
  - Transport infrastructure to and within the activity centre; and
  - Current and future transport demand.
  - Drivers of Change- including environmental factors and demographic (ageing population) factors;
  - Views of stakeholders gauged through workshops;

  Throughout the Baseline Situation chapter there will be 'gap boxes'. These boxes are included where the baseline analysis reveals a gap (problem). These will be then summarised in the following chapter Gap Analysis.
- **Chapter 3 Gap (Problem) Analysis:** Based on the baseline data and information walking, cycling, public transport, parking/driving and land use/transport planning gaps are identified.
- **Chapters 4 through 7** set out the strategies and actions applicable to (in chapter order) - walking/cycling, parking/driving, public transport and land use/transport planning.
- **Chapter 8 Next Steps** explains next stages of the project.

2 Baseline Situation

2.1 Planning Framework

This sub-chapter presents a summary of previous transport strategies and policies that affect transport in Diamond Creek and Eltham.

Various documents, including State and Local Government strategies and studies provide the overarching framework for this project. The selection of documents shown in Table 2-1 has been used to understand the problems in accessing Diamond Creek and Eltham.

An expanded summary of the policy framework is provided in Appendix 2.

Items listed in Table 2-1 with an asterisk (*) are represented in map form in sub-section 2.2 Planned Projects.

Table 2-1 Summary of applicable State and Local Policies

	Plan	Initiative or Finding
State Policy	Victorian Transport Plan, 2008	Green Orbital Smartbus (Future Route 902 Bus Route): The existing Springvale route will be extended to Airport West through Doncaster, Eltham, Greensborough and Broadmeadows* Clifton Hill Rail Upgrade: Improving train services on the Hurstbridge Line. No ring road through Nillumbik. North East Link: Detailed planning will be undertaken to investigate a road connection between the Metropolitan Ring Road in Greensborough and the Eastern Freeway in Bulleen.
	SPPF and Melbourne 2030. 2006	Nillumbik designated as low-growth area. Reduce the number of private motorised trips Concentrating activities that generate high numbers of (non-freight) trips in accessible Activity Centres. Diamond Creek and Eltham are both designated as Major Activity Centres, with low amount of growth.
Local Policy	North East Integrated Transport Strategy (NEITS), 2007	Nillumbik is a minimal growth municipality Local bus improvements are earmarked in Eltham; An Orbital SmartBus Route is planned connecting to Eltham (Note: this initiative is replicated in the Victorian Transport Plan, 2008); A number of bicycle network improvement were stipulated for both Diamond Creek and Eltham A road upgrade is predicted for Main Road, Eltham*
	Nillumbik Shire Council Integrated Transport Study (NITS), 2001	The NITS identifies a number of gaps in the transport network across the municipality. Recommendations span key areas of public transport facilities, station precincts, walking and cycling. They include: ▪ Improve car parks at rail stations, starting with Eltham ▪ Facilitate the provision of secure bicycle storage ▪ Improve the attractiveness of station precincts ▪ Integrate and distribute timetables ▪ Improve bus standing areas ▪ Make the public transport more visible through signing and marking ▪ Clearly signing the connection of Diamond Creek trail and the Diamond Creek Township via Eltham with the Yarra River Trails outside the Shire. ▪ Marking and signing of on-road and off-road bicycle lanes radiating from activity nodes in the Shire in the following grouped set of priorities

	Plan	Initiative or Finding
Local Policy	Nillumbik Transport Connections, 2007	The aim of this project is to improve access and mobility for isolated residents in Nillumbik; ▪ Connecting local communities, businesses, community organisations, transport providers and other agencies to better use existing transport resources; ▪ Improving transport options and access to services for transport disadvantaged residents in Nillumbik; ▪ Forging on-going partnerships between community groups and transport providers beyond the timeframe of the project.
	Eltham Major Activity Centre Structure Plan, 2004	Delays to through traffic on Main Road in the activity centre due to people using it as part of an anticlockwise "lapping" route around the main shopping centre and parking manoeuvres. The bus and station precinct is unsafe for pedestrians and operationally difficult for bus drivers. Construction of circulatory road. Eltham Town Square redevelopment and closure of access road. Underpass under railway line is 400 metres apart: at the station and Eltham Library. Commercial Place redevelopment. A proposal and plan for provision of at least 8 bus stops in island configuration may be achieved with enhanced kiss and ride drop off areas* There are sufficient parking areas provided within a convenient walking distance to the shopping precinct. Growth of office and retail land uses within the centre.
	Diamond Creek Twenty20, 2006	Plan for a 60 to 80% increase in retail space to 2021 Focus retail expansion in a retail core east of the rail crossing along Main Hurstbridge Road and south of the Station* Develop Chute Street as a secondary retail node (with limited retail expansion). Enhance the traffic environment for pedestrians and shoppers* Address local congestion and shopping access problems* Develop a new masterplan for Main Hurstbridge Road which puts priority traffic flow, pedestrian safety and crossings and more attractive environment* Reduce speeds for traffic in the Main Road* Improve access along Gipson Street and Elizabeth Street into the town centre* Develop a long term plan for managing car-parking to ensure an adequate supply Make better use of available car-parking Make sure adequate commuter parking is available A transport interchange and related improvements around the station* Better bus stops and services

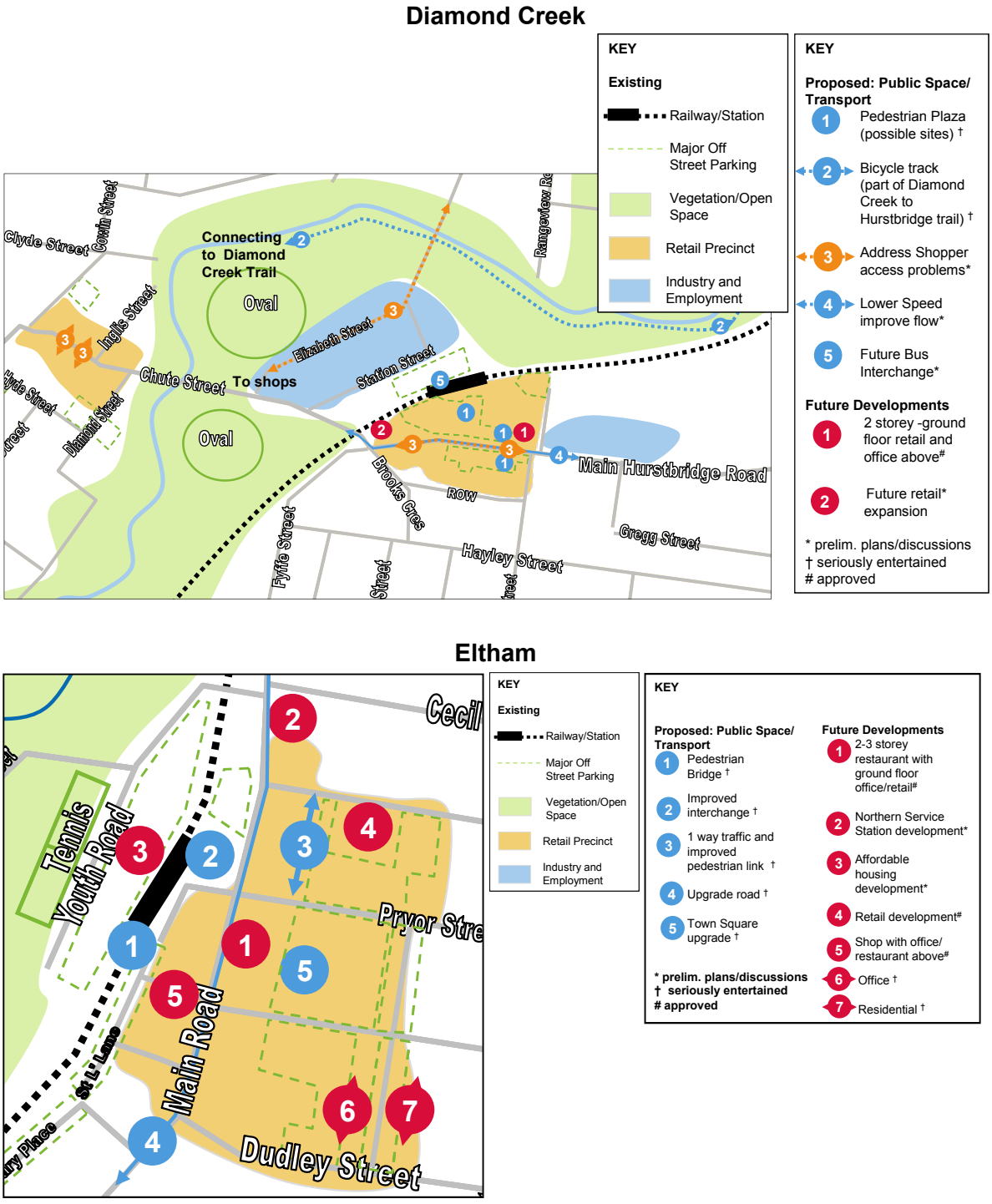
	Plan	Initiative or Finding
Local Policy	Diamond Creek Parking Review, 2007	Both these documents contain information regarding car parking occupancies, duration of stay, future development proposals and assessments undertaken by VCAT members or consultants on the likely impact of developments on parking in Diamond Creek and Eltham. A summary of this data is provided in the appendices
	Development Assessments and other Car Parking Studies	
	Diamond Creek to Hursbridge Shared Pathway	The Nillumbik Shire Council together with VicTrack and the DOT have prepared an assessment of a bicycle and pedestrian path between Diamond Creek and Hursbridge. This is a long term plan with an immediate Phase planned for commencement in 2009 from Diamond Creek. It is likely that this will be funded through a number of local, State and Federal Government funding resources. An initial stage of the project is anticipated in 2009*
	Diamond Creek Plaza	The Implementation Plan for Diamond Creek twenty20 identifies the need for the creation of a new urban plaza within the heart of the town centre as a focus for activity and to provide an informal outdoor space. Nillumbik Shire Council has been successful in obtaining funding from the State Government's Creating Better Places Program to undertake a feasibility study for the location of a plaza in the Diamond Creek Major Activity Centre. Three sites have been identified as possible areas for a plaza .

Note: All inititatives with an asterik (*) in the above table are represented in map form in the following sub-section 2.2 Planned Projects

2.2 Planned Projects

There are a number of infrastructure projects planned in Diamond Creek and Eltham Activity Centres. Planned projects include projects that are currently being considered by Council and those which have approval to proceed as shown in Figure 2-1 below.

Figure 2-1 Planned infrastructure and developments



Source: Booz & Company Analysis, 2009

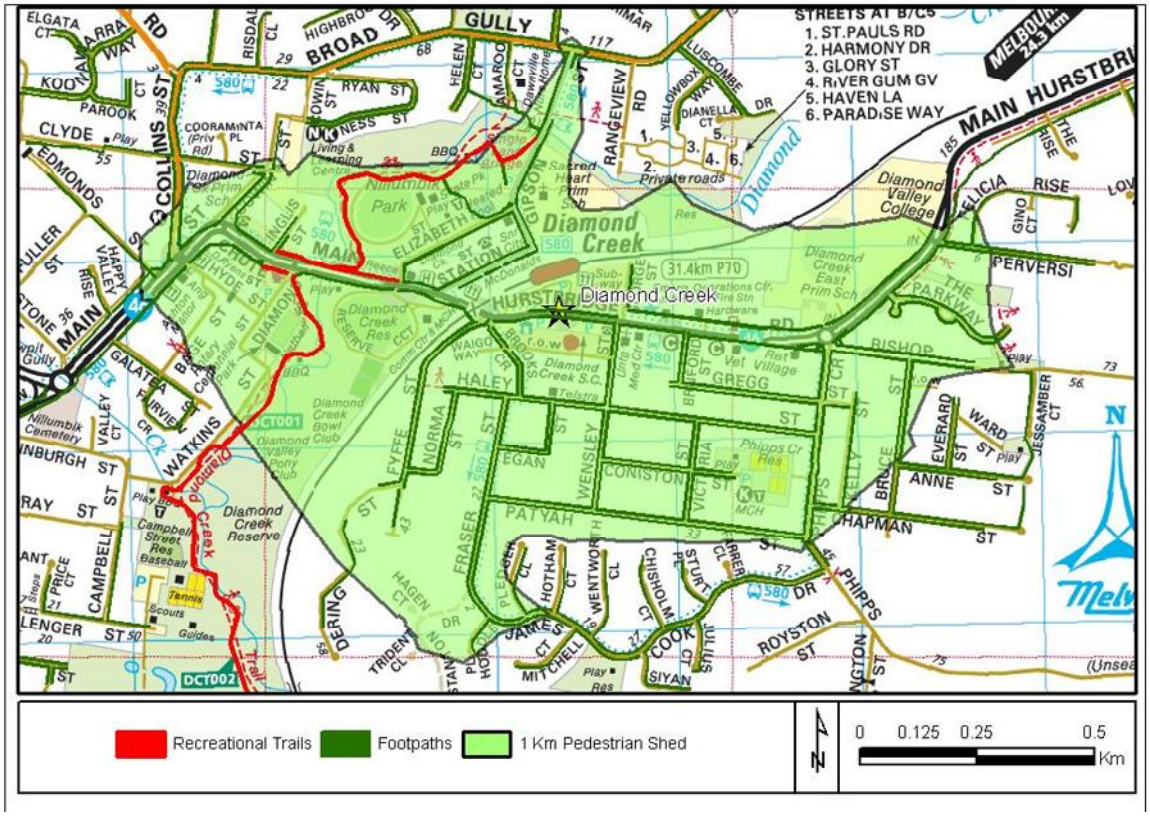
2.3 Transport Infrastructure

2.3.1 1km Pedshed

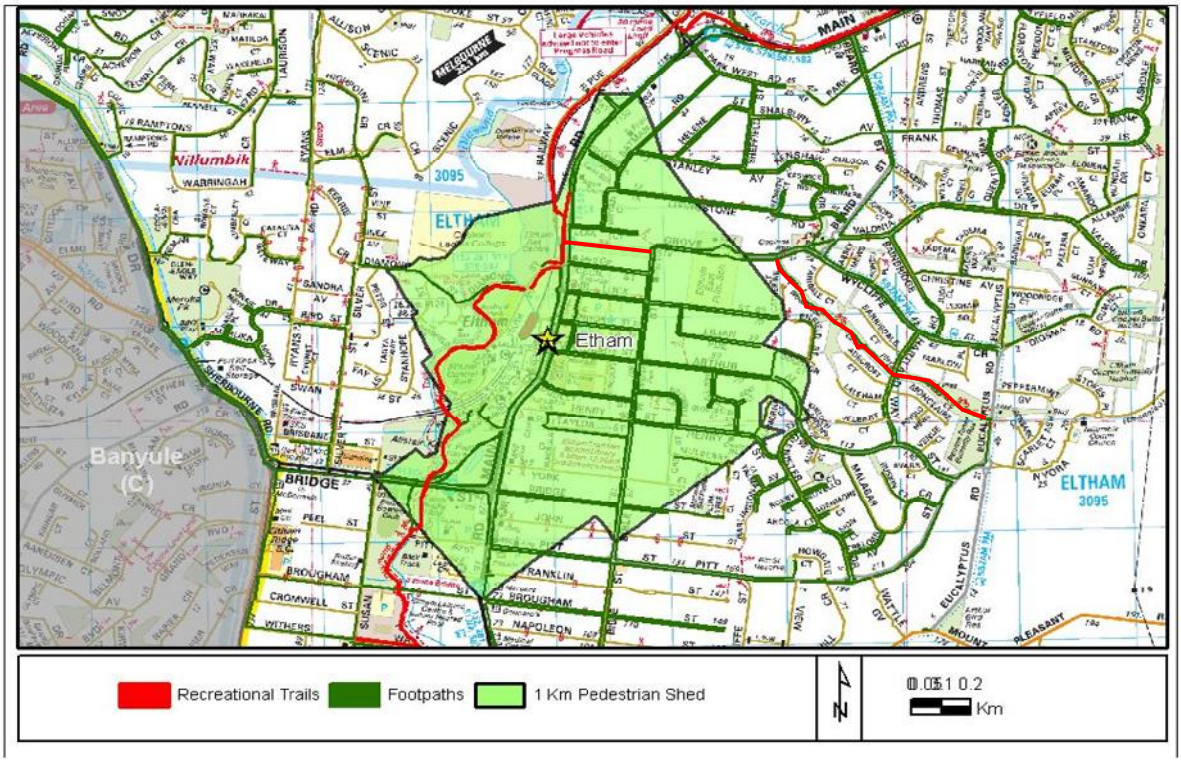
An analysis has been completed looking at the existing walking network within a 1km walk of Diamond Creek and Eltham. Figure 2-2 shows the area which can be reached on the existing street network within 1km of Diamond Creek and Eltham. The pedshed is calculated based on a 1km distance, using the existing street networks and walking paths. A 400m to 1km walking catchment is usually considered the distance which people have a tolerance for walking for functional trips. Both Eltham's and Diamond Creek's pedshed shows that the railway line and the Creek form a barrier to pedestrian access to the west of Eltham and north of Diamond Creek.

Figure 2-2 Walking Catchment

Diamond Creek



Eltham



Source: Booz & Company Analysis, 2009

Figure 2-2 shows that walk access is restricted by the railway line and river in both Diamond Creek and Eltham.

Within a 1km catchment there are approximately 2380 people of Eltham and 1554 people living in Diamond Creek[6]. The difference in the number of proximate population in each Activity Centres is possibly attributable to:

- Diamond Creek's lower density residential environment;
- A circuitous road network to the south of Patyah Street; and
- Minimal residences immediately to the north and southwest of the Diamond Creek Activity Centre.

GAP ANALYSIS: Section 2.3.1 has revealed the that the pedestrian network is restricted by the railway line and creek running through the centre of both Activity Centres and in the case of Diamond Creek, a circuitous road network in part of the residential area to the south of the Activity Centre.

A summary of all gaps can be found at Chapter 3 (page 82)

[6] *Booz & Company analysis based on 2006 Census meshblock data*

2.3.2 Pedestrian Infrastructure Standards

Walkability at an Activity Centre level can be evaluated by the existence of footpaths, crossings roadway conditions (road widths, traffic volumes and speeds), directness of desire-line and whether land uses are located within a walkable distance. There are a number of pedestrian infrastructure problems in Diamond Creek and Eltham which are similar.

Diamond Creek

The pedestrian environment in the two retail parts of Diamond Creek (Chute Street and, Main Hurstbridge Road) is different. For that reason they will be discussed separately in this section.

Notable features of the Diamond Creek, Chute Street pedestrian environment are:

1. The main section of the shopping strip is shaded with verandas;
2. Minimal crossings across Chute Street (only 1 in main shopping section);
3. Centre road fence dividing each side of Chute Street shops; and
4. Steep gradients of locale make walking more strenuous particularly for people with mobility impairments and elderly people.

Examples of some of the above are shown in Figure 2-3 below.

Figure 2-3 Chute Street pedestrian infrastructure and environment

Notable features of the Diamond Creek, Main Hurstbridge Road pedestrian environment are:

1. Pedestrians have to walk through car parks to get to shops;
2. There are sporadic (disjointed) pedestrian walkways through car parks;
3. There are high quality shaded pathways leading up to precinct;
4. Shaded and sheltered areas adjacent to shops;
5. (As with Eltham) the location of commuter car parking produces desire lines between train and car parking which guides people away from shopping areas.

Examples of some of the above are shown in Figure 2-4 below.

Figure 2-4 Main Hurstbridge Road pedestrian infrastructure and environment

Eltham

Some of the notable features of the Eltham pedestrians' network are noted below (and shown in Figure 2-5):

1. Public seating in active and sheltered places;
2. Key pedestrian routes are shaded and sheltered from weather;
3. A pedestrian plaza connects car parking with shopping;
4. Zebra crossings are located along key pedestrian desire lines;
5. Through-walks connect shopping to rear of Main street and Main Street shops;
6. Artistically designed footpaths contribute a sense of quality to pedestrian environment;
7. and 8. Minimal pedestrian crossing connecting shops and train station (only one crossing between the two sides of Main Street in the main shopping area);
9. Some through-walks are not optimised as pedestrian thoroughfares (unsafe);
10. The location of commuter car parking produces desire lines between train and car parking which guides people away from shopping areas;
11. Steep gradients of locale make walking more strenuous particularly for people with mobility impairments and elderly people.

Figure 2-5 Eltham pedestrian infrastructure and environment

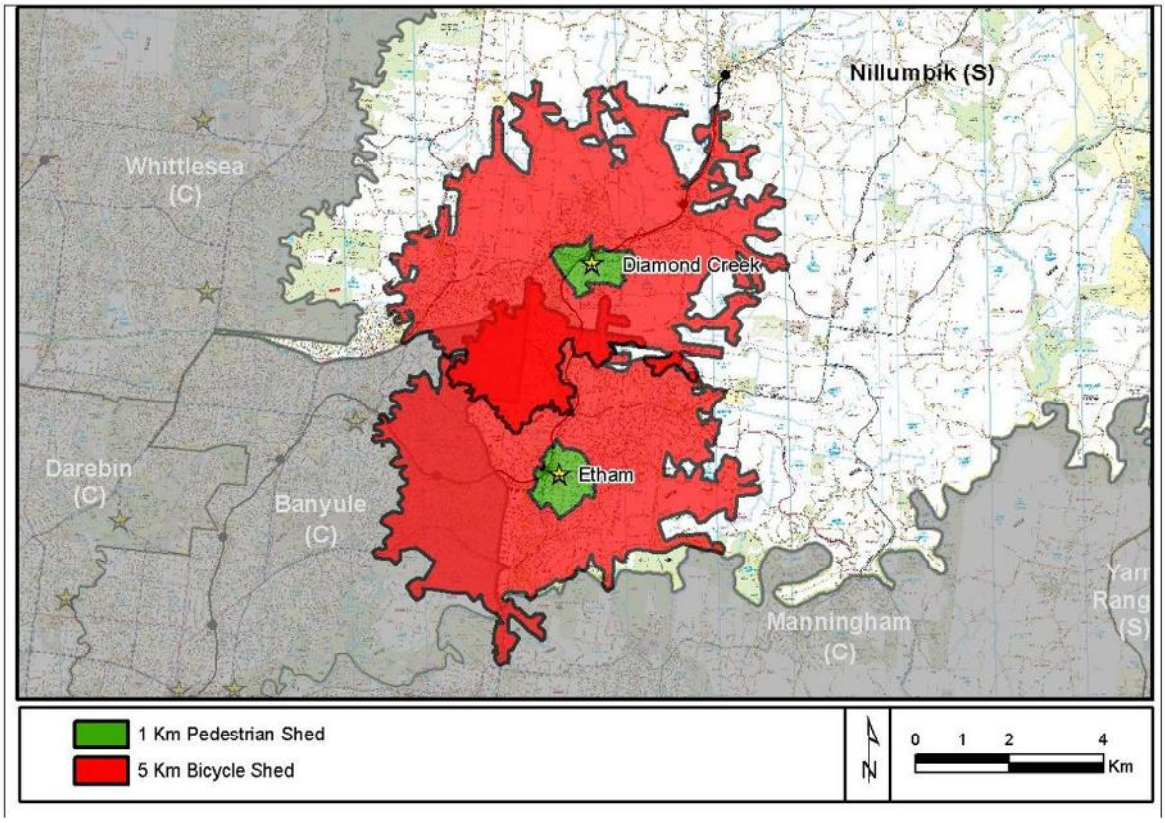
GAP ANALYSIS: Section 2.3.2 has revealed the following problems with the pedestrian network:

- Minimal points at which pedestrians can safely and conveniently cross Main Road (Eltham) and Main Hurstbridge Road (Diamond Creek);
- The location of commuter car parking guides commuters away from shops rather than maximising the potential for convenient 'dual purpose' shopping/commute trips.

2.3.3 5km Cycleshed

An analysis has been completed looking at the existing cycling network within a 5km bicycle ride of Diamond Creek and Eltham[7]. Figure 2-6 shows the area which can be reached on the existing street network within 5km ride of Diamond Creek and Eltham. As with the pedshed (pedestrian catchment in Figure 2-2) the Cycleshed is calculated using the existing streets and cycling/shared paths.

Figure 2-6 Cycling Catchment



Source: Booz & Company Analysis, 2009

Figure 2-6 shows the area which can be reached on the existing street network within 5km of Diamond Creek and Eltham. Notably:

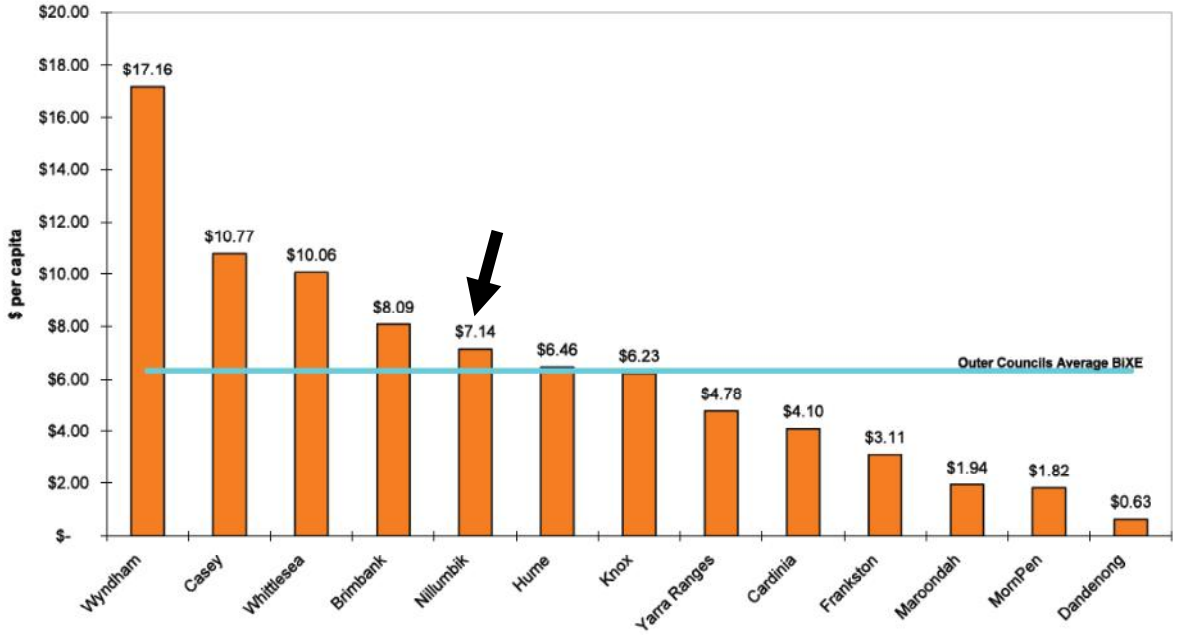
- The cycling catchment's cross-over. People in this cross-over section have the advantage of being in cycling proximity to both centres;
- A considerable portion of Eltham's western cycling is in the City of Banyule; and
- In Diamond Creek particularly, much of the catchment is outside the urban area where population is limited.

[7] *Travel diaries conducted in Vancouver, Canada indicated that 90% of cycling trips are under 8km (Translink, 2004, www.translink.bc.ca). There are no locally-based studies currently undertaken. Due to the topography of the Eltham and Diamond Creek area we have scaled this cycling catchment down to 5km.*

2.3.4 Cycling Expenditure

The amount spent on bicycle facilities correlates with the quality of the bicycle network and therefore the number of people who cycle. Figure 2-7 compares Cycling expenditure in municipalities across Melbourne. Bicycle Victoria estimates that $5.00 per resident is an appropriate target for Council's to achieve each year.

Figure 2-7 Cycling Budget 2008/09 by Outer Melbourne Local Governments



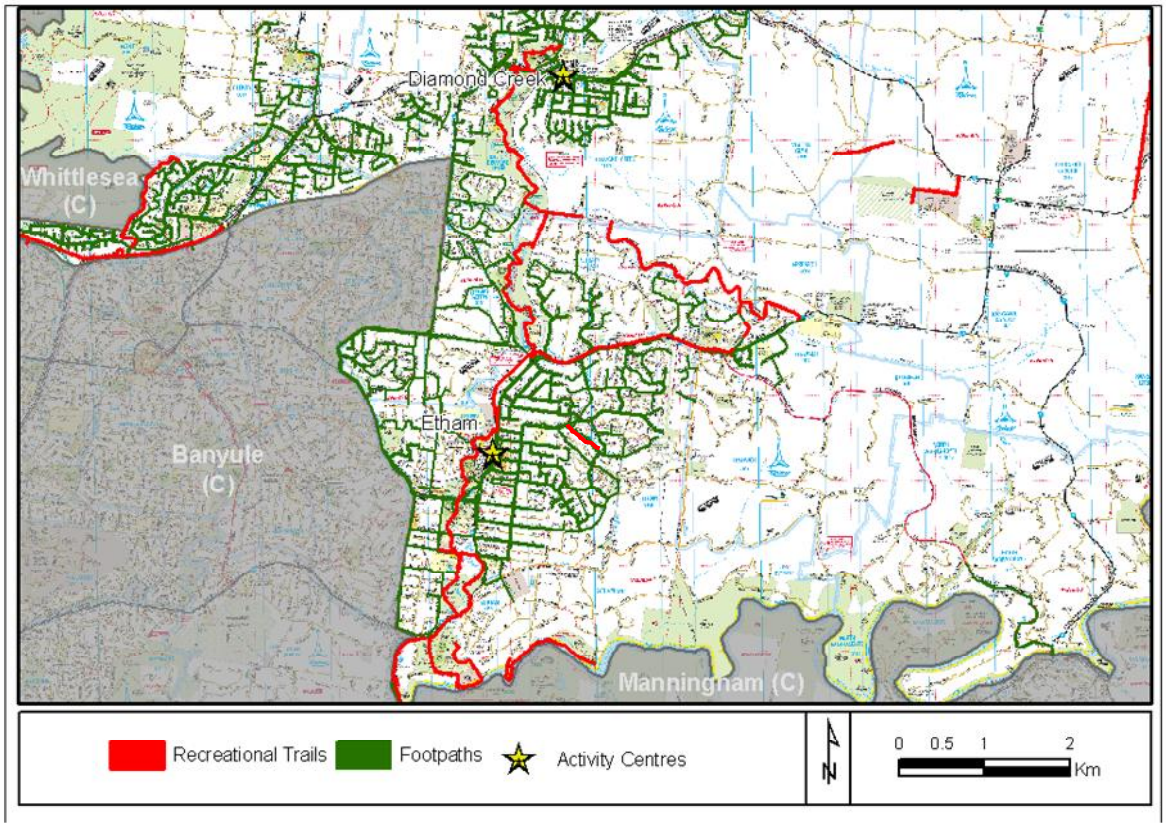
Source: Bicycle Victoria, 2007, BIXE Index, www.bv.org.au

The Nillumbik Shire Council allocated $7.14 per resident in 2008/09 budget. It is noted that the outer suburbs have a combination of lower densities and greater geographic size. In these municipalities $5.00 per person per annum will achieve less coverage of the municipality and population than in denser and smaller middle and inner suburbs.

2.3.5 *Cycling Infrastructure*

Cycling infrastructure is a determinate of the number of people choosing to cycle. It is not surprising that the municipalities with the highest expenditure on cycling infrastructure (Figure 2-7) also have the greatest participation in cycling as a transport mode and sport.

Figure 2-8 Cycling Routes and Footpaths in Nillumbik



Source: Booz & Company Analysis, 2009

Figure 2-8 shows that:

- There is a key north/south recreational trail (bicycle and pedestrian path) connecting Diamond Creek and Eltham;
- In Eltham North there is a circulatory route with three missing pieces; and
- There are no other local routes connecting local origins with either Activity Centre.

- **GAP ANALYSIS: Section 2.3.5 has revealed the there is a regional cycling network but that there are few routes connecting local people to each Activity Centre.**

A summary of all gaps can be found at Chapter 3 (page 82)

2.3.6 *Bus and Train Routes*

Diamond Creek is served by one bus routes shown in Table 2-2:

Table 2-2 Bus routes serving Diamond Creek

Route	Route Name	Operator
580	Diamond Creek - Eltham	Panorama

Eltham is served by eleven bus routes shown in Table 2-3 below:

Table 2-3 Bus routes serving Eltham

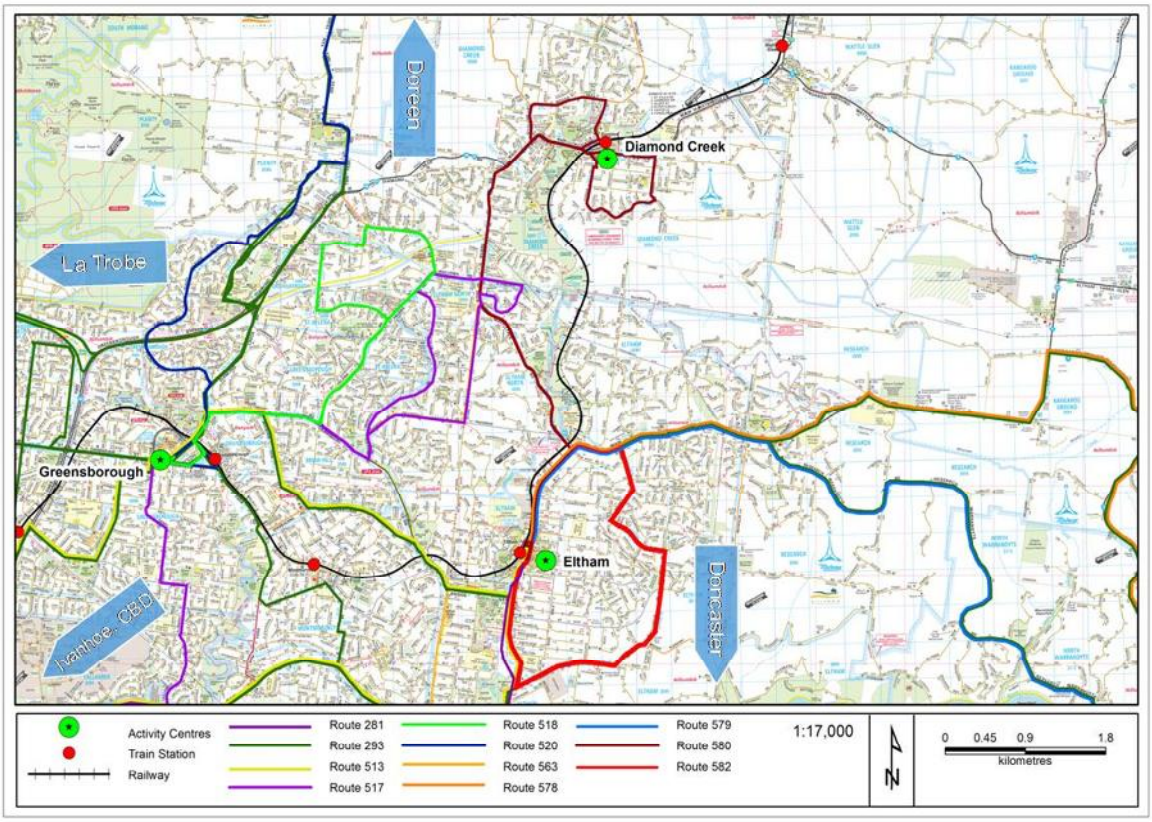
Route	Route Name	Operator
281	Box Hill - Eltham (Effective 24th November 2008)	National Bus
293	Box Hill - Greensborough via Doncaster Shoppingtown	National
513	Eltham - Glenroy via Greensborough, Lower Plenty	Dyson
517	Northland - St Helena via View Bank, Greensborough	Dyson
518	Greensborough - St Helena West via St Helena	Dyson
520	Yan Yean - Greensborough via Doreen, Yarrambat	Dyson
563	Greensborough - Northland via Mill Park, Plenty & via Diamond Creek Road	Dyson
578	Eltham - Warrandyte via Research, Kangaroo Ground, Warrandyte Road (Effective 09/11/2008)	Panorama
579	Eltham - Warrandyte via Research, Research Warrandyte Road (Effective 09/11/2008)	Panorama
580	Diamond Creek - Eltham	Panorama
582	Eltham Town Service via Woodridge Estate (Effective 09/11/2008)	Panorama

The Victorian Transport Plan, 2008 announced a new SmartBus route through Eltham. This service will commence in early 2010:

902 (Green orbital)	Springvale route to Airport West through Doncaster, Eltham, Greensborough and Broadmeadows	Unknown

Bus routes connect the activity centres to La Trobe University, Doncaster, Northland and other smaller townships to the north of the urban growth boundary (Figure 2-9). Council has been upgrading bus stops to DDA (Disability Discrimination Act) standards. Currently there are 91 DDA compliant bus stops throughout Nillumbik.

Figure 2-9 Bus and Train Routes in Diamond Creek and Eltham



The DOT is currently undertaking works to improve the Hurstbridge (and Epping) railway lines through track duplication works. These works will improve rail capacity and reliability by removing a major bottleneck between Clifton Hill and Westgarth stations. A new rail bridge has been constructed over Merri Creek.

2.3.7 *Public Transport Service Standards*

Table 2-4 summarises varying service level data across different lines and routes:

Table 2-4 Bus and Train Service Level for Diamond Creek and Eltham

	Average Daily Headways			Service Span			
Hurstbridge Line Train Stations	Mon - Fri	Sat	Sun	Mon - Thur	Fri	Sat	Sun
Hurstbridge	◔	◔	◔	●	●	●	●
Wattle Glen	◔	◔	◔	●	●	●	●
Diamond Creek	◔	◔	◔	●	●	●	●
Eltham	◕	◕	◕	●	●	●	●
Local Train Service Average	◑	◑	◑	●	●	●	●
Bus Route	Mon - Fri	Sat	Sun	Mon - Fri		Sat	Sun
281	◑	◔		◕		◑	
293	◑	◔	○	●		◑	◑
513	●	◔	◔	◕		◕	◕
517	◑	◔	◔	●		◕	◕
518	◑	◑		◕		◑	
520[1]	○			○			
563	◑	◔	◔	●		◕	◕
578	◔	○		◑		◕	
579	◔	○		◕		◕	
580	◑	◑	◔	●		●	◕
582	◔	◔	◔	◕		◕	◕
Local Bus Service Average	◑	◔	◔	◕		◕	◕

Service Rating Scale			
Headways		Service Span	
○	X>1:00	○	x<6:00
◔	0:30<x=1:00	◔	6:00=x<9:00
◑	0:20<x=0:30	◑	9:00=x<12:00
◕	0:15<x=0:20	◕	12:00=x<15:00
●	x=0:15	●	x=15:00

Source: Booz & Company Analysis, 2009

- 6 out of 10 bus services have weekday frequencies of between 20-30 minutes (calculation excludes route 520 as it is a special service 1 service each direction daily)
- 3 out of 10 bus services have weekday frequencies of between 30-60 minutes
- 5 out of 10 bus services do not run on Sundays
- The average bus headway is 32 minutes on a weekday, 46 minutes on Saturday and 51 minutes on Sunday.
- The average train frequency to Diamond Creek is 40min compared to 20min to Eltham.
- All train service spans are all greater than bus service spans
- Train service spans are consistently high across weekdays and weekends.
- The average service space of a train on a weekday is 20 hours 7 minutes compared to the average weekend span which is 18 hours and 59 minutes.

