Willoughby City Council

Integrated Transport Strategy – 2036

December 2019

Willoughby City Council, Integrated Transport Strategy 2036

This strategy provides the overarching framework for transport planning and initiatives across the Willoughby local government area to 2036.

Acknowledgement of Country

We acknowledge the traditional inhabitants of the land on which we stand, the Aboriginal People, their spirits and ancestors.

We acknowledge the vital contribution that indigenous people and cultures have made and still make to the nation that we share, Australia.

Contents

Key terms

Autonomous vehicles – do not need human intervention, a driverless car.

Electric vehicles – use electric motors to propel them.

Internet of Things - system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

Mobility as a service – is the integration of various forms of transport services into a single mobility service available on demand.

Modes of transport – distinguish between different ways of transporting people or goods such as by road, ferry, train or bus.

Open data – is data that can be freely shared, used and built on by anyone, anywhere, for any purpose.

Smart technology – allows sensors, databases, and wireless access to collaboratively sense, adapt and provide for users within the environment.

Transport connection – is the intercept between different transport modes.

Travel demand – is the amount and type of **travel** people would choose under specific conditions, accounting for factors such as the quality of **transport** options available and their prices.

Transport missing link – is an extension between the same transport mode.

Executive summary

Transport is a complex issue facing every urban area and Willoughby local government area is no different. We must proactively work with the state government, service providers, businesses and our communities to create a successful transport system.

This Integrated Transport Strategy 2036 identifies the strategic direction for transport for our local area. It details how we will plan for, operate and develop our transport system into the future. It brings together a suite of studies, plans, strategies, policies and actions into an overarching document to guide transport into the future.

The transport system is about more than moving people, good and services between places. It is also about creating places, supporting services that meet customer needs and enabling a more liveable city that can cater for the changes in population.

There will be significant population growth in our area, consumer expectations are changing, and congestion is increasing. Technology and innovation are creating significant changes to the transport system, with the future likely to focus more on data, connection, automation and shared information and services.

This strategy acknowledges future disruptors and attempts to proactively plan for them in the context of local government. We want to be agile enough to grasp opportunities as they arise and ensure we do not create assets that will soon be outdated, or a regulatory framework that will quickly be superseded. Acknowledging the fast pace of change in the transport sector is important.

The strategic directions below will help us plan, manage and prepare for the future of transport in Willoughby:

1. Our transport system will be sustainable and minimise negative impacts on the environment.
2. Our transport system will link people from Sydney and Chatswood CBDs to our local centres and villages and provide alternative choices for all.
3. Our transport system will support community needs while enabling development of places.
4. Our transport system will make life easier by using smart city technology and support our future growth.
5. Our transport system will respond to customer needs and align to council and state government strategies.

These directions align with the outcome areas of our community strategic plan, *Our Future Willoughby 2028.*

We have identified transport measures that will help us track our progress on a clear set of strategies and actions for the next five years.

The strategy will be reviewed annually, with a substantial review in 2024. This approach will enable us to respond to new data, studies and innovation in the transport sector.

Image/picture to be inserted

Blue boxes are design section breaks

Part 1: The transport context

1.1 Introduction

Transport is a major challenge and a complex issue in any urban environment. This strategy provides a cohesive framework for the future transport system in Willoughby local government area. It is based on community needs and the potential future of transport.

Willoughby local government area is 8.5kms from the Sydney Central Business District (CBD). It includes Chatswood CBD as well as smaller centres and suburbs in the north of Sydney. It is a demographically diverse, growing multicultural community. Its evolving centres and places lead to a complex array of transport uses and issues.

With significant population growth planned in future years, increased housing density and more jobs in the area, we need a strategic approach to optimise transport solutions.

Our communities have identified quality transport as a key issue. They have particularly noted the need for:

- increased and more efficient public transport
- up-to-date physical and digital connectivity
- greater variety and ease of parking options
- decreased traffic congestion
- improved sustainability and active transport options
- the development of walkable neighbourhoods to promote community health and wellbeing.

For a successful transport system and solutions we need to understand these needs, as well as future growth, the NSW Government's approach to transport and the potential of the transport sector.

1.2   About this strategy

The Willoughby Integrated Transport Strategy provides a strategic direction for transport in Willoughby that accounts for other strategies and identified community needs. It includes an implementation plan focused on the next five years and an annual review to maintain its currency.

This strategy is presented in four parts:
* understanding the planning and policy context
* understanding the transport system
* how we plan for the transport system
* our approach for a successful transport system.

The actions and outcomes in this strategy support the delivery of our community strategic plan and our communities' vison for transport in the area.

This strategy is supported by a suite of transport plans, studies and policies. It also aligns with relevant council and state government transport and land use planning strategies and approaches.

This provides an integrated transport approach that will guide transport investment, policy reforms and service provision.

Although the strategy has a focus until 2036, specific actions have been identified for the next five years. This enables us to be agile in our response to potential disruptions due to future technology and innovation. It also enables us to make more informed decisions based on new information at that time.

The strategy does not focus on a single mode of transport. It focuses on providing choices for our communities and an improved experience. It sets a transport approach that allows for alternative technology and innovation, irrelevant of the mode.

Community engagement

Through various engagement activities, our communities have told us that transport and traffic issues are a priority. This strategy has been developed with input from our community strategic plan, land use planning strategies, community perception survey, wellbeing survey, and research and workshops with stakeholders. A summary of results can be found in Appendix 2 – Background Information – Engagement Results.

Implementation and review

Given the pace of technology and innovation changes and the potential for disruptors in the transport sector, identifying actions in detail to 2036 is not realistic.

This first version of the strategy uses the information we have available now. Any future decisions will be based on developing and refining existing and new information.

Annual reviews of this strategy will ensure any transport initiatives respond to future development, infrastructure provision, changes in use, community needs and trends, technology changes and better practice.

These will also provide the opportunity to:
* advance initiatives
* hold initiatives to gather more information or rethink our approach
* stop the process if it does not deliver the intended outcomes.

The strategy will be reviewed annually by staff to ensure it aligns with the annual operational plan.

A substantial review will take place when the community strategic plan is next reviewed in 2024.

1.3 Policy and planning context

This strategy is one element of our future planning. A range of strategies, policies and plans guide its approach and support its implementation.

The integrated planning and reporting framework

The strategy sits within the framework of policies and planning required by council and the state government. See Figure 1.

Figure 1: How this transport strategy connects to the NSW Government's integrated planning and reporting framework

- *The Greater Sydney Region Plan: A Metropolis of Three Cities*
- *Future Transport 2056*
- *The North District Plan*
- *Draft - St Leonards and Crows Nest Plan 2036*
- *Road Safety Plan 2021*

- *Draft - Integrated Transport Strategy 2036*

- *Draft - Willoughby Local Strategic Planning Statement*
- *Local Environmental Plan 2012*
- *Development Control Plan*
- *Draft - Willoughby Local Centres Strategy to 2036*
- *Draft - Willoughby Economic Development Study*
- *Draft - Willoughby Housing Strategy to 2036*
- *Chatswood CBD Planning and Urban Design Strategy to 2036*
- *Disability Inclusion Action Plan 2017 – 2021*
- *Green City Plan 2028*

Supporting documents

This strategy is supported by the transport specific strategies, plans, policies and studies shown in Figure 2.

More detail on documents listed can be found in Appendix 2 – Background Information – Planning and Policy Context.

Figure 2: Integrated Transport Strategy documents

Willoughby Integrated Transport Strategy 2036					
Bike Plan	Pedestrian Access and Mobility Plan	Street Parking Strategy	Road Safety Plan	Plans, Studies	Policies
		Chatswood CBD Parking Guidance Study		Transport Congestion Mitigation	Willoughby Development Control Plan, Section C4, Transport Requirements for Development: Car Share Provision of Bicycle Racks Bicycle Parking Spaces Bus Shelters
				Active Transport and Public Transport	
				Transport Demand and Information Framework and Plan	

Image/picture to be inserted

Part 2: The transport system

2.1 A complex transport system

Our transport system is complex and relies on many stakeholders for its success. In creating an appropriate transport system for Willoughby local government area, we need to consider a range of factors, develop benchmarks for success, and remain aware of our level of influence and control.

The transport system, refer figure 3, includes the physical network and facets such as technology, land use, place and operations. It provides public and private transport options to transport people and goods in the most efficient way possible. See Figure 3.

The system consists of many modes of transport, such as roads, buses, trains, cycleways. These support a range of users, including pedestrians, car users and public transport users.

The Willoughby area is important as a transit location and as a destination in its own right. Its strategic importance is reflected in current transport infrastructure: Sydney Metro, T1 North Shore Line trains, major bus routes connecting to regions and centres, and Chatswood transport interchange. Major state roads include Pacific Highway, Gore Hill Freeway, Boundary Street and Fullers Road for freight and cars.

Figure 4 shows an overview of the local government area, highlighting existing rail stations, traffic generators, town centres and pinch point/congestion locations.

The area benefits from the recent and proposed investment in transport infrastructure projects, shown in Figure 5. These include North Connex, City and Southwest Metro and Western Harbour Tunnel and Beaches link. Some of these projects are not in the local government area but have related benefits or impacts on our transport system.

This transport system does not operate in isolation to the system across Greater Sydney. The infrastructure, challenges and opportunities are often interconnected. We also rely on state government, private providers and other councils to improve the overall transport system.
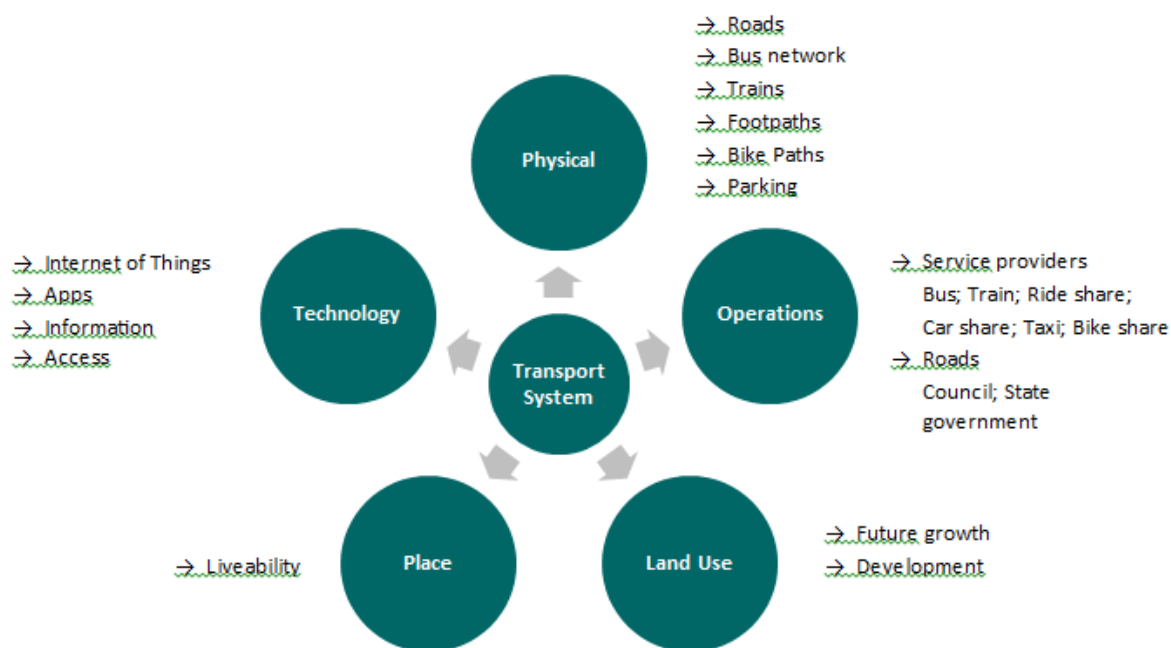