- The average service space of a bus on a weekday is 13 hours 53 minutes compared to the average weekend span which is 12 hours and 23 minutes.

The Victorian Transport Plan (2008) announced a new SmartBus route through Eltham (Route 902). This route will run from Chelsea to Airport West via Nunawading, Doncaster, Eltham, Greensborough and Broadmeadows. The SmartBus route would lift bus service standards to Eltham –operating on a 15min frequency between during the day and 30min frequency until midnight.

GAP ANALYSIS: Section 2.3.7 shows that Diamond Creek has a lower level of public transport service standards than Eltham. In combination with evidence presented in 2.4.1 it can be concluded that this factor has contributed to lower public transport usage to access Diamond Creek Activity Centre.

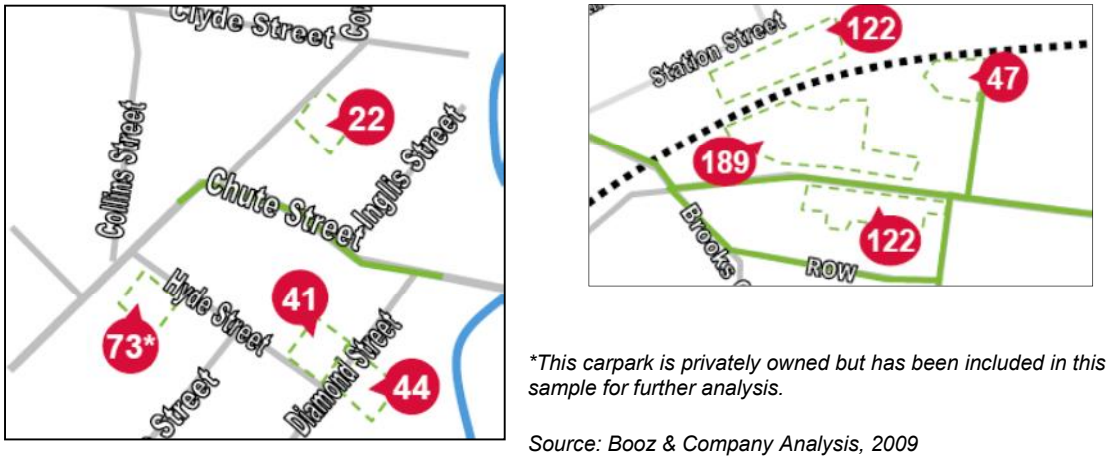
A summary of all gaps can be found at Chapter 3 (page 82)

2.3.8 *Parking Supply*

Both Diamond Creek and Eltham have a large portion of the car parking supplied off-street. There is a significant amount of privately provided public parking in Eltham. Figure 2-10 shows on and off street parking locations.

Figure 2-10 Location and number of off street car parking spaces

Diamond Creek



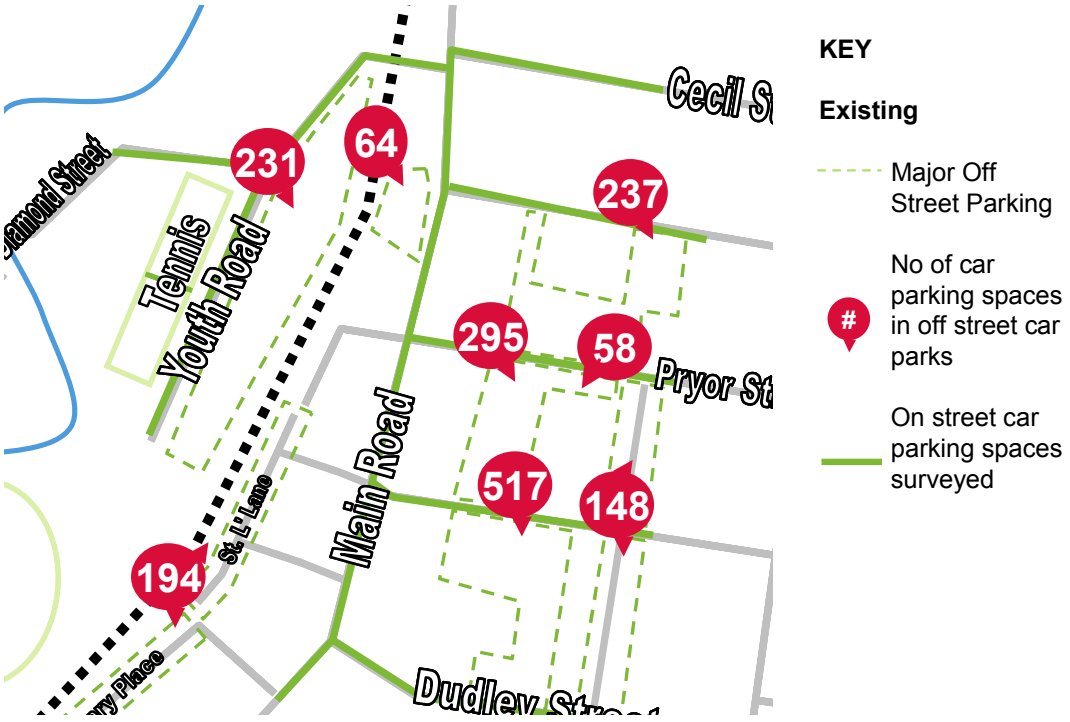
**This carpark is privately owned but has been included in this sample for further analysis.*

Source: Booz & Company Analysis, 2009

Car parking is located as close as possible for users to access their destination:

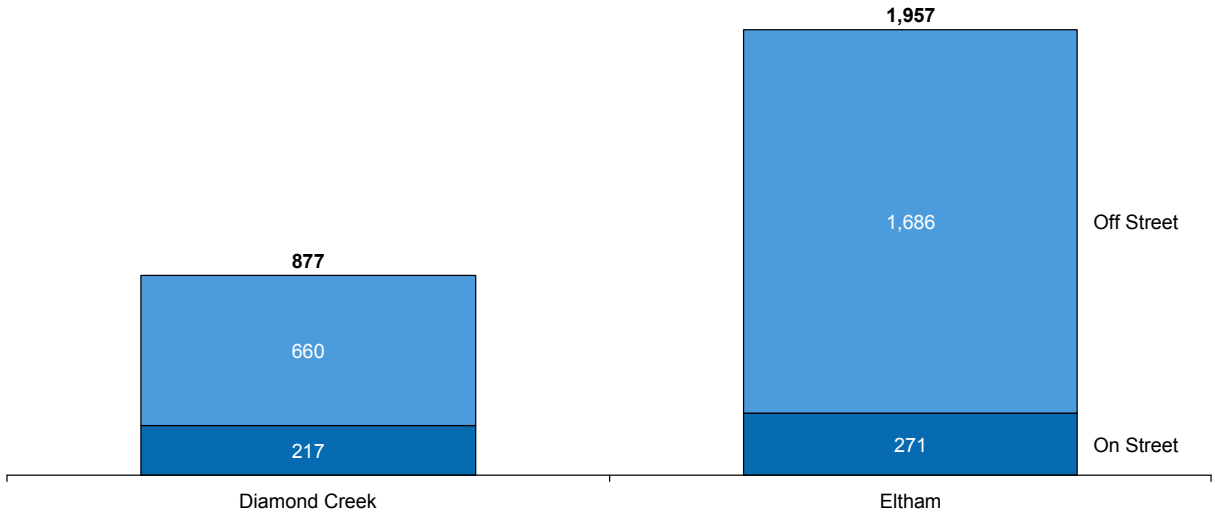
- Shoppers parking (1P and 2P) and trader permit parking is located close to shopping areas; and
- Commuter car parking (in Diamond Creek mostly in Station Street and Eltham in Youth Street and St Laurence Place) close to train and bus stations.

Eltham



The number of on and off street parking as a proportion of parking supply in each Activity Centre is shown in Figure 2-11 below.

Figure 2-11 On and Off Street Car Parking Supply



Source: Booz & Company Analysis, 2009

Figure 2-12 shows the percentage of businesses in Eltham which have private car parking available to their employees and/or customers.

Figure 2-12 Eltham Businesses with private off-street car parking

	Private parking for business
Yes	37%
No	63%

Source: Nillumbik Shire Council, Eltham Trader Survey, 2009

An analysis of Figure 2-11 and Figure 2-12 shows that:

- Eltham's 1975 car parking spaces predominantly comprise of off street spaces (86%);
- Likewise, Diamond Creek has 877 car parking spaces predominantly made up of off street spaces (75%); and
- Most Eltham businesses do not have private car parking available to their employees and customers (63%).

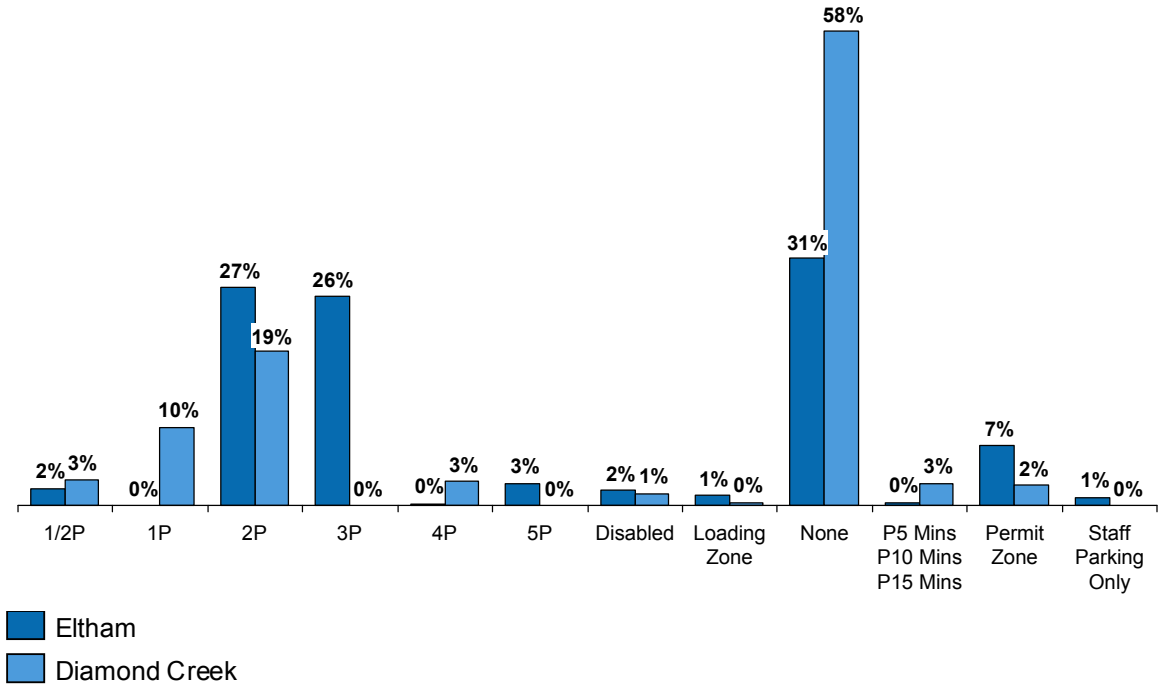
GAP ANALYSIS: Section 2.3.8 shows that commuter car parking spaces have been located in close proximity to train/bus hubs. Section 2.3.2 reveals that such location of car parking supports desirelines between car and train/bus but does not facilitate incidental dual purpose commute/shopping trips.

A summary of all gaps can be found at Chapter 3 (page 82)

There are differences in the types of parking available in each of the activity centres. Figure 2-13 shows the types of parking restrictions in Diamond Creek and Eltham as a percentage of overall parking in each Activity Centre.

Parking restrictions are an important travel demand management tool. Tailoring parking to fit a purpose ensures that parking is available for the intended user, and unnecessary driving trips are not being made.

Figure 2-13 Parking Restriction Type in Eltham and to Diamond Creek (%)



Source: Booz & Company analysis, 2009

Eltham:

The majority of parking in Eltham is medium term parking. The main target groups for this type of parking are shoppers, people attending appointments/meetings and eating out.

- Short term parking[8]: 2% of parking;
- Medium term parking[9]: 53% of parking; and
- Long term parking[10]: 42% of parking.

Diamond Creek:

The majority of parking in Diamond Creek is long term parking, mainly as a result of many spaces having no restrictions on them. The target group for long-term parking is workers in the Activity Centre and commuters.

- Short term parking: 15% of parking;
- Medium term parking: 22% of parking; and

[8] *Short term parking is defined as P5 Min, P10 Min, P15Min, 1/2P and 1P*

[9] *Medium term parking is defined as 2P, 3P and 4P*

[10] *Long term parking is defined as 5P, No Restrictions, Permit Zone and Staff Parking. Permit Zone is included in this grouping as all permits in these areas are for staff at businesses.*

- Long term parking: 61% of parking.

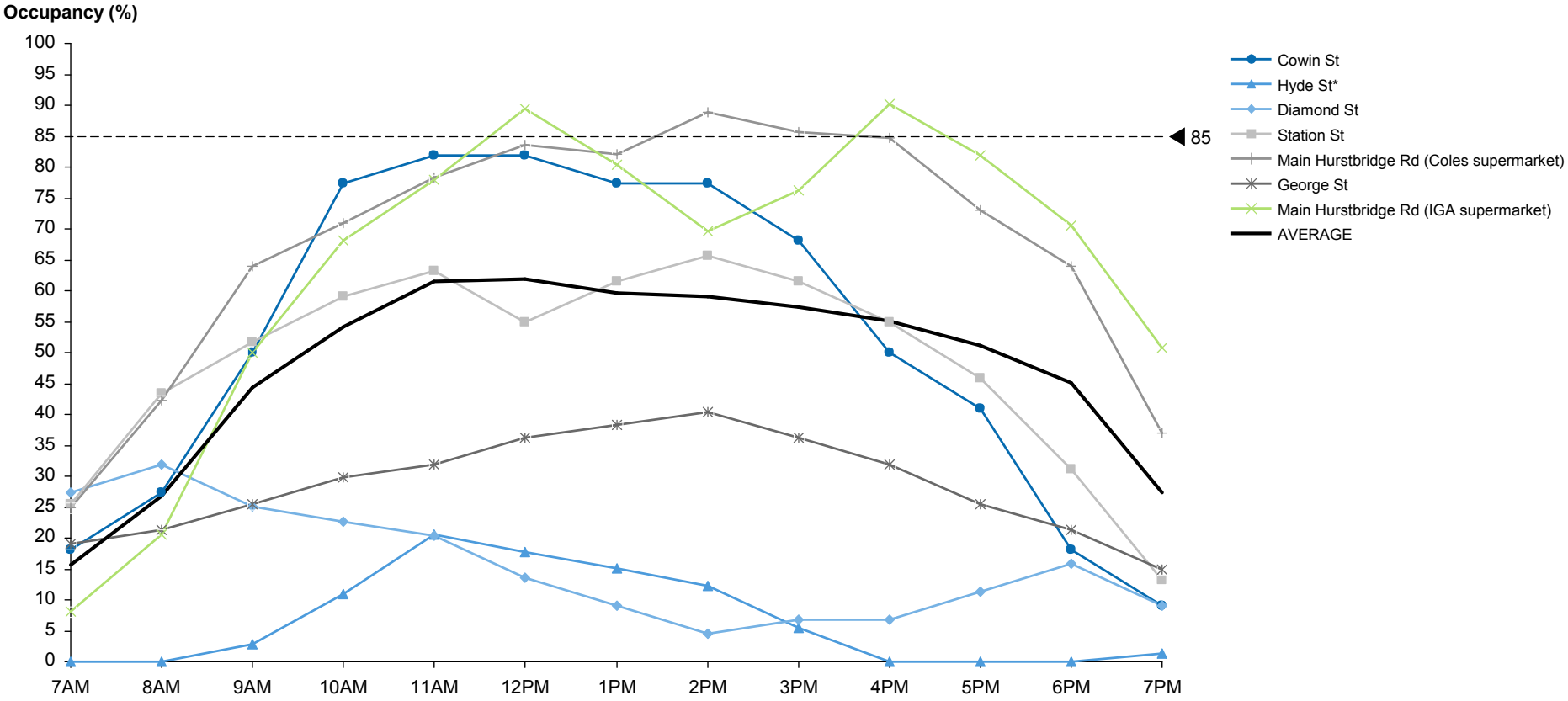
2.3.9 Parking Occupancy

Measuring parking occupancy indicates the ease with which a driver can find a car park. Donald Shoup, pre-eminent professor of urban planning at the University of California and author of the *High Cost of Free Parking*, cites an 85% occupancy rate as a common point at which car parking occupancy should be targeted. Greater than 85% occupancy can result in driver frustration and less than 85% can be considered unnecessarily inefficient use of land resources. Given this, 85% occupancy will be used for this report. It is comparable to 3 spaces in every 20 being available to park.

The parking occupancy of on and off street spaces in Diamond Creek is shown in Figure 2-14 below.

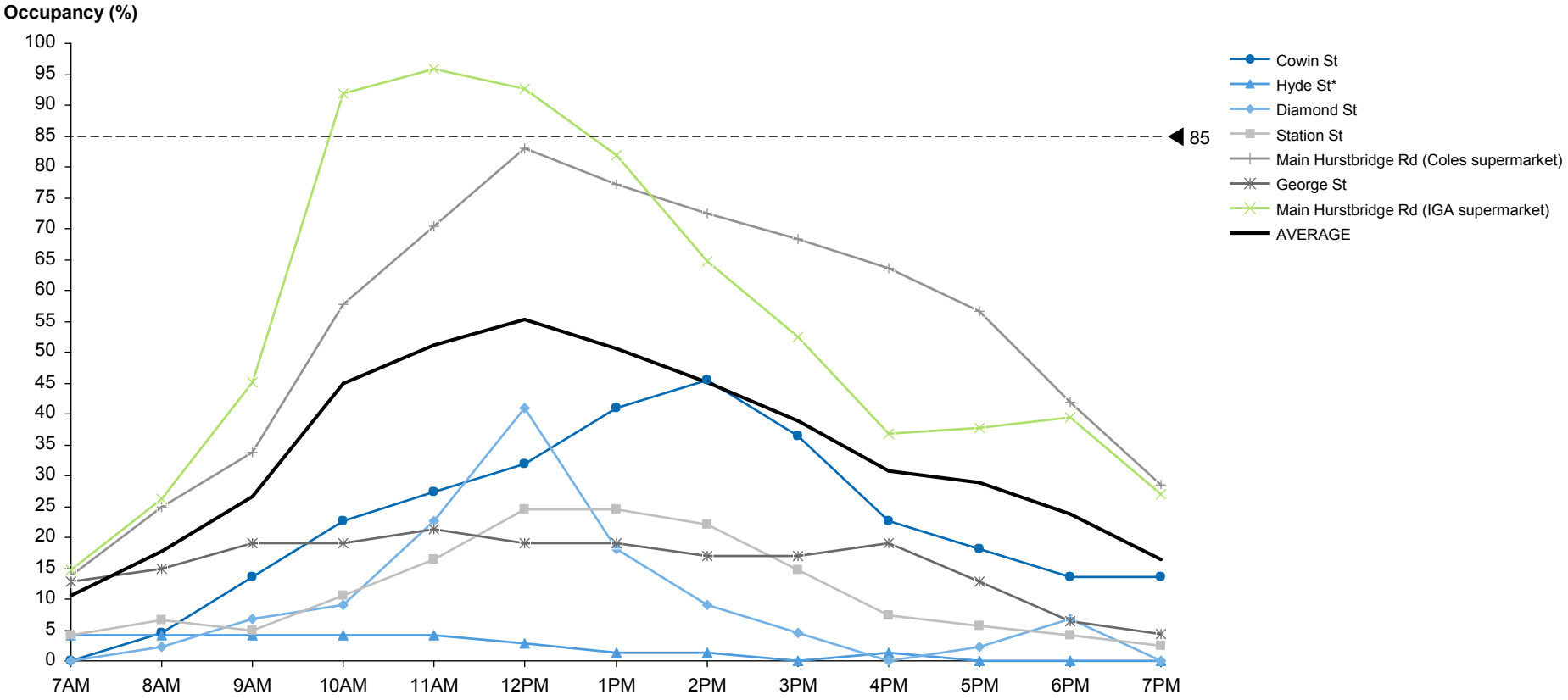
Figure 2-14 Diamond Creek Car Parking Occupancy

Thursday: Off Street Car Parking



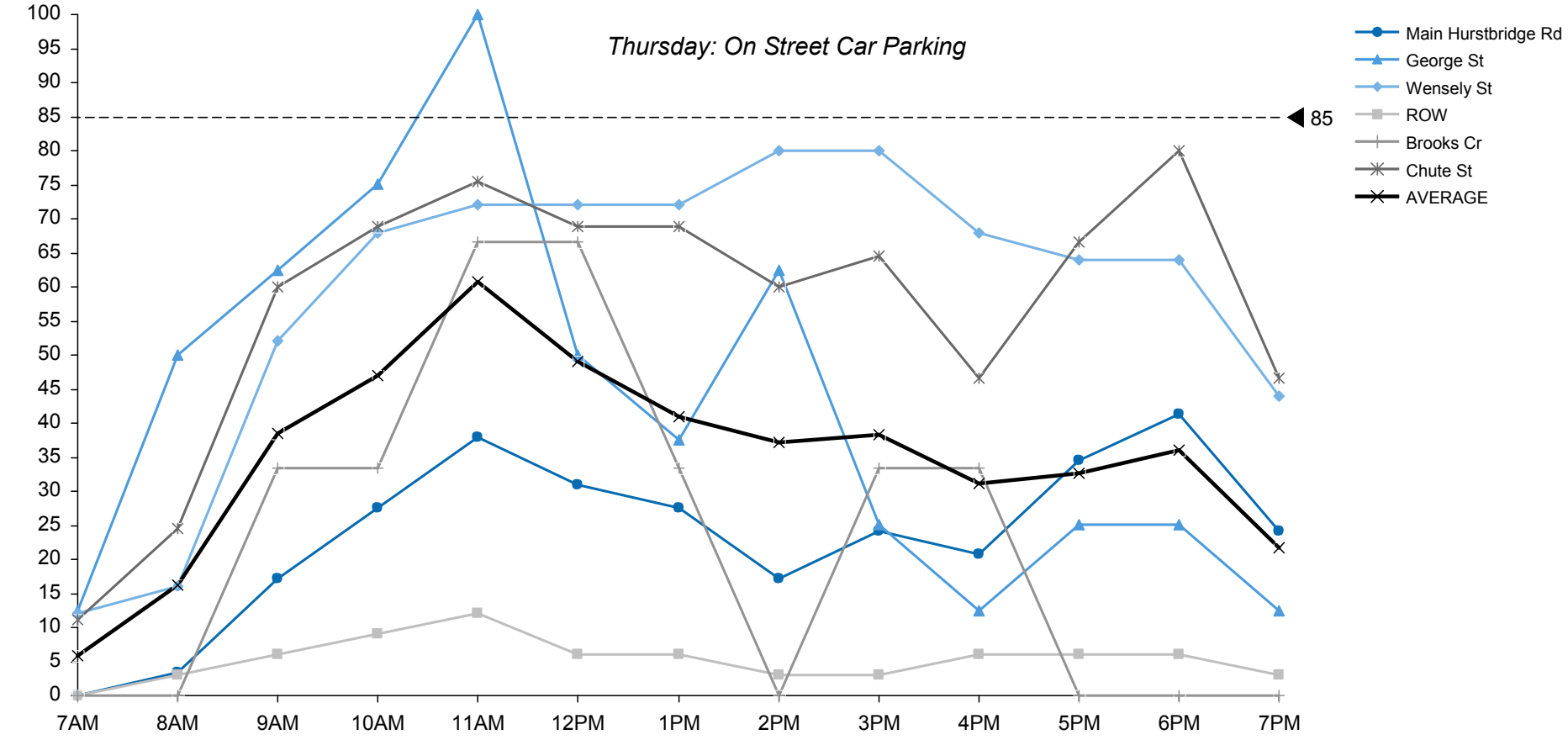
Source: Booz & Company Analysis, 2009
Notes: No data available for Watkins Street/Hyde Street car park
** denotes private car parks included in sample*

Saturday: Off Street Car Parking



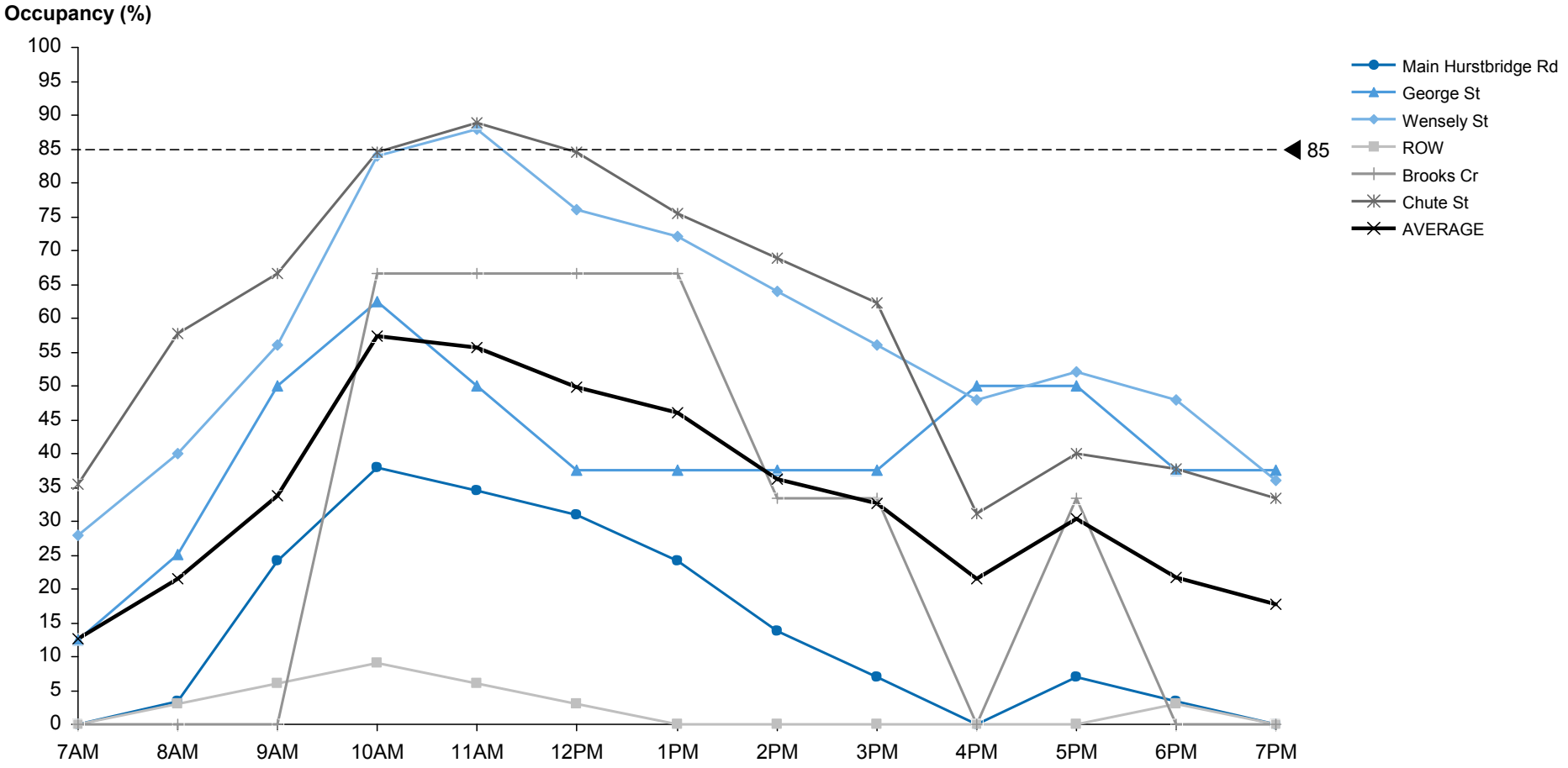
Source: Booz & Company Analysis, 2009

Occupancy (%)



Source: Booz & Company Analysis, 2009

Saturday: On Street Car Parking



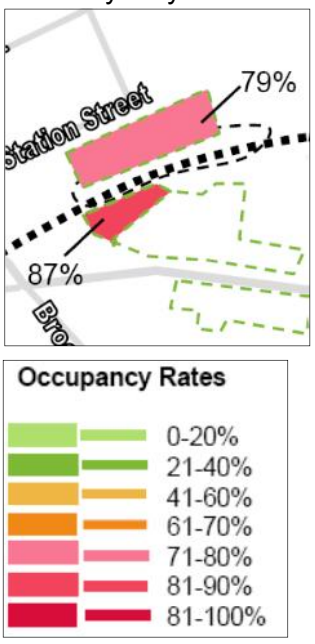
Source: Booz & Company Analysis, 2009

Occupancy of off and on street car parking at 12pm is shown in Figure 2-15 below.

Figure 2-15 Diamond Creek: 12pm car parking occupancy

Weekday/Weekend average:

Commuter parking spaces
Weekday only:



Notes: * *No data available for Watkins Street/Hyde Street car park*
\# *Car park privately owned*
Source: *Booz & Company Analysis, 2009*

To summarise the occupancy survey undertaken in Diamond Creek (Figure 2-14 and Figure 2-15):

- A significant portion of Diamond Creek car parking is unoccupied across the day, with particularly low occupancy rates on a Saturday compared with a weekday.
- Parking is most occupied at 11am on a weekday (7 out of 10 spaces occupied) and 1pm on a Saturday (6 out of 10 spaces occupied);
- Both supermarket car parks are the most occupied on a weekday and on Saturdays. The IGA supermarket car park has a peak occupancy of 90% at 4pm on a weekday and 96% occupancy at 11am on a Saturday. Similarly, the Coles supermarket car park has a peak occupancy of 90% at 2pm on a weekday and 83% occupied at 12am on a Saturday;
- On street parking in George Street peaks at 100% occupied on a weekday at 11am before demand falls away. Wensley Street on street car parking spaces achieves the

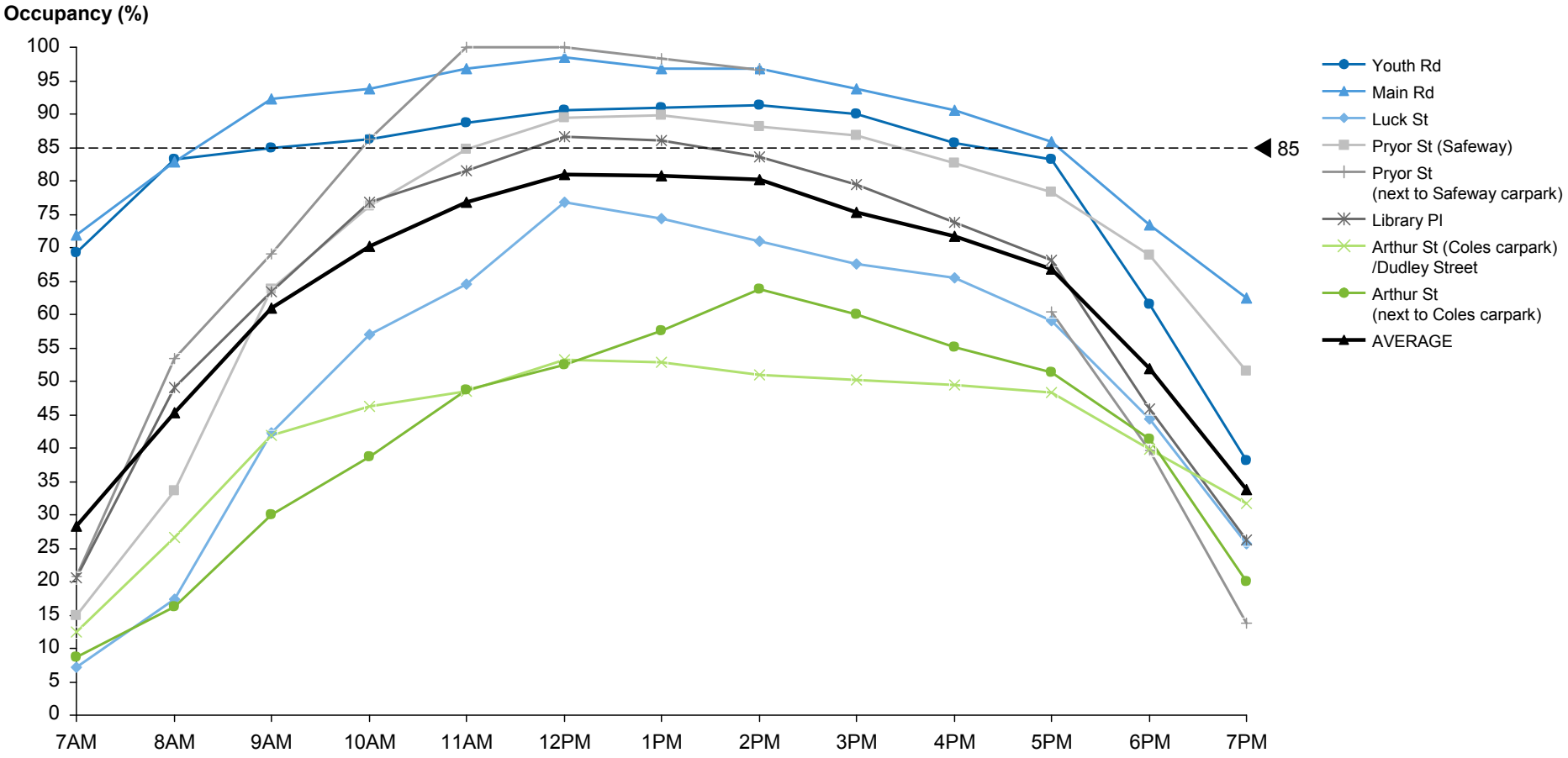
next highest occupancy levels with 8 out of every 10 spaces unavailable between 2pm and 3pm (80% occupancy); and

- Commuter car parking is well occupied during the week (79-87%), particularly the commuter spaces in the Main Hurstbridge Road, at the western end of Coles supermarket car park.

Parking occupancy of on and off street spaces in Eltham is shown in Figure 2-16 below.

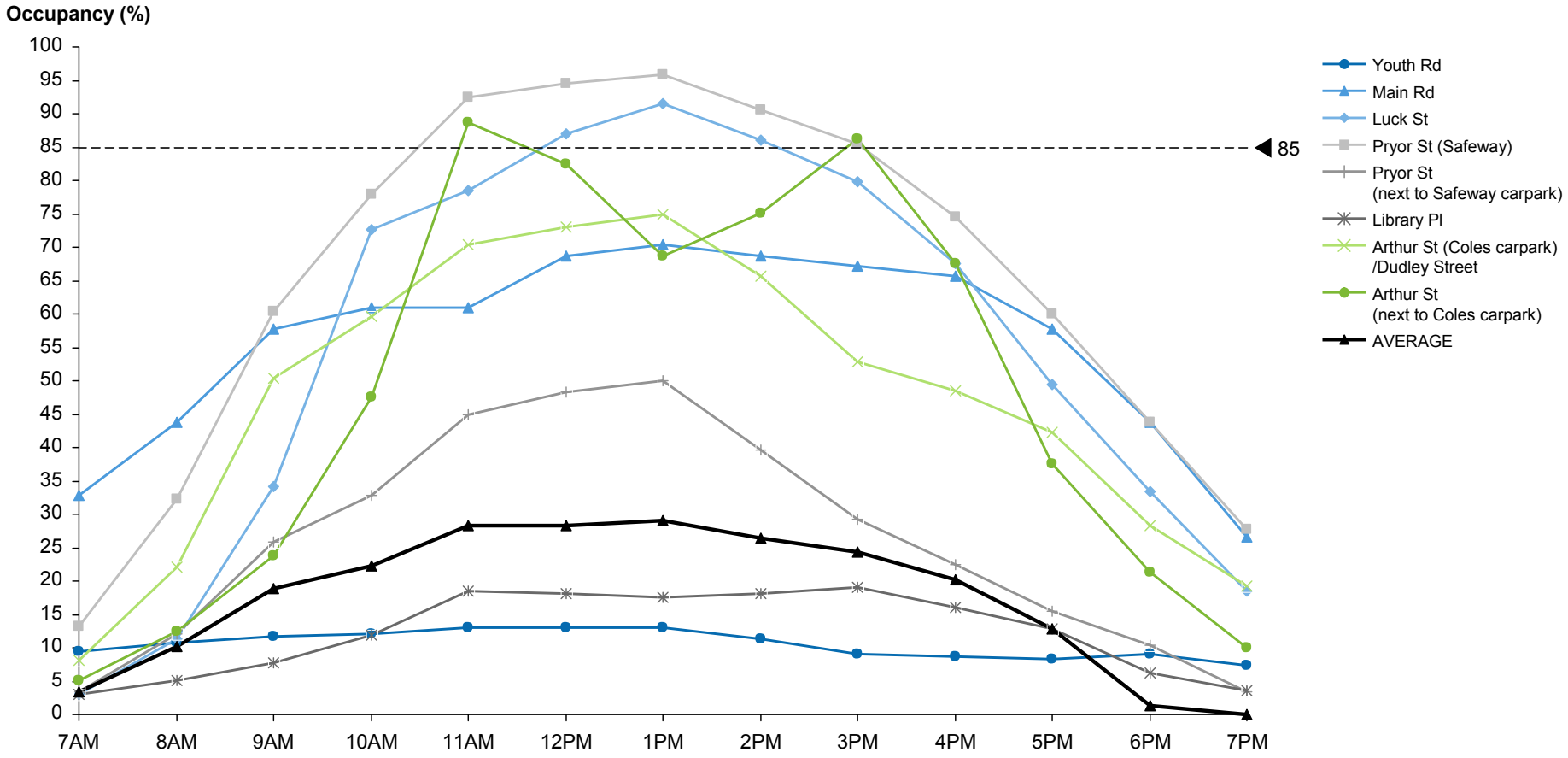
Figure 2-16 Eltham Car Parking Occupancy

Thursday: Off Street Car Parking



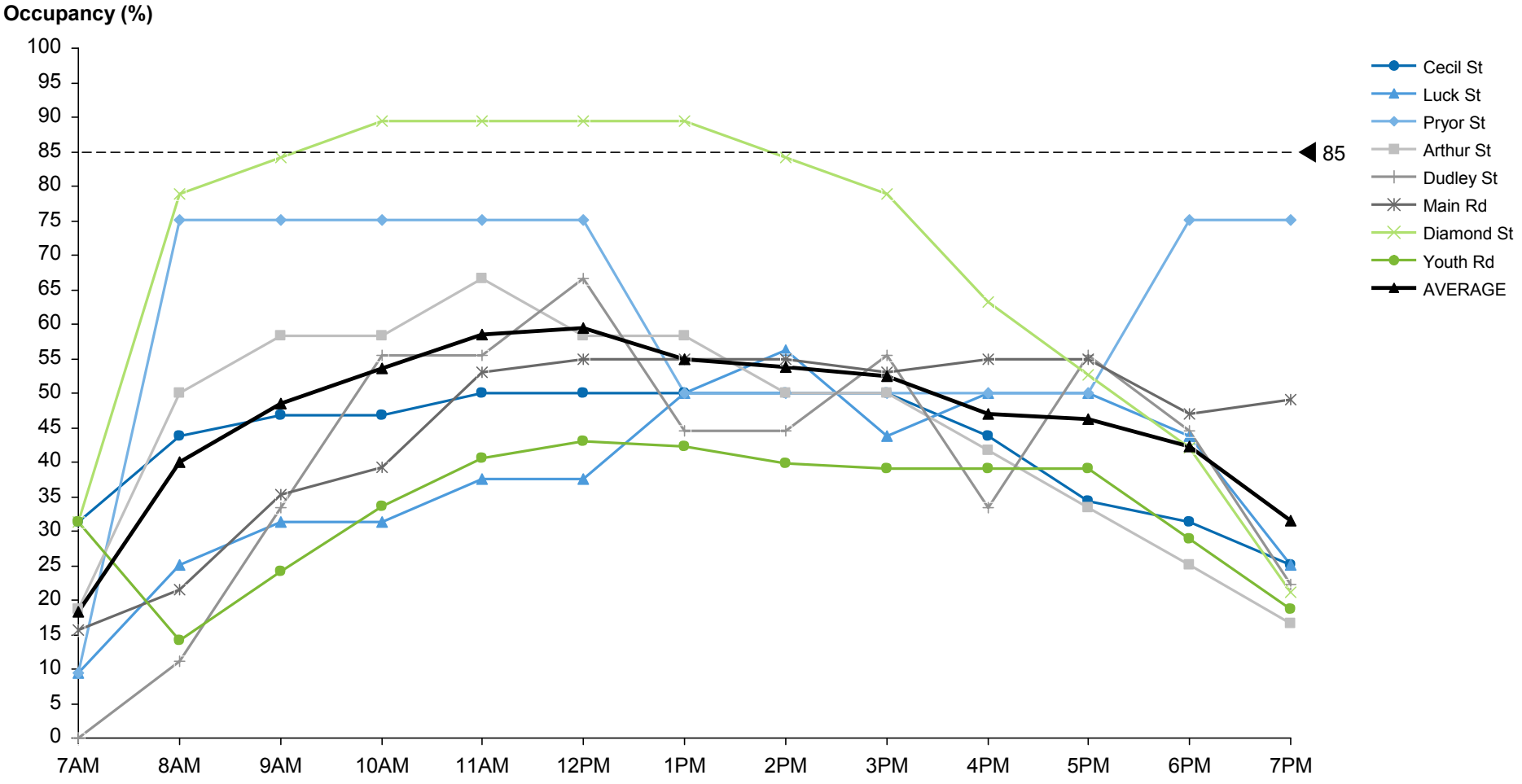
Source: Booz & Company Analysis, 2009

Saturday: Off Street Car Parking



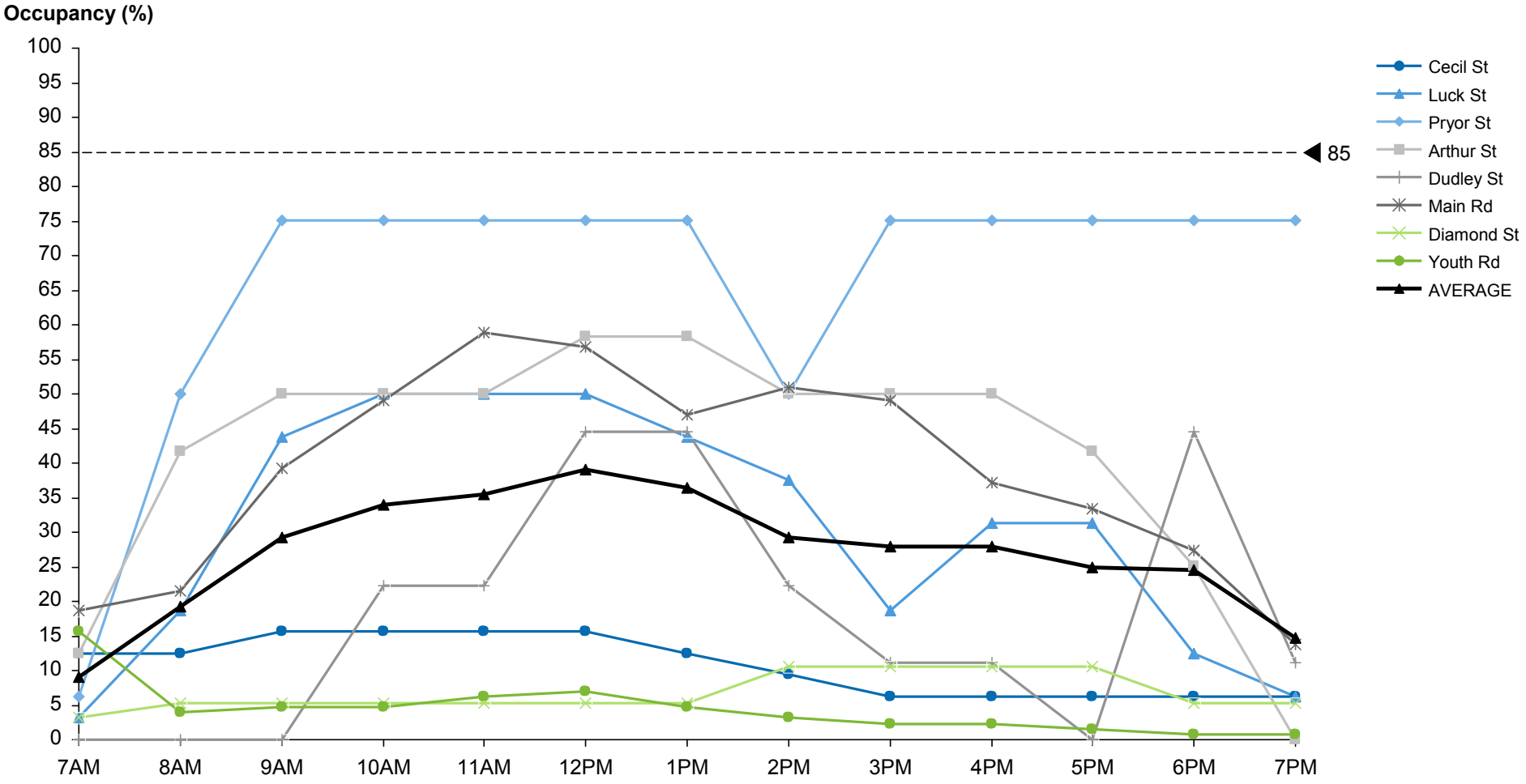
Source: Booz & Company Analysis, 2009

Thursday: On Street Car Parking



Source: Booz & Company Analysis, 2009

Saturday: On Street Car Parking

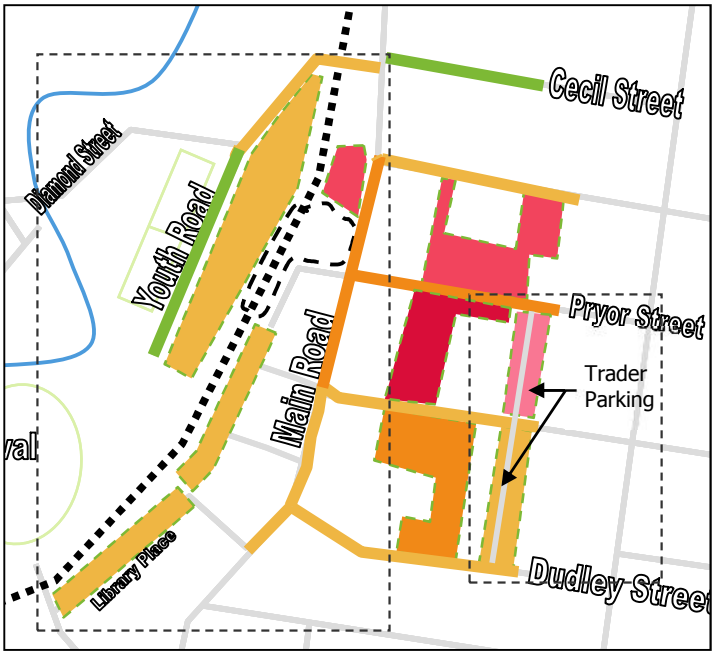


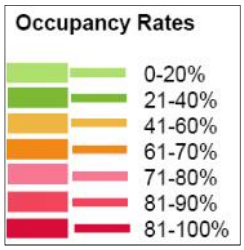
Source: Booz & Company Analysis, 2009

Figure 2-17 shows the occupancy of off and on street car parking at 12pm[11].

Figure 2-17 Eltham: 12pm car parking occupancy

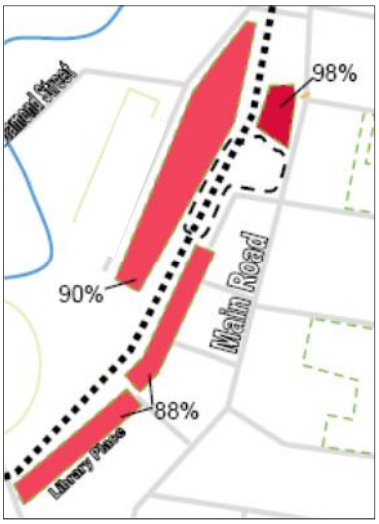
Weekday/Weekend average:



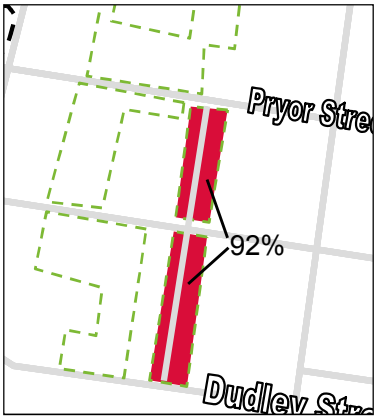


Commuter parking spaces

Weekday only:



Weekday only:
Trader Permit Parking



Source: Booz & Company Analysis, 2009

To summarise the occupancy survey undertaken in Eltham (Figure 2-16 and Figure 2-17):

- Parking utilisation is sporadic in Eltham with parking demand high on a weekday for commuter and trader spaces. For other visitors such as shoppers there are generally only high occupancies in central spaces;
- Off street trader parking spaces in the Pryor Street car park (next to Safeway car park) are totally occupied by 11am.
- Off street car parking spaces used by commuters are highly utilised on a weekday with a maximum of 98% occupancy in the car park in Main Road, a maximum of 91% occupancy in the Youth Road car park.

[11] *Occupancies have been taken at 12pm as this is generally the hour when peak occupancy occurs in both Eltham and Diamond Creek.*

- On a Saturday it is mainly the central visitor parking which is highly occupied with the Pryor Street Safeway car park achieving the highest occupancy of 96%, and the Luck Street car park achieving occupancy of 92%.
- On street car parking spaces are much less occupied than off-street spaces.
- On a weekday the most highly occupied on street spaces are in Diamond Street, with 9 out of 10 spaces occupied by 10am (89% occupied). It is likely that these spaces are operating as 'spill over' parking for the off street commuter car parks.
- On a Saturday the most utilised on street parking spaces are those in Pryor Street in which 75% of spaces are occupied between 9am and 1pm and 3pm until late.

GAP ANALYSIS: Section 2.3.9 reveals the following car parking occupancy problems:

- Commuter car parking is congested on weekday;
- Trader car parking is congested on weekdays;
- Most car parking for shoppers is underutilised beyond a small central area, and beyond small peak periods.

A summary of all gaps can be found at Chapter 3 (page 82)

2.3.10 Parking Occupancy: Accessible Parking Spaces

There are 34 Designated Accessible Parking Spaces in Eltham and 12 in Diamond Creek.

What is a Designated Accessible Parking Bay?

A Designated Accessible Parking Bay is designed and managed to accommodate car drivers who have a physical disability. They are managed through an access permit displayed on the car.

The design guidelines for Designated Accessible Parking Bays are:

- A minimum width of 3200mm (3800mm preferred).
- Ideally, the bay will be adjacent to the building entrance and be on level ground
- On a firm surface with no loose particles.
- Access to adjacent pathways shall be level or via kerb ramps. lines marked as per Australian Standard 2890.1 and AS1428 in white, yellow or blue paint (blue preferred).
- Pole signs located at the front (or side if parallel bay) should be provided. An overhead clearance of 2500mm is required.

The number of accessible car parking spaces in locations throughout the Activity Centre is set out is set out in Figure 2-18 and the occupancy of these spaces is shown in Figure 2-19 below.

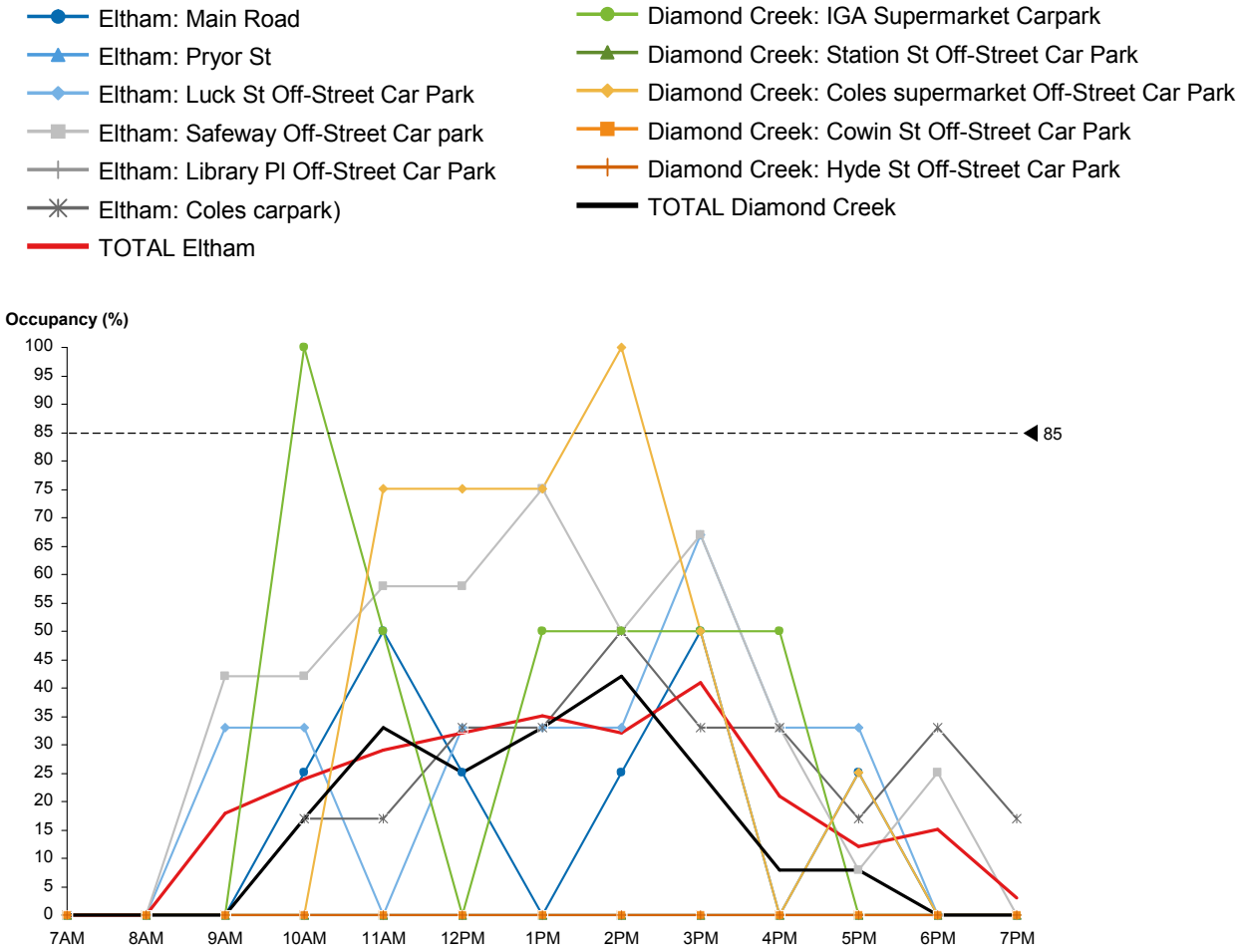
Figure 2-18 Accessible Car Parking Supply (2P Disabled and P Disabled)

Location	Supply
Eltham: Main Road	4
Eltham: Pryor St	1
Eltham: Luck St Off-Street Car Park	3
Eltham: Safeway Off-Street Car park	12
Eltham: Library Pl Off-Street Car Park	6
Eltham: Coles carpark)	6
TOTAL Eltham	**34**
Diamond Creek: IGA Supermarket Carpark	2
Diamond Creek: Station St Off-Street Car Park	2
Diamond Creek: Cowin St Off-Street Car Park	1
Diamond Creek: Hyde St Off-Street Car Park	3
TOTAL Diamond Creek	**12**

Note: As part of works in the area currently planned one additional Accessable Parking Space will be provided in the Luck Street off-street car park and one space along Commercial Place, Eltham.

Figure 2-19 Saturday Car Parking Occupancy Diamond Creek and Eltham (%)

Accessible Car Parking Spaces (2P Disabled and P Disabled)



Note: *As part of works in the area currently planned one additional Accessable Parking Space will be provided in the Luck Street off-street car park and one space along Commercial Place, Eltham.*

Figure 2-19 shows that:

- The average occupancy of accessible car parking spaces peaks in Diamond Creek at 2pm (41%) and Eltham at 3pm (42%);and
- There are only two locations where accessible car parking spaces achieve greater than 85% occupancy- Diamond Creek's IGA Supermarket and Diamond Creek's Coles Supermarket.

GAP ANALYSIS: Section 2.3.10 reveals the following car parking occupancy problems:

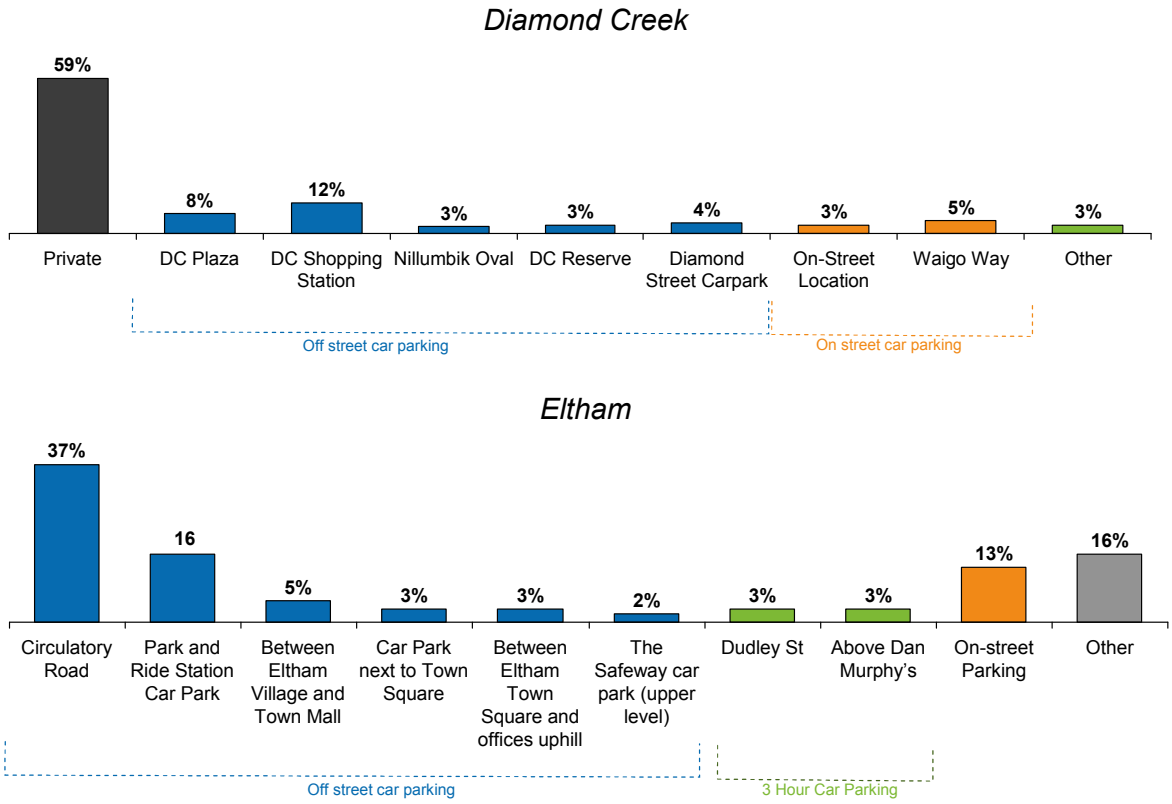
- Accessible car parks (signed 2P or P Disabled) get congested at Diamond Creek's IGA and Coles Supermarkets

A summary of all gaps can be found at Chapter 3 (page 82)

2.3.11 *Parking Use by Traders*

Traders represent a large and active group within the Activity Centres. Understanding their transport habits needs is important to ensuring appropriate management and provision of infrastructure. Traders park in a variety of locations in Diamond Creek and Eltham (Figure 2-20).

Figure 2-20 Location of where Traders Park



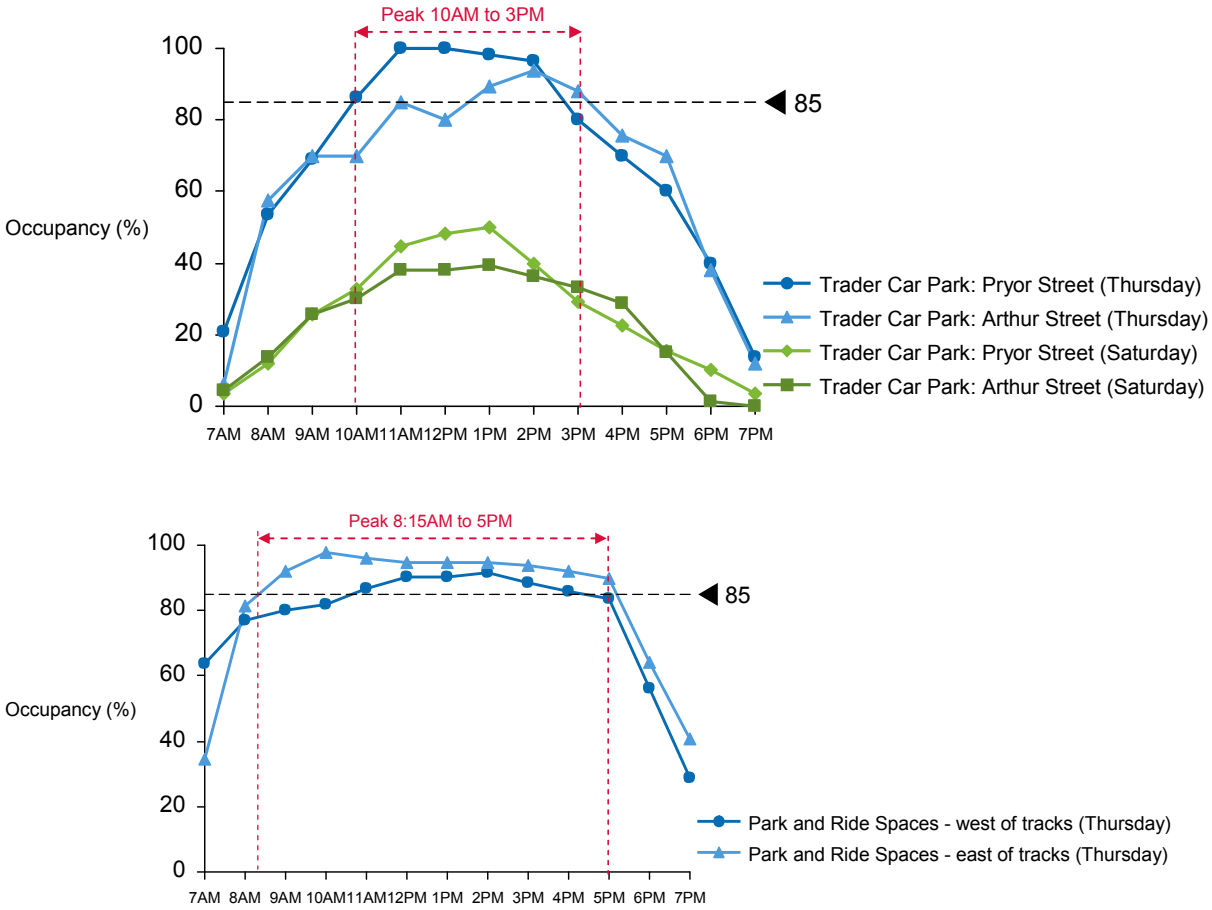
Source: Nillumbik Shire Council, Eltham Trader Survey, 2009 and Diamond Creek Trader Survey, 2007

Figure 2-20 shows that the majority of traders use private parking facilities in Diamond Creek. About 30% of Diamond Creek traders use off-street public parking facilities in either the shopping area or nearby sports/recreation facilities.

Regarding Eltham, it shows that:

- The majority (65%) park in off street public car parking;
  - The most popular off-street car park is circulatory road, where 37% of traders who drive park and which is purpose managed to provide car parking for traders.
  - The second most frequented car parking location is the Park and Ride spaces around the Eltham train station, which is purpose built and managed to serve public transport users;
- 13% of park on-street; and
- 6% of park in 3 hours spaces.

Figure 2-21 Trader and Park and Ride Car Parking Occupancy: Eltham



Source: Booz & Company Analysis, 2009

shows that:

- There are capacity constraints in the trader car parking spaces on a weekday but not on a weekend;
- Capacity constraints are experienced from10am to 3pm on weekdays;
- The Park and Ride spaces experience capacity constraints between 8:15 to 5pm on weekdays.

Using information from Figure 2-20 and it can be concluded that traders are potentially using the Park and Ride spaces as a result of weekday overcrowding of the car park designated for traders. The liberal

GAP ANALYSIS: Section 2.3.11 reveals a significant portion of Eltham traders are using commuter spaces in the Park and Ride facilities

A summary of all gaps can be found at Chapter 3 (page 82)

2.3.12 *Visitor Satisfaction with Parking*

Overall levels of satisfaction with car parking is high. This is measured in peoples satisfaction levels of the time taken to find a car park and the location of their car park. Figure 2-22 shows the results of an opinion based survey to determine levels of satisfaction with the time taken to find a car parking space and the location of the car parking space. These results are part of the intercept survey conducted for this study (see Method, section 1.4, for details). A total of 2,090 people responded to this question.

Figure 2-22 Visitor satisfaction with parking

	Time taken to find a car park	Location of car park
Diamond Creek	88% satisfied	88% satisfied
Eltham	82% satisfied	93% satisfied

Source: Booz & Company Analysis, 2009

Diamond Creek

- 9 out of 10 respondents were satisfied with the time taken to find a car park; and
- 9 out of 10 respondents were satisfied with the location of their car park.

In Diamond Creek, the slightly higher level of satisfaction with the time taken to find a car park is most likely a result of the low occupancy levels of car parking spaces during most of the day.

Eltham

- 8 out of 10 respondents were satisfied with the time taken to find a car park; and
- 9 out of 10 respondents were satisfied with the location of their car park.

2.3.13 *Trader Satisfaction with Parking and Access*

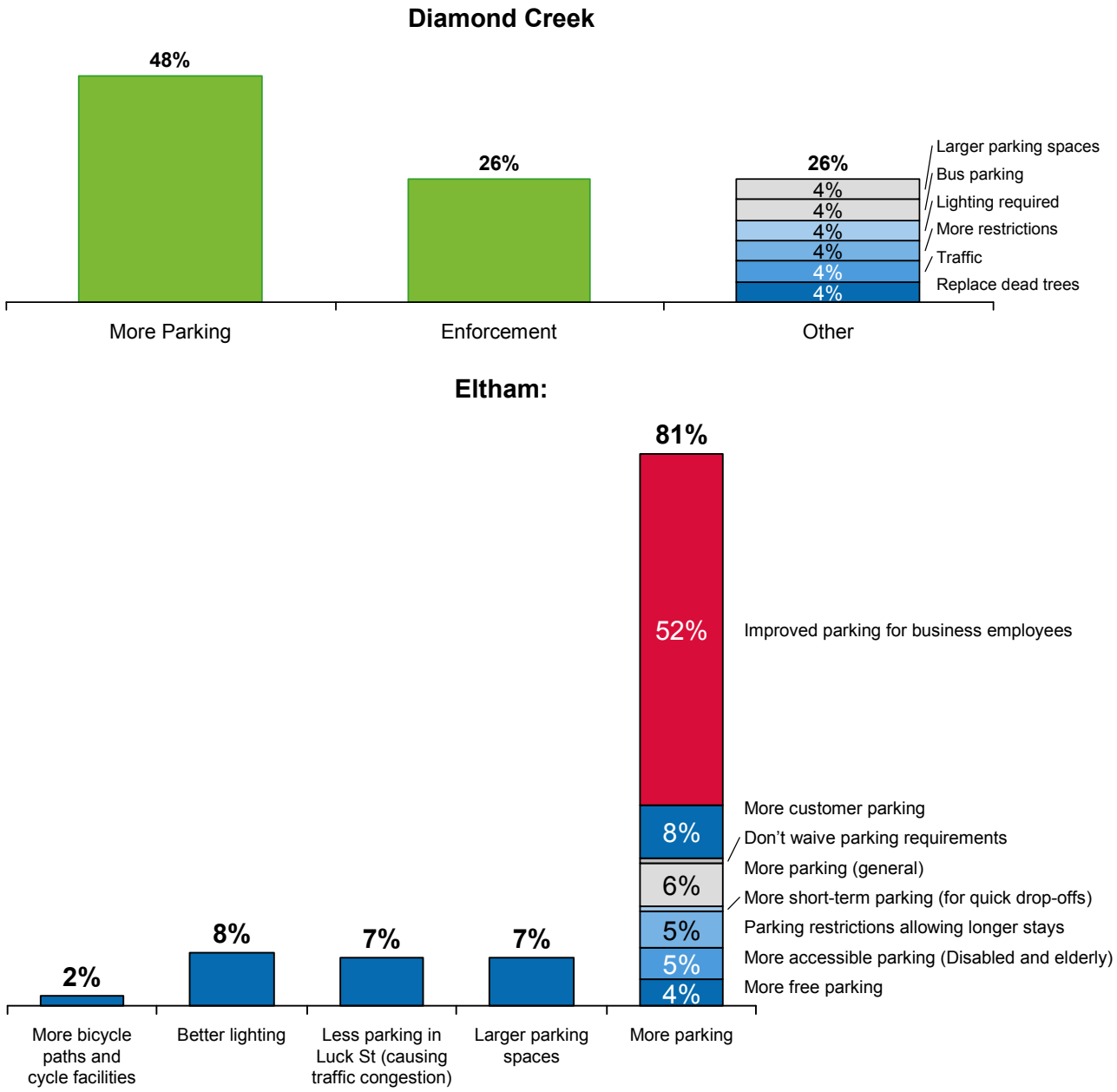
Figure 2-23 and Figure 2-24 show the level of satisfaction traders have with car parking and their priorities for improvements in Eltham.

Figure 2-23 Trader Satisfaction with Car Parking

	Time taken to find a car park	Location of car park
Diamond Creek	*No data available*	*No data available*
Eltham (Traders)	76% satisfied	78% satisfied

Source: Nillumbik Shire Council, EthamTrader Survey, 2009

Figure 2-24 Trader priorities for improvements in Activity Centre



Source: Nillumbik Shire Council, Eltham Trader Survey, 2009 and Diamond Creek Trader Survey, 2007

An analysis of Figure 2-23 and Figure 2-24 shows that:

- A high proportion of Eltham traders are satisfied with the time taken to find car parking:
  - 7 out of 10 respondents were satisfied with the time taken to find a car park; and
  - 7 out of 10 respondents were satisfied with the location of their car park.
- Despite this, the vast majority of Eltham traders (81%) called for more car parking, including 52% of respondents specifying more trader parking specifically;
- About half the Diamond Creek traders considered more parking to be the most important initiative in their Activity Centre, followed by enforcement of existing parking (26%).

2.4 People and Travel: Current and Future Patterns

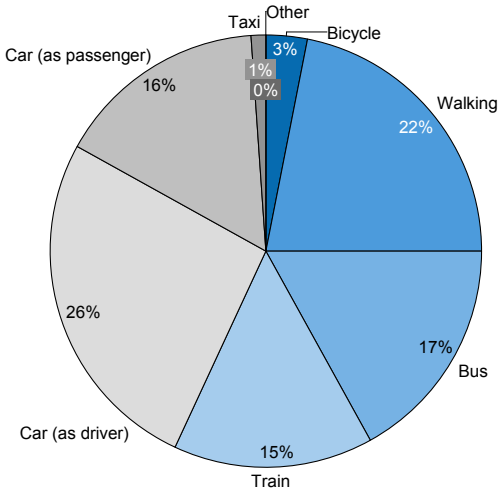
2.4.1 Modal Split

Understanding how people travel to the shopping centre assists in determining which management measures should be undertaken and what sort of infrastructure Council should prioritise. Figure 2-25 shows the mode split in Eltham and Diamond Creek.

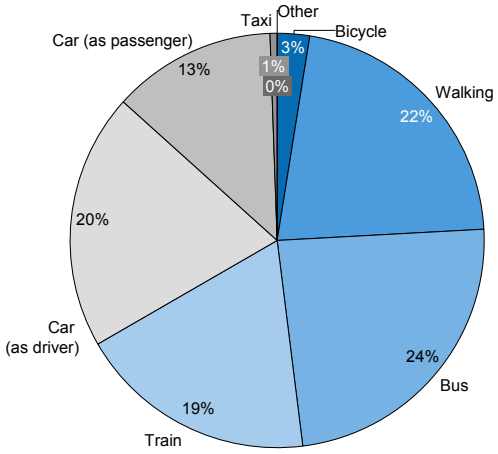
The mode split charts for Eltham shown in Figure 2-25 are split between intercept surveys results from Shopping Centre Only locations (non-train and bus station) and all locations (see 1.4 for a list of all intercept survey locations). Train and bus station location include the train station forecourt and the car park off Youth Street. Using the intercept survey from all locations would have skewed the mode split results due to the large number of people intercepted in the train and bus station locations[12]. In this *2.4.1 Mode Split* section the data excluding train and bus station locations have been used.

Figure 2-25 Mode Split

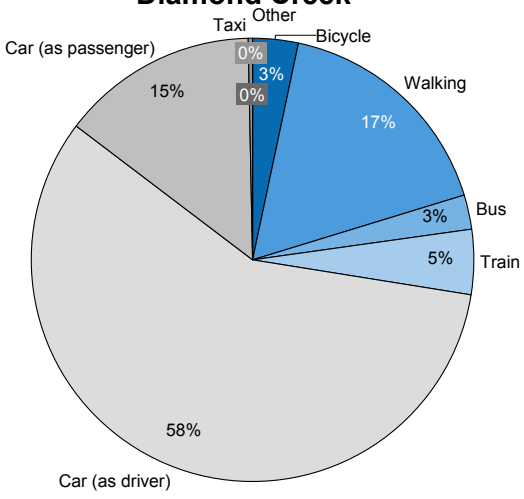
Eltham (Shopping Centre Only)



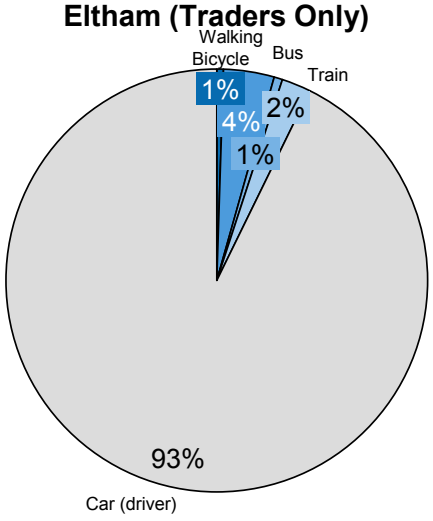
Eltham (All locations)



Diamond Creek



Eltham (Traders Only)



[12] *For a full list of intercept survey locations see section 1.4 Method. The intercept survey for Diamond Creek did not include any locations in close proximity to the railway station, therefore there was no need to do a 'shopping centre only' sample for Diamond Creek.*

The mode split diagrams reveal some interesting findings:

Diamond Creek

- The majority of visitors to Diamond Creek arrive by car:
  - 73% of visitors arrive by car;
  - 8% of visitors arrive by public transport; and
  - 20% of visitors arrive by walking and bicycle (with the vast majority of this being pedestrians).