Figure 3: Overview of transport system

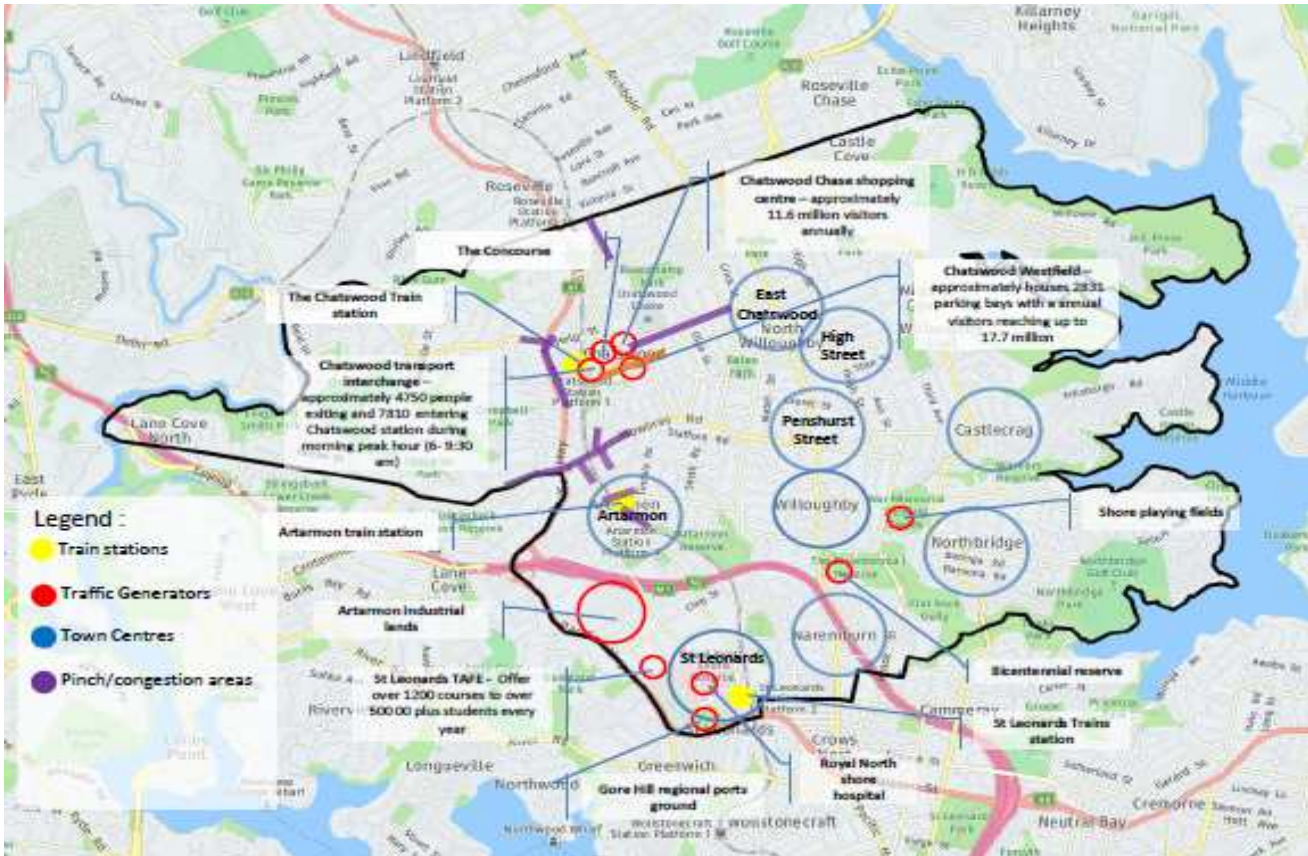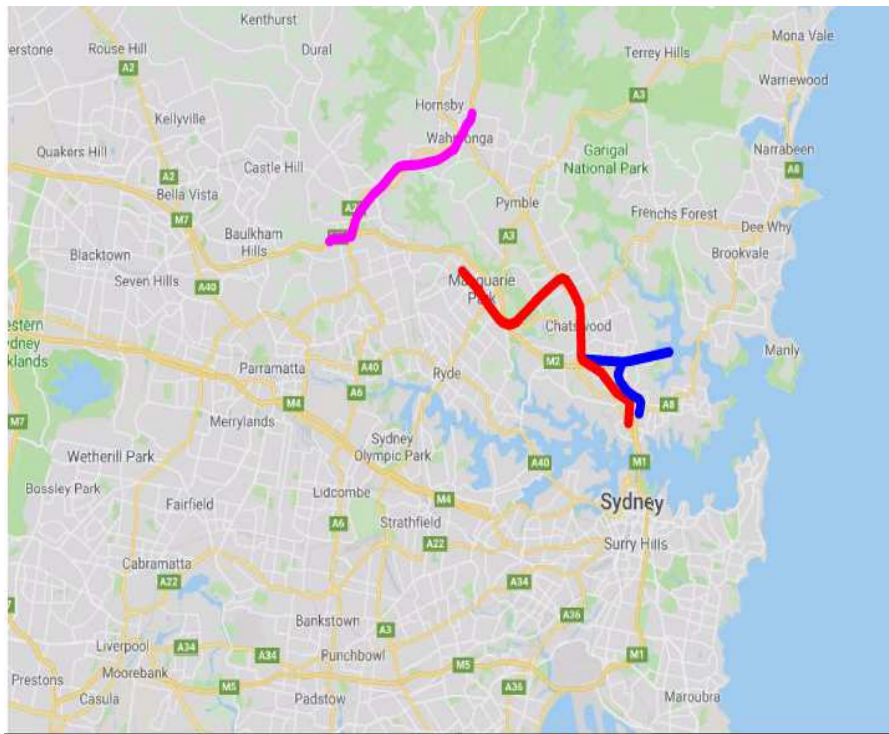Figure 4: Overview of the local government area

Figure 5 – Major NSW Government transport projects

LEGEND

— North Connex

— City and Southwest Metro

— Western Harbour Tunnel and Beaches Link

What a successful transport system looks like

A successful transport system:
- provides accessible choices and links across the Willoughby area
- focuses on customer satisfaction including service provision, ease of use, reliability and safety
- is efficient and provides timely delivery and value for money
- is environmentally sustainable
- uses multiple modes and provides ancillary services
- uses data to improve travel decisions
- uses innovation and technology to support the system
- provides a comprehensive and harmonised land use and transport system
- meets legislative and policy obligations.

Snapshot of our current transport

3 train stations – Artarmon, Chatswood and St Leonards.

Around 20 bus routes from Chatswood interchange alone.

A regional and local road network of 211 kms.

A pedestrian footpath network of 188 kms.

A bicycle network of existing and planned routes of 153 kms.

2.2 Factors to consider when planning for transport

Many factors need to be considered when planning for a successful transport system. We understand the current pressures and the outcomes our communities want. But we do not know what the future holds given the momentum of change in the sector and the potential for disruption. Remaining agile will help us create a transport system that caters for future possibilities.

Current pressures, community needs and potential risks need to be examined when planning transport policies, managing operations, and developing infrastructure projects and new services.

This section summarises the key factors we must consider. Some of these we can influence, some we can control, and others we can only respond to.

Managing risks in the system is essential

Risks come in many forms and we can respond in many ways.

What we know

Proactively managing risk is essential. If we do not manage risk in our transport system:

- there will not be sufficient infrastructure to serve the needs of the growing population
- the liveability of the area will be negatively impacted
- environmental impacts will continue to grow
- there will be insufficient resourcing to address future needs
- investment into the area will decrease
- economic growth and productivity will stagnate or decrease
- ongoing issues will be exacerbated.

Figure 6 – Factors challenging our transport system
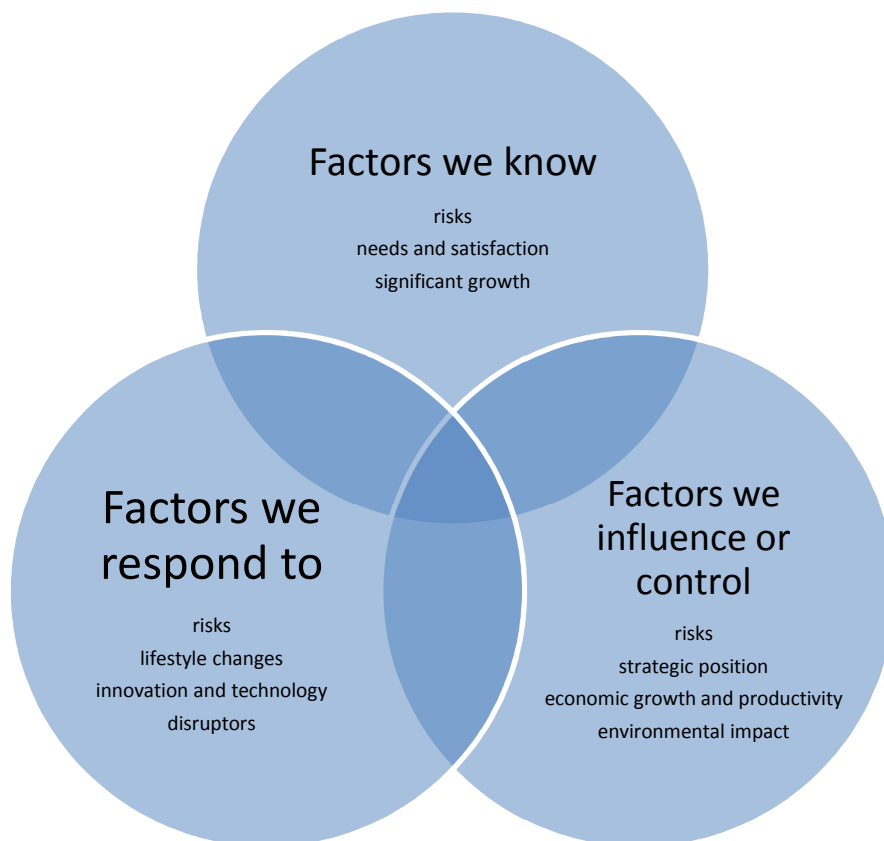
Our communities prioritise choice and connections

The Transport for NSW Customer Satisfaction Index (May 2018) shows that most respondents in the Willoughby local government area had a very high satisfaction rate with public transport services at 86% overall. The associated Customer Satisfaction Roads Index shows 75% overall satisfaction.