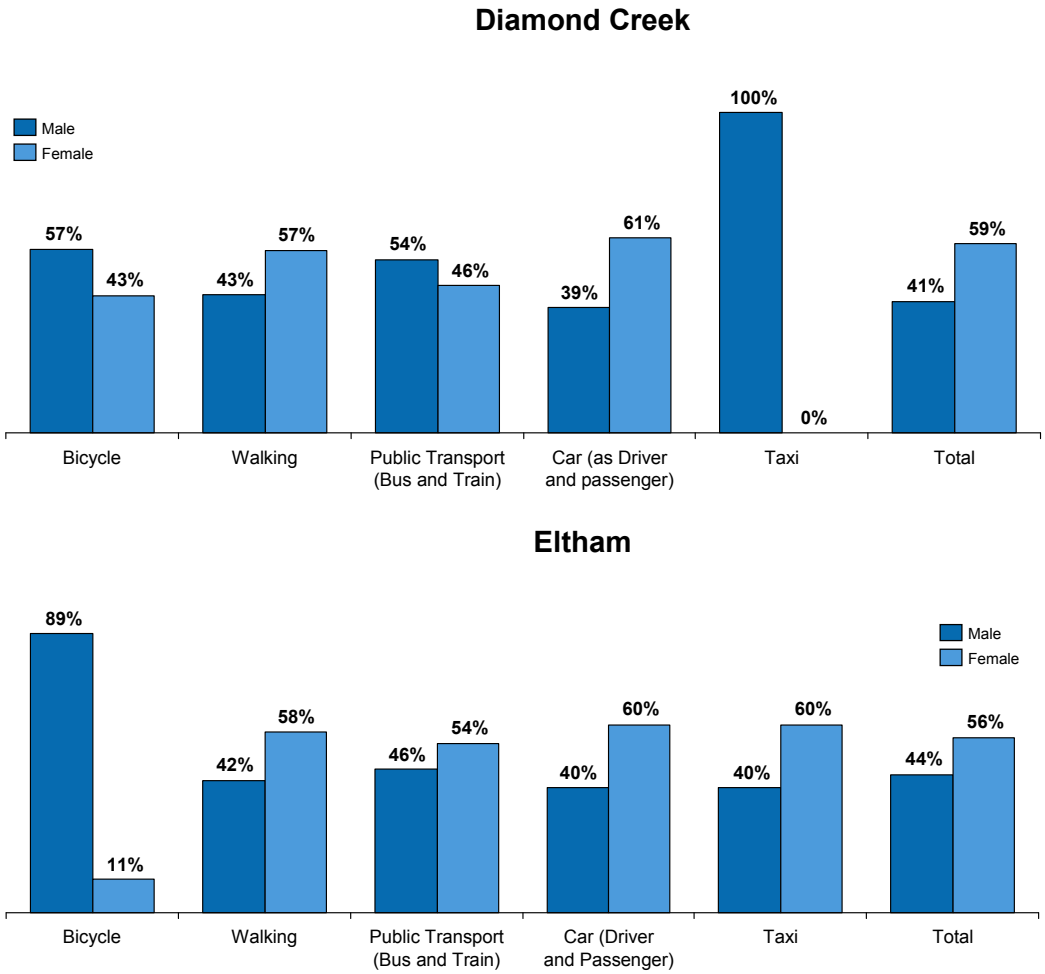
Eltham

- The majority of visitors to Eltham (excluding traders) do *not* arrive by car:
  - 42% of visitors arrive by car;
  - 32% of visitors arrive by public transport; and
  - 25% of visitors arrive by walking and bicycle (with the vast majority of this being pedestrians).
- The vast majority of traders arrive by car (93%).

2.4.2 *Mode Split and Gender*

An analysis of the way men and women access Activity Centres can provide useful insight into perceptions of safety and comfort. Figure 2-26 analyses gender and mode split:

Figure 2-26 Gender and Mode Split



Source: Booz & Company Analysis, 2009

Based on the data shown in Figure 2-26 some notable trends occurring in both Activity Centres are[13]:

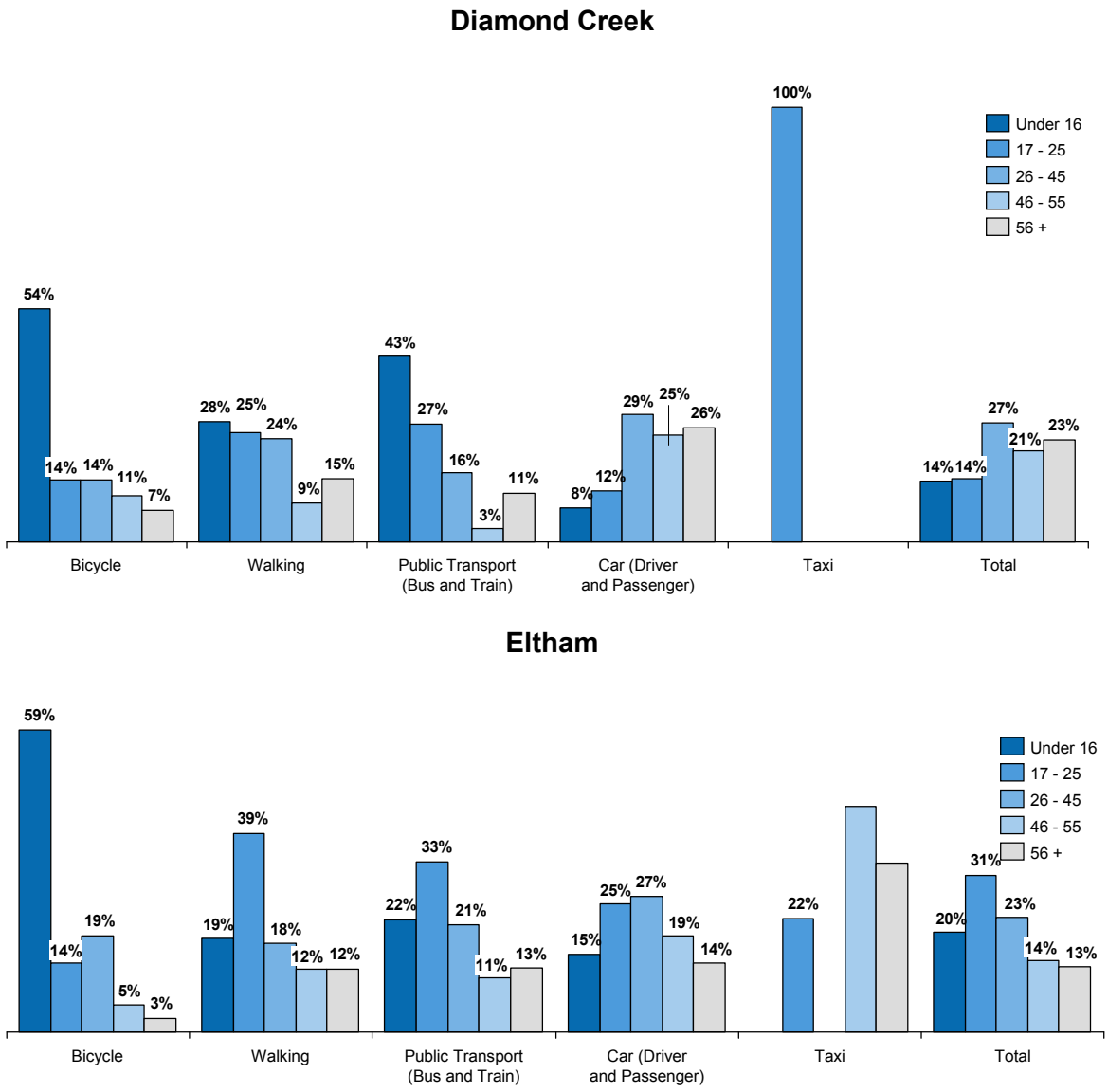
- **Cycling:** Women are less likely to bicycle in Nillumbik, particularly in Eltham, where women represent just 11% of the cyclists. The low rate of women who cycled is indicative of an unsafe or difficult cycling network as women are much less likely to cycle in imperfect conditions. Comparisons can be made to inner city Melbourne or indeed Scandinavian countries, in which women represent the majority of cyclists.
- **Walking:** Women are slightly less likely than men to walk to both activity centres.
- **Public Transport/ Driving:** In both Activity Centres women are more likely to be driving than men. Inversely men are more likely to be using public transport than women.

[13] *This analysis takes into account the unequal proportion of males and females surveyed.*

2.4.3 *Mode Split and Age*

An analysis of the age of people accessing the Activity Centres can provide useful insight into whether particular modes are being favoured by a particular age cohort. It can also provide some further insight into reasons behind mode split. Figure 2-27 analyses mode split and age profiles:

Figure 2-27 Mode Split and Age (%)



Source: Booz & Company Analysis, 2009

Figure 2-27 shows some notable trends with regard to modal choice and age[14]:

- **Age profile:**
  - The age profile of visitors to Eltham is youthful, with 50% of visitors being under 25 years old;
  - The age profile of visitors to Diamond Creek is older, with only 28% of visitors being under 25 years old and the majority in the 46-55 age bracket.
- **Cycling:** In both Activity Centres cycling is significantly less attractive to those over 17 years old than those under 16;
- **Walking:** Pedestrians are under-represented by those over the age of 46;
- **Public Transport:** People under the age of 25 years old are more likely to catch public transport than those 26 years old and older;
- **Driving:** Car drivers and passengers are more likely to be older than 26 years old; and
- **Taxi:** There are no clear age profiles of taxi given the small number of people using this mode in the sample.

There is a clear age-based division between those who use sustainable transport and those who are car-based. In general:

- **Young people are more likely to use sustainable transport:**
  - People who are under 16 years old largely rely on cycling, walking and public transport to access the Activity Centres;
  - People who are 17-25 years old largely rely on walking and public transport to access the Activity Centres;
- **People who are 26 and older largely rely on the car**;

Travel mode choice is often thought of as simply a result of available infrastructure (if there are pedestrian paths then people will walk but if there is good car parking people will drive). But the above analysis shows that in Diamond Creek and Eltham the travel mode people choose is also very dependant on their age with people over 26 being more car-based than 17-25 year olds.

Investment in behavioural change programs may encourage older people (26+) to use sustainable transport. Without such an initiative infrastructure is likely to be better utilised in Eltham than it would in Diamond Creek due to the younger age profile of visitors to this centre.

A study of more than 10,500 people showed a strong correlation between time spent driving and obesity. The report states that 'people who can walk to stores and restaurants are less likely to be obese than their counterparts living in more sprawling areas'[15]. This highlights the health benefits of compact centres that encourage active transport rather than car based travel.

GAP ANALYSIS: Section 2.4.3 reveals that visitors over the age of 26 are more likely to rely on driving than their younger cohorts.

A summary of all gaps can be found at Chapter 3 (page 82)

[14] *This analysis takes into account the unequal proportion of males and females surveyed*

[15] *Frank, L. (2004) 'How people with long commutes add weight', The Atlanta Journal-Constitution, May 31, 2004*

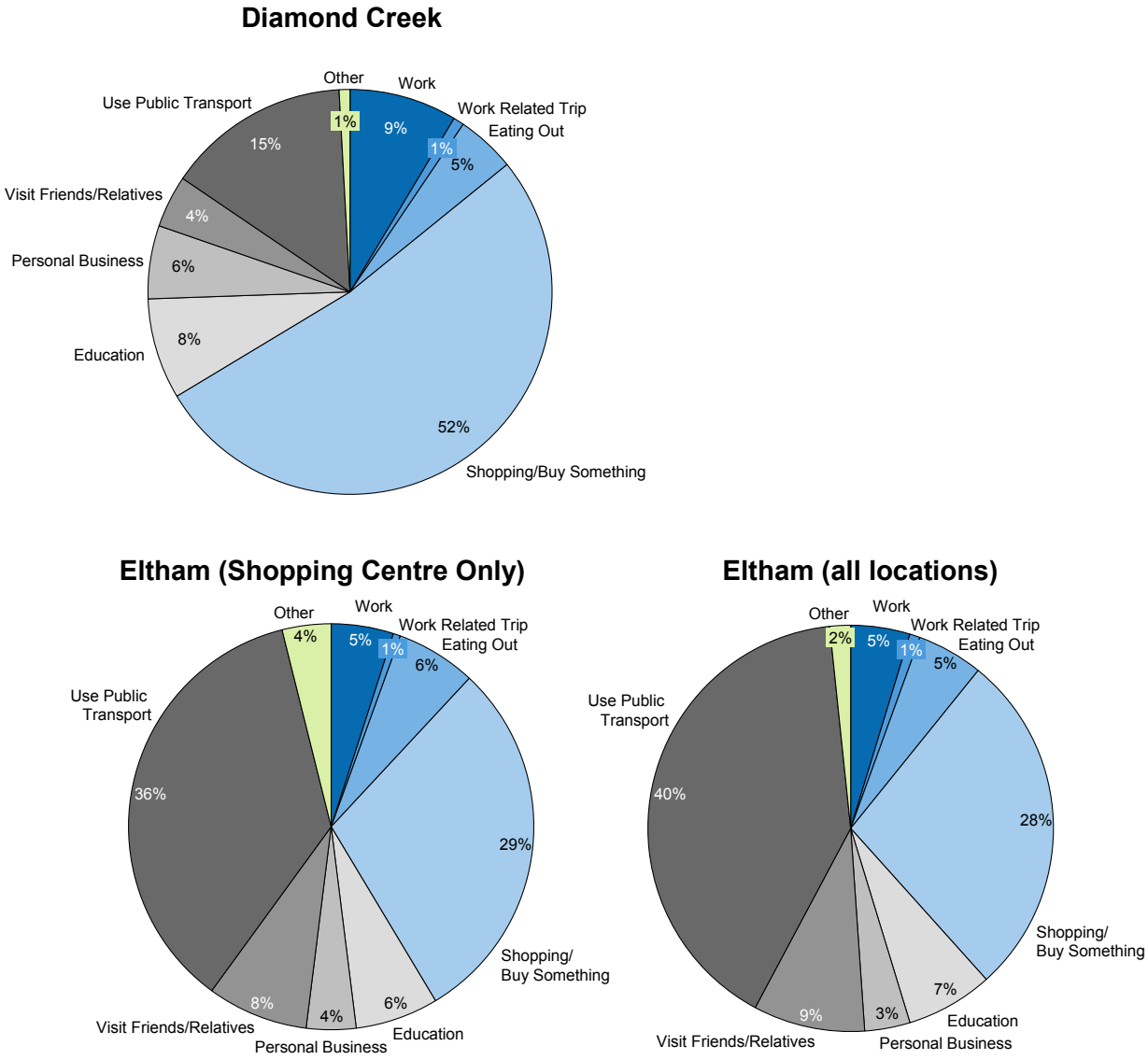
2.4.4 Trip Purpose

An analysis of the reason why people are accessing the Activity Centres can provide useful insight how Council should prioritise investment in infrastructure.

As with the analysis of mode split (*2.4.1*) the trip purpose charts for Eltham shown in Figure 2-28 are split between intercept surveys results from Shopping Centre Only locations (non-train and bus station) and all locations. Train and bus station locations include the train station forecourt and the car park off Youth Street. Using the intercept survey from all locations would have skewed the trip purpose results due to the large number of people intercepted in the train and bus station locations. In this 2.4.4 *Trip Purpose* section the data excluding train and bus station locations have been used.

Figure 2-28 analyses trip purpose:

Figure 2-28 Trip Purpose



Source: Booz & Company Analysis, 2009

Figure 2-28 shows that there is a strong role played by both Activity Centre's as transport interchange hubs, shopping/dining centres and as places of work. Specifically:

Diamond Creek

- Overwhelmingly, shopping was the most common trip purpose (52%), reflecting that Diamond Creek offers less variety of Activity Centre services;
- Using public transport was the second most common trip purpose (15%)
- Work and work related trips were the third most common trip purposes (10%).

Eltham

- Using public transport was the most common trip purpose (36%); and
- Shopping was the second most common trip purpose (29%); and
- Eating out was the third most common trip purpose, coming equal with trips to work/work related trips (both 6%).

Interestingly, an analysis of trip purpose data from Eltham shows that there was only minimal difference between the trip purposes of those intercepted in the general sample and those intercepted in the shopping centre locations only (which excluded the train/bus station intercepts). This result could be due to:

- As Eltham has a high portion of people walking (22%) as their primary transport mode it is likely that many people who were walking to and from the train and bus station were intercepted on their way through the shopping area; and
- A high level of multi-purpose trips. For example, if Person A mainly came to the Activity Centre to catch a train but also had a secondary trip purpose of buying a drink, they could have been intercepted on their way to buy a drink in a non train/bus station location.

GAP ANALYSIS: Section 2.4.4 indicates that trip purposes to Diamond Creek are narrower than in Eltham. This suggests that Diamond Creek has less 'Activity Centre' type offerings than Eltham.

A summary of all gaps can be found at found at Chapter 3 (page 82)

2.4.5 *Trip Purpose and Mode*

An analysis of trip purpose and mode can determine what the most common trip types are and how people are accessing those functions. Figure 2-29 displays all the types of trips in each of the Activity Centres and the mode people use to undertake these trips as a percentage of the whole sample:

Figure 2-29 Trip Purpose by Mode

Diamond Creek

	Work	Work Related Trip	Eating Out	Shopping/ Buy something	Education	Personal Business	Visit Friends/ Relatives	Use Public Transport
Bicycle			0.3%	0.6%				0.4%
Walking	0.3%	0.1%	1.4%	4.1%	0.3%	0.9%	1.0%	7.8%
Bus	0.4%	0.1%	0.3%	0.8%		0.1%	0.6%	0.3%
Train	0.8%			1.3%		0.3%	0.8%	0.3%
Car (as driver)	5.8%	0.5%	1.9%	39.3%	6.2%	4.1%	1.2%	2.1%
Car (as passenger)	1.3%		0.8%	6.1%	1.6%	0.5%	0.5%	3.8%
Taxi								0.1%
Total	**8.7%**	**0.8%**	**4.7%**	**52.3%**	**8.0%**	**6.0%**	**4.1%**	**14.6%**

Eltham[16]

	Work	Work Related Trip	Eating Out	Shopping/ Buy something	Education	Personal Business	Visit Friends/ Relatives	Use Public Transport
Bicycle	0.1%		0.4%	0.3%	0.1%	0.2%	0.3%	1.1%
Walking	0.9%	0.2%	1.4%	5.4%	1.1%	0.3%	2.0%	10.4%
Bus	0.9%	0.4%	0.4%	4.8%	1.8%	0.6%	2.1%	12.7%*
Train	0.9%	0.2%	0.4%	3.6%	2.4%	0.5%	2.1%	8.8%*
Car (as driver)	1.8%	0.1%	1.4%	9.7%	1.1%	1.3%	1.1%	2.8%
Car (as passenger)	0.2%	0.1%	1.0%	3.8%	0.4%	0.6%	1.4%	4.3%
Taxi			0.1%	0.1%		0.1%	0.1%	0.4%
Total	**4.7%**	**1.0%**	**5.1%**	**27.7%**	**7.0%**	**3.5%**	**8.9%**	**40.5%**

Source: Booz & Company Analysis, 2009

[16] *The data for Eltham shows that catching the bus and train to catch a further leg of public transport was the most common (12.7%) and third most common (8.8%) mode/trip purpose combination. This is not considered to be accurate. Rather, this result is most likely the consequence of the method of surveying in which survey respondents were asked a) "what was your primary transport mode"; and b) "what is your main trip purpose". This data is most likely a result of respondents who drove, walked, cycled or used a taxi to access public transport answering that "bus" and "train" was their primary mode and that their main trip purpose is to "use public transport".*

An analysis of trip purpose and mode shows that car use for shopping and walking to catch public transport was highly prevalent. Specifically:

- In Diamond Creek, the three most common trips were:
  - 45.4% of people were driving or being driven to go shopping/buy something;
  - 7.8% of people were walking to catch public transport; and
  - 7.1% of people were driving or being driven to work.
- In Eltham, the three most common trips were:
  - 13.5% of people were driving or being driven to go shopping/buy something;
  - 10.4% of people walking to catch public transport; and
  - 5.4% of people walking to go shopping/buy something.
- There is very low use of walking and cycling for education trips[17].

- **GAP ANALYSIS: Section 2.4.5 has revealed the following gaps:**
- There are very low incidences of walking and cycling for education trips (to school or other classes); and
- There are strong pedestrian desire-lines to the station. In combination with the gap presented in 2.3.2 it is reasonable to also conclude that these pedestrian desire-lines to the train station are not supported by appropriate infrastructure

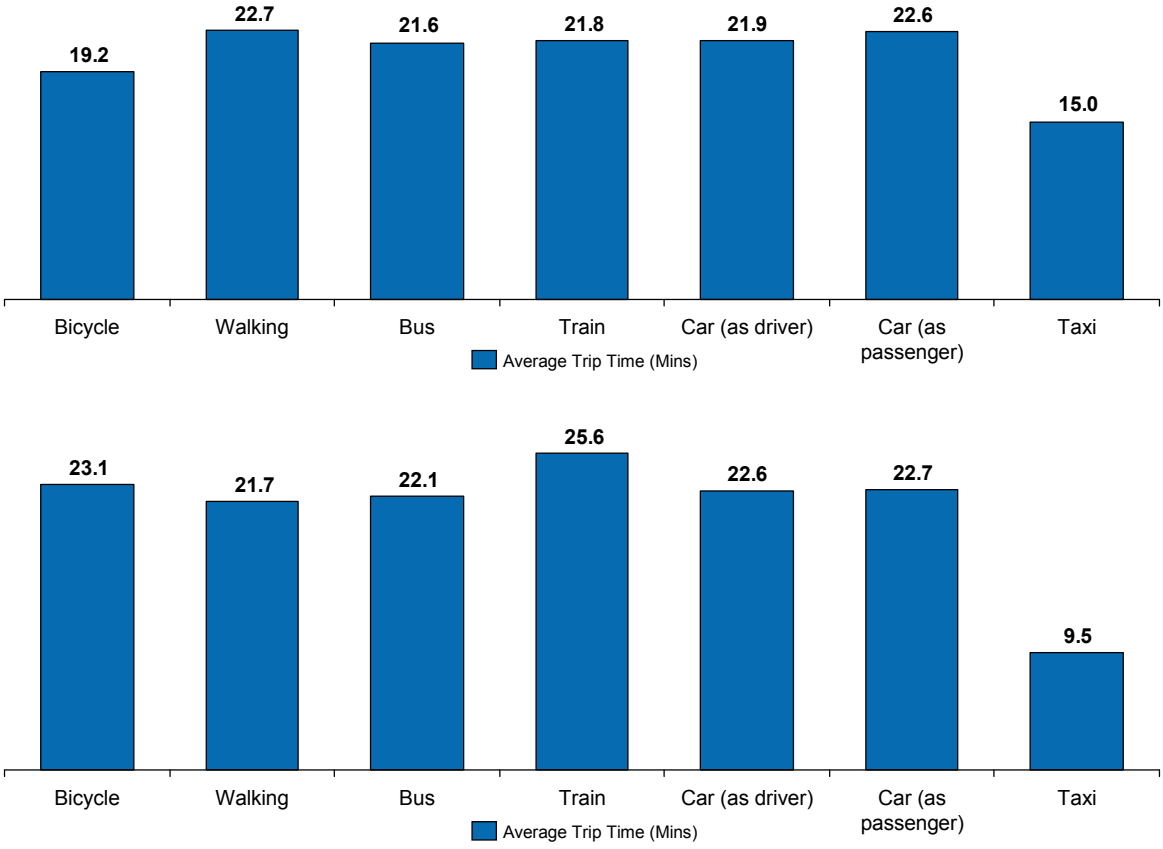
A summary of all gaps can be found at Chapter 3 (page 82)

[17] *VicHealth's aims to increase the number of children accessing school by active transport from 30% (currently) to at least 60%. Whilst it is noted that a true measure of walking and cycling to school should be measured at the school itself (rather than the Activity Centre as in this case) it is hypothesised that schools in Eltham would not be achieving VicHealth's target.*

2.4.6 Trip Duration

An analysis of trip duration can be used to assess a likely catchment of the Activity Centre for each mode. Figure 2-30 show the average time people took to access the Activity Centres.

Figure 2-30 Trip Duration by Mode (Minutes) - Diamond Creek (Top), Eltham (Bottom)



Source: Booz & Company Analysis, 2009

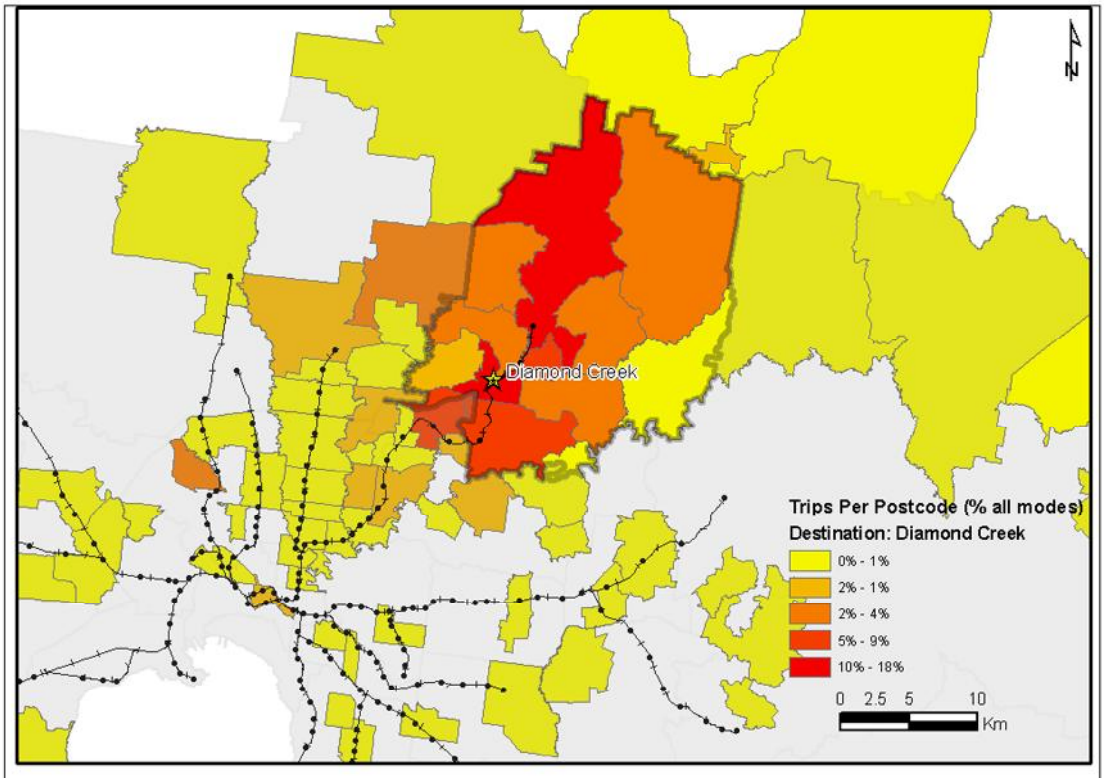
The average trip duration across modes was very similar, with the exception of those using taxis. Regardless of whether the visitor is walking, cycling, using public transport or driving, it appears that the visitors spend between 19.2 minutes and 25.6 minutes travelling to the Activity Centres.

2.4.7 Trip Origin

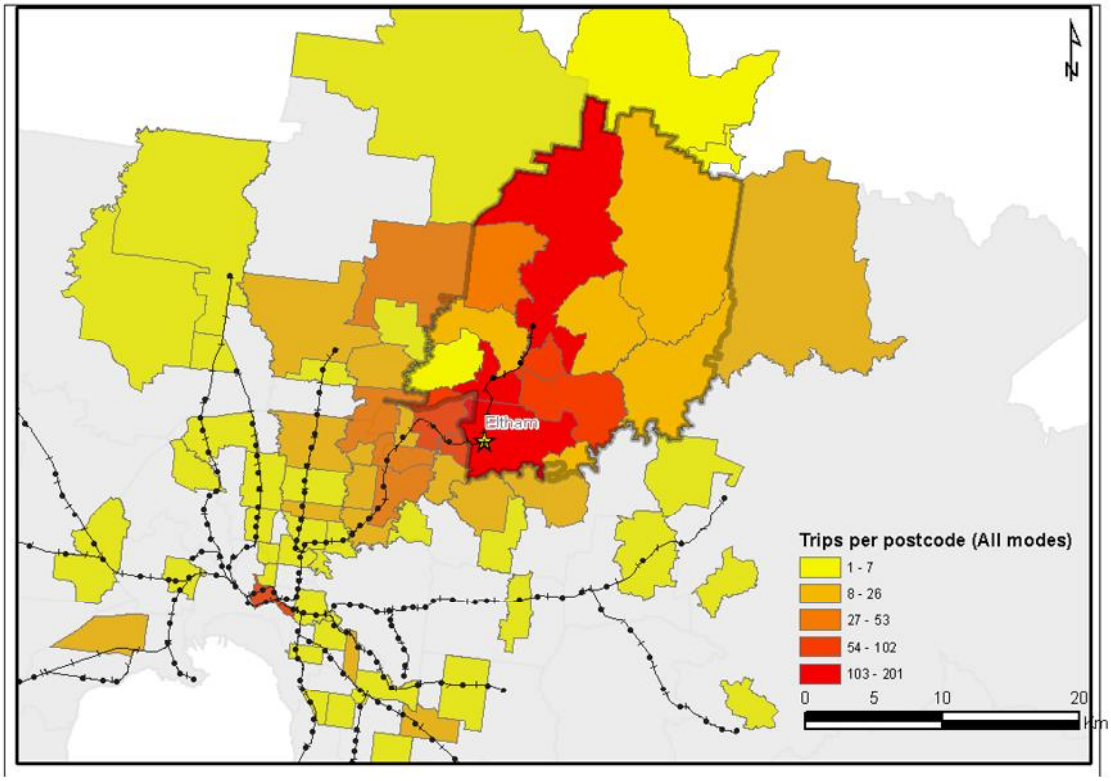
An analysis of trip origin can indicate the Activity Centre's role within the region. Figure 2-31 shows the most common residential postcodes for people in Diamond Creek and Eltham. It should also be noted that population densities decrease toward the north and east of the municipality.

Figure 2-31 Residential postcode of visitors

Diamond Creek



Eltham



The previous figures show that both Diamond Creek and Eltham have a role in the broader area (supporting their nominations as Major Activity Centres). Furthermore:

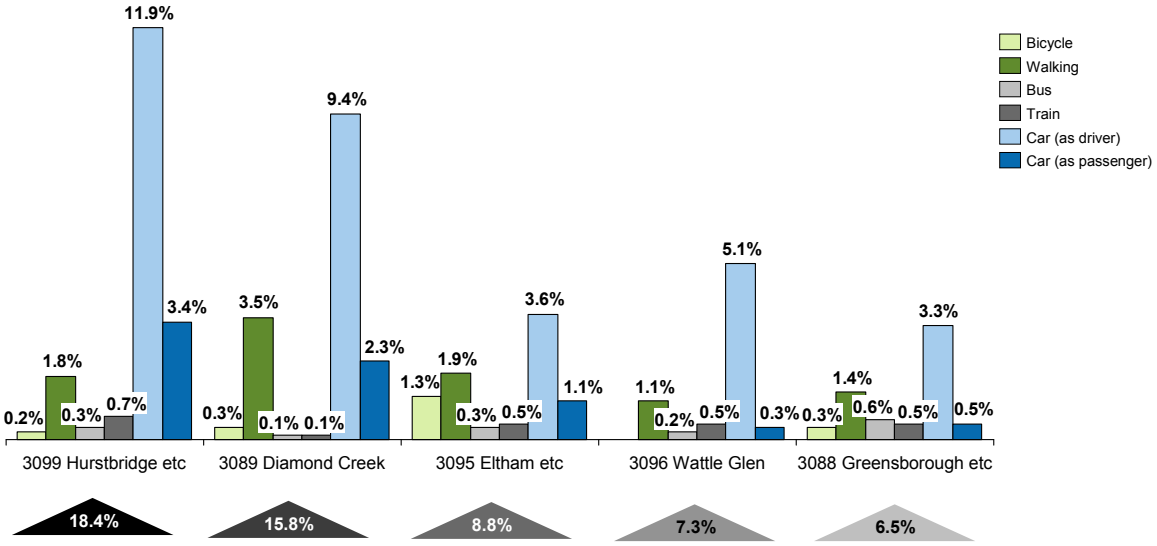
- Whilst people come from across the metropolitan region to visit both Activity Centres, their role is largely in serving a local catchment;
- Diamond Creek has a greater role to the north of Nillumbik; and
- Visitations from postcodes along the Hurstbridge railway line are emphasised.

2.4.8 Trip Origin and Mode

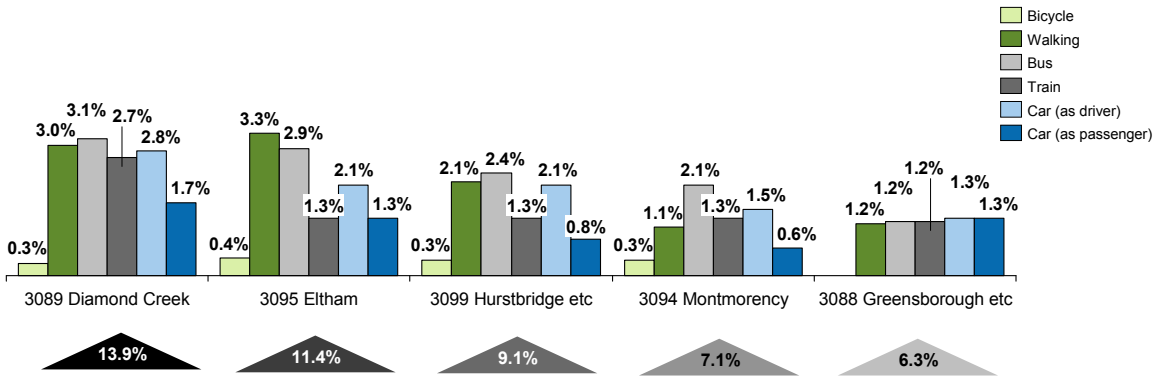
Figure 2-32 shows the most common residential postcodes for people in Diamond Creek and Eltham and the modes these visitors used to access the centres:

Figure 2-32 Trip Origin (Postcode) by Mode

Diamond Creek



Eltham



Note:
The 3095 postcode includes Eltham, Eltham North and Research.
The 3099 postcode includes Hurstbridge, Strathewen, Nutfield, Cottlesbridge and Arthurs Creek.
The 3088 postcode includes Briar Hill, Greensborough and Saint Helena

Source: Booz & Company Analysis, 2009

Interestingly neither Activity Centre has their major catchment based locally.

Diamond Creek

- Diamond Creek's major catchment is Hurstbridge (18.4% of visitors).
- The most common origin/mode combination for people accessing Diamond Creek is people from Hurstbridge who drive to the Activity Centre (11.9%).
- 9.4% of visitors are driving intra-suburb (from within the suburb) rather than walking or riding their bikes for short trips.

Eltham:

- Eltham's major catchment is Diamond Creek (13.9% of visitors), suggesting that people are travelling from Diamond Creek to access Activity Centre functions not available locally.
- The most common origin and mode for people accessing Eltham was people walking from within the suburb (3.3%);
- Walking and cycling trips from within Eltham represent approximately the same amount of people driving intra-suburb (from within the suburb) to access the Activity Centre (3.7% and 3.4% respectively).

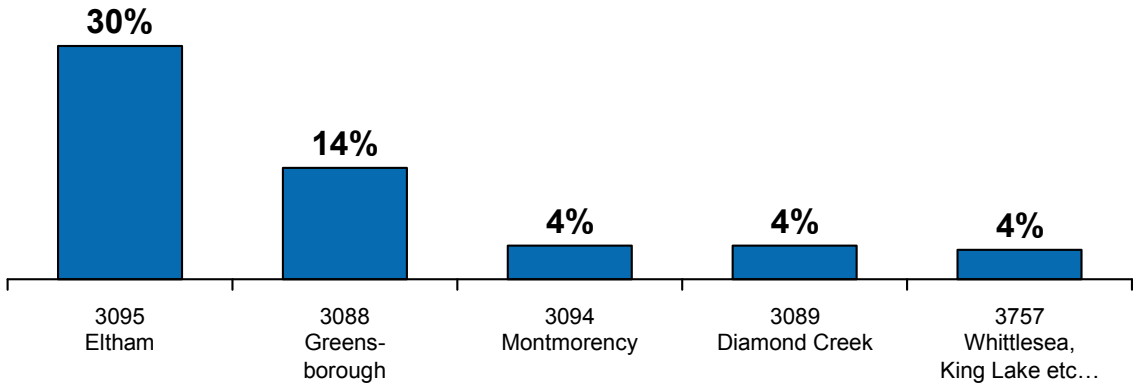
GAP ANALYSIS: Section 2.4.8 reveals that a large portion of Diamond Creek residents undertake 'Activity Centre' type trips to Eltham. Section 2.4.4 indicates that trip purposes to Diamond Creek are narrower than in Eltham. These two findings together suggest that there is 'leakage' from Diamond Creek to Eltham as a result of a greater range of services and activities being available in Eltham.

A summary of all gaps can be found at Chapter 3 (page 82)

2.4.9 Trip Origin of Traders

Figure 2-33 shows the main five residential postcodes of Eltham traders.

Figure 2-33 Residential postcode of Eltham Traders



Source: Booz & Company Analysis, 2009 of Nillumbik Shire Council Eltham Trader Survey, 2009

Figure 2-33 shows that the main postcode of origin of Eltham traders is Eltham itself (30%).

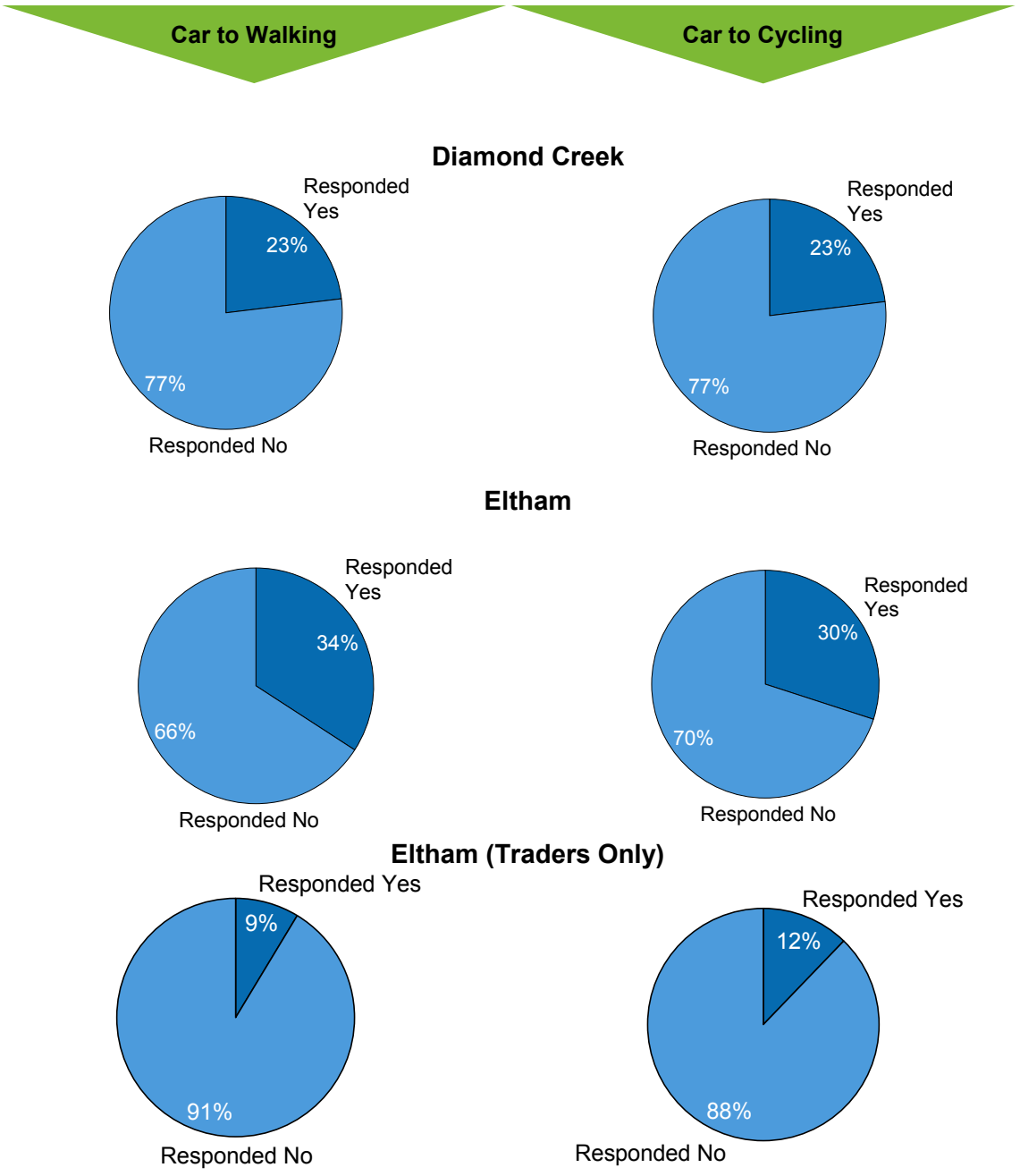
GAP ANALYSIS: Eltham traders are almost entirely reliant on car to access Eltham (2.4.1) even though a third come from Eltham (2.4.9).

A summary of all gaps can be found at Chapter 3 (page 82)

2.4.10 Mode Shift Potential

This sub-chapter considers visitor opinions regarding their potential to shift from driving to walking or cycling to the Activity Centres. Figure 2-34 displays visitor responses to the question- *'If there were better walking/cycling paths would you consider walking/riding?'*

Figure 2-34 Car Drivers Willingness to Change to Walking and Cycling



Source: Booz & Company Analysis, 2009 and Nillumbik Shire Council, Eltham Trader Survey , 2009 (Traders Only)

There is scope for a significant reduction in car use if cycling and walking is made easier:

- **In Eltham:** 34% of car drivers were willing to walk and 30% of car drivers would consider cycling if there were better walking and cycling routes.
- **In Eltham (Traders only):** 9% of drivers were willing to walk and 12% of drivers would consider cycling if there weer better walking and cycling routes
- **In Diamond Creek:** 23% of car drivers walking or cycling (non cumulative) if there were better walking and cycling routes.

Within the non-trader population, there is a greater scope for mode shift in Eltham than Diamond Creek, likely due to:

- The greater likelihood of drivers in Diamond Creek driving to transport shopping and children (see following sub-chapter 2.4.11 *Reasons for Car Use*);
- The older age profile of people visiting Diamond Creek and the increased reliance on the car for older visitors (see previous sub-chapter 2.4.3 *Mode Split and Age*); and
- There are more people with the primary trip purpose of shopping and this trip purpose is more likely to be carried out by car (see previous sub-chapter 2.4.5 *Trip Purpose and Mode*).

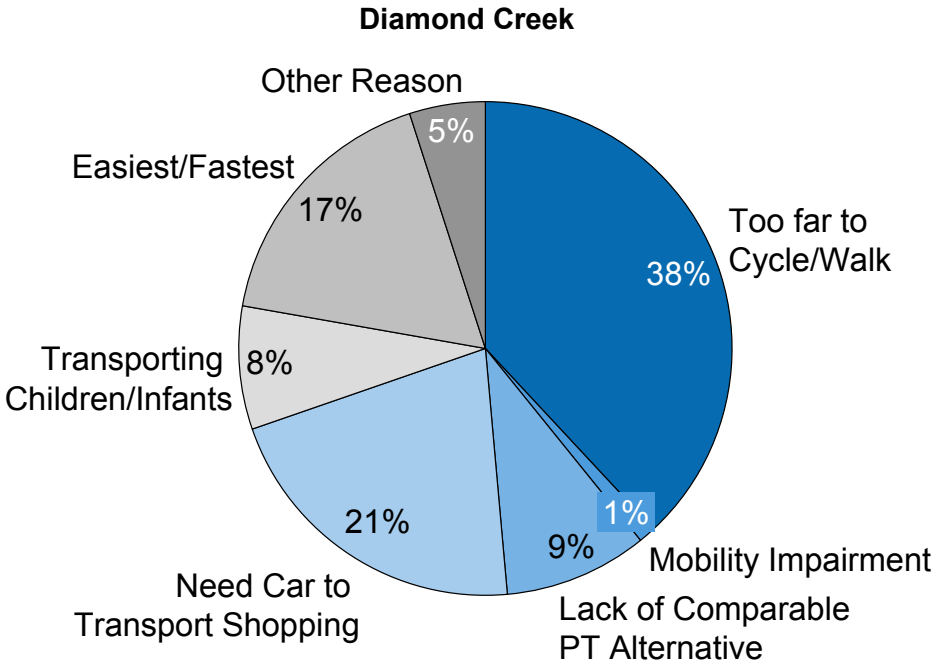
GAP ANALYSIS: Section 2.4.9 has revealed that there is a community desire to walk and cycle which is not being met by current infrastructure.

A summary of all gaps can be found at Chapter 3 (page 82)

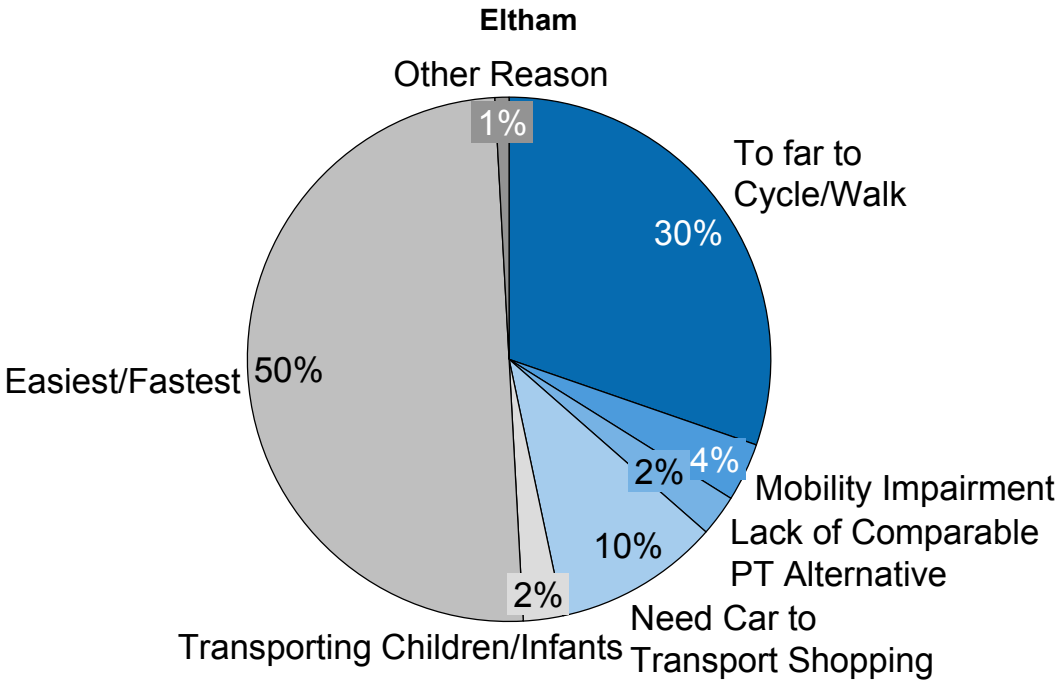
2.4.11 *Reasons for Car Use*

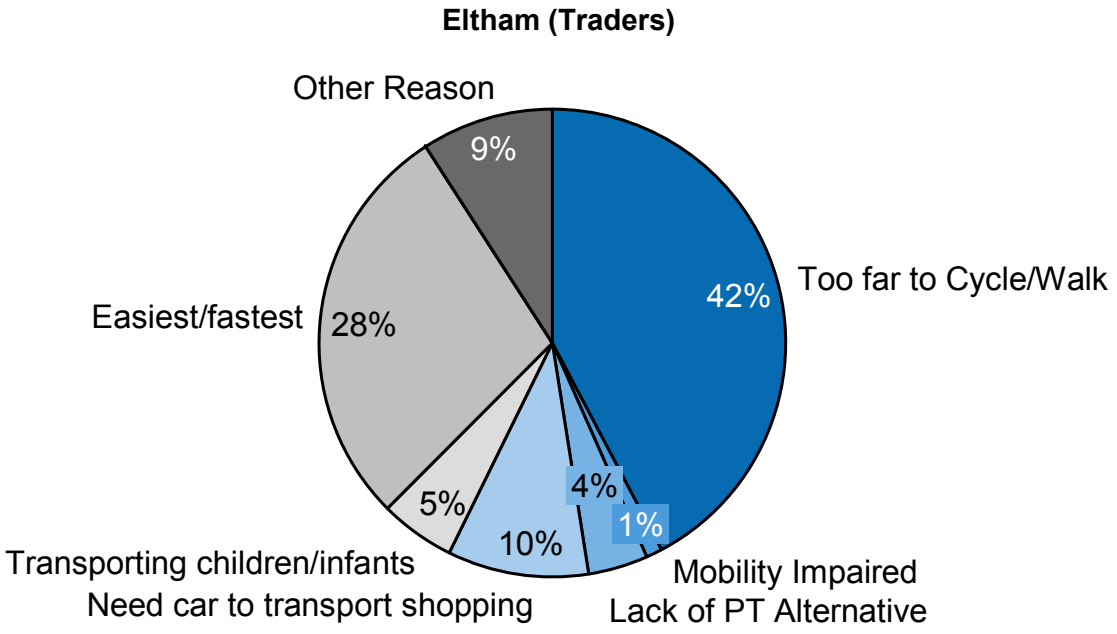
To determine whether there is significant scope for a shift away from car-based transport to access the Activity Centres it is necessary to understand the reason why people make the choice to drive. Figure 2-35 shows the results to the question asked of car drivers and passengers – *"What was the main reason you chose to drive today?*".

Figure 2-35 Reasons for Car Use



Source: Booz & Company Analysis, 2009





Source: Booz & Company Analysis, 2009 of Nillumbik Shire Council, 2009 Eltham Trader Survey

An analysis of Figure 2-35 shows that:

- **In Diamond Creek:** There were three major reasons why people drove:
  - The primary motivation behind people's choice to drive was that it was too far to cycle/walk (38%);
  - The second most cited reason people chose to drive was that it was to transport shopping (21%); and
  - The third most cited reason people chose to drive was that driving was considered 'easiest/fastest' (17%).
- **In Eltham:** There were two major reasons why people drove:
  - The primary motivation behind people's choice to drive was that driving was considered 'easiest/fastest' (50%). Considering this in relation to the trip origin and mode data (see 2.4.8), it can be concluded that a portion of locally-based car trips are undertaken due to convenience rather than necessity;
  - The second most cited reason people chose to drive was that it was too far to cycle or walk (30%).
- **Eltham traders:**
  - The primary motivations of traders choosing to drive to Eltham is due to walking/cycling being to far (42%) and because driving is easiest/fastest (28%). Considering this in relation to trip origin data showing that 30% of traders come from within Eltham (see 2.4.9) it may be concluded that some locally-based car trips are undertaken due to convenience rather than necessity;

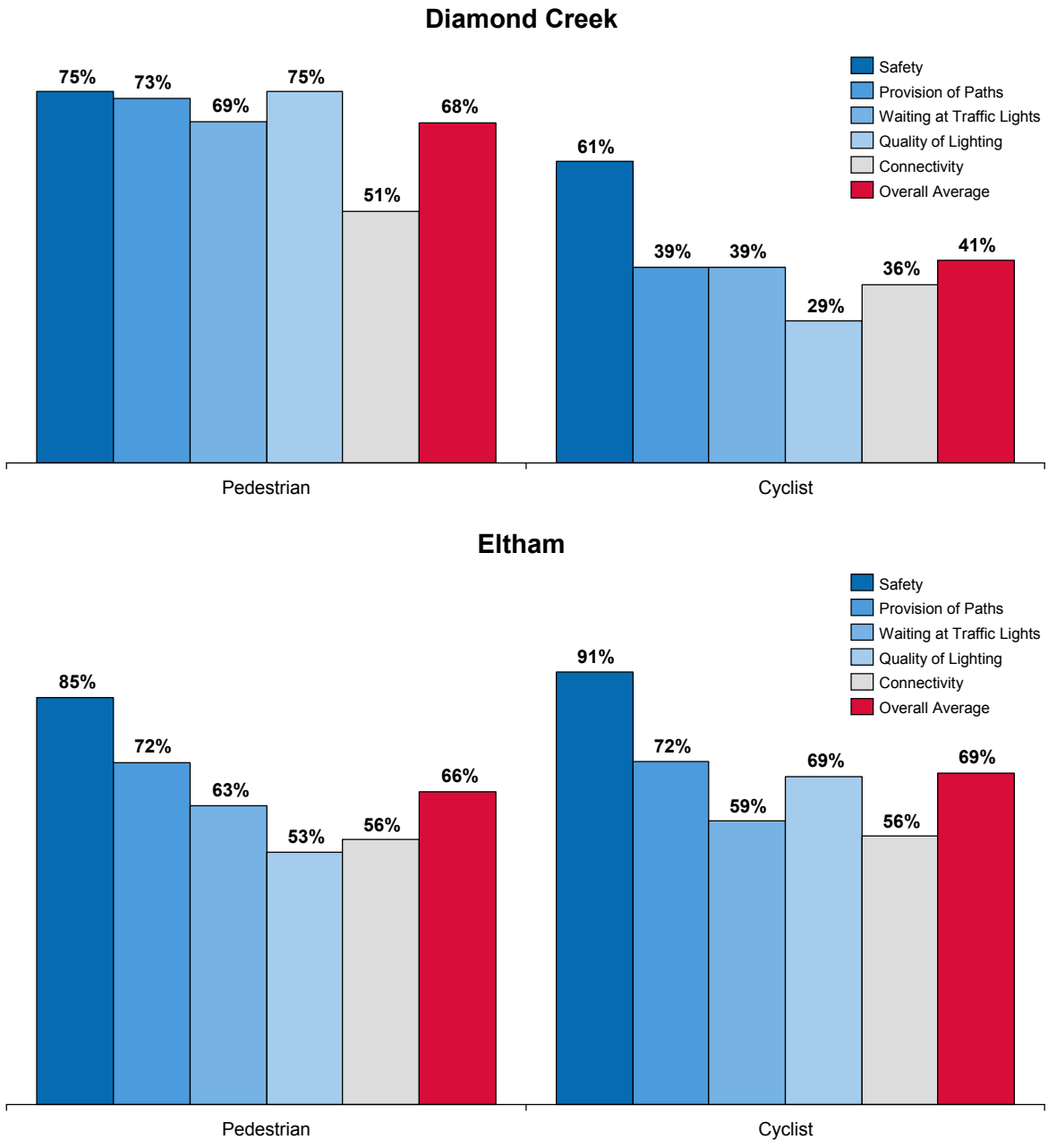
GAP ANALYSIS: Eltham traders are almost entirely reliant on car to access Eltham (2.4.1) even though a third comes from Eltham (2.4.9). Their primary motivations for driving are distance and convenience (2.4.12).

A summary of all gaps can be found at Chapter 3 (page 82)

2.4.12 Satisfaction with Cycling and Pedestrian Infrastructure

Figure 2-36 presents the findings of opinion-based surveying of pedestrians and cyclists in Diamond Creek and Eltham regarding their satisfaction with infrastructure for these transport modes.

Figure 2-36 Pedestrians and cyclists rating infrastructure 'good'/'very good' (%)



Source: Booz & Company Analysis, 2009

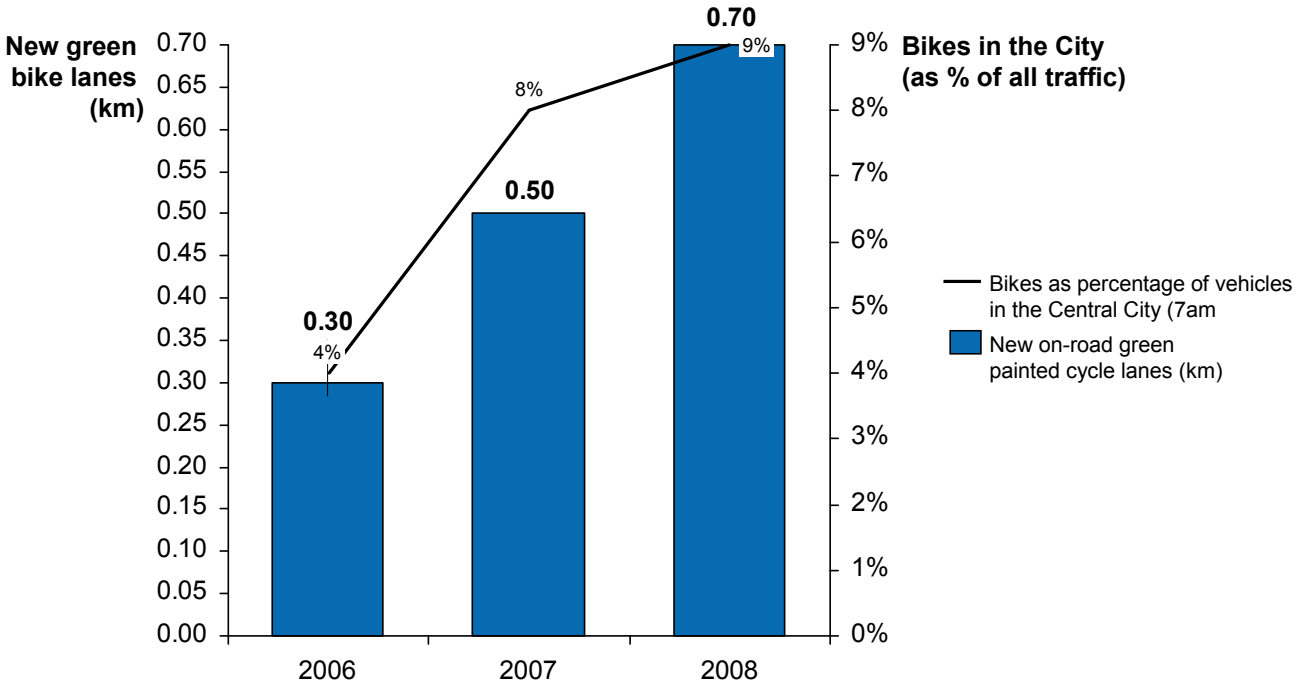
There are some differences in how users rate their cycling and pedestrian network (Figure 2-36):

- **Diamond Creek:** Pedestrians rated the overall standard of pedestrian infrastructure significantly higher than cyclists rated cycling infrastructure (68% and 41% respectively considered it 'good' or 'very good'.
- **Eltham**: Cyclists rated the overall standard of their cycling infrastructure marginally higher than pedestrians rated pedestrian infrastructure (69% and 66% respectively considered it 'good' or 'very good'; and

In a similar survey conducted in the Knox Central Activity Centre overall satisfaction ratings were 42% of cyclists rating cycling infrastructure 'good or very good' and 72% of pedestrians rating pedestrian infrastructure 'good or very good'[18]. This is comparable to cyclists and pedestrian's opinions of Diamond Creek's cycling/pedestrian infrastructure.

Bike use as a transport mode (as distinct from a sport activity) has expanded significantly across metropolitan Melbourne in recent years. A number of Council's have been particularly active in expanding their expenditure and provision of bicycle facilities including bike parking and paths. This has resulted in an increased number of cyclists. The City of Melbourne has been particularly successful in reporting their program. The City of Melbourne example can show how expenditure on cycling infrastructure can have a direct impact on the number of people cycling[19].Figure 2-37 shows this connection.

Figure 2-37 Bicycle infrastructure and use in City of Melbourne



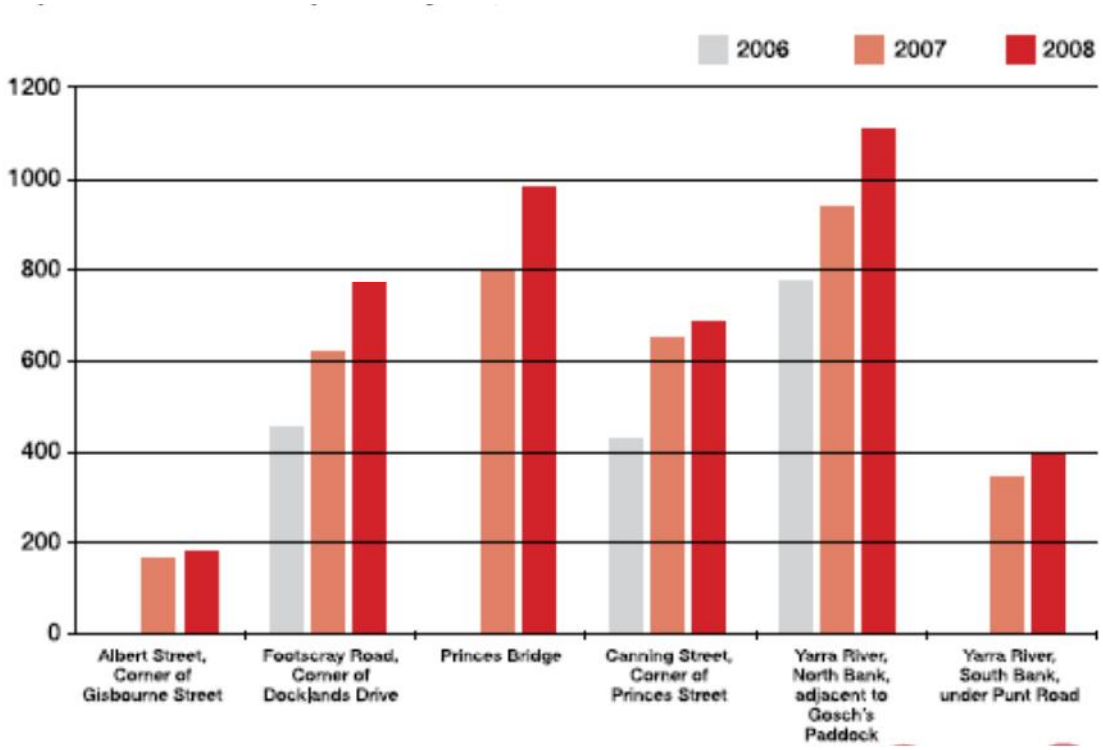
Source: City of Melbourne, Bicycle Account, 2009 (www.melbourne.vic.gov.au/bicycleaccount

A more route-specific example of the growth in cycling is shown in Figure 2-38.

[18] *Source: Booz & Company Analysis, Knox Central Sustainable Transport Options Report, 2008*

[19] *It is noted that the increase in the number of cyclists in the City of Melbourne is a result on a co-ordinated effort across many inner-region Council's however the City of Melbourne has been singled out due to availablity of data for this Council.*

Figure 2-38 Number of people on City of Melbourne Bike Routes (2006-08)



Source: City of Melbourne, Bicycle Account, 2009 (www.melbourne.vic.gov.au/bicycleaccount)

GAP ANALYSIS: Section 2.4.12 has revealed cyclists in Diamond Creek have a lower opinion of cycling infrastructure (compared with pedestrian's opinion of their infrastructure).

A summary of all gaps can be found at *Chapter 3 (page 82)*

2.4.13 Comparing Nillumbik

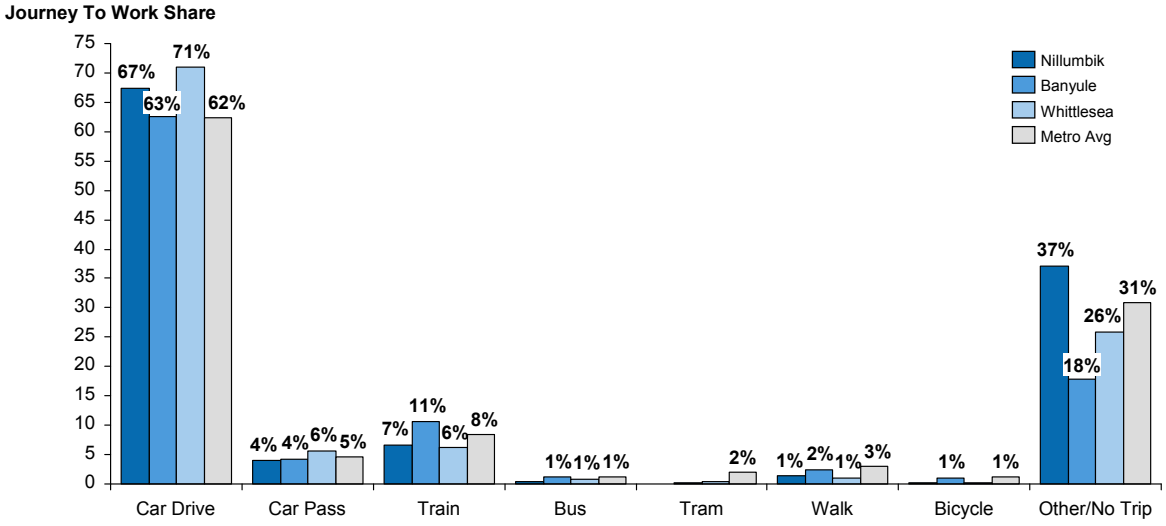
An analysis of transport patterns in the Shire of Nillumbik compared with its contemporaries can determine how relatively vulnerable Nillumbik Shire's population and businesses are to anticipated future scenarios such as rising petrol prices.

This sub-section compares the Shire of Nillumbik with the Cities of Banyule, Whittlesea and the Melbourne metropolitan average. Specifically comparisons look at:

- The mode residents of each municipality use to journey to work (Figure 2-39);
- The mode workers in each municipality use to journey to work (Figure 2-40); and
- The incidence of 0, 1, 2, 3 and 4+ car households in each municipality (Figure 2-41).

Overall, households, workers and workplaces in Nillumbik are more reliant on cars than Banyule and the metropolitan average but less reliant on cars than Whittlesea.

Figure 2-39 Journey to Work Mode Share (2006) By Place of Residence

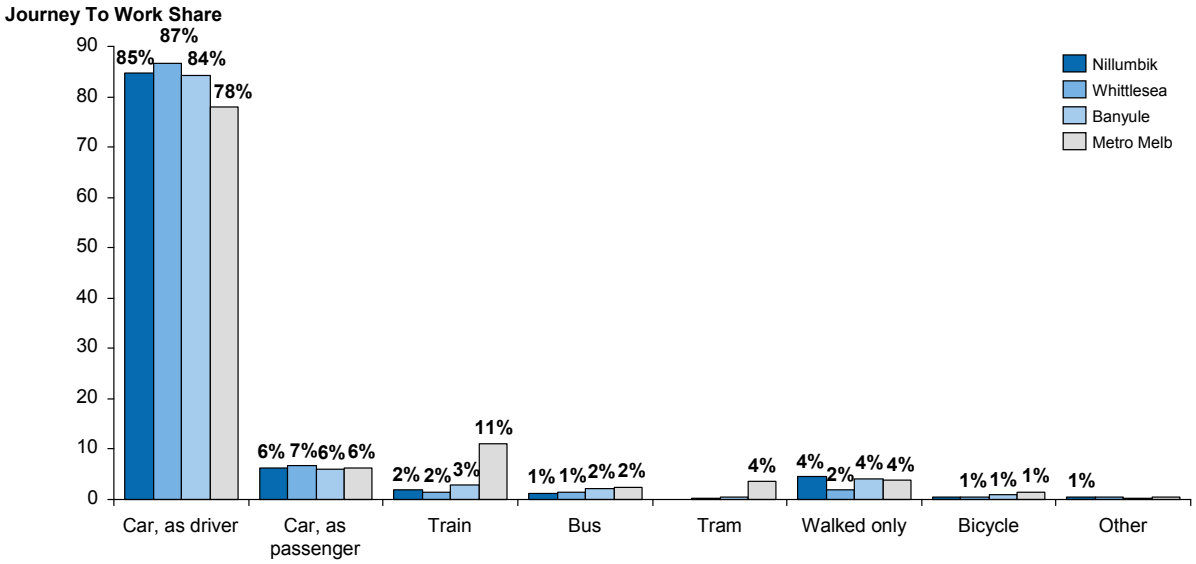


Note: The category 'Other/No Trip' includes a high proportion of people who did not go to work on that day.

Source: ABS Census, 2006 and Booz & Company Analysis, 2009

Figure 2-39 shows that 67% of Nillumbik Shire's residents drive or are driven to work. This is less reliant on the car than Whittlesea (77%), but is more reliant than Banyule and the metro average (63 and 62% respectively).

Figure 2-40 Journey to Work Mode Share (2006) By Place of Employment

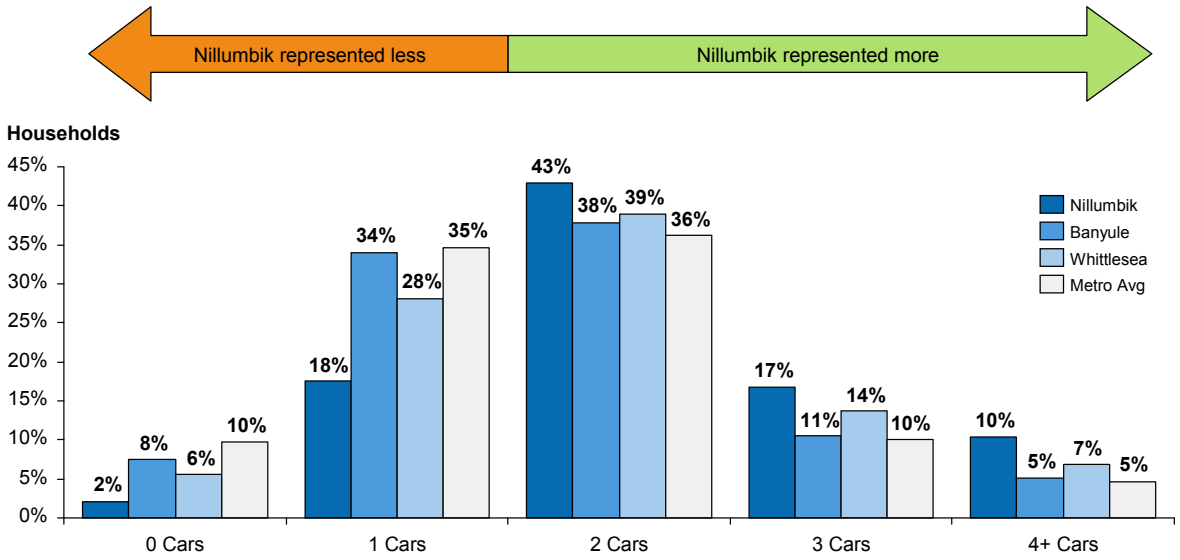


Source: ABS Census, 2006 and Booz & Company Analysis, 2009

Figure 2-40 shows that Nillumbik Shire's working population uses the car more to access work (91%) compared with the metropolitan average (84%) and Banyule (90%), but less than Whittlesea (94%).

Concentrating employment in the Diamond Creek and Eltham Activity Centres will reduce daytime car use and assist the local economy in these centres. City User Surveys conducted by the City of Melbourne have shown that the majority of expenditure in the CBD is not undertaken by special purpose shopping trips but by employees shopping in their lunch-breaks and at other times during the day.

Figure 2-41 Car Ownership by municipality (2006)



Source: ABS Census, 2006 and Booz & Company Analysis, 2009

Figure 2-41 shows that households in Nillumbik are less likely to have one or no cars and more likely to have 2, 3 or 4+ cars. 70% of households in Nillumbik have 2+ cars, compared with 54% in Banyule, 60% in Whittlesea and 51% across the metropolitan area.

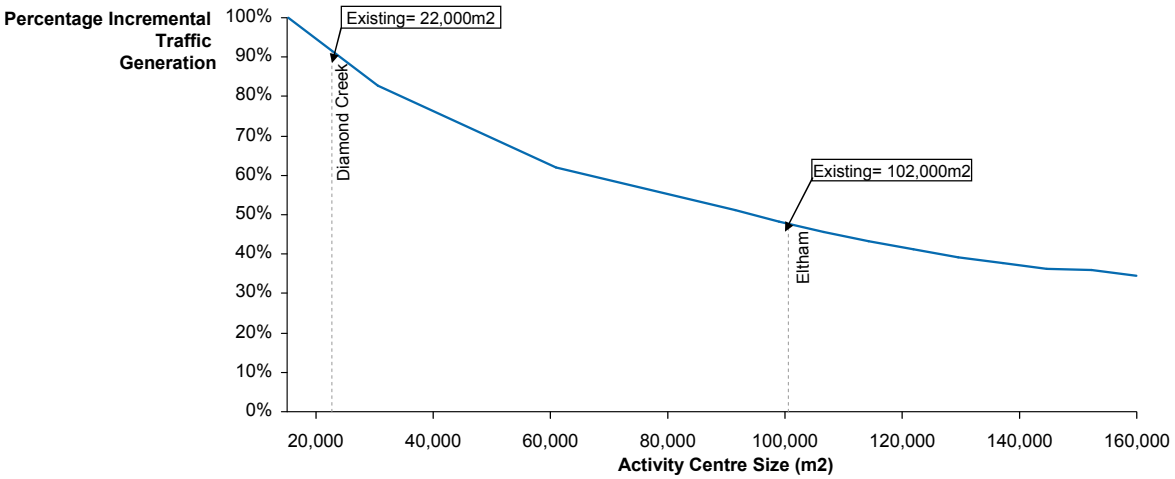
GAP ANALYSIS: Section 2.4.13 shows that residents and people working in the Shire of Nillumbik have a comparitively high car dependance. This factor in combination with evidence presented in the sections 2.5.2, 2.5.3 and 2.5.4 shows that the Shire of Nillumbik's population is more suseptible to oil price rises and isolation as it's population ages.

A summary of all gaps can be found at Chapter 3 (page 82)

2.4.14 Future Growth

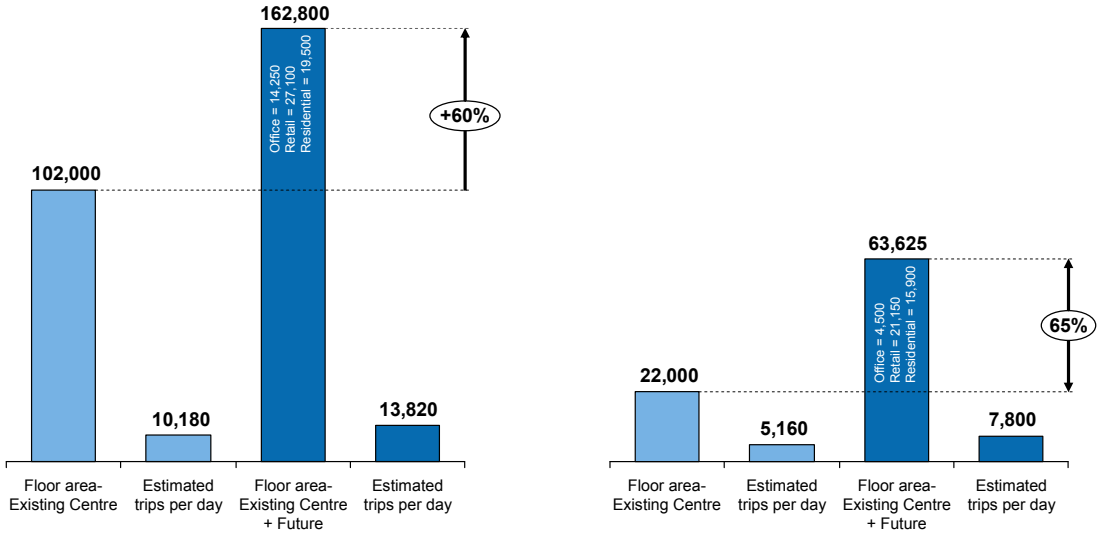
The rate of growth in housing and commercial development will have an impact on the number of people accessing the Diamond Creek and Eltham and the requirements of transport infrastructure to accommodate growth in these Activity Centres. Figure 2-42 shows that additional floor area in both Eltham and Diamond Creek will produce progressively less trips per m2 as the centres grow. For example if Diamond Creek activity centre doubled in size (from 22,000m2 to 44,000m2) then there would be approximately 75% more trips rather than 100% more trips.

Figure 2-42 Reduced traffic generation due to land use mix



Future trip growth associated with each Activity Centre is shown in Figure 2-43 below.