Understanding our communities' priorities for transport, and their satisfaction with transport services and infrastructure, is essential for future planning.

What we know
Our surveys and research have highlighted various perceptions of transport issues in our communities.
Themes in these responses include:
- Traffic is the 'biggest challeneg' about living in Willoughby LGA and traffic and parking had very poor perceptions of service.[i]
- Choices and connections are the priority, followed by parking and traffic, safety, security, cleanliness, healthy lifestyle and digital services.[ii]
- Detractors of Chatswood include crowded / busy and too much traffic / hard to get to.[iii]
- Current parking and traffic issues are important elements to be addressed.[iv]
- Older residents are not satisfied with access to public transport. They have limited access to a car and do not feel safe walking in the day or at night.[v]

Suburbs around the peninsulas (Castle Cove, Castlecrag and Northbridge) have either limited access or direct connections to public transport.

Older and young portions of the population have different needs around transport.

> The Greater Sydney Commission's five-year target to 2021 for increased housing supply in our local government area under the North District Plan is 1,250 new dwellings. Our draft Housing Strategy goes further to project that 6,000 to 6,700 new dwellings will be required in response to growth.

Our area will see significant population and visitor growth

The anticipated growth of the Willoughby local area will have significant impact on transport services and infrastructure. It will require a collaborative effort from a range of stakeholders.

What we know
Population projections for our area are significant:
- Our estimated population is 91,848 in 2036, a 20% increase.
- Households will increase to 35,688 in 2036, a 23% increase.
- A further 10,600 jobs will be created with 30% of residents employed locally by 2036.
- Anticipated growth is over the current 20 million shopper visits to Chatswood, with a significant increase to Chatswood Chase shopping centre by 2025.
- Growth will focus in the Chatswood CBD and other local centres with some other notable sites such as the former Channel 9 site at Artarmon.

This growth will require infill development – the redevelopment of vacant spaces – and the development of local centres. This can lead to pressure on existing infrastructure and services, unless appropriate land use planning instruments are in place.

> Trends show that medium and high density housing in 1999 made up 30% of all housing, compared to 55% in 2019. This is projected to reach over 70% by 2036.

We are in a strategic transport position

Our strategic transport position is an advantage and should be exploited to garner support and funding.

What we know
Chatswood is seen as a strategic centre by the state government. It has proximity and good connections to Sydney's other strategic centres.

The Willoughby local government area is connected to mass transit public transport, particularly Chatswood interchange, a major transport hub for trains, buses and taxis.

Our location in the Eastern Harbour City and as part of the Eastern Economic Corridor, as recognised by the Greater Sydney Commission, provides opportunities for strategic influence.

The state government's vision of a 30-minute city is a city where people can conveniently access jobs and services. It is a city where people can reach their nearest metropolitan and strategic centre within 30 minutes, seven days a week, by public transport.

Increased visitation and use also enhance challenges, such as congestion, in our area.

Data from ABS 2016/17 highlights that the trip distance, in terms of commute and change mode of travel, is the highest ranking factors for users looking at travelling into/out of the Willoughby LGA. Accessing the Chatswood CBD via Interchange is a strategic travel destination.

An effective transport system supports economic growth and productivity

Economic growth and productivity in any city is vital in supporting local communities and businesses and attracting investment. This can be heavily impacted by the transport system.

What we know
The Willoughby local government area is performing well economically:
- The unemployment rate in the local government area is 4.06%. This is lower than both NSW and Greater Sydney (2018 June quarter).
- There were more jobs than resident workers in 2017/18.
- Chatswood is the 6th largest office market in metropolitan Sydney.[vi]
- Chatswood is a significant retail centre with Chatswood Chase Sydney and Westfield Chatswood.
- Willoughby is ranked 14 across 88 local government areas for core night-time economy establishments density per km^2, with 587 establishments.[vii]
- The value of tourism in 2016/17 was $883m, with Willoughby contributing 3.2% to the NSW tourism economy.
- Gross Regional Product is $11.39b per annum (year ending June 2018) and 1.9% of the NSW Gross State Product.

In 2017, there were 12,427 businesses in the local government area, with the largest industry being health care and social assistance. Most businesses are located in Chatswood, St Leonards and Artarmon.

The area supports regional and statewide economic development with freight through traffic.

The economic output of the Eastern Economic Corridor is expected to grow by 30% in the next 20 years.

We must reduce the environmental impacts of transport

The environmental impacts of transport need to be a greater focus to improve the liveability, environment and sustainability of our resources.

What we know
One of the main sources of air pollution in Sydney is car emissions, with smaller and hybrid vehicles offering the greatest abatement potential.

Electric vehicles generate no CO_2 emissions directly from their operations. But they cannot be considered zero emission vehicles unless their batteries are charged from renewable energy sources and their design and construction phase emissions footprint is minimised or offset.

Active transport and public transport are more environmentally friendly options, producing fewer emissions than cars, requiring less infrastructure and with less impacts during construction.

2016 saw a decrease in car use of 4.5% from 2011, with 40.1% of people getting to work in a private vehicle (truck, car, motorcycle).

We need to adapt for work and lifestyle changes

Changes in societal thinking, activities or approaches to lifestyle can greatly influence the type of transport services required.

What we know
Greater use of smartphones and access to the internet has changed the speed and way in which people receive information.

There is more interest in active and healthy lifestyles and increased access and participation in community events and recreational activities.

Awareness of sustainability and environmental issues and use of public transport and ride sharing is increasing.

More companies provide flexible work arrangements such as virtual workspaces, different hours, working from home and various location options.

An ageing population often requires more access to a range of affordable, safe and dependable transport services.

A focus on increasing the night-time economy, will likely lead to an increased need for more dependable and frequent services in the evening.

More people are shopping online.

In Willoughby 6.2% of workers worked from home in 2016 compared to 4% in greater Sydney. This was a small increase from 2011.

New technologies can support us

Innovation and technology connect information and people and can support automation. They support faster, better quality, more accessible and affordable services and infrastructure that improves the customer experience. The fast pace of technology and sharing data will continue to play an important role in transport planning and services.

What we know
Connection to internet and data provides many opportunities:

- The 'internet of things' is already embedded in our way of life and will increase.
- Access to wifi in public spaces provides improved access to information.
- Open data may lead to innovative transport solutions.

5G technology is expected in our area from 2020, increasing speed and responsiveness that in turn supports technology and innovation advances.

Active and intelligent transport facilities are available now. Examples include parking guidance and management, all day real-time delivery of goods, Uber services and bicycle couriers and on-demand buses.

Intelligent transport systems use data and technology to connect components across the city and improve liveability. They can provide real-time information such as system demands, vehicle patronage and vehicle monitoring. This can assist in managing transport issues.

Electric and hydrogen powered vehicles (including bikes) are increasing. Car sharing and shared bicycles are already a significant option.

New technology being developed and trialled elsewhere includes:

- hyperloops delivering people and freight quickly through a high propulsion tube with no direct carbon emissions
- autonomous vehicles
- drones for delivery of services and goods
- mobility as a service
- shared ownership models
- Uber Air – to be trialled in Melbourne in 2020.

By 2040, it is predicted that four out of every 10 vehicles on the road will be autonomous (Accenture Digital 2014: The Road to the Future).

We must remain agile

Disruptors are unknown elements that lead to significant change. They are a key challenge when planning for future transport.

The success of disruptors depends on elements such as:

- rate of technology advancement
- alignment to government policy
- availability of suitable infrastructure
- ability to work on a large scale
- accessibility to customers
- the cost for the owner and customer
- product quality
- how it improves on current options.

Being prepared and agile enough to pre-empt or respond to disruption will help us create a transport system that caters for future possibilities.

Examples of historical disruptors:
Model T Ford
digital camera
downloadable and digital music
LED lighting

Image/picture to be inserted
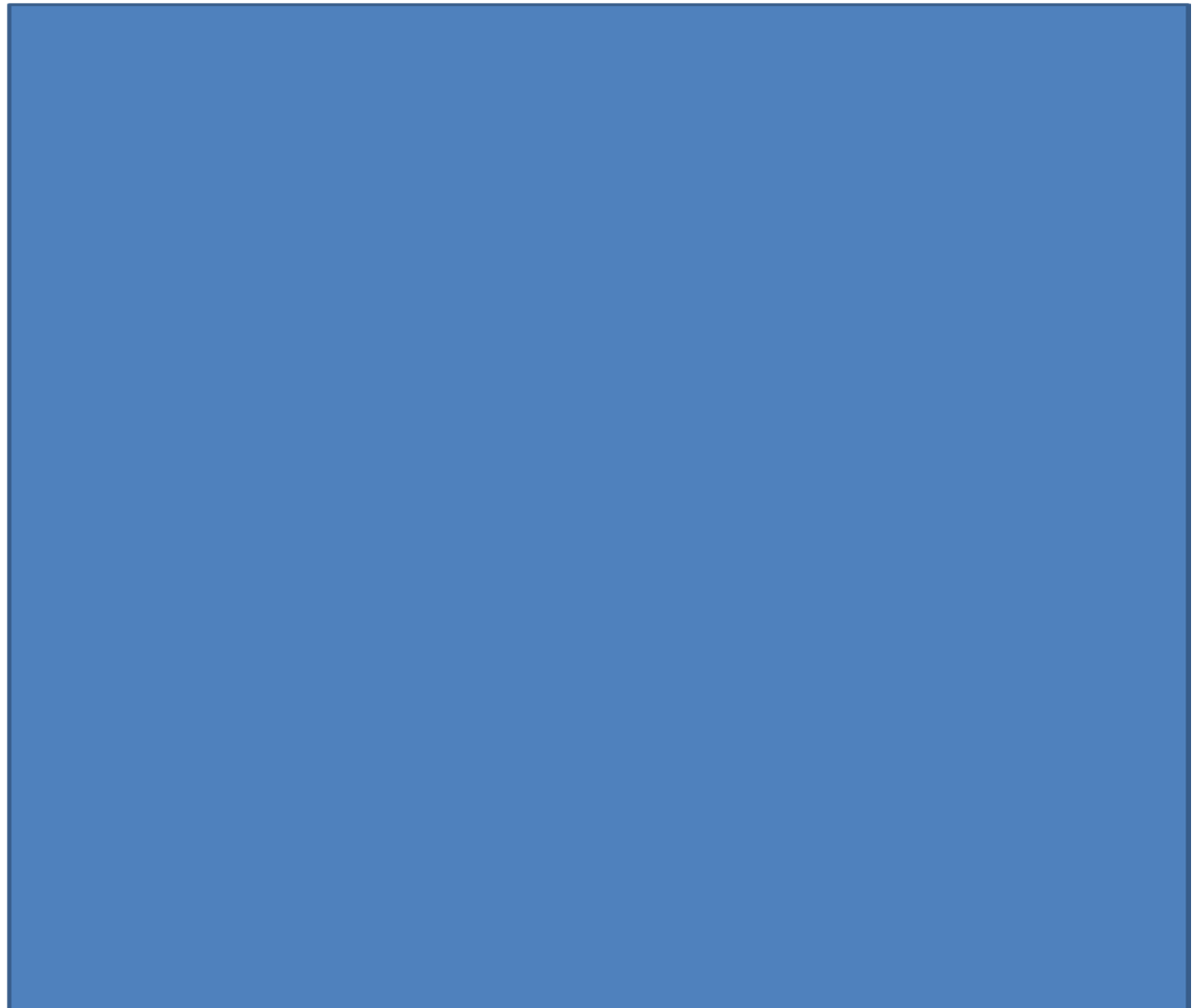
Part 3 How we plan for transport

3.1 Understanding our customers and stakeholders

Planning for transport is complex and requires an understanding of data, trends, needs and behaviours. Integrating policy frameworks with land use planning is important. The importance of behaviour over infrastructure and a focus on user experience is core to a successful transport system.