Figure 2-43 Predicted Growth and Trip Generation (2009 and 2024)



Eltham **Diamond Creek**

Source: Booz & Company Analysis, 2009 of figures from Eltham Structure Plan, 2005, Essential Economics analysis, 2004 and Diamond Creek Structure Plan
Note 1: Analysis has pressumed steady annual growth commencing 2009 and growth rate continuing indefinitely.
Note 2: Existing Eltham Activity Centre size includes floor area from industrial estate.

This shows that:

- Eltham is projected to increase it's floor area by 60% from 2009 to 2024- but trip generation increases by 36%
- Diamond Creek is projected to increase it's floor area by 189% from 2009 to 2024- but trip generation increases by 51%
- In Diamond Creek and Eltham there is limited road space to accommodate a significant increase in road traffic. Therefore, additional trips generated by new

development should be accommodated by more space efficient transport modes- walking, cycling and public transport use.

Trip generation for projected land uses is widely used for forecasting future travel demands. It predicts the number of trips originating in or destined for a particular land use. Trips generation includes trips taken by any mode- walking, cycling, public transport or driving trips. At the moment there is no reliable data available for how internet use will impact trips in the future. Therefore the figures used do not include any impact that the internet may have.

2.5 Drivers of Change

There are a number of trends and demographic factors relevant when considering the future direction of transport planning in Diamond Creek and Eltham. All these factors are point towards a population which will need to be less reliant on cars and more reliant on walking, cycling and public transport in the future. This will be necessary given the following environmental, economic and demographic trends impacting the Shire of Nillumbik:

- **Environmental Considerations:** Road transport accounts for a significant amount of household greenhouse gas emissions. By minimising reliance on private car usage the Shire of Nillumbik Shire's impact on the environment can be minimised;
- **Peak Oil:** The reality of peak oil is well established[20]. Car dependant communities, such as Nillumbik (refer 2.4.13) will be less well-equipped to deal with a world in which oil is less readily available;
- **Petrol Price rises:** Following from the above point, a decrease in oil supply and a corresponding increase in demand will increase in petrol prices. With the cost of driving increasing people will move towards cheaper options such as walking, cycling and public transport; and
- **Nillumbik Shire's population is ageing:** By 2030 27% of Nillumbik Shire's population will be over 60, whereas in 1996 it was 7%. This presents significant new challenges for the Council to cater for a portion of the population who will be more reliant on walking and public transport for their mobility needs.

These factors will be discussed in greater detail in the following sub-sections.

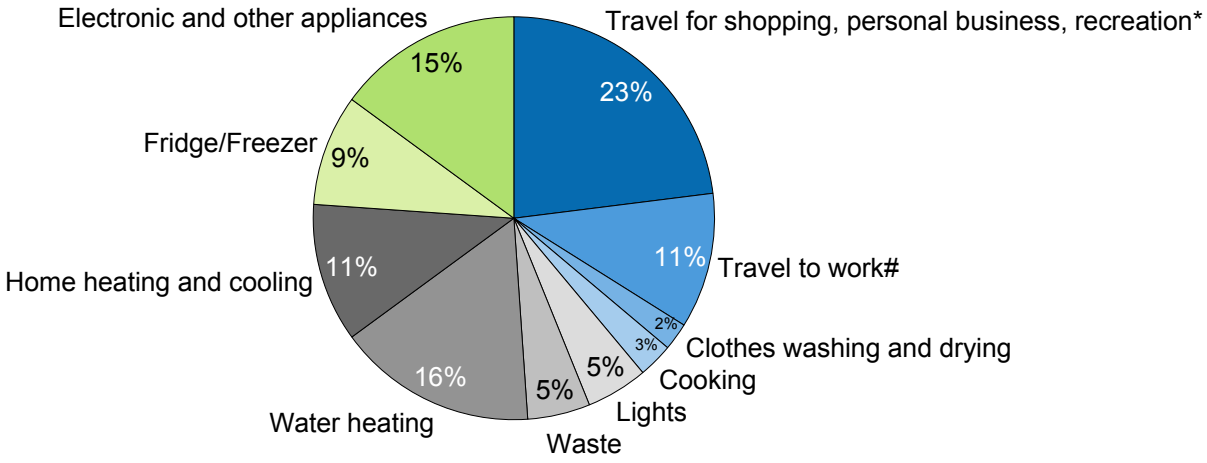
[20] In July 2007 (14-20 July print edition) the world's most repected journal of economics acknowledged the advent of peak oil saying: "The world is consuming more oil than it is producing".

2.5.1 Demand for Travel and Environmental Considerations

Transport accounts for 34% of household greenhouse gas emissions (Figure 2-44). Increased demand for transport will therefore lead to rising greenhouse emissions unless walking, cycling or public transport are used.

Greenhouse emissions, amongst other elements such as air, noise and water pollution, urban separation, and nature and landscape deterioration, are all externalities created by the demand for transport. These impose significant costs on residents and business.

Figure 2-44 Forecasts of Transport Emission Futures, Australia



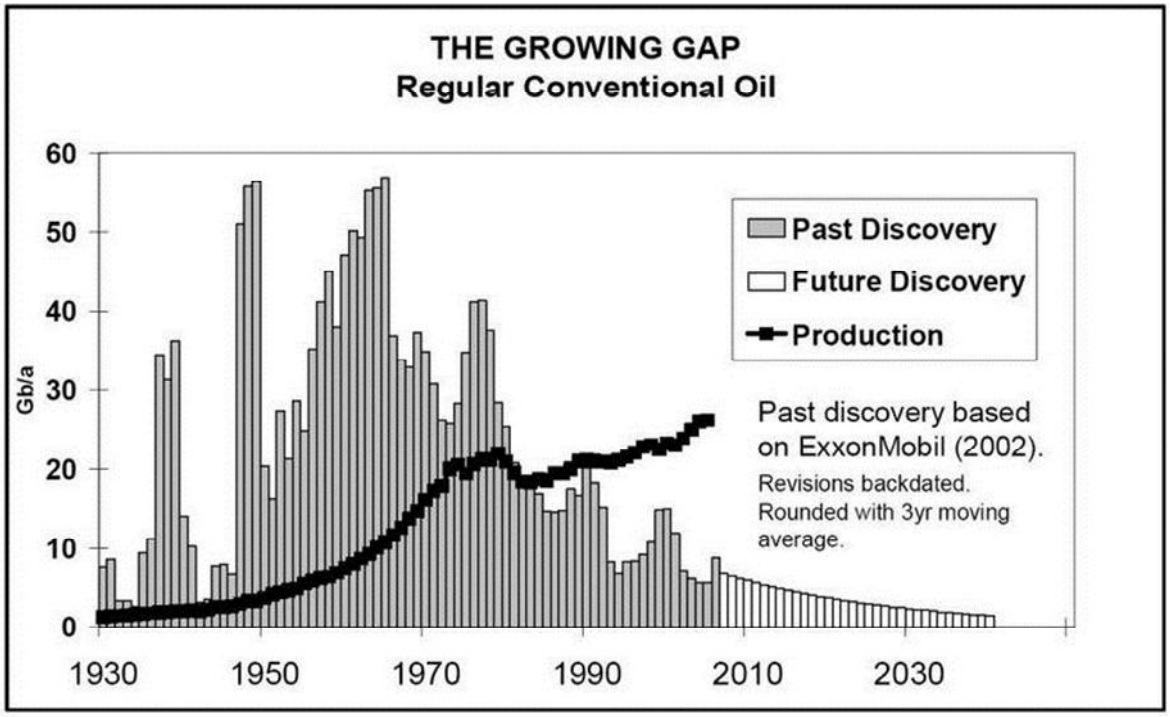
Source: Department of the Environment, Water, Heritage and the Arts, 2008
** 67% Private Car Use*
 # 32% Private Car Use

2.5.2 Peak Oil

Peak oil will have a more severe impact upon communities which are reliant on car-based travel. Section 2.4.13 *Comparing Nillumbik* shows that households in the Shire of Nillumbik are more likely to own 2 or more cars than households in neighbouring municipality and the metropolitan average. A more sustainable transport network (less dependent on fossil fuel) is required to ensure the mobility of residents of the Shire of Nillumbik is maintained in a future in which oil is less readily available. The Association for the Study of Peak Oil and Gas predicts that peak oil is likely to occurred between now and 2015[21]. Figure 2-45 predicts the decline in oil yielded from the world's oil fields in correlation to demand for oil resources. This supply and demand imbalance will result in increasing prices for fuel (see discussion in next section 2.5.3).

[21] *Association for the Study of Peak Oil and Gas (ASPO- USA), 2008* www.aspousa.org

Figure 2-45 Comparison between oil discovery and consumption



Source: The Oil Drum, 'World Oil Forecasts Including Saudi Arabia, Kuwait and the UAE', Feb 2008, www.theoildrum.com

2.5.3 Petrol Prices and Driving Costs

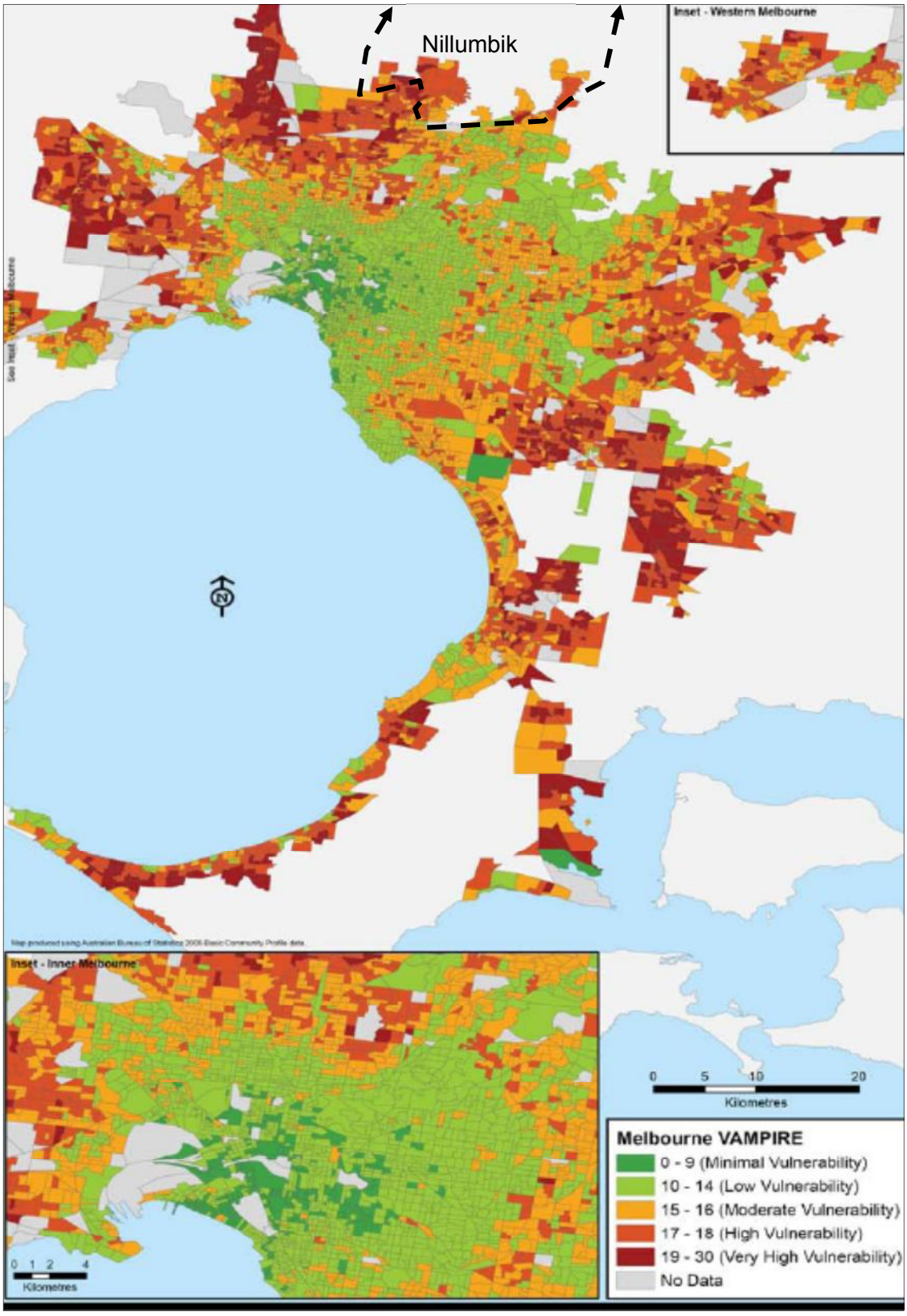
Transport costs are one of the largest components of a household budget. Dodson & Sipe (2008) highlighted areas of Melbourne which are vulnerable to fuel price and interest rate rises through their VAMPIRE index ('Vulnerability Assessment for Mortgage, Petrol and Inflation Risks and Expenditure',). Whilst the entire Shire of Nillumbik municipality is not shown some extrapolations can be drawn from the southern portion which is shown. A comparison of the Shire of Nillumbik Shire's vulnerability to these pressures is shown in Figure 2-46.

This figure shows that:

- Some parts of the Shire of Nillumbik have higher vulnerability than others, and
- The problem has worsened between 2001 and 2006 (evidenced in previous data from 2001)

A municipality's sensitivity to petrol price rises can be measured based on car dependence. Households in Shire of Nillumbik are more reliant on cars than their counterparts in the Cities of Banyule and Whittlesea. The Shire of Nillumbik Shire's car reliance is discussed in greater detail in section 2.4.13 *Comparing Nillumbik*.

Figure 2-46: Oil and mortgage vulnerability in Melbourne (2006)

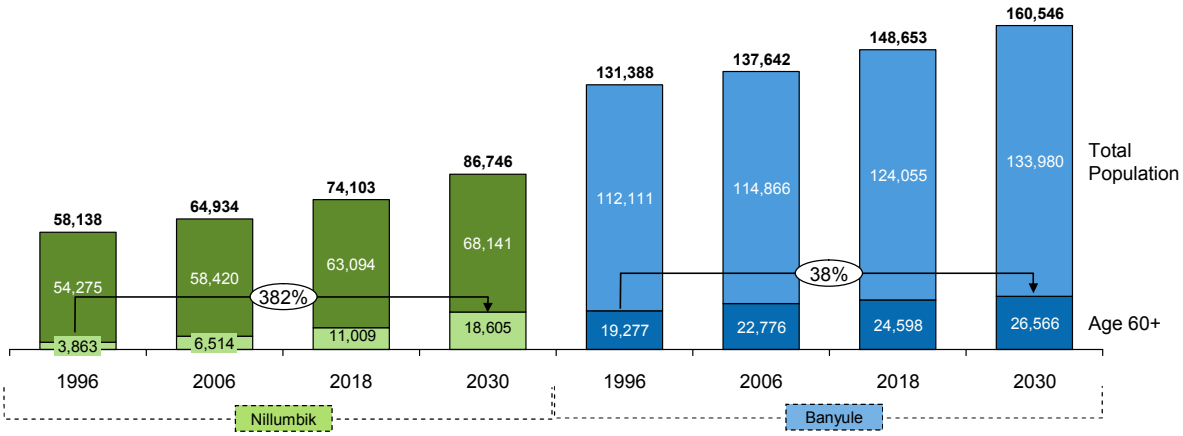


Source: Dodson and Sipe, 2008

2.5.4 *Ageing Population*

The number of senior adults and elderly people living in the Shire of Nillumbik is likely to change dramatically in the next 20 years. Figure 2-47 shows that in the years between 1996 and 2006 there were 69% more residents over the age of 60 living in the Shire of Nillumbik. By comparison, the Shire's neighbour, the City of Banyule, only experienced growth of 8% of 60+ year olds during this time.

Figure 2-47 Population profile projections (Ages 60+)

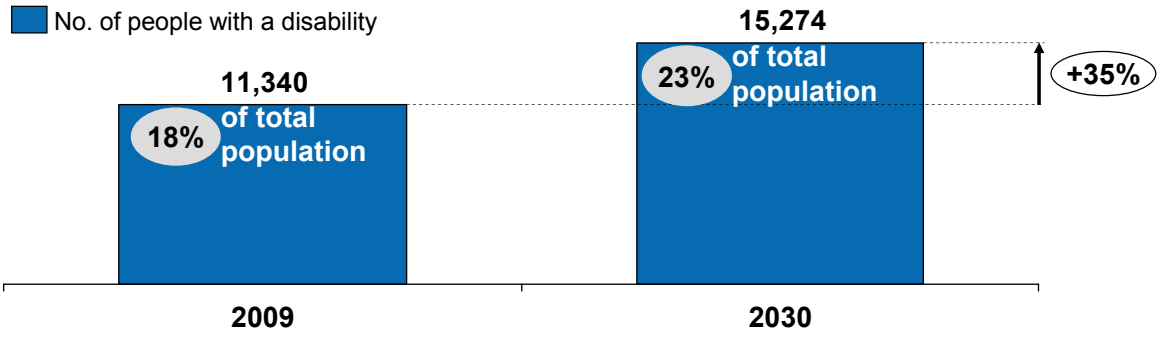


Source: Booz & Company Analysis, 2009 based on ABS Census, 1996 and 2006

Note: Projections beyond 2006 are based on average growth between 1996 and 2006. This equates to 60+ population growth of 69% every 12 years for Shire of Nillumbik and 8% every 12 years for City of Banyule. Total population growth is based on 12% per 12 years for Shire of Nillumbik and 5% per 12 years for City of Banyule.

Figure 2-48 shows the growth in population of people in the Shire of Nillumbik who have a disability.

Figure 2-48 Population projections of people with a disability, (2009-2030)



Source: Source: Disability Ageing and Carers. Summary of Findings, Australia, 2003 ABS.

Figure 2-47 and Figure 2-48 show that:

- Between 1996 and 2030 the Shire of Nillumbik Shire's population of 60+ year old residents will grow by 382%;
- In 1996 the proportion of the population aged over 60 years old was 7%, in 2030 it is predicted to be 27%;
- By comparison, the City of Banyule's growth in residents over 60 is less significant:

  - Between 1996 and 2030 the City of Banyule's population of 60+ year old residents will grow by 38%;
  - In 1996 the proportion of the population aged over 60 years old was 17%, in 2030 it is predicted to be 20%;
- There are going to be 35% more people with a disability in 2030 as there are in 2009.

Older adults, elderly people and people with a disability have different travel needs to the general population. These groups are generally more reliant on non-car based transport. Therefore there will greater need for public transport services and pedestrian links in order to ensure this population group is mobile and socially connected to their community.

GAP ANALYSIS: Section 2.5.3 and 2.5.4 shows that the Shire of Nillumbik's population is more suseptible to oil price rises and isolation as it's population ages. Previous evidence presented in Section 2.4.13 shows that residents and people working in the Shire of Nillumbik have a comparitively high car dependance.

A summary of all gaps can be found at Chapter 1 (page 1)

2.6 Community and Stakeholder Engagement

Two community workshops were held for the Nillumbik STSS project. The details for the workshops were as follows:

	Diamond Creek	Eltham
Date and Time	25th March 2009	26th March 2009
Attendees	14	20

The workshops were designed to be active- with significant audience participation and involvement in identifying problems and solutions.

The workshops were designed around four key stages:

- **Baseline presentation of data:** This was to ensure the community understood the issues and were equipped with information to assist them in the following workshop stages;

  Participants break off into workshop table groups of about 6-8 people.

- **Good Things:** Each participant has to prioritise the top three good things about transport and access in their Activity Centre.
- **Issues/Problems:** Each participant has to prioritise the top problems or issues they have regarding transport in their Activity Centre. In their table groups they vote on their combined priority problems/issues.
- **Solutions:** Each participant has to prioritise what they think the solutions are for transport and access in their Activity Centre. In their table groups they vote on their combined priority problems/issues.

Figure 2-49 to Figure 2-51 is a summary of the results from the workshop. A full list of comments under each workshop session is available at Appendix 6.

Figure 2-49 Good things about Transport and Access

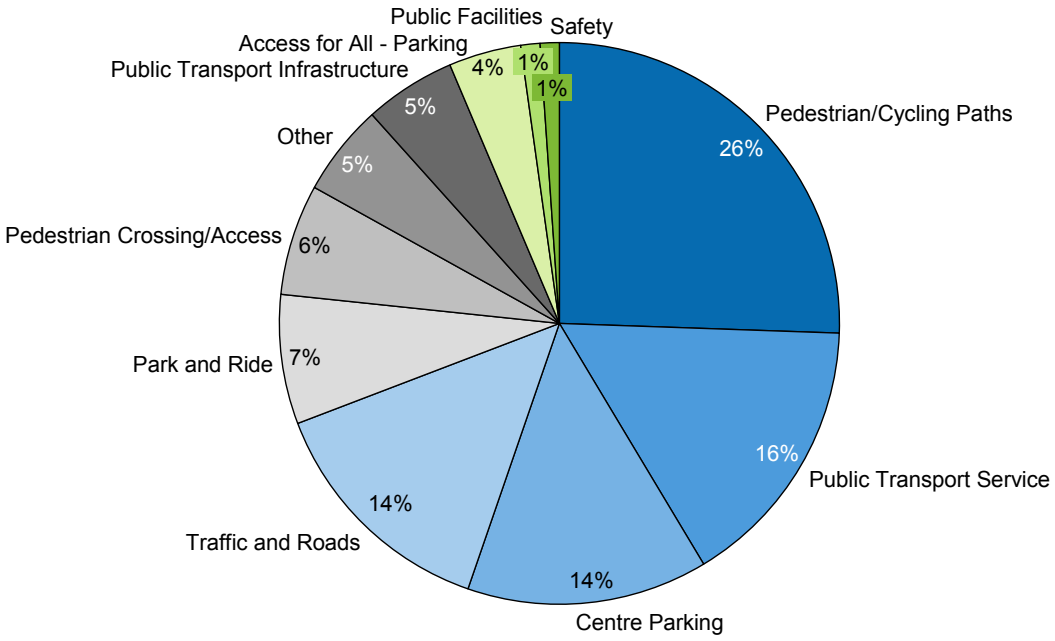


Figure 2-50 Issues/Problems with Transport and Access

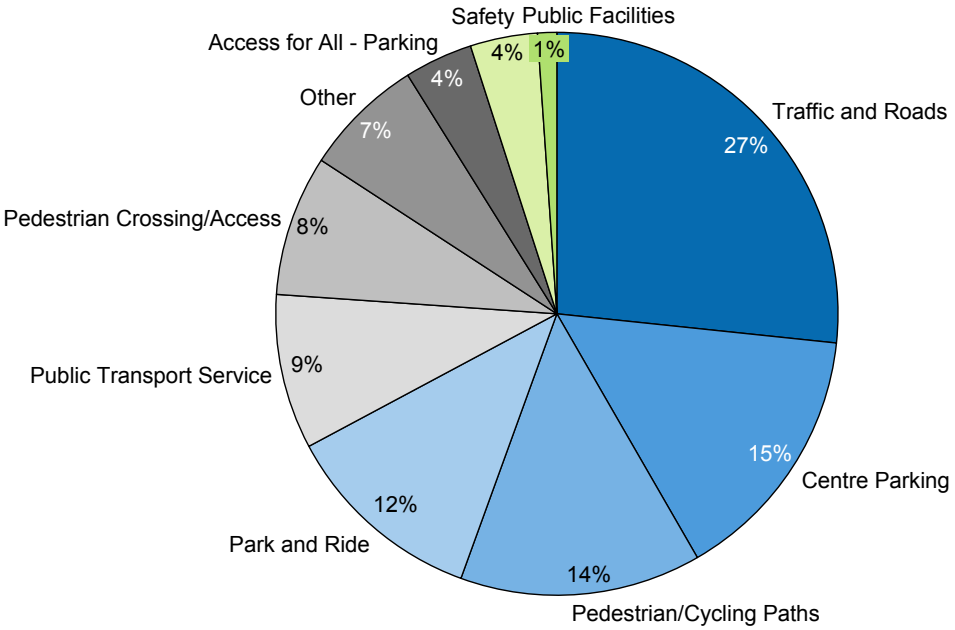
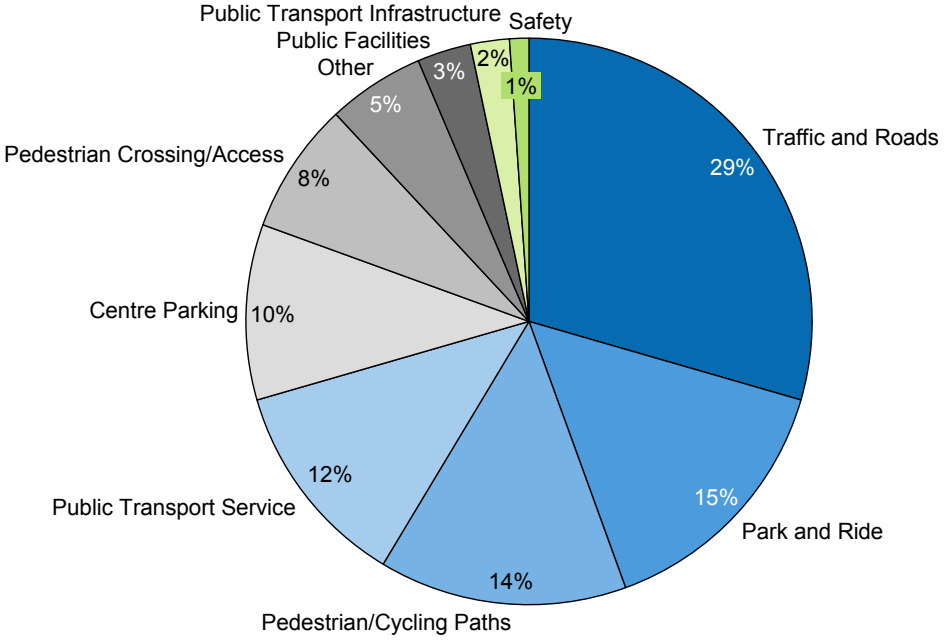


Figure 2-51 Solution for Transport and Access



In addition to the community workshops, two pieces of correspondence were submitted via the Shire of Nillumbik:

- Nillumbik Community Health Centre (NCHC) attended the workshop but also put forward a written submission detailing:
  - The need to consider people who do not have access to a car;
  - Improved disability parking (particularly close to NCHS) including consideration of kerb detailing next to such spaces to ensure easy wheelchairs/walking frames access;
  - Need for bicycle parking facilities outside NCHS which younger people and others without vehicles can utilise;
  - Priority parking for mothers with young children in close proximity to NCHS
  - Elderly people are especially challenged due to decreased physical mobility and poorer vision and hearing. A blanket reduction in speeds throughout Eltham Township would increase safety for this group.
  - More all day parking in Eltham for staff;
  - NCHS has parking under our building, but there are only a handful of parks available at any one time. Most of our clients who drive, end up parking on the street or over in the shopping centre car park.
- The NillumBUG (Bike User Group) were not able to attend a workshop but put forward a written submission detailing:
  - The need for a reduced speed limit in Main Rd. Eltham and Main Hurstbridge Road, Diamond Creek (from 60kmph to 50 or 40kmh);

3 Summary of Gap Analysis (Problems)

Based on an examination of the baselines conditions and data available for the Nillumbik Activity Centres the following gaps have been identified:

Table 3-1 Summary of Gaps

Evidence	Gap	Strategies	Eltham	D'mond Creek
Walking and Cycling:				
2.3.1 1km Pedshed	Walking catchments are restricted by the railway line and river, road network and low densities	5.1 Enhance pedestrian access through infrastructure improvements	✓	✓
2.3.2 Pedestrian Infrastructure Standards	There are minimal pedestrian crossing points across main streets		✓	✓
2.4.5 Trip Purpose and Mode; & 2.3.2 Pedestrian Infrastructure Standards	There are strong pedestrian desire lines to stations which are not recognised in infrastructure		✓	✓
2.4.10 Mode Shift Potential	There is a community desire to walk which is not being met by infrastructure		✓	✓
2.4.10 Mode Shift Potential	There is a community desire to cycle which is not being met by infrastructure	5.2 Provide local cycling routes and infrastructure	✓	✓
2.4.5 Trip Purpose and Mode	There is very low use of active transport for education trips		✓	✓
2.3.5 Cycling Infrastructure	Cycling paths do not connect people locally		✓	✓
2.4.12 Satisfaction with Cycling and Pedestrian Infrastructure	Cyclists perceive cycling infrastructure as of a lower standard than pedestrian infrastructure			✓
Driving and Parking:				
2.3.8 Parking Supply;	The location of commuter car parking guides commuters away from shops rather than maximising the potenital for convenient 'dual purpose' shopping/commute trips.	6.7 Enhance viability of Activity Centre through 'anchor' car parking	✓	✓
2.3.2 Pedestrian Infrastructure Standards; & 2.3.9 Parking Occupancy	Commuter parking is congested	6.4 Manage public parking with a hierarchy of use	✓	✓

Evidence	Gap	Strategies	Eltham	D'mond Creek
2.3.11 Parking Use by Traders	A significant portion of Eltham traders are using commuter spaces in the Park and Ride facilities	6.4 Manage public parking with a hierarchy of use	✓	
2.3.9 Parking Occupancy	Most parking for shoppers is underutilised beyond a small area and a defined peak (12-1pm).	6.6 Improve access to underutilised car parks	✓	✓
2.3.9 Parking Occupancy	Some private car parks are utilised for short weekends periods but are largely vacant through week.	6.2 Support shared car parking opportunities	✓	✓
2.3.9 Parking Occupancy; 2.3.13 Trader Satisfaction with Parking and Access;	User satisfaction with car parking is high, however there is still a strong perception in parts of the community that more parking is required.	Have a clear plan for parking infrastructure and management in each Activity Centre using the following strategies: ▪ 6.1 Respond strategically to parking needs with Parking Precinct Plans ▪ 6.2 Support shared car parking opportunities ▪ 6.3 Enable car parking to be on separate titles	✓	✓
2.3.9 Parking Occupancy	Accessible car parks (signed P Disabled or 2P Disabled) can be congested at the Diamond Creek IGA supermarket and Coles supermarket	6.8 Regularly review and install Accessible Parking Bays		✓
Public Transport:				
2.3.7 Public Transport Service Standards; & 2.4.1 Modal Split	Lower public transport service levels effect public transport use	7.1 Use the Transport Connections Program to		✓
Land Use Planning:				
2.4.8 Trip Origin and Mode; & 2.4.4 Trip Purpose	Limited variety of Activity Centre functions available locally	8.1 Mixed land use to facilitate local and multi-purpose trips		✓

The following gaps have also been identified however there are not specific strategies devised in response. Due to their overarching nature they are more likely to be addressed through the suite of strategies proposed:

Evidence	Gap	Strategies	Eltham	D'mond Creek
2.4.11 Reasons for Car Use	Visitors are not choosing sustainable transport as driving is perceived as the fastest/easiest option	*There is no specific strategy responding to this gap- rather it will be addressed through the suite of strategies proposed.*	✓	✓
2.4.13 Comparing Nillumbik 2.5.3 Petrol Prices and Driving Costs 2.5.4 Ageing Population	Comparably high levels of car dependence will leave Nillumbik's population vulnerable to future oil price rises and isolation as it's population ages		✓	✓
2.4.3 Mode Split and Age	Visitors older than 26 years old are more likely to rely on driving		✓	✓
2.4.9 Trip Origin of Traders; & 2.4.11 Reasons for Car Use	Traders are choosing to drive due to convenience rather than necessity		✓	

4 Introduction to Strategies

The strategic vision for in Diamond Creek and Eltham Major Activity Centres is set out in existing structure plans.

4.1 Vision for Diamond Creek and Eltham Major Activity Centres

The structure plans for Diamond Creek and Eltham both set clear visions for how the Activity Centres should function and the role of transport to them.

Both structure plans emphasise convenience and attractiveness:

- The vision for Diamond Creek is to help reduce the need for travel and increase social interaction whilst 'improv[ing] access to the centre for all modes of travel'. Main Hurstbridge Road should be better managed to ensure an attractive shopping environment and meeting place[22].
- The vision for Eltham is to ensure convenience for all modes and the urban design of the centre is attractive and distinctively 'Eltham'[23].

[22] Paraphrased from Diamond Creek 2020

[23] Paraphrased from Eltham Major Activity Centre Structure Plan

4.2 Achieving Convenience and Attractiveness

Maximising convenience whilst not detracting from the centre's attractiveness is a fine balance. There is an interrelationship between convenience and attractiveness. Furthermore convenience means different things to people depending on the transport mode they use. Figure 4-1 gives examples of a number of centres with different convenience definitions and ranks them based on whether transport is managed in accordance with individual convenience requirements.

Figure 4-1 Convenience and Attractiveness rankings (Melbourne Samples)

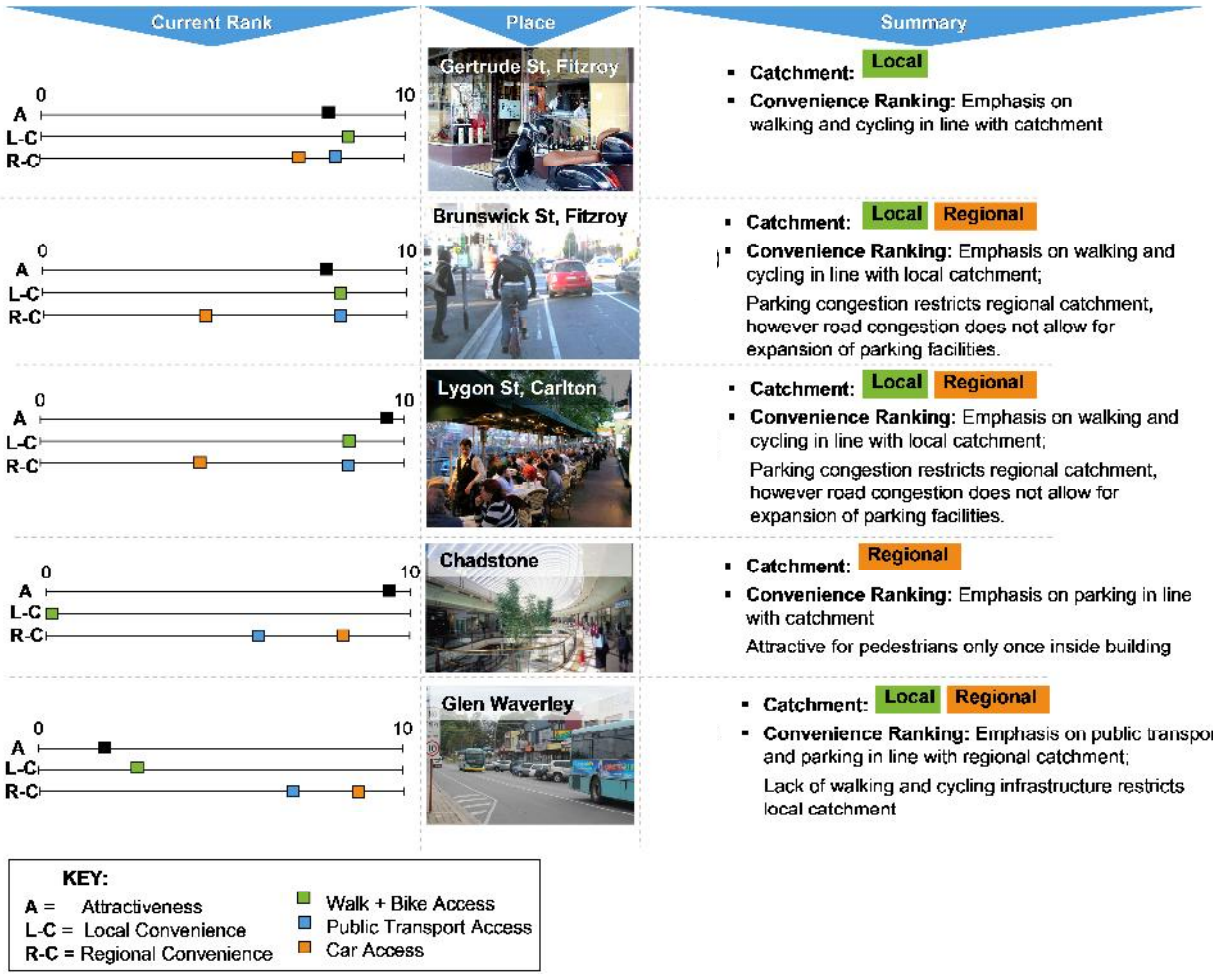


Figure 4-1 shows that:

- It is possible to achieves a high ranking for both attractiveness and convenience (for example Gertrude Street in Fitzroy).
- Brunswick Street in Fitzroy and Lygon Street in Carlton both have similar mixed local and regional catchments. They achieve a poor overall ranking due to the difficult access for car drivers from the regional portion of their catchment. It is noted that low convenience for car drivers is in this case unavoidable due to road congestion;
- Chadstone achieves a positive overall ranking even though convenience for pedestrians and cyclists is low. This is due to access management being in line with

it's regional catchment- the local catchment for this Chadstone being of low importance.

- Glen Waverley is an example where the regional catchment is served very well by public transport and car access, however the local walking and cycling catchment is largely neglected in infrastructure provision. The attractiveness rating of this centre is compromised by the overemphasis on car parking and traffic.

Consideration has been given to the catchment in Diamond Creek and Eltham. In both these cases surveying has shown that the centres have both a local and regional catchment (Diamond Creek 16% local and Eltham 11% local). In Diamond Creek and Eltham the spectrum of what is considered 'convenient access' will differ for different visitor groups. Figure 4-2 indicates how Diamond Creek and Eltham should be managed for access from each of the tertiary, primary and secondary catchments.