Customers and stakeholders are those who use, rely on, create or support the transport system.

Our customers demand quality and we can influence their experience

Customers use the transport system and they demand quality. We have limited control over the significant changes in technology, operations and demand. But we have greater influence over the customer experience.

We have multiple stakeholders to manage

Stakeholders may use, enable or influence the transport system. They include:

- transport users – pedestrians, commuters, drivers, visitors, businesses
- residents and visitors
- businesses that rely on transport services and technology for goods and customers
- urban developers who create transport infrastructure and places
- transport providers that provide services, companies and drivers
- all levels of government that create transport infrastructure and services, develop legislation and policy or operate services.

Image/picture to be inserted

Understanding reasons for travel will help us respond to customer needs

If we are to address the needs of all customers, we need to understand the reasons for their transport uses.

These reasons include:
- as a destination, shop, entertainment or visit
- goods and services
- travel through
- recreation
- commuting
- creative 'high quality of life' communities
- deliver goods and services
- work.

We know:
- congestion and parking are key issues
- use of public transport increases when living on the train line
- more people are using bicycles and public transport to commute to work
- the top reasons for trips were social / recreation, change of mode, and shopping.

As a local government agency, our transport planning must focus on providing customers with access to various modes of transport, connecting those modes either physically or virtually and providing options. This will improve the customer experience regardless of changes in infrastructure, modes of transport or technology.

This approach relies on having:
- the right infrastructure to support the different modes
- the right information to assist the customer in knowing their options.

Image/picture to be inserted

We also need to understand in detail the needs of more vulnerable members of our communities, such as children, older people and people living with disability. This will help us provide improved access, choices and customer experience.

3.2 Understanding the data, information and knowledge

Data provides the foundation for what we know. It helps identify how to provide the best solution for a liveable city and increase value in a place.

This data is valuable:
- travel behaviour
- benchmarking to predict future behaviour and impact
- better practice
- guidelines and studies
- customer feedback
- population and land use analysis
- travel demand and network modelling
- travel demands and performance
- road safety performance
- existing maximum carrying capacity of transport systems
- frequency of exceeded capacity.

We do not have access to all of this data for the local government area at present. This will be a continual focus with the state government and other providers to improve planning and customer experience.

Relevant transport data from ABS and other sources can be found in Appendix 2 – Background Information – Modes of Transport.

Ecommerce Austalia (2019) predicts that by 2020, 1 in 10 items will be bought online.

76.6% homes in Willoughby local government area had an internet connection in 2016.

Open data is where data from many providers can be freely used, shared and built by anyone. It supports effective technology for improved transport solutions.

3.3 Focusing on behaviour and services rather than infrastructure

Building more infrastructure is not always the solution. Focusing on changing behaviours and improving services to use what we have more efficiently is a more financially and environmentally sustainable option. This is a priority in achieving a more successful transport system and improved customer experience.

Some simple changes in behaviour that minimise travel times and influence the system are to:
- use different routes
- access options at different times of the day.
- use more sustainable options of shared paths or public transport
- plan trips considering current travel times.

3.4 Preparing for the future

Preparing for the future of transport is preparing for the unknown. We need to consider learnings from the past, understand the immediate pressures faced by transport providers and infrastructure providers, and understand the future disruptors that may change the face of future transport.

Planning for transport over a long period at the local government level is challenging. We rely on the integration of planning policies and strategies at state and federal government levels, as well as the private industry for infrastructure and operations.

Recent advances in transport are likely to place us on the precipice of significant change to the industry.

Understanding and responding to this will help futureproof our approach.

Disruptions occurring soon are usually easier to predict. Those taking place 10 years from now are much harder to plan for and may have greater impacts. Even so, we must build an awareness of the trends, technology, vulnerabilities and commitments needed to transform our transport system.

Some past learnings influence the present drivers and the disruptors change the future. See Figure 7.

¶
¶
¶
¶
---------------------Page Break----------------------¶

PAST → ¶
(learnings)¶
¶

PRESENT ¶
(pressures)¶
¶

FUTURE ¶
(disruptors)¶
¶

We need to understand:¶
- Design¶
- Infrastructure¶
- Utilisation¶
- Financials¶
- Needs and expectations¶

We need to understand:¶
- Strategic objectives¶
- Growth¶
- Innovation and technology¶
- Environmental impact¶
- Needs and expectations¶

We need to understand:¶
- Autonomous vehicles¶
- Electric vehicles¶
- Drones¶
- Internet of Things¶
- Mobility as a service¶
- Hyperloop¶
- Energy advances¶
- Societal forces¶
- The not yet known¶

Page 40 of 53¶
¶

> We cannot use known solutions alone to address future problems.

3.5 Integrating with land use planning

Integrating transport with land use is critical to ensure the highest levels of connectivity. Understanding the relationship between movement and place helps create healthy built environments where people can move around with ease and comfort. Successful integration can reduce the number of trips and congestion, help to create great places and improve the overall travel experience.

Developing policies and processes for development that complement sustainable transport outcomes is essential. Examples include co-locating development with key transport nodes to increase the use of public and active transport such as walking and bike riding. This also supports the 30-minute city concept – where home and work are close to public transport – and it supports vibrancy in our communities.

Using the movement and place framework

The NSW Government Architect's movement and place framework[viii] , refer Fig 8, recognises that streets perform multiple functions, transporting people and goods as well as being places and destinations for people. The framework attempts to manage these competing demands and focus on the user.

Balancing the creation of places and the movement of people or goods is challenging but necessary, particularly where the consideration of place drives the development of our transport systems. We will achieve this by working with our communities and movement and place practitioners to ensure transport systems that better support our places. The movement and place framework will help us find this balance.

It is important to find a balance between a movement corridor where the focus is on minimising travel time and keeping people and goods moving, versus a destination which aims to increase visitor dwell time. Using this framework when planning for individual streets across the Willoughby area will help create liveable places and provide the right transport modes in the right locations at the right time.

Aligning movement functions with the places they serve ensures our transport networks and public spaces better contribute to the liveability of our communities and the productivity of NSW.

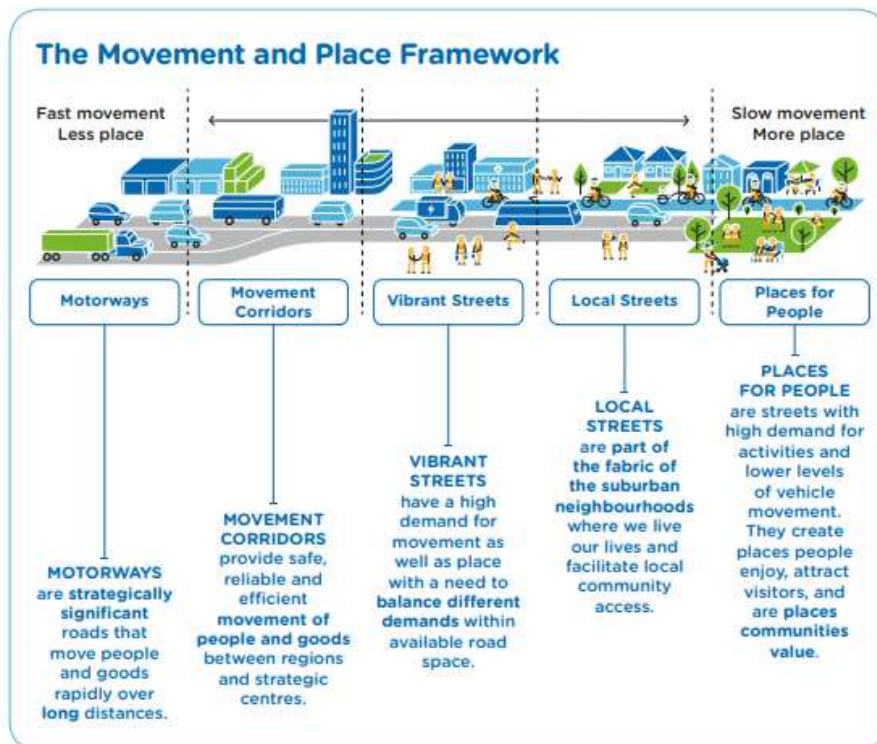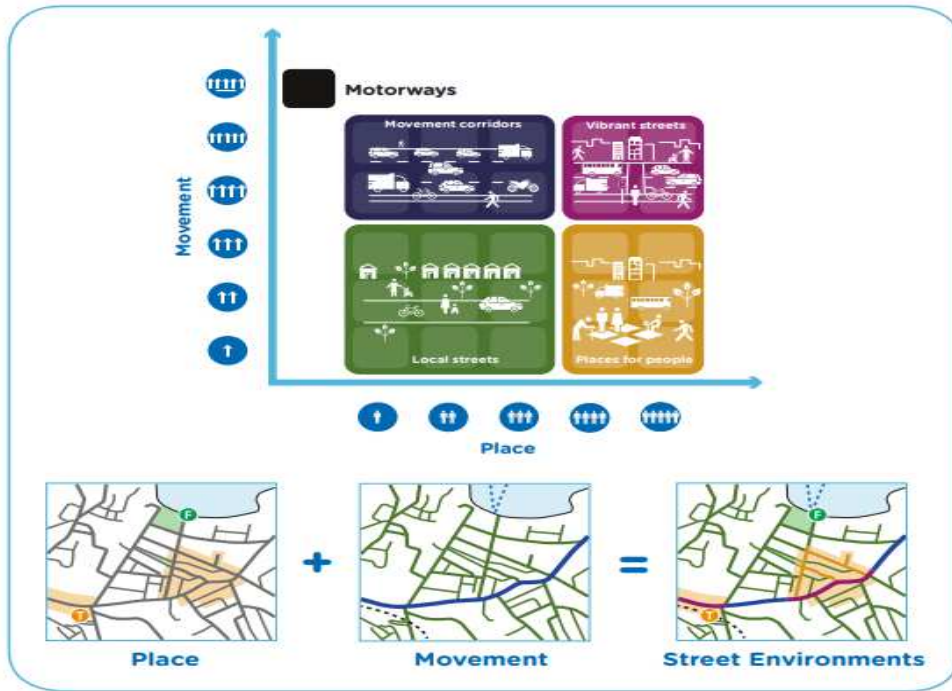*Figure 8 – NSW Government Architect's Movement and Place Framework*

Figure 37: Movement and place framework

Figure 9 – Example of the movement and place framework

Image/picture to be inserted

Part 4: Our transport approach

4.1 The overall framework

We have aligned this strategy with issues raised by our communities when developing our community strategic plan, Our Future Willoughby 2028. This has driven the development of the transport directions, strategies, measures and actions in this section.