Figure 4-2 Access from Activity Centre Catchments

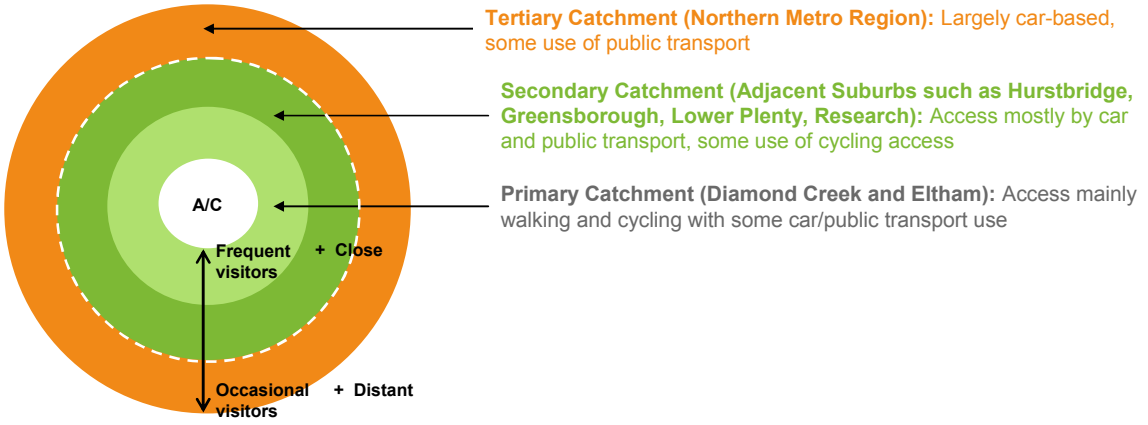


Figure 4-2 indicates that within Diamond Creek and Eltham's primary catchment access to the Activity Centres will be mainly by walking and cycling. Secondary and tertiary catchments will mainly access the centre by public transport and car.

In line with Figure 4-1 which ranks a number of Activity Centre's around Melbourne, Figure 4-3 applies the attractive and convenience ranking to Diamond Creek and Eltham.

Figure 4-3 Convenience and Attractiveness rankings (Diamond Creek and Eltham)

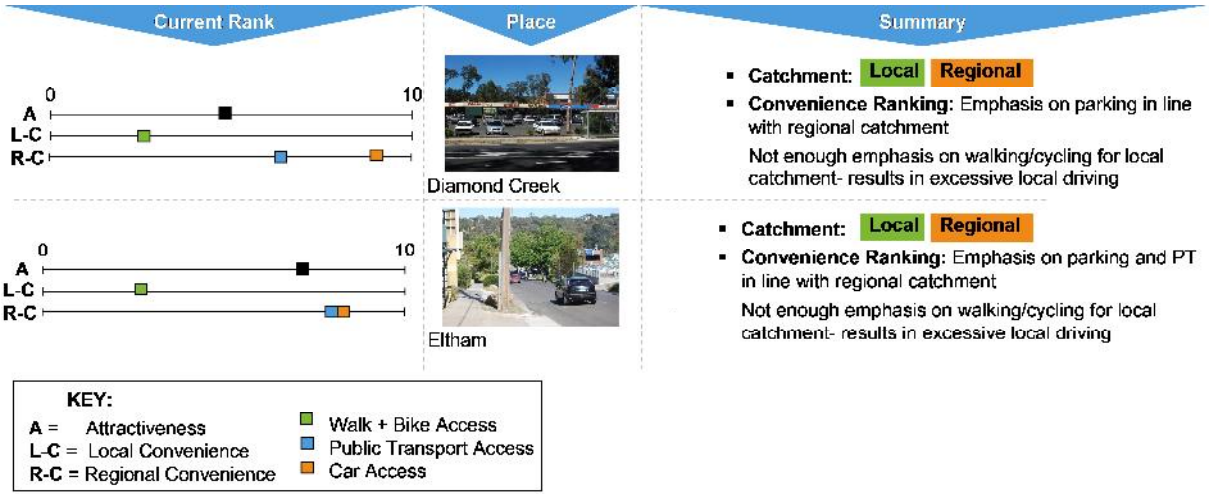


Figure 4-3 shows that both Eltham and Diamond Creek achieve poor overall rankings. This is due to:

- Attractiveness, particularly in Diamond Creek, being compromised by parking and traffic.
- The local walking and cycling catchment is largely neglected in infrastructure provision.

Managing Car Parking for a convenient and attractive centre

Particular attention should be given to the management of car parking and car access to achieve a conveinent and attractive centre. There are three general options for how convenience and attractiveness may be managed:

Table 4-1 Three levels of attractiveness and convenience

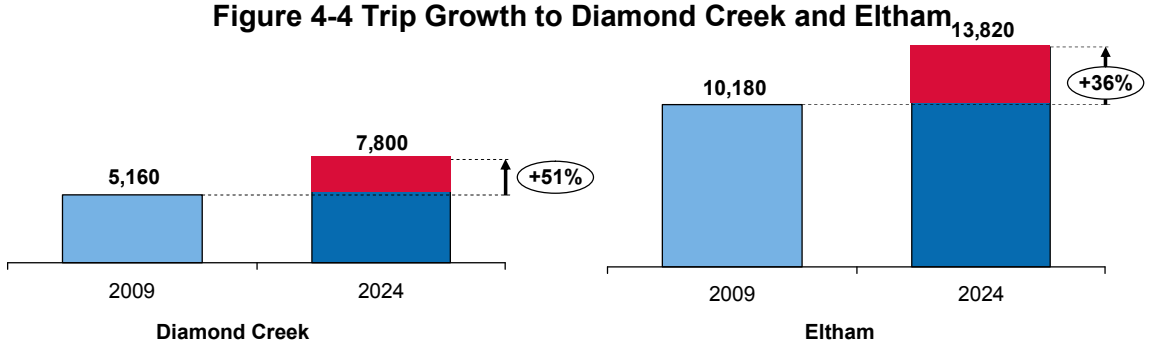
	Convenience	Attractiveness	How?
1.	↑ High	↓ Low	▪ Car parking for everyone who *desires* it ▪ Car (and car parking) dominated streets – Not enough room for walking and cycling infrastructure – Car dominated streets make cycling and walking less safe (therefore less likely people choose to walk/cycle). ▪ Attractiveness compromised by car dominance.
2.	← Medium	← Medium	▪ Car parking for those who *need* it ▪ Existing infrastructure expanded upon to include high quality walking and cycling infrastructure on key streets ▪ Attractiveness enhanced in key areas
3.	↓ Low	↑ High	▪ Not enough car parking for those who *need* it ▪ All streets dominated by walking and cycling infrastructure ▪ Highly attractive urban environment throughout centre

4.3 Accommodating visitation growth in Diamond Creek and Eltham

Growth in the number of people accessing Diamond Creek and Eltham will result from Activity Centre expansion, growth in adjacent areas (such as Hurstbridge), and relative attractiveness and convenience of Diamond Creek and Eltham in comparison to similar Activity Centre's in the area.

Figure 4-4 shows the level of growth in Diamond Creek and Eltham resulting from Activity Centre expansion.

Figure 4-4 Trip Growth to Diamond Creek and Eltham



Note: Only includes additional trips resulting from Activity Centre growth

The road network does not have the capacity to accommodate 51% and 36% growth in trips to Diamond Creek and Eltham respectively. Congestion already occurs, particularly around Main Hurstbridge Road, Diamond Creek and Main Road, Eltham. Construction or expansion of the road network to cope with additional trips is not desirable, given such developments would impact on the attractiveness of these townships and their surrounds.

Additional growth will therefore have to be managed by:

- Increased walking, cycling and public transport trips; or
- Increased car trips resulting in road and parking congestion.

4.4 Future parking requirements

The future need to provide parking will depend on the intensity of development and the success of other projects in creating mode shift. Given the amount of development expected, new car parking may be required in the future. This should be determined through analysis of data and trends identified in this project. All possible management options should be exhausted before new parking is built. If parking is required in the future the most efficient way to provide it is as a shared resource.

A developer contributions scheme could be established to accommodate this (refer discussion on a Parking Precinct Plan in 6.1). However if it is not, Council should construct new parking in strategic locations and manage their use. For example Council should plan for future construction of parking on edges of each centre. This could form a boundary to each centre, reducing traffic congestion within the centre and making pedestrian improvements more achievable.

No additional parking is currently required. There is capacity to better manage existing car parking resources to allow access for those who need parking at peak times, however, beyond short peak periods parking is readily available for shoppers in Diamond Creek and Eltham. Capacity constraints occur in commuter Park & Ride spaces and the Eltham

Trader Car Park however there is some scope to create a mode shift for both these groups (given short trips by traders and commuters). Improved local bus services and better enforcement of commuter Park & Ride spaces will also make more parking available.

4.5 Managing parking to achieve a thriving retail economy

Car access is often overemphasised as the main source of retail trade. This section sets out two local studies which discuss the role of transport and retail expenditure:

Two lessons from two studies:

- **Acland Street, St Kilda**: Local visits (largely walked) are 86% of expenditure[24];
- **Lygon Street, Carlton**: Reallocating 1 car park to 6 bike parks could generate 3.6 times the expenditure[25].

Unfortunately there are no outer suburban studies such as these. However these inner city examples are still relevant as both Eltham and Diamond Creek have a local and regional catchments (like Acland Street St Kilda and Lygon Street, Carlton).

Acland Street St Kilda: In St Kilda in 2003 the Acland Street Precinct Traders Association undertook market research, with support and funding from the City of Port Phillip, into ways to make their shopping strip more 'vibrant'. The Acland Street Precinct Traders Association found that the walkability of the area was a driving force behind its success and that it was this feature which made it attractive to shoppers and therefore successful in a business sense. Specifically it was found that, of the locals who visited the shopping strip, over half walked. The key visitor groups who drove to the shopping strip were rural and regional Victorians, metropolitan Melbournians[26] and to a lesser extent residents within the area but not classified as 'local' to St Kilda. Whilst the emphasis had often been on the shopping strip's 'tourism' role, it was found that whilst local residents (half of whom walked) accounted for nearly 86 percent of expenditure and interstate and internationals (most of who drove) only 1.2 and 0.5 per cent respectively[27]. Traders improved their centre by removing nine car parking spaces in the shopping strip to improve pedestrian amenity.

Lygon Street, Carlton: A 2007 study conducted in Lygon Street, Carlton showed that car drivers spend twice as much as cyclists per capita but are allocated 37 times the amount of public space. This study concluded that public space should be reallocated from car parking to bike parking in order to take advantage of the space efficiency of other transport modes. This would produce 3.6 times the retail spend for surrounding retailers. For example: 13m2 allocated to 1 car park generates $27 per hour but allocated to 6 bike spaces could generate $97.20 per hour. The study also found that cyclists are more likely to be shopping for comparison goods[28] and eating out compared to car drivers, who are more likely to be going to entertainment venues and grocery shopping.

[24] Acland Street Precinct Association (2003) *Draft Summary of Key Findings and Recommendations*, 30 June 2003, City of Port Phillip, Melbourne

[25] Lee, A. (2007). *What is the economic contribution of cyclists compared to car drivers in inner suburban Melbourne's shopping strips?* Melbourne: Unpublished Master of Urban Planning Thesis, University of Melbourne

[26] Metropolitan Melbournians were classified as those who lived beyond a 15km radius

[27] Smith P., 2004, *Improving 'Walkability' in Acland Street*, City of Port Phillip, Melbourne

[28] Such as books, music and other 'discretionary spending' items.

5 Walking and Cycling Strategies

Nillumbik Shire Council has been increasingly supportive of the trend toward greater participation in cycling for functional trips. This is evident through Council's expenditure on cycling in the last financial year (2.3.4) and significant planned infrastructure projects such as the Diamond Creek to Hurstbridge Shared Path (2.2). Despite recent good works, Figure 5-1 indicates that there are a number of gaps still evident.

Figure 5-1 Diamond Creek and Eltham Walking and Cycling Gaps

- Walking catchments are restricted by the railway line and river, road network and low densities
- There are minimal pedestrian crossing points across main streets
- There are strong pedestrian desire lines to stations which are not recognised in infrastructure
- There is a community desire to walk which is not being met by infrastructure
- There is a community desire to cycle which is not being met by infrastructure
- There is very low use of active transport for education trips
- Cycling paths do not connect people locally
- Cyclists perceive cycling infrastructure as of a lower standard than pedestrian infrastructure

Reference: From baseline section of this report (Sections 2.3.1, 2.3.2, 2.4.5, 2.3.5, 2.4.10 and 2.4.12)

The following strategies (described in 5.1 and 5.2) respond to the above gaps. Actions shown with an asterisk (*) next to them are shown in the Walking and Cycling Priority Improvement maps (see 5.3).

5.1 Enhance pedestrian access through infrastructure improvements

A designed urban form for pedestrians is one in which people find that they can walk to activities such as work, shopping and public transport easily and with comfort. This may be achieved by appropriate infrastructure improvements.

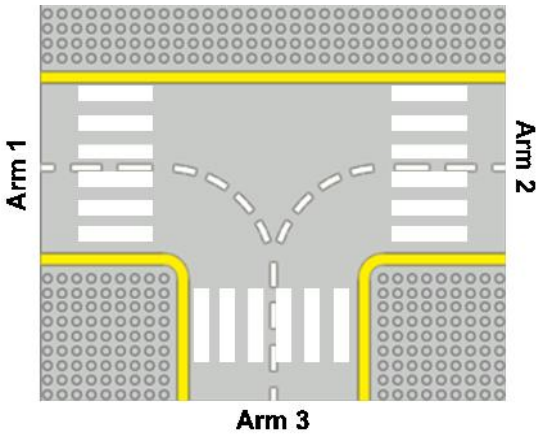
Actions:

- Enhance existing laneways and pedestrian arcades*;
- Seek opportunities for additional pedestrian crossings of railway tracks*;
- Improve signalised pedestrian crossings including additional arms at existing crossings and identifying opportunities for shorter wait times (Figure 5-2 gives an example)*;
- Provide additional opportunities to cross main roads in accordance with pedestrian desire-lines*;
- Develop heads-up[29] pedestrian way-finding signage, which provides concise information for accessing a destination by walking;

[29] *"Heads up" mapping has been used successfully in Bristol, UK and Bendigo. This style of mapping shows what the pedestrian sees at that location. Rather than a traditional aerial view of a location the map shows what the person sees in front of them "above" their location on the map and what is behind them is "below" their location on the map.*

- Aim for the installation of weather protected street furniture and other pedestrian facilities at 60m intervals[30];
- Reduce speed and calm traffic in locations where pedestrian demands are high*;
- In new developments provide weather protection of footpaths; and
- Ensure that new developments have active frontages and are constructed abutting the street.

Figure 5-2 Example of pedestrian crossings at all arms of an intersection



5.2 Provide local cycling routes and infrastructure

The Nillumbik Shire Council's ability to create a cycling culture is largely a matter of infrastructure provision. Infrastructure can be of a variety of different standards (examples are detailed in the 'Actions' section below) but it is important to note that infrastructure should be provided that is appropriate to make the cyclist safe and *feel* safe:

> *Cycling is much safer and more popular precisely where significant interventions such as bikeways, bike lanes, special intersection modifications, and priority traffic signals exist.*
>
> -John Pucher, *Cycling Safety on Bikeways vs. Roads*,
>
> Transportation Quarterly, vol 55, no.4

The VicRoads Principal Bicycle Network (PBN) has mapped a number of proposed routes through Eltham and Diamond Creek. As this is a VicRoads plan the routes are located on VicRoads-managed roads, which are major roads. Using only major roads for a cycling network will result in a lower uptake of cycling due to the perceived and real safety problems of mixing cyclist with heavy and fast traffic on major roads.

The Nillumbik Shire Council can have a greater role in provision of cycling routes on local streets. Priority cycling routes for implementation by the Nillumbik Shire Council are detailed in Figure 5-3 and Figure 5-5 (Diamond Creek) and Figure 5-4 and Figure 5-6 (Eltham). These routes are sited using the following principles:

Principles for provision of cycling routes

Cycling routes should:

[30] *This is a Disability Discrimination Act Standard (AS1428.2, Clause 7)*

- Be sited to utilise and build on the existing regional and local pedestrian network where possible
- Be approximately 200m apart as part of an ultimate future scenarios
- Be as direct as possible
- Not use busy roads
- Have a high standard of cyclist amenity
- Connect key activities (schools, shops, housing, public transport)

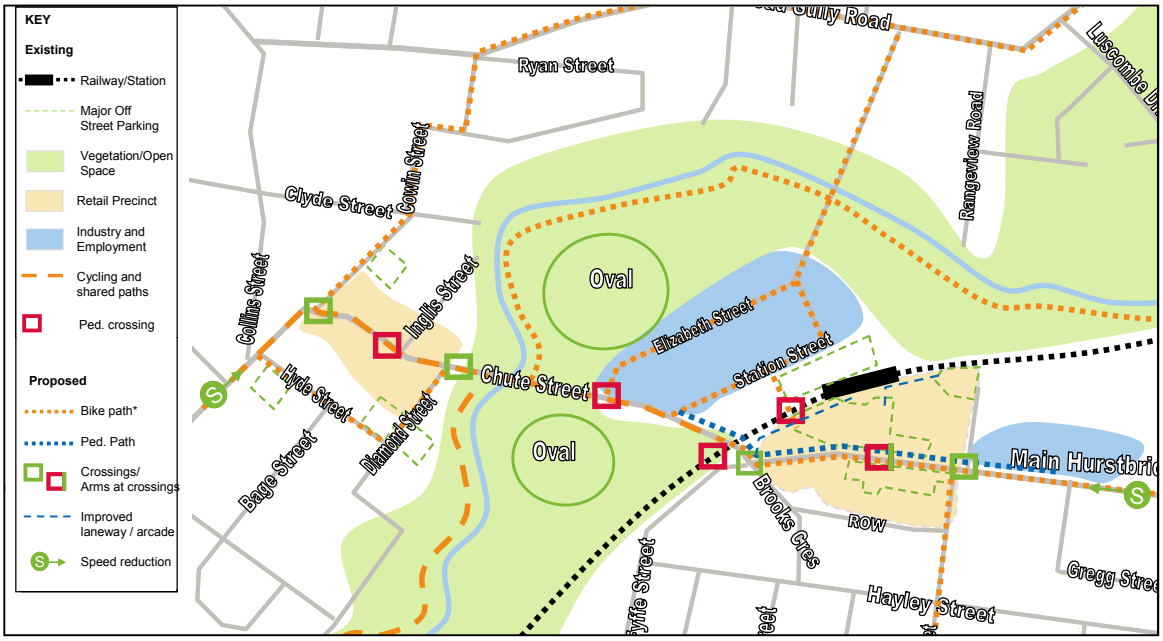
Actions:

- Investigate and implement the priority improvements shown in Figure 5-5 and Figure 5-6;*
- Use the priority cycling routes detailed in Figure 5-5 and Figure 5-6 on which to concentrate infrastructure improvements focussing on the following possible treatments:
  - Installation of safe on-road cycling lanes;
  - Seek opportunities for additional cycling crossings of railway tracks*;
  - Develop cycling-oriented signage, which provides concise information for accessing a destination by cycling; and
  - Intersections should accommodate cyclists either through signal phasing, bike lanes or appropriate kerbing.

5.3 Map: Walking and Cycling Priority Improvements

Priority walking and cycling improvements to be carried out in Diamond Creek are detailed in Figure 5-3 below. These maps represent the physical expressions of a number of the actions listed in Chapter 4 (those with an asterisk "*"). These are considered improvements to be implemented as a matter of priority. Priority has been given to the most obvious improvement requirements and in the case of cycling network development, routes which link the most significant activities.

Figure 5-3 Recommended Diamond Creek Walking and Cycling Improvements Map



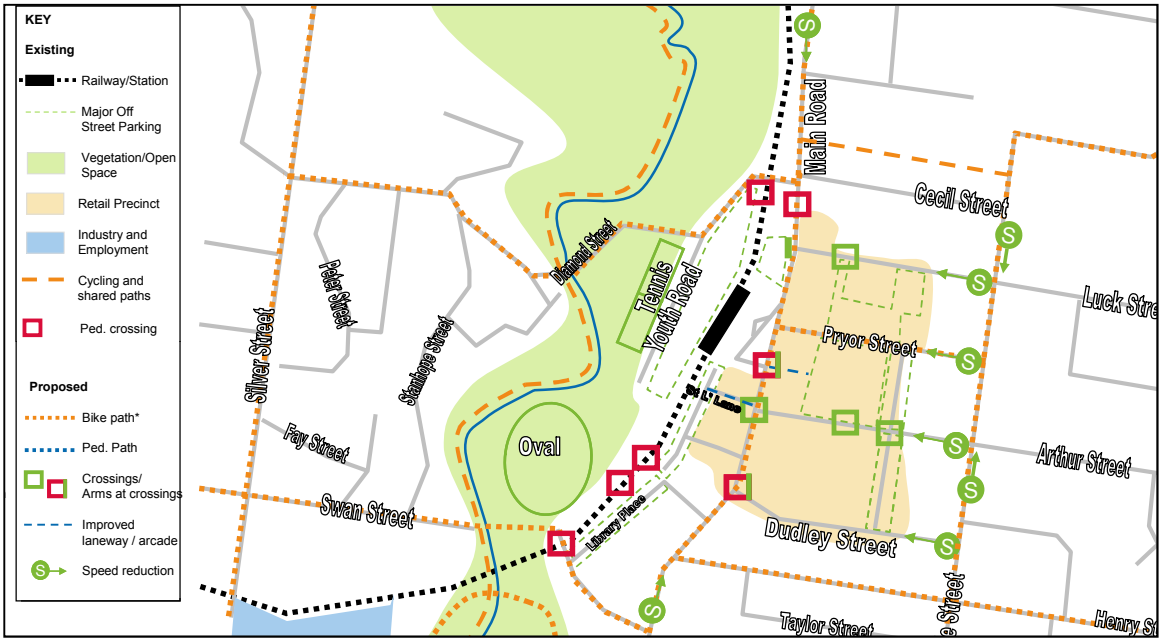
** Note: Main Hurstbridge Road bike path is proposed through VicRoads Principal Bicycle Network (PBN) and Diamond Creek to Hurstbridge Shared Pathway along railway reserve) proposed by VicTrack/DOT/Nillumbik Shire Council Shared Pathway Study.*

Some recommended improvements, difficult to convey in a map form include:

- Narrowing of Diamond Street and raised pedestrian crossing to improve pedestrian access across this street;
- Redesign of Brooks Crescent, Fyffe Street and Main-Hurstbridge Road to improve pedestrian safety at the intersection;
- Improved bike parking across the entire centre;
- Development of an additional entrance to Platform 2 of Diamond Creek Station at the eastern end of the platform to provide a direct link into Diamond Creek Plaza; and
- Investigation of how more trains could use Platform 2 at Diamond Creek Station, to better integrate the station into surrounding activity at Diamond Creek Plaza.

Priority walking and cycling improvements to be carried out in Eltham are detailed in Figure 5-4 below.

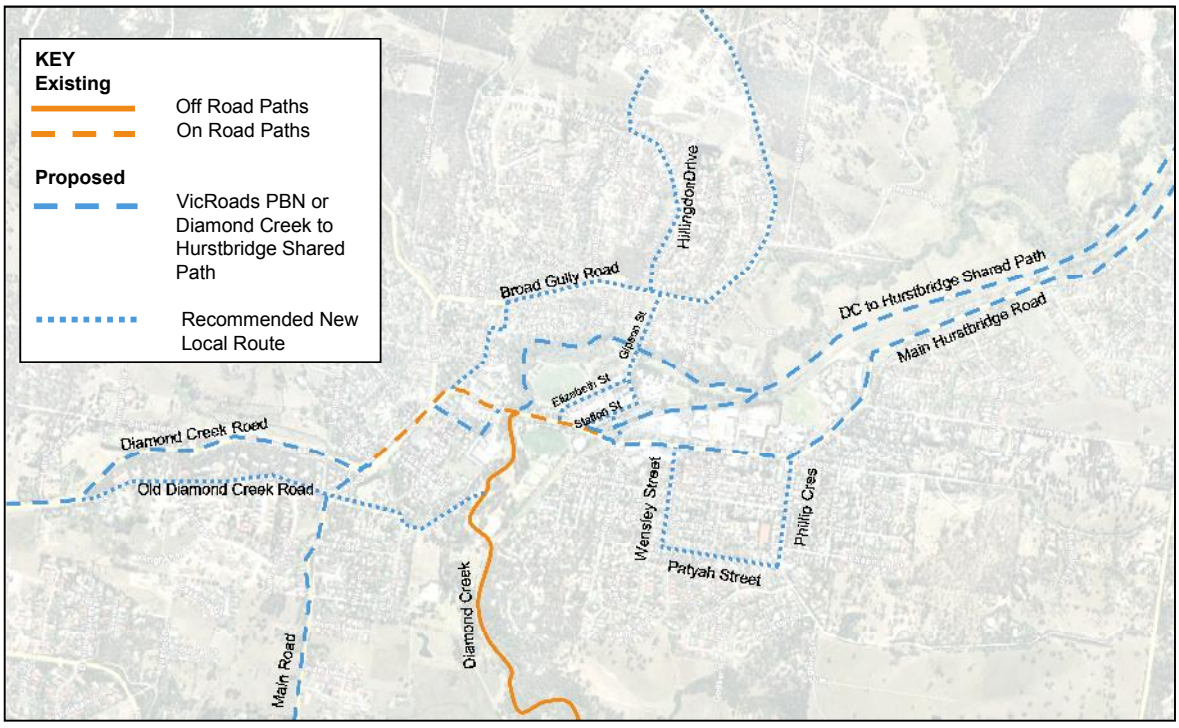
Figure 5-4 Recommended Eltham Walking and Cycling Improvements Map



**Note: Main Road Bike Path is proposed through VicRoads Principal Bicycle Network (PBN) and route around Alistair Knox Park is from the Eltham Structure Plan.*

An expanded network of paths connecting to the Diamond Creek and Eltham Major Activity Centres is shown in Figure 5-4 and Figure 5-5 below. This network has been developed in response to analysis showing that there are few routes connecting the Diamond Creek and Eltham Major Activity Centres with the surrounding local area.

Figure 5-5 Diamond Creek Recommended Expanded Cycling Network

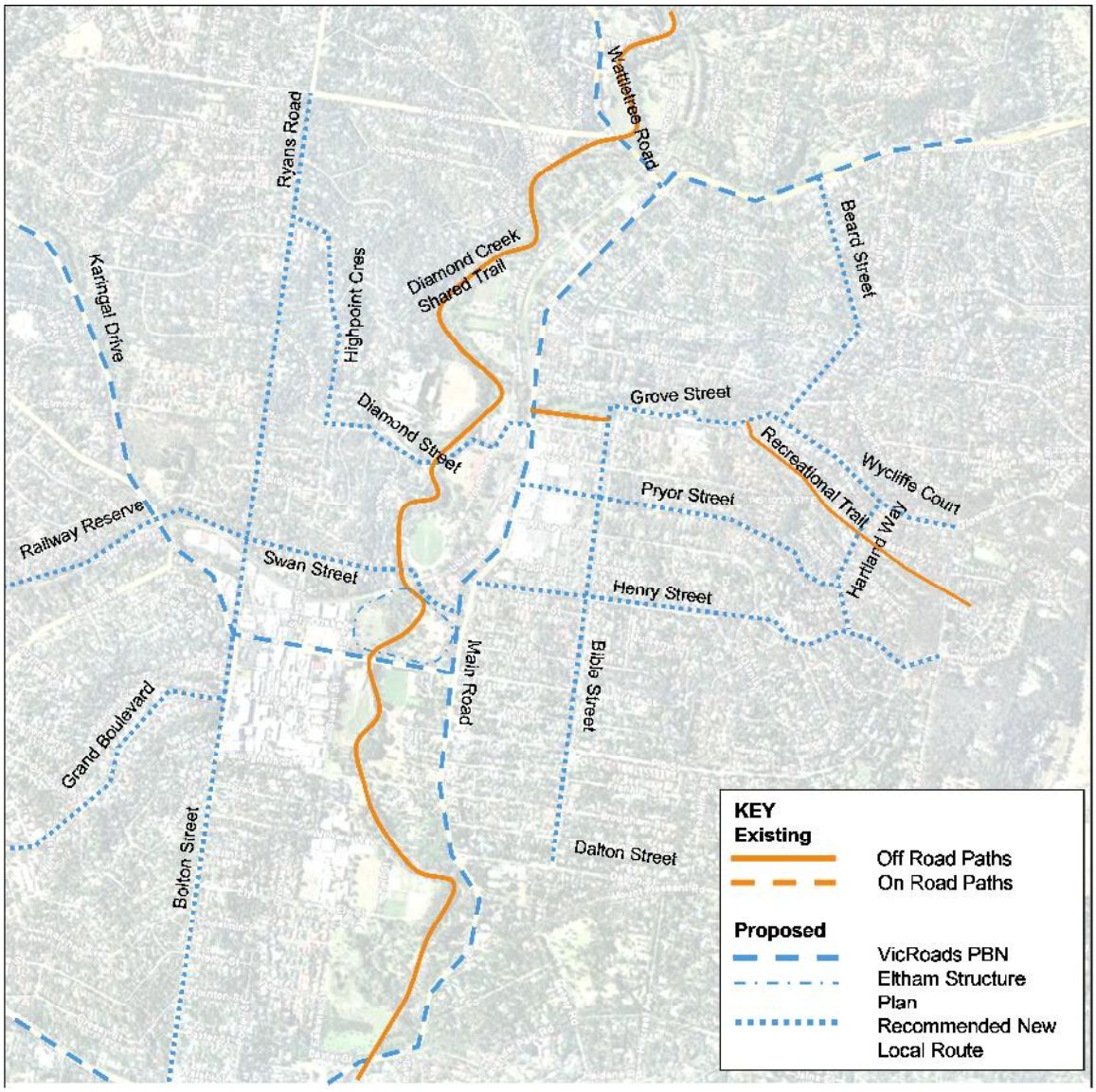


Further analysis also showed that visitors had a desire to cycle which but were not willing to try without improved infrastructure. These routes are nominated to connect to major

residential areas, employment hubs and education institutions. The routes may have a variety of infrastructure improvements (for example: on-road bike paths *and* cyclist way-finding signage). The array of possible treatments is discussed in under *Actions* in Section 5.2.

The extent of routes connecting the main residential areas of Diamond Creek to the Activity Centre is restricted due to the road network in the town. New subdivisions have tended to use circuitous road networks, dead end streets and cul-de-sacs which are not amenable to cycling routes (cycling routes should be direct and convenient).

Figure 5-6 Eltham Recommended Expanded Cycling Network



Note: Some streets are in the City of Banyule however form part of the recommended network for Eltham so have been included in this map.

6 Parking/Driving Strategies

Currently, the Nillumbik Shire Council uses the structure plans for Eltham and Diamond Creek to determine parking projects. Over the last few years this has resulted in the following developments, as issues and opportunities have arisen:

- Construction of a Park and Ride facility south of Eltham Station;
- Construction of the circulatory road, Eltham with associated car parking; and
- Various waivers of car parking issued by Council (see Appendix 3).

Individual parking matters, such as those arising through planning application processes, rely on information provided by applicants and assessment by Council officers to determine appropriate parking outcomes.

Despite this approach Figure 6-1 indicates that there are a number of gaps evident.

Figure 6-1 Diamond Creek and Eltham Parking/Driving Gaps

- Commuter parking locations guide commuters away from shops
- Commuter parking is congested
- A significant portion of Eltham traders are using commuter spaces in the park and ride facilities
- Most parking for shoppers is underutilised beyond a small area and a defined peak (12-1pm).
- Some private car parks are utilised for short weekends periods but are largely vacant through week
- User satisfaction with car parking is high, however there is still a strong perception in parts of the community that more parking is required.
- Accessible car parks (signed P Disabled or 2P Disabled) can be congested at the Diamond Creek IGA supermarket and Coles supermarket

Reference: From baseline section of this report (Sections 2.3.8, 2.3.2, 2.3.9, 2.3.11, 2.3.13)

Figure 6-2 shows the approaches possible to achieve mode shift through better parking management.

Figure 6-2 Parking management categories and strategies

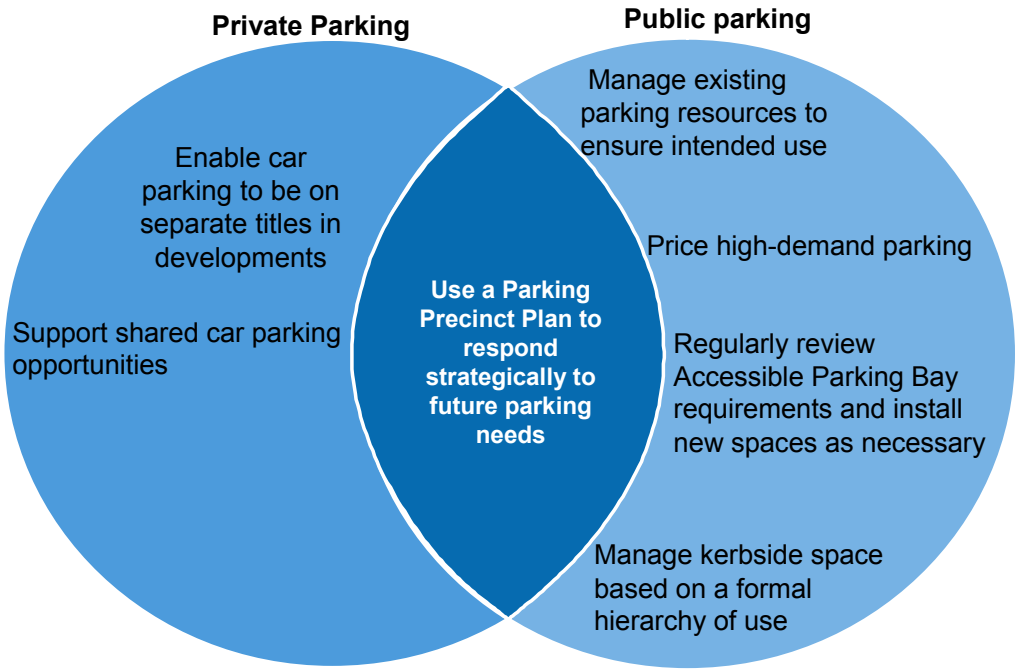
Mode shift approach	Strategies to be used in Diamond Creek and Eltham	Comment
Regulate and manage parking supply	6.1 Respond strategically to parking needs with Parking Precinct Plans 6.2 Support shared car parking opportunities 6.7 Enhance viability of Activity Centre through 'anchor' car parking 6.3 Enable car parking to be on separate titles 7.6 Improve access to underutilised car parks	No additional parking supply is required currently. However, additional supply may be required at a future point. All management techniques should be exhausted before additional car parking supply is considered. The most efficient way to supply additional car parking is through a Parking Precinct Plan.

Mode shift approach	Strategies to be used in Diamond Creek and Eltham	Comment
Price parking	6.5 Price high-demand parking	High demand parking should have prices introduced which reduce demand (below 85% occupied). A response to high demand for parking is not necessarily to increase supply. An assessment of whether management of existing parking is a solution available.
Enforce Restrictions	6.4 Manage public parking with a hierarchy of use	Enforcement should be introduced to ensure parking is available for its intended users.

The strategies described above are detailed in this chapter.

Figure 6-3 shows the division between policy applicable to private car parking and public car parking. Parking management strategy of private parking spaces is largely affected through the planning permit process. A Parking Precinct Plan would influence both parking in new private developments and public parking (through cash-in-lieu schemes, parking restrictions and costs[31]).

Figure 6-3 Division of strategy applicable to private and public parking



In the following sub-chapters actions shown with an asterisk (*) next to them are shown physically applied to Diamond Creek and Eltham contexts in the Parking Priority Improvement Maps (see 6.9).

6.1 Respond strategically to parking needs with Parking Precinct Plans

A Parking Precinct Plan is a tool to provide customised guidance on current and future parking needs in a centre based on local conditions. An initial assessment has been

[31] *VPP Practice Notes: Parking Precinct Plan*

completed which indicates that a Parking Precinct Plan is required for Diamond Creek and Eltham. The reason for this is that it will allow the Nillumbik Shire Council to:

- Revise parking rates set out in Clause 52.06 of the Nillumbik Planning Scheme; and
- Set up a possible cash-in-lieu scheme for provision of public parking facilities rather than individual developments providing separate facilities and provision of other sustainable transport infrastructure.

The parking precinct plan can take account of any previous parking contributions made, usage and demand management strategy.

As per discussion in Chapter 4.4, there is no evidence to suggest additional parking is required currently, however there may be a requirement for more parking at a future date (depending on level of development and ability to create mode shift). The Parking Precinct Plan should be put in place as soon as possible however to build funds for any future parking or other sustainable transport infrastructure requirement.

A Parking Precinct Plan sets out:

- demographics of the surrounding population
- types of land use and development in the area
- parking demand profile of the various uses
- interaction between different uses and developments
- availability and use of public transport
- Impact of transport and parking policies, and the strategies that are designed to influence parking outcomes.

Table 6-1 shows the steps required to complete the Parking Precinct Plan:

Table 6-1 Steps to complete a Parking Precinct Plan

Steps	Comments
Identify the likely issues and objectives:	No additional parking supply is required currently. However, additional supply may be required at a future point. All management techniques should be exhausted before additional car parking supply is considered. The most efficient way to supply additional car parking is through a Parking Precinct Plan.
Define the survey area and precinct	This should apply to the Activity Centres.
Survey existing conditions Supply data, quantify record and map The number of parking spaces; The location of parking spaces; Ownership or management Restrictions on use Enforcement data	The Nillumbik STSS addresses some of these data requirements.
Involve Stakeholders	This has commenced with the Nillumbik STSS but greater stakeholder engagement is required specifically on the issue of a Parking Precinct Plan.
Study rates of car parking utilisation generated by specific land uses in comparable areas	-

Steps	Comments
Identify issues, including: Identify relevant trends and issues Model scenarios based on likely change	-
Identify and evaluate options: Develop preferred responses Evaluate these options Prioritise options Analyse equity impacts	-
Develop objectives and strategies	The hypothesized objective set out in Step 1 should be tested. Strategies can relate to the operation of parking provisions including best practice techniques. Some of these techniques are set out in the following sub-chapters (refer to discussion in 6.2 Support shared car parking opportunities; and 6.3 Enable car parking to be on separate titles).
Develop implementation mechanisms and administrative responsibilities	-
Establish an evaluation framework and performance indicators	-
Establish a Change Management Plan	-

Source: *Adapted by Booz & Company from the VPP Practice Notes:* Parking Precinct Plan *and Litman, T. 2005* Parking Management Best Practice*, pp206 – 224*

Note: *The VPP Practice Notes: Parking Precinct Plans and Litman, T. 2005, Parking Management Best Practices contain additional advice on types of research and surveying necessary to complete a successful parking precinct plan.*

Actions:

- Develop a Parking Precinct Plan for Diamond Creek
- Develop a Parking Precinct Plan for Eltham

A note about sub-chapters 6.2 and 6.3

Parking management techniques listed in the following sub-chapters (6.2 and 6.3) should guide Council's discretionary decision making. They are management techniques which should eventually be incorporated into the Eltham and Diamond Creek Parking Precinct Plans. They follow the rule that constructing additional car parking supply is expensive (see below) and therefore the management of existing and new resources should be paramount.