We have also considered plan's overarching vision that Willoughby's diversity underpins our liveable and prosperous city.

The community strategic plan's future aspirational statement for transport is:

'It is easy to get around our city. Public transport options, connected walkways and cycle paths help minimise the impact of cars on our roads and provide us with healthier choices. The connections between the CBD and our villages are strong, creating liveable spaces which support our needs and serve as meeting places. Digital connections and infrastructure support a smart city that provides real time information to people seeking to navigate our city and access its services.'

The following pages detail our transport directions, strategies, measures and actions.

Understanding our directions, strategies, measures and actions

The **community strategic plan outcomes** support our communities' overall vision for the Willoughby local government area.

In this strategy, **transport directions** are a direct response to the priorities within the plan that relate to transport.

Transport strategies focus our attention on achievable objectives. They respond to the key issues for the transport system in Willoughby, as identified through engagement results and technical expertise.

Transport measures help us track our progress to achieve the strategies. They have been identified based on the data we have available to measure. Particular projects may have specific measures.

Transport actions identify the specific actions we will take to progress this strategy. A summarised

action plan is in Appendix 1 – Action plan summary.

Transport actions and funding sources

The actions in this strategy are a mix of infrastructure, services or behaviour solutions.

They do not include business-as-usual activities, existing projects, or those we have already identified.

Examples of ongoing business include:
- assessment of traffic / transport requests
- management of the Willoughby Traffic Committee
- review of fees and charges
- annual footpath maintenance and replacement program
- annual road maintenance and replacement program
- annual cycleway construction program
- requests for traffic signs
- management of transport permits, parking schemes.

Many of the actions identified require studies, planning and concept development, meaning we need lead time before any infrastructure work progresses.

The action plan identifies high level costs and sources of funding for each action. Some actions have not yet secured a funding source. Funding sources may include:
- Willoughby City Council
- state or federal government grants
- voluntary planning agreements
- Section7.11 and Section7.12 developer contributions
- businesses.

Working with others to realise benefits

The transport system is complex and has many stakeholders involved in providing infrastructure and services, and in planning and policy, as well as users.

Many actions are the responsibility of others. We can advocate and partner with them on providing outcomes, particularly for transport services and large infrastructure solutions.

We need to work with other partners to implement actions, source funding and create changes. These include:

- State and Federal government.
- private providers of services.
- community groups.
- businesses.
- peak bodies.

A strategy summary is in Figure 10. The following pages detail each transport strategy, what we know about it, the initiatives we are working on and future initiatives.

Figure 10: Strategy Summary

Community Strategic Plan

Transport strategic directions

Transport strategy

Transport measures

Transport actions

Green
Connected
and
Inclusive
Liveable
Prosperous
and Vibrant
Effective
and
Accountable

Our transport system will be sustainable and minimise negative impacts on the environment

Our transport system will link our people from CBD to the local centres and villages and provide alternative choices for all

Our transport system will support community needs while enabling development of places

Our transport system will make life easier by utilising smart city technology and support our future growth

Our transport system will respond to customer needs and align to council and state government strategies

Reduce environmental impact
Reduce congestion in CBD and local centres

Increase transport choices
Increase accessibility across modes
Increase active transport options

Improve safety
Enhance the development of places

Increased efficiency in travel and parking demand

Align to regulation and strategic plans and policies

Decrease in cars used as a method of travel to work
Increase in positive community perception of transport issues

Increase kms of bike paths and footpaths
Increase number of users on active transport modes
Increase in ancillary infrastructure

Reduced injuries and crashes on local roads
Increase in positive community perception of transport issues

Increased parking turnover and occupancy in council car parks and on street parking
Increase in % of trips by travel mode other than vehicles

Decrease in % of transport issues to improve its performance
Increase in positive community perception of transport issues

Various actions over the next five years

Underpinned by our principles: Sustainability   Social Justice   Ethical Governance

Transport strategic direction 1

Our transport system will be sustainable and minimise negative impacts on the environment

Andrew looked at 6-down again in the morning crossword. A 10-letter word for "blocked with nowhere to go". He put it down and turned his attention to his emails just as his car turned off the M1 at Wahroonga and headed south to the city along the Pacific Highway. He was surrounded by other autonomous vehicles all travelling in perfect harmony, linked to each other and the road management network system like a giant invisible spider web. Each car's sensors relayed its data to the surrounding cars and the network so each car anticipated vehicle movements ahead and compensated in the most efficient method. As a result, the speed camera at Knox Grammar had been removed years ago. There was little need for it when 95% of cars on the road were controlled by the system.

Andrew was a creature of habit and still liked to sit in the 'drivers' seat but he could sit back and relax or get work done now on the way to the office. He knew that in a minute or two they'd pick up Bill in Turramurra. Bill worked with Andrew and they coordinated through their app to ensure the same AV picked them up each day. They'd have 15 minutes in the car together to discuss work matters before picking up Sally. Neither Bill nor Andrew knew Sally other than as a car share passenger but they all got on so well that picking up Sally was locked in and they all travelled together. Once Sally got in, the three of them would probably enjoy a more social discussion.

Sally, as always, was lively and joined the conversation the moment she got in the car. She worked in North Sydney so she would continue the trip past Chatswood to her destination after Bill and Andrew got to their workplace at Chatswood.

As they passed through Lindfield Sally talked about a story her dad told her from the old days when traffic was at a standstill most mornings in both directions. Sally said her dad reckoned that some mornings the congestion was so bad it took 20 minutes just to go a few kilometres. Bill chimed in and said he'd heard the stories of congestion too but wasn't sure he believed them. Bill reckoned the stories got exaggerated over the years. Andrew just went back to the crossword and completed 6-down: C-O-N-G-E-S-T-I-O-N.

Community strategic plan outcome	**A city that is green**
Transport strategic direction 1	**Our transport system will be sustainable and minimise negative impacts on the environment**
Transport strategies	**Reduce environmental impact of the transport system**
	Reduce congestion in CBD and local centres
Transport measures	**Decrease in cars used as a method of travel to work**

Reduce environmental impact of the transport system

Our environment faces threats from climate change, a growing population and increased urbanisation. We have to balance the needs of residents and commercial precincts with those of the environment and its ecosystems.

Transport has a significant and direct impact on the environment, including on local air quality, noise levels, water quality, biodiversity and greenhouse gas emissions.

Current council initiatives
- partner with the state government on active transport projects
- provide education and training events promoting active transport
- provide electric vehicle charging stations
- promote car share and bicycle operations
- implement a fleet efficiency strategy, reducing greenhouse gas emissions from our fleet by 31 per cent since 2008/09
- release Our Green City Plan 2028, our sustainability action plan with sustainable transport targets.

Future council initiatives
- explore solar power generation for EV charging stations
- develop a transport resilience plan
- install further electric vehicle charging stations.

In 2016, compared to 2011:
- fewer people drove to work
- more people used public transport
- fewer people cycled to work.

Electric vehicles benefits over conventional petrol/diesel cars:
- cheaper to run and maintain
- better for the environment and air quality
- improved safety
- easy to power from local and renewable energy sources, reducing dependence on oil.

Greenhouse gas emissions from our residents' car transport is estimated at 124,000 tonnes of CO2 -e – 19% of our local area's emissions.

Reduce congestion in CBD and local centres

Congestion impacts many Sydney roads and is a key frustration for residents and travellers in and through our local government area.

Managing congestion, refer Figure 10, relies on:
- integrated transport and land use planning
- increased use of active and public transport
- an improved road network
- management of user behaviours.

A particular challenge for Willoughby is the amount of through traffic – traffic that does not make Willoughby a destination. This impacts the Pacific Highway as the main arterial road and access to the highway from local streets.

Chatswood CBD is an important place for transport, shopping and entertainment. This contributes to the level of congestion while making a key contribution to the economy.

Increasing road space to decrease congestion is not realistic or feasible. This is due to levels of urbanisation, costs, timeliness, and environmental and community impacts.

Instead, reducing the demand for road space, managing the road network better and supporting behavioural change with our communities is the solution.

Reducing congestion on roads is about finding alternative options for road users through public transport, bike or pedestrian paths.

On-demand buses with real time information, system demands, vehicle patronage and vehicle monitoring have been trialled in Sydney.

Drone technology and autonomous vehicles are being explored and will likely impact levels of congestion in years to come.

There is no singular measure of congestion. It can be based on facts and figures, but this requires data that may not be available to everyone. Open data is an evolving concept that will assist in understanding and creating solutions for congestion.

Measuring congestion may also be based on perception. In most urban areas, congestion is a given. The reliability of journey time is often more important as individuals can factor this into their journey.

Transport infrastructure and services need to link to other local government areas and are often reliant on state government funding or service provision. What happens outside of the Willoughby area has flow-on effects for our transport system.

We support the approach to managing congestion as, outlined in Figure 10 However, we are reliant on integration with the state government and other councils to address the problem collectively.

Figure 11 Managing Congestion
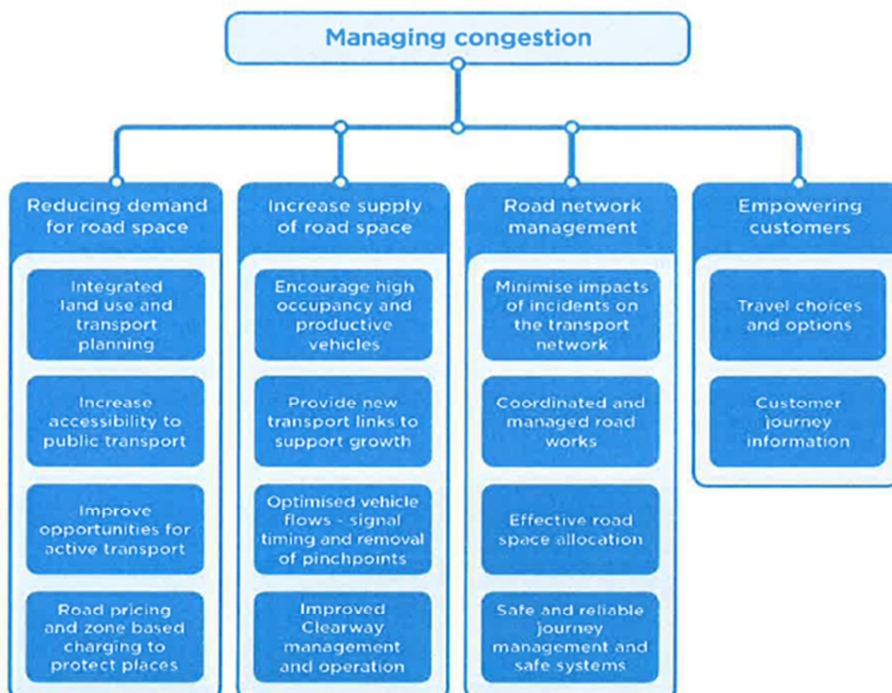
Current council initiatives

- work with the state government to provide improved public and active transport options as alternative to car journeys and reduce parking congestion
- promote and educate on active transport and car share options
- explore wayfinding signage to improve flow
- provide planning controls to limit opportunities for congestion around new developments and reduce reliance on private vehicles.

Future council initiatives

- advocate for improved state bus infrastructure and services
- do studies on taxi, car share, ride share spaces and tonnage limits in the CBD

- lobby state government for improvements to Chatswood interchange and dedicated bus lanes in peak hour on Eastern Valley Way.
- implement works in the CBD including closing streets to vehicles, increasing taxi zones and creating bus lanes
- do a study into Chatswood CBD orbital roads – Albert (south), Archer (east) and Ashley (north) roads and Pacific Highway
- work with the state government on a study into technology, infrastructure and policy requirements for drone technology in the local government area.

Figure 11 below outlines main congestion points within the local government area.

Figure 12 – Congestion Points in Willoughby LGA
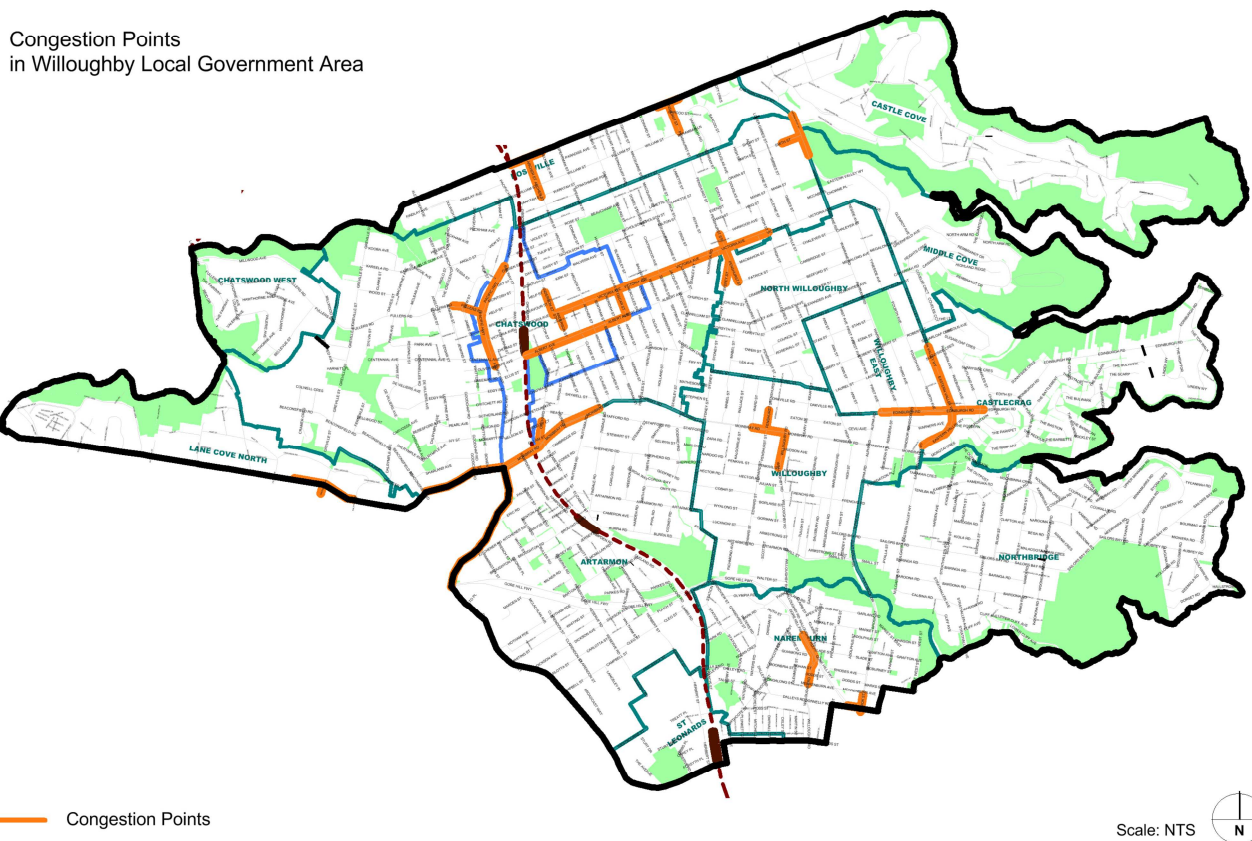
Congestion Points in Willoughby Local Government Area

Congestion Points

Scale: NTS

Transport strategic direction 2
Our transport system will link our people from CBD to the local centres and villages and provide alternative choices for all

Sarah stepped out the front door for her normal journey to work. She loved living so close to the CBD and the advantages that came with that. She loved the nightlife and the weekend excitement in the mall. She loved the variety of food offerings and entertainment options in the CBD and how convenient it was to get to the city to meet her friends on Friday night.

Normally she enjoyed the short stroll to the station with the sun drenched avenues and mall, but this morning was wet so she'd have to zig zag through the shops and plazas that linked the streets to stay dry. This wasn't a bad thing. All the new developments in the CBD had public access through their forecourts so this was a great excuse to have another look at the watch she had her eye on in a shop in the alleyway near the station.

The shop was closed but the watch she liked was still in the front window. Her train was due in 2 minutes but there was no rush. Trains came every 5 minutes. She could afford a few minutes and now was the time to purchase. Two swipes later on her phone and the transaction was done without ever entering the shop and the watch would be delivered to her home ready for tomorrow night's outing. Easy.

Sarah's trip on the train to Barangaroo was less than 10 minutes but she still got a few emails done before arriving. She even booked the on-demand bus for tonight so she could go straight from the station after work to her mum and dad's house at Castle Cove for dinner. She knew her Dad would be happy to pick her up but it was raining and it was so much easier for her to jump on and off the bus than him coming out on a cold wet night to get her. She felt good knowing he wouldn't be driving in these conditions.

Community strategic plan outcome	**Connected and inclusive**
Transport strategic direction 2	**Our transport system will link our people from CBD to the local centres and villages and provide alternative choices for all**
Transport strategies	**Increase accessibility across modes**
	Increase active transport options
Transport measures	**Increase in positive community perception of transport issues**
	Increase kms of bike paths and footpaths
	Increase number of users on active transport modes
	Increase in ancillary infrastructure

Increase accessibility across modes

Accessibility means different things to different people. It can include:
- mobility – ease of physical movement and quality (availability, speed, frequency, comfort) of travel modes
- proximity – distances between destinations
- connectivity – between modes
- affordability – costs of travel relative to income
- convenience – ease of obtaining travel information, paying fares, carrying luggage
- social acceptability – social status of modes.

A transport system is more successful when there is access to and between modes of transport, giving customers choice. Having more choice, and choices that are convenient, will encourage varied use and less use of private vehicles.

Multi-modal use improves options for the customer, particularly those who have limited access to private vehicles. It also disperses the congestion on any one mode and increases the use of more sustainable transport options.

Creating connections and missing links within the transport network between places and between modes of transport is important, particularly for customers in more isolated areas. In Willoughby, many of the peninsular suburbs do not have immediate access to transport choices beyond roads.

The first and last mile is often a key challenge for accessing modes of transport. This is an important area for us to gather more data and lobby service providers.

Using technology to provide access to information supports the creation of better connections. Connections and choices are also about having the technology to support the individual customer in creating a route that suits their needs and provides them with various choices in their hand. Using technology, such as mobility as a service, which provides a one-stop shop for timetabling, connections, modes and payment, could significantly increase use of alternative transport and lessen the dependency on cars. The state government is trialling this service.

As a limited service provider, we need to lobby state government and private providers for accessible services across the local government area.

Current council initiatives

- provide connector paths between services, bus shelters and end-of-trip facilities
- operate The Loop free bus five days a week
- plan for and regulate more accessible land use patterns to reduce travel distances
- increase the bike path and footpath network
- work with Transport for NSW and a private provider on exploring a trial mobility as a service project in Chatswood CBD in 2020
- increase the bike path and footpath network
- advocate for increased public transport services into the area
- promote active transport networks
- provide planning controls to build close to public transport, encourage connections to public transport services around new developments, and reduce reliance on private vehicles.

Future council initiatives

- dedicate road widening at Pacific Highway and Mowbray Road
- lobby the stale government to bring mobility / disabled parking restrictions in line with other states
- develop an accessible parking space policy
- develop movement and place plans for all centres, Chatswood CBD and St Leonards
- trial a mobility as a service project in and around Chatswood CBD
- lobby state government to develop and implement a trial of autonomous buses in Chatswood CBD
- develop an active transport plan, including an app, education projects and signage.

82% of our roads have a footpath (on one or both sides).

End-of-trip facilities (bike parking, lockers, change rooms and showers) are designated places that support cyclists, joggers and walkers in using alternative ways to travel rather than driving or using public transport.

Increase active transport use

Using active transport relies less on the use of motorised vehicles and more on alternatives such as walking and cycling. It has the potential to increase levels of physical activity and reduce the negative impact on the environment.

A key to improving walking and cycling rates is to provide high quality, safe and accessible infrastructure, and end-of-trip facilities.

Improving options for the first and last mile of journeys is important. Otherwise this can be a deterrent to using transport other than a private vehicle.

Bike sharing is an emerging and developing technology that can make cycling a convenient and cost-effective option. We no longer have any bike share programs in the local government area.

Current council initiatives

- adopt our Bike Plan in 2017 for the provision of cycling infrastructure and facilities in our local area
- identify 13.1kms of additional bike paths to be constructed over time
- install bike racks at key sites
- increase the number and quality of footpaths through a footpath program
- provide planning controls to encourage use and connections with active transport around new developments and reduce reliance on private vehicles.

The second highest travel mode is 'walk only' (27% of all trips), highlighting the use, proximity and accessibility of local centres and connections as a positive within the local area. See Figure 11 for walkability scores across the local government area.

Future council initiatives

- implement an east–west green connection for walking and cycling
- work with state government to install end-of-trip facilities at Artarmon, Willoughby and Bicentennial Park
- install drink stations, rest stop areas and lighting for key footpaths
- enhance the safe pedestrian network through lighting, linkages, pedestrian crossings and pedestrian activity mobility plans
- complete a study into widening all footpaths to 1.8m
- do a feasibility report on our fleet becoming electric vehicles.