Parking supply costs:

- **The developer,** who has to construct the parking;
- **The community**, as there is an opportunity lost for the provision of a higher use (or if the developer is the Council – the funding which could have gone to other projects);
- **The eventual owner, renter or user** of the development, as the developer passes on the cost of the car park (for example, to a resident who purchases the flat, or the restaurateur who passes on the higher rent to the patrons in the restaurant); and
- **The environment**, as there is a link between ease of car parking and the use of car based access rather than sustainable transport.

6.2 Support shared car parking opportunities

Many public and private parking facilities are occupied for short periods but otherwise lay unutilised throughout the week. Examples in Diamond Creek include:

- A church in Hyde Street, Diamond Creek (private ownership), which has 73 spaces to cater for it's congregation on Sunday but is less utilised throughout the week (a maximum of 3 cars used this car park on the Saturday surveying was undertaken);
- The Netball Club car park (public ownership) has 44 spaces to cater for maximum crowds during games on weekends, but has a maximum of 15 cars parked in it on a weekday; and
- The car park on the corner of Hyde Street and Diamond Street (public ownership) has 41 spaces. Whilst the occupancy of this car parking facility was not surveyed anecdotal evidence suggests that this facility is usually well below capacity.

"Shared parking" means that a parking facility serves multiple users or destinations. Shared parking takes advantage of the fact that most parking spaces are only used part time by a particular motorist or group, and many parking facilities have a significant portion of unused spaces, with utilisation patterns that follow predictable daily, weekly and annual cycles. There are several ways shared parking can take place[32]:

- **Zoned Rather Than Assigned Spaces:** Parking can be shared among a group of employees or residents, rather than assigning to individuals. For example, this technique is already in use in Eltham with zoned spaces available to retailers to park with a permit.
- **Share Parking Between Sites:** Parking can be shared among different facilities in an area to take advantage of different peak periods (see Table 6-2). For example, a car park used by a place of worship on the weekend might be used for parking of an office during the week. An audit of available parking spaces could be undertaken and notional pre-agreement reached with the owners of parking facilities. Potential applicants of planning permit applications which cannot provide appropriate levels of parking can be advised of the shared parking option when pre-permit lodgement discussions are taking place. Appropriate sharing arrangements can then be negotiated between the parties.

[32] *From the Victoria Transport Policy Institute, Litman, Todd, 2005*

Table 6-2 Typical Peak Parking Periods for Uses in Eltham and Diamond Creek

Uses	Weekday: Day	Weekday: Evening	Weekends
Banks and other public services	✓		
Libraries (Eltham only)	✓		✓
Offices and employment centres	✓		
Park and Ride Facilities	✓		
Education	✓		
Medical Clinics	✓		
Sports grounds/clubs		✓	✓
Gyms and Pools	✓	✓	✓
Quality Restaurants		✓	✓
Housing		✓	✓
Shops	✓		✓
Supermarkets	✓		✓
Places of Worship			✓

Actions:

- Where appropriate partially or wholly waive car parking requirements on site in favour of Section 173 Agreement on title indicating shared parking arrangement:
  - Assist planning applicants to engage in shared parking arrangements by gauging interest from owners of private parking facilities in offering spaces (times of day and days of week).
  - Advise potential applicants of planning permit applications which cannot provide appropriate levels of parking[33] of opportunity for them to negotiate Shared Parking Plan.

6.3 Enable car parking to be on separate titles in developments

Enabling car parking in new developments to be subdivided onto separate titles is known as 'unbundling car parking'. This practice enables a future tenant or purchaser of property to only lease or buy the parking they need. Unbundled car parking separates the cost of parking and building spaces, so occupants only pay for parking they actually need. The effects of unbundling car parking include:

- Increased affordability: as occupants only pay for the parking spaces they need; and
- Rationalisation of car use: as occupants think laterally about their need for a car when a separate price tag is placed on the housing of the car.

It would be important to ensure on-street car parking spaces are well managed to ensure costs of car parking are not simply shifted from the private development to the public realm.

Developers and owners can unbundle parking when selling or leasing building space. Public policies may be used to further encourage or necessitate it.

Actions:

- Reduce parking requirements for buildings with unbundled parking.

[33] *An appropriate level of car parking may still be below the Nillumbik Planning Scheme prescribed rate.*

- Subdivide buildings/land with unbundled parking so that titles of car parking spaces and other floor area can be sold separately.
- Additional regulation for nearby on-street parking to avoid spill-over problems from occupants parking off site.

6.4 Manage public parking with a hierarchy of use

Public parking, including kerb-side parking, is an important component of the overall parking supply within Eltham and Diamond Creek. However, in these Activity Centres there is increasing demand for public parking spaces for parking (traders/workers, commuter and visitor) as well as other uses including public transport, cycling, loading zones and outside dining. It is therefore necessary to establish clear policies for the use of the available kerbside space as part of the Nillumbik Shire Council's overall parking strategy.

Kerb side parking

Currently, an *implied* hierarchy of uses is adopted by Council to prioritise the allocation of kerbside space. This is a logical approach that recognises that some uses are more important than others, in order to optimise the overall performance of both the centre and transport network. For example, public transport vehicles often require access to specific spaces in order to make connections easier, and delivery vehicles need spaces close to their destination in order to facilitate efficient economic activity.

However, this hierarchy is currently unwritten and therefore lacks transparency. Furthermore, the lack of formalised hierarchy requires each decision about allocation of kerb-space to be made on a case by case basis.

Park and Ride:

An assessment of some visitor groups' use of car parks has been completed. This has shown that there is significant unintended use of Park and Ride by traders. This represents a breakdown of the hierarchy of uses for this specific site. At the same time occupancy surveys show that there is very high demand for these car parking spaces by commuters.

Management of kerbside space and Park and Ride facilities is built on the understanding that not all uses of these spaces are of equal importance. The main uses of kerbside space have been identified and are outlined in detail in Appendix 7. The recommended hierarchy includes the following features:

- A separate hierarchy for both commuter areas and Major Activity Centres[34];
- Safety zones are the highest priority in both hierarchies;
- Public Transport zones are the second highest priority in both hierarchies;
- Disabled permit zones are the third highest priority in both hierarchies;
- In order to promote economic activity, priority is given to loading activities, customers and employees in that order.

The recommeded hierarchy is shown in Table 6-3 below.

[34] *Other specific needs not included in the hierarchy could include parking for Doctors around medical centres; Emergency service vehicles; and Australia Post vehicles near postal boxes.*

Table 6-3 Potential uses of kerb space

User Category	Relative Priorities	Activity Centre	Park and Ride
Safety Zone	Safety is the highest priority in all situations	1	1
Public Transport Zone	Public Transport is the second highest priority in all situations for efficiency, environmental and social equity reasons	2	2
Disabled Permit Zone	People with disabilities are the third highest priority across all situations for social equity reasons	3	3
Residents (including visitors)	Residents are the next highest priority in residential areas. In Major Activity Centres residents should not expect priority in commercial areas access to on-street parking.	9	7
Loading Zone	Loading zones have a medium priority in all Activity Centre areas to support local economic activity.	4	8
Customers	Customers have priority in Major Activity Centres and residential areas.	5	6
Commuters	Commuters have medium-low priority in Activty Centres and are a high priority in Park and Ride designated facilities.	6	4
Local employees	Local employees are encouraged to use alternative modes or use the least convenient car parking – leaving more convenient spaces for customers.	7	5
Commercial	Using the kerb side for commercial activity is a low priority except in specific circumstances where Council has slowed traffic speeds and is encouraging pedestrian activity.	8	9

Actions:

- Council endorse the proposed hierarchy of kerbside use shown in Table 6-3;
- Review existing parking management and revise in cases where the uses described allocations and in the case of uses where current demand is not being reasonably meet;
- Requests for allocation outside the adopted hierarchy will be dealt with on a case by case basis through officer recommendations to council;
- Undertaken car parking enforcement activities in line with appropriate uses; and
- Investigate the use of Parking Overstay Detection Systems (PODS) technology to monitor overstaying of high demand on-street car parking spaces.

Specific Actions for Park and Ride spaces are:

- Ensure signage at all park and ride car parks clearly states who can use these facilities;
- In partnership with DOT, occasionally enforce use of Park and Ride car parking spaces by spot checking public transport tickets of those using the car parks*.

6.5 Price high-demand parking

Parking is often considered to be a 'right' rather than a 'service' particularly by residents and business operators. Within the Shire of Nillumbik parking has traditionally been provided free of charge. However, in recent times, the provision of *free parking* in areas with high demand has been exacerbating parking problems (because demand for the scarce resource is exceeding supply).

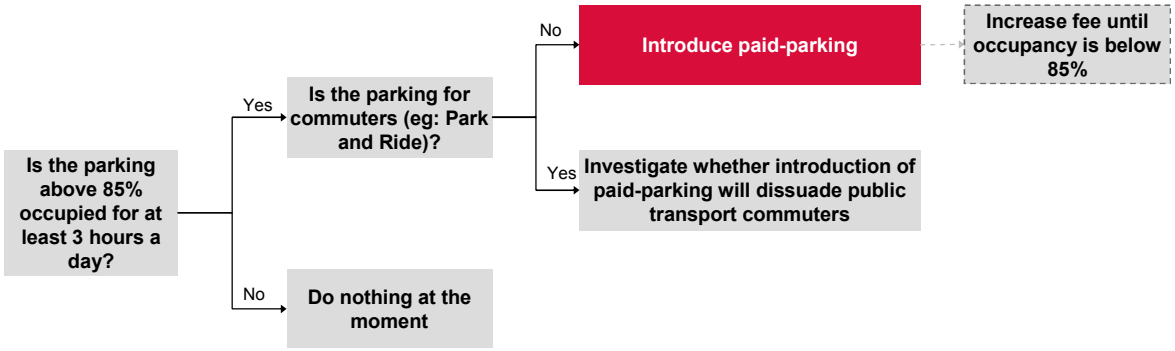
Parking is never free. It costs money to build (construction cost vary between $15,000 and $30,000 per undercover space[35] and generally around $5,000 for an 'at grade' uncovered space. These costs are passed on to ratepayers through higher rates (for council supplied parking) or through higher prices (where parking is provided by property owners).

Nillumbik Shire Council currently charges a nominal fee of $10 per annum for a trader parking permit providing an income of around $1,600 per annum. It is doubtful whether this income would cover the costs of running the permit administration.

There are no other parking fees in the Diamond Creek or Eltham Major Activity Centres. As consumers of parking are generally not required to pay for parking this distorts their mode and travel choices and inflates demand. In Eltham and Diamond Creek, this has resulted in a large portion of short local trips being taken by car.

When other management options exhausted the recommended trigger points for considering paid parking are set out in Figure 6-4.

Figure 6-4 Recommended Trigger points for Paid Parking

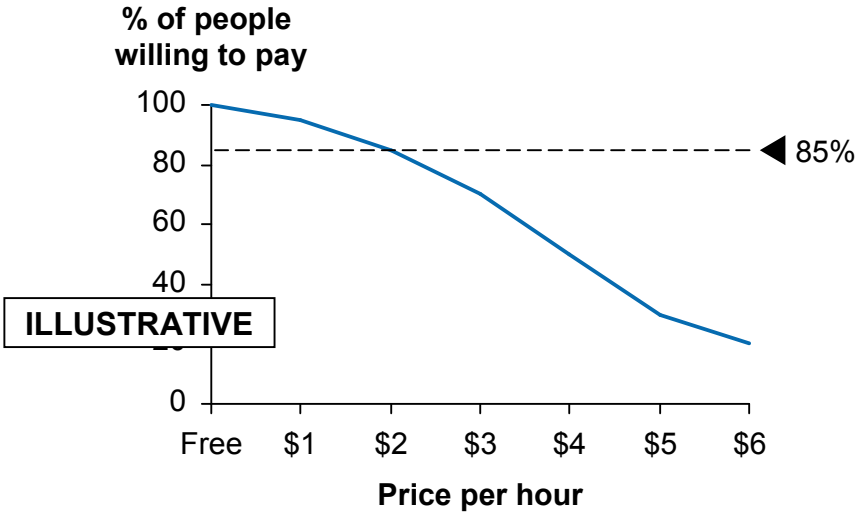


Source: Booz & Company, 2009

Ideally parking should be priced at a point which brings highly occupied parking facilities down to below 85% occupied (Figure 6-5). For example, a parking fee of $1 per hour may result in parking occupancy of 95% for 4 hours of the day falling to 90% for 3 hours of the day. In which case the fee would need to be increased to $1.50 per hour and occupancy resurveyed to determine whether another fee increase is required prior to bring occupancy below 85% for 3 hours of the day.

[35] Depending on the efficiency of the parking layout (Shoup, 2005).

Figure 6-5 Using parking pricing to manage demand



The objective of the fee introduction is to reduce occupancy of these spaces. Table 6-4 shows the two options for how fees could be introduced and the likely occupancy impact for each. This is relevant particularly to the trader car park- where a parking permit scheme currently exists.

A priority of any parking charges strategy must be to improve the customer accessibility and increase the number of people able to shop in the centre easily. This is achieved through a strategy that includes clear information to all drivers about where they can park for free (as an alternative). In addition, information about what the fees charged are funding may raise awareness of amenity improvements that reinforce the attractiveness of the centre.

There are four options available to the Council in introducing fees which reflect the cost of providing trader car parking. They are:

a. **Increase municipal rates:** The whole (residential and commercial) community pays for the car parking;

b. **Increase commercial rates:** The whole Nillumbik commercial community pays for the car parking;

c. **Introduce a special rate:** The whole Eltham trader community pays for the car parking; or

d. **Amend the current fees paid by users:** Users of the car park pay for the car park.

Option (d) above is the most equitable as it is the user of the car park who pays. Option (d) may be enacted through either annual parking permit fee increases or introducing a daily parking charge. These two options are set out in table Table 6-4. The introduction of a daily charge is likely to achieve the greatest occupancy impact (and mode shift impact) as users will make a daily choice about whether to drive or not. The problem with increasing the annual parking permit fee is that once people pay the fee they may feel the need to 'get their money's worth' and also it disadvantages occasional users (such as part-time employees).

Table 6-4 Fee type increases and likely impact

	Annual Charge: Increase annual fee for Parking Permit	Daily Charge: Introduce daily parking charges
Likely Outcome/s	▪ Some people choose not to buy a permit – and either park elsewhere *or* use other transport modes ▪ Some people pay the increased fee and feel they need to 'get their money's worth'.	▪ People make a daily choice about their car use – using another transport mode on some days (i.e. based on weather, time and other factors).
Impact	Least occupancy impact Disadvantages occasional 'light' users such as part-time workers.	Greatest occupancy impact

Actions:

- Investigate per-day (and per ½-day) fees applied for trader parking permits in consideration of the cost of providing parking spaces:
- Consider introducing fees in parking spaces that are occupied more than 85% for 3 or more hours of the day (initially introduce at $1.00 per hour and measure effect, increasing or decreasing fee if necessary)[36]. At the moment, this action applies to:
  - Safeway car park (underground level) – 1/2P, 2P and 3P spaces[37].

6.6 Improve access to underutilised car parks

Most parking for shoppers is underutilised beyond a small area and a defined peak (usually around 12-1pm). At peak times, these underutilised car parking spaces could be better utilised by providing better information to drivers and by providing better pedestrian connections from these car parks to the main attractions in the Activity Centre. The following off-street car parks are underutilised:

- Diamond Creek:
  - Diamond Street
  - Main Hurstbridge Road (Coles Supermarket)
  - Cowin Street
  - George Street
- Eltham:
  - Arthur Street (next to Coles car park)
  - Arthur Street/Dudley Street (Coles car park)
  - Main Road (near Panther Place)

[36] *Displacement of cars is likely where car parking fees are introduced. This is an intended result of fee-introduction as high demand spaces are available to those who are willing to pay for the parking most convenient. After introduction of paid parking a wider surveying of area is required to determine the impacts.*

[37] *With the exception of the Trader Car Park and the Safeway carpark there are currently no parking spaces which trigger the need for introduction of paid parking (over 85% occupied for 3 or more hours). Some spaces achieve over 85% occupancy regularly (Diamond Creek, IGA Car Park) however this peak is for less than 3 hours.*

Furthermore, whilst Park and Ride facilities are currently well over 85% occupied there is no plan for State Government to start introducing paid parking for Park and Ride facilities. This may not be ruled out in the future however, analysis would have to be undertaken to understand impacts on commuter's overall travel choices.

Actions:

- Ensure visitors who drive to the centre know that these car parking spaces are there (through signage or other information) *;
- Concentrate urban improvement efforts on making pedestrian experience convenient and attractive to these under-utilised car parking spaces*.

6.7 Enhance viability of Activity Centre through 'anchor' car parking

The appropriate mix of land uses extends to locating car parking to facilitate 'park once' trips and trips which maximize use of the Diamond Creek and Eltham Activity Centres.

Currently major commuter car parks in Diamond Creek and Eltham are located in a way that facilitates quick exchange between the commuter car parking and the train station and bus stops but guides commuters away from shops. This co-location of parking adjacent and separate from the main shopping area does not maximise the opportunity for dual purpose shopping trips or incidental shopping trips.

The recommended strategy is to manage existing parking resources rather than constructing new parking resources. However, in the future it may be found necessary to expand parking resources. If this eventuates then locating parking in appropriate locations will be necessary.

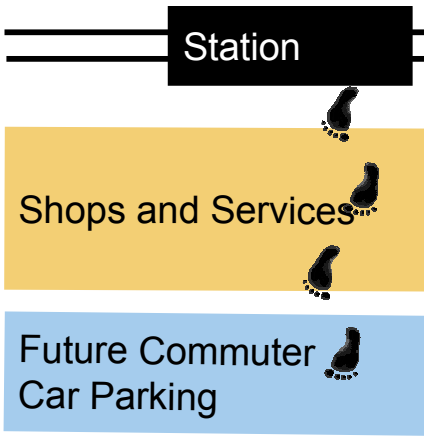
Some of the advantages of this strategy are:

- **Less congestion**: Due to the 'park once' principle (avoiding people getting in their car from commuter car park and then driving short distance to shops);
- **Greater retail expenditure:** More incidental purchasing and less 'seepage' of purchasing to other centres; and
- **More amenable urban environment:** Greater number of people on the street.

Actions:

- Locate future Park and Ride facilities to facilitate convenience and incidence of multi-purpose trips (for example see Figure 6-6).

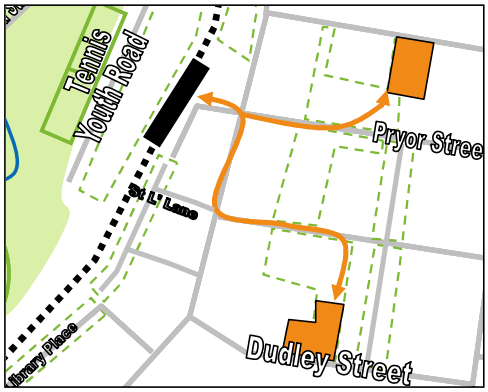
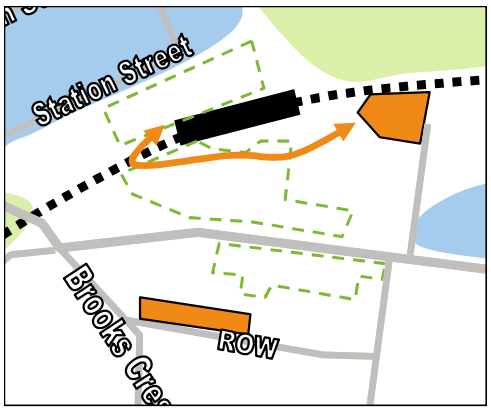
Figure 6-6 Depiction of Location of Future Commuter Car Parking



Source: Booz & Company Analysis, 2009

An example of how the above principle *could* be applied is shown in Table 6-5 below. This example indicates some of the likely outcomes of such a move. Further investigation would be required before an *actual* location of future commuter car parking spaces is determined.

Table 6-5 Example of Future Commuter Parking Location and Outcomes

Example Description	Likely Outcomes
 **Eltham** Key: Commuter Car Park Station Access Route	▪ Greater utilisation of currently under-utilised 'shopper' car parks and other spaces; ▪ More people walking through the shopping areas: – more expenditure; – greater street activity; – more social interaction; and – Safety (due to activity). ▪ Some people who can walk/ride to the train station but choose not to due to convenience of parking may choose not to drive when faced with slight inconvenience of walk between car park and station. ▪ Greater number of people crossing Main Hurstbridge Road- greater street activity: – Traffic calming would need to occur (see Chapter 5.3).
 **Diamond Creek** Key: Commuter Car Park Station Access Route	

6.8 Regularly review and install Accessible Parking Bays

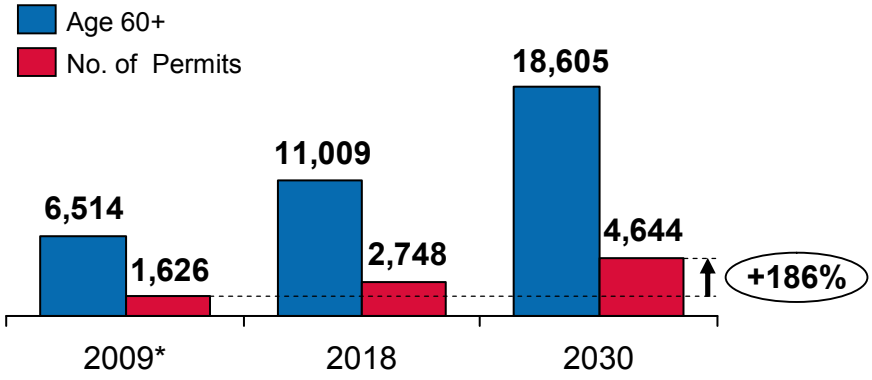
Surveying showed that there were two places in which accessible parking bays were more than 85% occupied during the day. These are:

- Main Hurstbridge Road (Coles Supermarket), Diamond Creek; and
- Main Hurstbridge Road (IGA Supermarket), Diamond Creek.

Accessible parking bays in Eltham were not occupied more than 85%.

Figure 6-7 shows the number of parking permits for accessible parking spaces available in 2009. A projection of the number of parking permits issued for people with a disability is based on anticipated growth in the number of people over 60 years old living in the Shire of Nillumbik (see 2.5.4 *Ageing Population* for more).

Figure 6-7 Projection of Disabled Parking Permits 2008-2030



Source: Booz & Company Analysis, 2009

Figure 6-7 shows that by 2030 it is anticipated that there will be a 186% increase in the number of parking permits issued for accessible parking spaces. This will require a similar increase in the level of parking spaces designated for use by people with a disability.

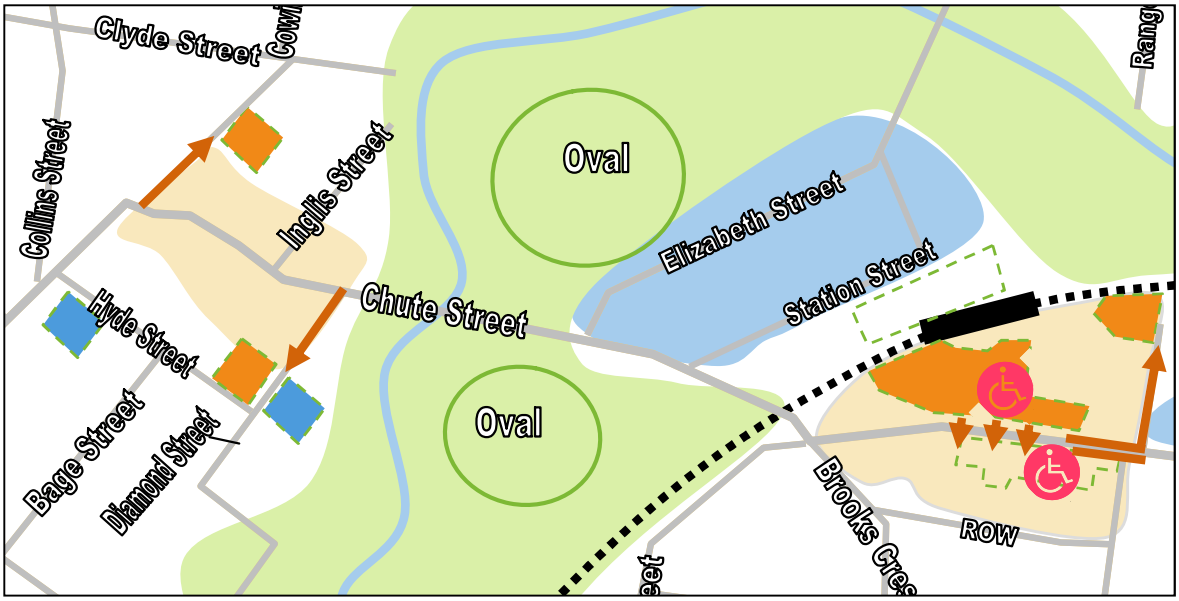
Action:

- Increase allocations of accessible parking bays in locations where accessible parking bay occupancy reaches over 85% at any point in the day. Initially this will be applicable in:
  - Main Hurstbridge Road (Coles Supermarket), Diamond Creek; and
  - Main Hurstbridge Road (IGA Supermarket), Diamond Creek.*;
- Annually review occupancy levels of accessible car parking to determine if a greater number are required.

6.9 Map: Parking Priority Improvements

Figure 6-8 and Figure 6-9 detail priority parking improvements to be carried out in Diamond Creek and Eltham Major Activity Centres. These maps represent the physical expressions of a number of the Actions listed in Chapter 6 (those with an asterisk (*)). These are considered improvements to be implemented as a matter of priority. Priority has been given to the improvements required in response to current problems identified through the data collected for this study. As demand changes over time different improvements will become a priority.

Figure 6-8 Diamond Creek Parking Improvements Map



KEY

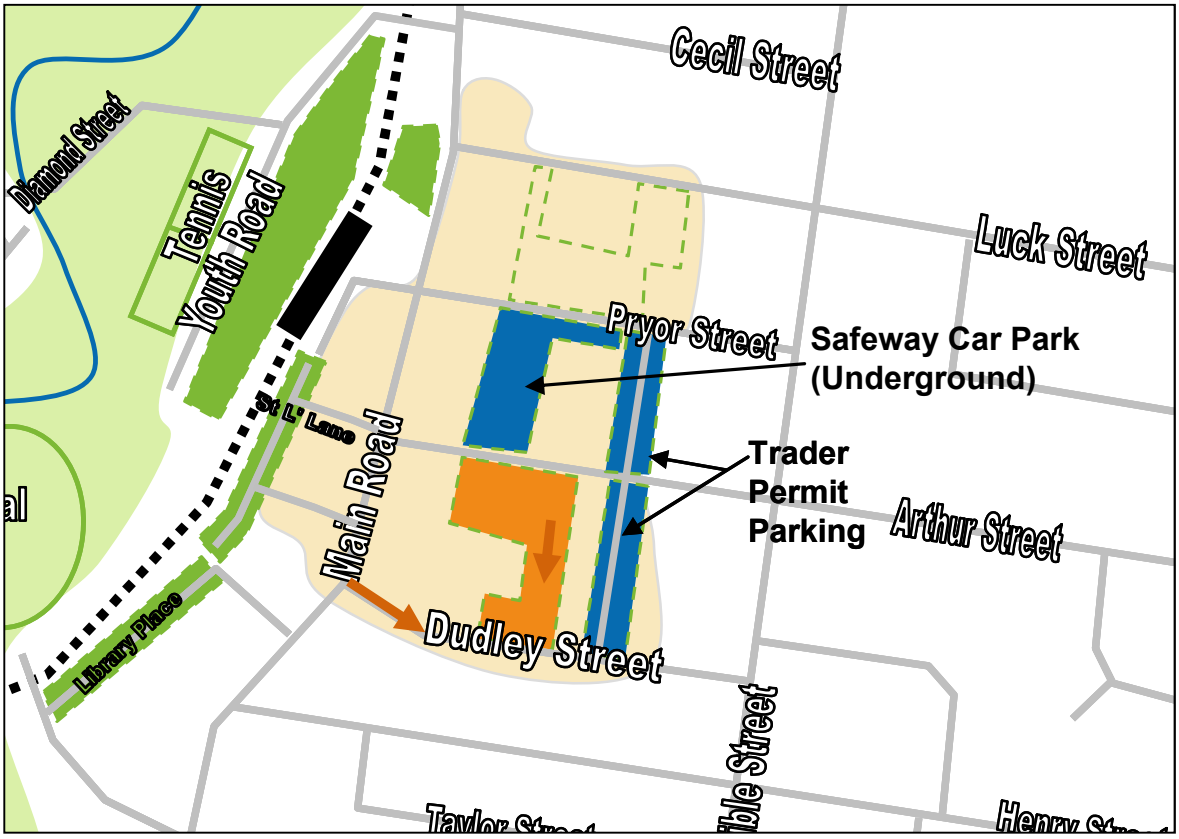
Existing

- Railway/Station
- Major Off Street Parking
- Underutilised car parks
- Vegetation/Open Space
- Retail Precinct
- Industry and Employment

Proposed

- Enforcement to ensure appropriate parking use
- Investigate shared parking opportunities
- Better signage/connections to underutilised car parks
- More Accessible Parking Spaces

Figure 6-9 Eltham Parking Improvements Map



KEY

Existing

- Railway/Station
- Major Off Street Parking
- Underutilised car parks
- Vegetation/Open Space
- Retail Precinct
- Industry and Employment

Proposed

- Enforcement to ensure appropriate parking use
- Better signage/connections to underutilised car parks
- Investigate paid parking

7 Public Transport Strategies

A single public transport gap was evident in Diamond Creek. The baseline data showed that there were both lower public transport service levels in Diamond Creek and that public transport use was less widespread[38]. The following strategy (7.1) responds to this gap.

7.1 Use the Transport Connections Program to improve access

The Transport Connections Program aims to improve access and mobility for isolated residents in Nillumbik. It achieves this by acting as a go-between for local communities and transport providers. Some tangible outcomes of such a program may be reconfiguration or scheduling of bus routes to service particular community needs or developing and presenting a business case to the Department of Transport for introducing a public transport service. Improving transport options and access to services for transport disadvantaged residents in Nillumbik is an important step to create a mode shift toward public transport.

At the moment the program is focussed on transport disadvantaged areas in the vicinity of Hurstbridge. There is an immediate need in these areas as some residents have no public transport options currently available. As this situation improved it is envisaged that the Transport Connections Program could be redirected to needs in around the Diamond Creek Station precinct. It is envisaged that such a move could be a second-tier priority once service levels are improved for public transport disadvantaged residents in the north of Nillumbik.

Actions:

- Focus the Nillumbik Transport Connections Program on assisting isolated residents to access facilities and services;
- Improve usability, amenity and connections to Diamond Creek Station.

[38] *Reference: From baseline section of this report (Sections 2.3.7 and 2.4.1)*

8 Land Use and Transport Integration Strategies

A great transport network is useless without an appropriate collection and form of land uses. Eltham has a fairly traditional strip-shopping focus, supported by office, small business and other services and facilities. Diamond Creek, once a smaller version of this 'strip-shopping' model, is now largely dominated by its new and separate retail core further along Main Hurstbridge Road.

With regard to land use and transport integration, there has been one particular gap with was identified for Diamond Creek- that there is limited variety of Activity Centre functions available locally. The following strategy (described in 8.1) responds to this gap.

8.1 Mixed land use to facilitate local and multi-purpose trips

An urban form with appropriate pedestrian infrastructure has been discussed in Chapter 5.1. Another important factor is locating land uses in appropriate locations to ensure people can walk more readily.

Land use mix is the degree to which various land uses are located close together to achieve a hub in which a number of functions (i.e. commuting, living, recreation and shopping) may be undertaken. Creating an appropriate mixture of land uses may reduce car dependence. Some of the advantages of this strategy are:

- **Less congestion**: Reduced need for cars; and
- **More amenable urban environment:** Greater number of people on the street.

Actions:

- Improve likelihood of local visitations to the Diamond Creek Major Activity Centre by increasing variety of land uses;
- Identify potential sites for higher-intensity activities commensurate with an Activity Centre;
- Encourage high-intensity land use within each Major Activity Centre.

9 Indicative Project Costs

Figure 9-1 presents indicative project costs for each of the Actions. General indicative costs have been identified at this point in the project. Greater planning of individual Actions and Projects will be undertaken at a later stage which will define more specific figures based on more detailed plans.

Figure 9-1 Indicative Project Costs

Key:

- $1 to $4,999
- $5,000 to $49,000
- $50,000to $99,000
- $100,000 to $999,000
- Over $1 million
- N/A: Where cost is borne through internal Council process or private development

	Actions	Project / Comments	Indicative Cost
Walking and Cycling Actions and Projects	Enhance existing laneways and pedestrian arcades	2 x infrastructure works; 380m2 of paving	
		Other miscellanious works (lighting, seating, landscaping)	
		Planning scheme changes to encourage private development	N/A
	Seek opportunities for additional pedestrian crossings of railway tracks	Overpass or underpass	
	Improve signalised pedestrian crossings including additional arms at existing crossings and identifying opportunities for shorter wait times	per intersection	
	Provide additional opportunities to cross main roads in accordance with pedestrian desire-lines	Where signal is provided	
	Develop heads-up pedestrian wayfinding signage, which provides concise information for accessing a destination by walking		
	Install weather protected street furniture and other pedestrian facilities at 60m intervals;	per seat	
	Reduce speed and calm traffic in locations where pedestrian demands are high	Signage (per sign)	
		Traffic Calming measures (eg: Speed bumps, road narrowing)	to

	Actions	Project / Comments	Indicative Cost
	In new developments provide weather protection of footpaths	Private development requirement	N/A
	Ensure that new developments have active frontages and are constructed abutting the street.	Private development requirement	N/A
	Use the priority cycling routes detailed in Figure 5-5 and Figure 5-6 on which to concentrate infrastructure improvements focussing on the following possible treatments	Installation of safe on-road cycling lanes on roads identified as priorities	
		Seek opportunities for additional cycling crossings of railway tracks (underpass)	
		Develop cycling-oriented signage, which provides concise information for accessing a destination by cycling (per sign)	
	Intersections should accommodate cyclists either through signal phasing, bike lanes or appropriate kerbing	Signal change	
Parking Actions and Projects	Develop a Parking Precinct Plan for Diamond Creek	Study	
	Develop a Parking Precinct Plan for Eltham	Study	
	Where appropriate partially or wholly waive car parking requirements on site in favour of Section 173 Agreement on title indicating shared parking arrangement: ■ Assist planning applicants to engage in shared parking arrangements by gauging interest from owners of private parking facilities in offering spaces (times of day and days of week) ■ Advise potential applicants of planning permit applications which cannot provide appropriate levels of parking of opportunity for them to negotiate Shared Parking Plan	Internal Council program	N/A
	Reduce parking requirements for buildings where parking is provided on separate titles and able to be sold separately to other floor space (unbundled parking)	Internal Council program	N/A
	Subdivide buildings/land with unbundled parking so that titles of car parking spaces and other floor area may be sold separately	Internal Council program	N/A
	Additional regulation for nearby on-street parking to avoid spill-over problems from occupants parking off site	Potential parking permit system	N/A
	Council endorse the proposed hierarchy of kerbside use	Internal Council program	N/A
	Review existing parking management and revise to ensure that the uses described in the hierarchy have adequate amounts of car parking allocated to them;	Internal Council program	N/A

	Actions	Project / Comments	Indicative Cost
	Requests for allocation outside the adopted hierarchy will be dealt with on a case by case basis through officer recommendations to council.	Internal Council program	N/A
	Undertaken car parking enforcement activities in line with appropriate uses;	Internal Council program	N/A
	Investigate the use of parking PODS technology to monitor overstaying of high demand on-street car parking spaces.	Internal Council program	
	Introduce per-day fees applied for trader parking permits in consideration of the cost of providing parking spaces	Internal Council program	N/A
	Introduce fees in parking spaces that are occupied more than 85% for 3 or more hours of the day (initially introduce at $1.00 per hour and measure effect, increasing fee if necessary)	Multi-space parking meters (per meter) Council should aim to generate revenue from this investment.	
	Ensure visitors who drive to the centre know that these car parking spaces are there (through signage or other information) *;	Signage (per sign)	
	Concentrate urban improvement efforts on making pedestrian experience convenient and attractive to these under-utilised car parking spaces*.	Ensuring footpaths, kerbs, road crossing points and other infrastructure is provided	
	Locate future Park and Ride facilities to facilitate convenience and incidence of multi-purpose trips	N/A: In principle Action for future project	N/A
	Increase allocations of accessible parking bays in locations where accessible parking bay occupancy reaches over 85% at any point in the day. Initially this will be applicable in:	Line marking and other works (per space)	
Public Transport Actions and Projects	Focus the Nillumbik Transport Connections Program on assisting isolated residents to access facilities and services;	Study	
	Improve usability, amenity and connections to Diamond Creek Station.	Ensuring footpaths, kerbs, road crossing points, bicycle parking and other infrastructure is provided	
Land use Integration Actions and Projects	Improve likelihood of local visitations to the Diamond Creek Major Activity Centre by increasing variety of land uses;	Internal Council program	N/A
	Identify potential sites for higher-intensity activities commensurate with an Activity Centre;	Study	
	Encourage high-intensity land use within each Major Activity Centre	Internal Council program	N/A

10 Next Steps

This report marks the final stage of the Nillumbik Major Activity Centres Sustainable Transport Study and Strategy. This project is strategic in scope. It is envisaged that the Actions and Priority Improvements identified in this study will be progressed through individual projects which focus on feasibility, processes and exact costs.

* * *

Appendix 1. Survey Responses

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009

Appendix 2. Policy Framework

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009

Appendix 3. Parking Waivers

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009

Appendix 4. Intercept Survey Questionnaire

Please see the separate document

Titled: APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy

Dated: August 2009

Appendix 5. Car Parking Survey Results

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009

Appendix 6. Community Engagement Responses

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009

Appendix 7. Kerbside Space Uses

Please see the separate document

Titled: *APPENDICES - Nillumbik Major Activity Centres Sustainable Transport Study and Strategy*

Dated: August 2009