Figure 13 – Walkability Score Map
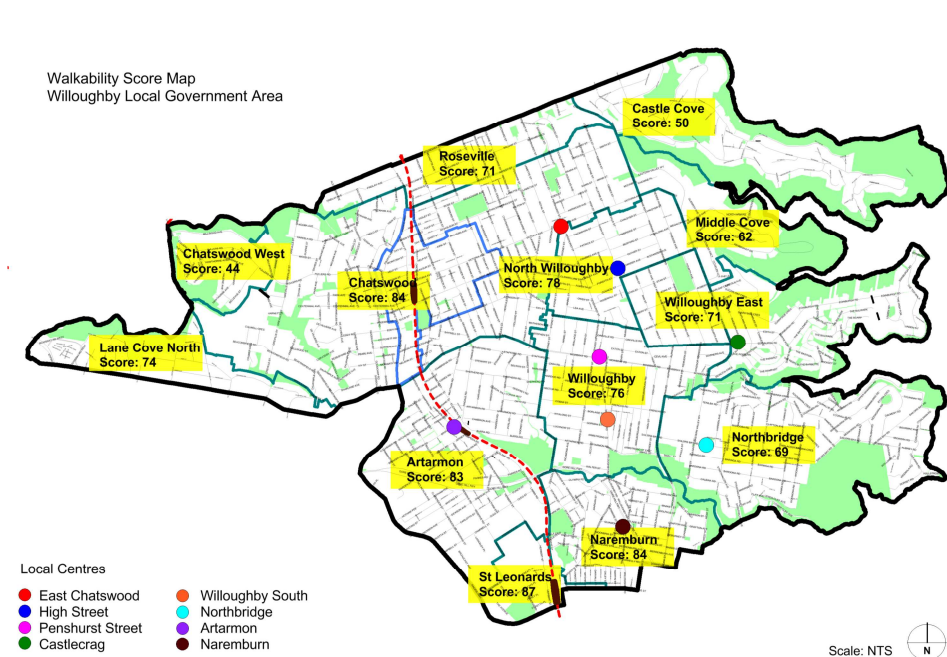
Transport strategic direction 3
Our transport system will support community needs while enabling development of places

Jack liked to work from home in the mornings. He could do most things from home now anyway so the need to travel had been reduced. It also gave him a chance to have breakfast with the kids and sometimes he travelled with them on the automated bus from his home in Northbridge to Chatswood where he then jumped on the metro to Macquarie Park.

His eldest daughter Maddy had just turned 10 and wanted her independence. "I think I'll stay at school a bit longer this afternoon Dad," she said. "No need to meet me at the gate this afternoon. I'll find my own way home today. I might even go to the movies with Jenny."

Jack knew he had to give Maddy some responsibility and thought through the options. "Do Jenny's mum and dad know about this? If I agree to this, you'll need to stay in the safe zone until mum or I can pick you up."

"Of course, dad. I love you dad. You're the best dad in the world." Jack smiled and knew when he was being buttered up but he knew the safe zone was well lit and had full CCTV coverage. He'd linked Maddy's phone to the safe zone app so he knew where she was at all times in the zone and could even be notified if she left the zone. "Ok," he said without lifting his eyes from his iPad. He spent the next minute on his iPad then turned back to Maddy. "I've booked an automated vehicle to pick me up at 6. I'll come in and pick you up in the kiss and ride at the edge of the safe zone on Albert Avenue at 6.15. I'll send you the details of the vehicle tracking code so you know when I'm getting close. I've already booked it to swing past Jenny's house on the way home so make sure the two of you are ready and waiting."

"Great," replied Maddy. "I've already emailed Jenny and she's looking forward to it. Jenny's mum wants to know if I can stay at her house tonight instead and I'll ride home along the new cycle path tomorrow. It's only a few kilometres and it's all off the road."

"Sounds like a great idea," replied Jack. "I might dust my bike off and we'll all go for a ride together in the morning."

Community strategic plan outcome	**Liveable**
Transport strategic direction 3	**Our transport system will support community needs while enabling development of places**
Transport strategies	**Improve safety**
	Enhance the development of places
Transport measures	**Reduced injuries and crashes on local roads**
	Increase in positive community perception of transport issues

Improve safety

Safety focuses on not only safety on our roads but also on the safety of customers when using transport services.

The main factors influencing the rate of road trauma across NSW include:
- the economy and associated increased travel exposure
- increasing fuel costs
- motor vehicle sales
- urban development and travel patterns
- ageing population
- increased freight movements.

Automated vehicle technology is often seen as a means to reduce death and injuries resulting from factors such as driver fatigue, driver distraction, speed and inexperience. Trials are underway across Australia.

Using crime prevention through environmental design principles to assess and plan for safety concerns around active transport infrastructure is important.

Current council initiatives
- continue to develop and provide annual road safety education programs for:
    - child restraint checking days
    - community road safety presentations
    - motorcycles
    - pedestrians
    - safety outside schools
    - school zones
    - seniors road safety
    - speeding
    - supervising learner drivers.

Future council initiatives
- complete studies and develop priority actions that create 40km/hr shared zones in high pedestrian areas within Chatswood CBD, Artarmon, St Leonards, Northbridge and High Street
- do a road safety audit on Archer Street between Mowbray and Boundary streets
- explore the feasibility of having CCTV installed on road reserves.

The total number of crashes in Willoughby area by fatal/injury/non-casualty classification over the last 5 years was 1362, with the average just under 273 crashes per year. This represents a 55% decrease on the 5-year average from 2004 to 2008, which averaged 498 crashes per year.
The number of fatal crashes since 2008 has also decreased with an average of 2 per year, compared to 3 per year in 2008.

Over 80% of people who are involved in crashes within the Willoughby area are not local residents.

'Australia is ranked 15 out of 25 countries in KPMG's autonomous vehicle readiness index 2019.'

Enhance the development of places

Transport infrastructure can support and enable the development and overall creation of vibrant places.

Using the movement and place approach helps us balance areas that are primarily for movement of people and goods with destinations where people are the more important element. Identifying the areas that need to have a travel focus and those that need a place based approach is crucial.

> Data from 2016/17 highlights that for residents 'social / recreation' is the most popular purpose for a trip across the local area, followed by 'change mode of travel', which is supported by recent Chatswood interchange upgrades. 'Shopping' is the third highest purpose for a trip.

Current council initiatives
- review our development control plan with the aim of introducing planning regulations that decrease car/vehicle dependency
- increase the bike path network by 13.1kms
- review engineering specifications to have facilities installed that encourage greater multi-mode trip use.

Future council initiatives
- advocate to state government for public buses fitted with bike loading racks
- deliver multi-modal plans for Willoughby Park, Bicentennial reserve, and the provision of shuttle buses to the CBD.

Transport strategic direction 4
Our transport system will make life easier by using smart city technology and support our future growth

Thelma looked out the window of her unit in west Chatswood across the bushland down to the Lane Cove River below. She'd lived in the area all her life and even went to school just around the corner. It seemed so long ago yet some memories of Chatswood and the suburbs were like yesterday. She remembered the days when you had to plan shopping trips to Chatswood in advance because getting across the Pacific Highway in the old days was almost impossible. Today would be so much different.

Rodger from unit 22 next door still had his licence but didn't own his car anymore. He liked to use the community share car. Rodger said he knew he could use the bus and the automated vehicles but having the independence of the share car made him feel more in control. Plus he liked the excuse to offer Thelma a lift and she liked that too. Today Rodger was going to visit his daughter so he could drop Thelma at the shops if she wanted. Thelma liked Rodger's company so she accepted the offer.

Thelma had a doctor's appointment so Rodger used the drop-off zone in front of the medical centre. It was easy now that parking in the CBD had been removed – it allowed you to be dropped and picked up at any location you wanted. The doctor provided Thelma a prescription but Thelma chose the home drop-off service, which meant the prescription was prepared and shipped to her home address. It would be there before she got home and save her a trip to the chemist.

There was a great cafe just up the road from the medical centre and the new pedestrian mall that extended along most the CBD was easy to walk through. It also had lots of seating so if she needed a rest along the way she could do so. Her favourite seat was the one in Anderson Street looking towards where the old Albert Avenue carpark used to be. With less car parking needed in the CBD, the carpark had been redeveloped into new shops and community hubs. Today though Thelma didn't need to rest and walked the full length of the mall to the cafe.

Drinking her hot chocolate, she thought through the rest of her day. She had some groceries to buy and a few gifts for friends and family. She'd be able to carry the small gifts on the bus on the way home but would arrange for an automated vehicle delivery of the groceries. She could go home in the automated vehicle but she'd need to carry them in. Better to wait and time it for when Rodger got back from his daughter's place so she had an excuse to call him. He could carry them in for her.

Community strategic plan outcome	**Liveable**
Transport strategic direction 4	**Our transport system will make life easier by using smart city technology and support our future growth**
Transport strategies	**Increased efficiency in travel and parking demand**
Transport measures	**Increased parking turnover and occupancy in council car parks and on-street parking**
	Increase in % of trips by travel mode other than vehicles

Increased efficiency in travel and parking demand

We have an important responsibility to balance the allocation of parking to meet the needs of residents, local workers, business, visitors and commuters.

Parking congestion, particularly in and around the Chatswood CBD, St Leonards and local centres has been raised by our communities. Their concerns are: 'there isn't enough', 'it's too costly' or 'it's too hard to find'.

Parking is a particular focus around the fringes of the commercial centres and transport hubs and other focal points such as sports facilities, cultural and religious centres. Public on-street parking is seen as vitally important to the economic and social wellbeing of the city.

In urban areas, the growth in vehicle ownership creates high demand for public car parking, where often there is limited availability. To reduce demand, avoid scarcity and avoid surplus there are two broad options:
- increase the parking supply
- manage the current parking more efficiently.

Providing more car park infrastructure is not a feasible or a realistic response due to cost, space and, the unintended response of more reliance on cars. In turn, this leads to more congestion.

Tools we can use include: limiting parking, road space allocation, road user priority, technology and pricing. Improved communication, information and wayfinding on parking options with real-time data will also assist in providing quicker access to parking.

Parking data is limited. It would benefit us to understand our communities' concerns in detail and where and when the issues are.

For on and off-street car parking spaces, it would be useful to know:
- the total number of spaces, both on and off-street
- rates of use
- the number and location of restricted spaces and metered spaces
- the specific purpose for the parking.

For more information on the Willoughby LGA in context, refer to Appendix 2 – Background Information – Willoughby LGA in Context.

The Chatswood CBD Traffic Study (2012) identified options for improving operations of the movement/parking systems in the Chatswood CBD, with specific emphasis on removing on-street parking in places and implementing a parking guidance system to guide users to off-street car parking locations.

2016/17 data highlights that of Willoughby residents 'vehicle driver' (43% of all trips) is the most used travel mode in the local area.

Council has around 2600 dedicated off-street carparks and (metered) on-street spaces. Use of these spaces from 6am to 7pm averages 90% on weekdays and 80% on weekends.

Current council initiatives

- operate a number of car parking stations, manage on-street parking and use resident parking schemes and parking permits to proactively manage parking
- implement a street parking strategy (2016) to optimise street parking, with time and pricing restrictions, parking controls, car share opportunities and alternative transport choices for non-essential car journeys
- operate a SPOT parking website that identifies the availability and cost of on and off-street council parking
- work with private providers to explore wayfinding signs to parking in Chatswood CBD to reduce the amount of traffic circling for spaces
- measure all non-metered, time restricted and non-time restricted on-street car parking spaces (information available in 2020). See Figure 12 for an outline of our draft street parking strategy.

Future council initiatives

- revise transport requirements within the development control plan to include conditions that reduce parking provisions in new developments that support more sustainable transport options
- provide driver awareness/education programs that encourage drivers within the Chatswood CBD to use parking guidance technology
- implement a parking guidance system in Chatswood CBD
- audit the provision of designated accessible parking
- advocate to state government to do a feasibility study of expanded commuter parking at Artarmon
- continue to implement the street parking strategy.

Figure 14 – Street Parking Strategy Drivers and Objectives

Transport strategic direction 5
Our transport system will respond to customer needs and align to council and state government strategies

The sun still hadn't risen when Phil left home for the office. There was faint glow from the solar powered street lights at the corner of his street and they provided enough light to see without being intrusive. He walked the 50 metres to the corner and checked his phone for the loop bus location. He'd checked his phone before leaving the house so there was really no surprise it was almost here. Some mornings if he was feeling energetic he'd walk the two kilometres to the main bus stop but today he'd jump on the shuttle as it did its loops through the suburbs linking back to the main bus route. Maybe he'd walk home he told himself, putting the little bit of guilt at not exercising at bay for a few hours at least.

It only took a few minutes to the Eastern Valley Way bus stop where Phil would pick up the bus to the city. But even in those few minutes it was a chance to say hi to the regulars and catch up on a little community gossip. Harry from number 9 was always full of info and the loop bus was sometimes a better source of community info than the local newsletter. The council had started electronic display information on the bus shelters and in the loop bus so there was plenty of opportunity to access information.

Phil enjoyed the bus trip to the city. It was a relatively easy and fast run. Bus services were regular, and not crowded anymore. With the data available to the bus company of live traffic flows there was rarely a time when the bus wasn't running to the scheduled timetable.

Community strategic plan outcome	**Vibrant and prosperous**
Transport strategic direction 5	**Our transport system will respond to customer needs and align to council and state government strategies**
Transport strategies	**Align to regulation and strategic plans and policies**
Transport measures	**Decrease in % of transport issues as a means to improve overall traffic and transport performance**
	Increase in positive community perception of transport issues

Align to regulation and strategic plans and policies

Transportation regulation is administered by all levels of government and covers:

- fees and charges
- conditions
- levels of service
- operating authority of public transport modes such as rail, light rail, ferries and buses.

These regulations ensure transportation services are adequate and that users are protected from excessive prices or unfair practices.

As new business models and services emerge, such as ridesharing services and mobility as a service, governments are challenged with creating or modifying regulations, enforcing them, and communicating them to the public at a previously undreamed-of pace. And they must do this while working within legacy frameworks and attempting to foster innovation.

Often technology and the systems are available but the customer sentiment and the regulatory framework to support the innovation is not. This is a challenge for all governments and operators.

Forecasting for user take-up – both in interest and time – on changing technology and transport modes, will need to be closely monitored and assessed.

We need to stay aware of transport innovation so we do not inadvertently prevent or limit an opportunity due to legislation or policy.

Current council initiatives

- review our development control plan with specific consideration of appropriate levels of regulation around transport requirements in the local area
- adopt and implement key transport strategies, the bike plan, and street parking strategy
- enforce parking restrictions and transport planning
- work with private businesses and state and federal government on trials of electric vehicles, autonomous vehicles and drone technology – regulatory requirements and restrictions will impact the speed and extent to which these transport modes change and climate change actions take place
- do traffic studies around each local centre.

Future council initiatives

- lobby state and federal government for a working group with greater Sydney councils to review transport and traffic legislation
- review our development control plan to incorporate restricting heavy vehicle access in CBD and town centres at peak times.
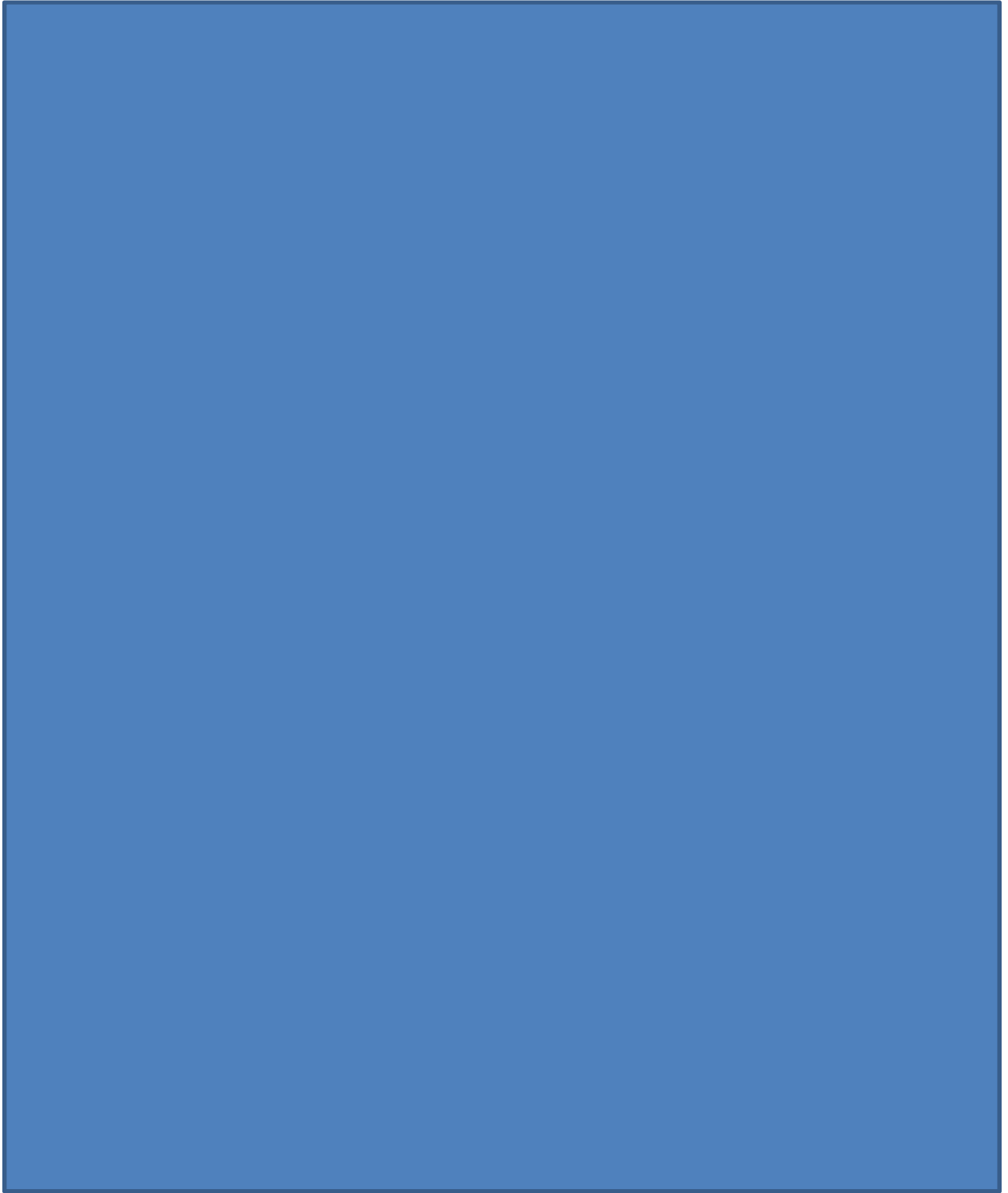
Appendices

1. Action plan summary
2. Background Information
   - Engagement Results
   - Planning and Policy Context
   - Modes of Transport
   - Willoughby LGA in Context

References

[i] Willoughby City Council, Community Perception Survey 2018

[ii] Willoughby City Council, Community Strategic Plan: Our Future Willoughby 2028

[iii] The Concourse Research, Clarity Strategic Research, October 2018

[iv] Willoughby City Council engagement through local centres exhibition

[v] Willoughby City Council Community Wellbeing Survey 2019

[vi] Colliers International 2017, NSW Office Market Research Report 2017 (unpublished) *Component of Harbour CBD

[vii] Measuring the Australian Night Time Economy 2016–17, Ingenium Research, 2018

[viii] Aligning Movement and Place, Outline for understanding places in relation to movement infrastructure, Government Architect for New South Wales, 2019

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Liveable	Our transport system will support community needs while enabling development of places	9. Safety	9a	Lobby TfNSW for details outlining what supporting technology and infrastructure is needed to operate an automated shuttle within Willoughby LGA, how it interacts with other precinct users (pedestrians, cyclists, etc.) and how it integrates with the broader transport network. Further projects may flow from this action	Short	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1a	Lobby TfNSW for development and implementation of trial on the use of electric autonomous buses into and out of the Chatswood CBD. This is the highest priority action for accessibility strategy. Several major factors will impact on the delivery of this action including: - State Government support - legislation changes - power supply provision (it is TfNSW's intent to implement trial of electric automated buses. Power supply is a major factor impacting on trial of electric automated buses/vehicles and will need to be considered as part of any implementation process). Further projects may flow from this action	Short	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4b	In conjunction with State Government (TfNSW), undertake study that investigates technology, infrastructure and policy requirements for use of drone technology with the view to applying in high traffic and pedestrian use areas. Further projects may flow from this action.	Medium	Further funding required
Effective and Accountable	Our transport system will align to ours and State Government strategies and respond to customers needs	8. Regulation	8a	Lobby State and Federal Government Agencies for Working Group to be set up, incorporating representatives of all Greater Sydney Councils, including Willoughby, to review all proposed new and/or changes to traffic and transport legislation. Further projects may flow from this action.	Short	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7a	Revise Part C.4 'Transport Requirements for Development of Council's Development Control Plan (DCP) to include the following conditions relating to new developments: - reduce provision of car parking - reduce car parking rates to 0.5 spaces per dwelling within 200m of a railway station - increase provision of car share spaces - Increase bicycle and end of trip facilities - provide infrastructure for electric vehicles - autonomous vehicle drop-off/pick up points	Short	Further funding required

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4c	Lobby TfNSW for improved and increased state infrastructure including: - rapid bus link connecting Willoughby LGA to the Northern Beaches with a terminus at Chatswood (Dee Why to Chatswood) - Encouraging increased district / regional bus trips through the provision of enhanced safe bus network and facilities - Relocating bus stops to areas better aligned to cater for access and mobility issues - increasing loop bus program to include a high frequency bus service between Chatswood, Northbridge and St Leonards - undertake feasibility study on double decker buses on key routes and explore infrastructure requirements / issues - implement enhanced bus interchange and wayfinding and directional signage - implementation of smaller buses to service remote areas and streets with narow access within the LGA as identified under Council's Movement and place Framework. - implement loop bus sytem to operate across the LGA Further projects may flow from this action.	Short	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2a	Develop east-west green connection plans for walking and cycling, linking all open space assets. The actions of the plan are to include identification of all land acquisition, program development, construction costs, time frames and GIS mapping details.	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4d	Complete study and develop priority actions that: - provide appropriate level of car share spaces in CBD and Local Town Centre areas - provide appropriate level of taxi/uber spaces in CBD and Local Town Centre areas - restricts tonnage limits on local roads to reduce through traffic by heavy vehicles	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	5. Environment/Sustainability	5a	Undertake review of both on and off-street parking rates within Chatswood CBD, as part of fees and charges schedule, to incentivise EV, off peak utilisation, car sharing facilities at existing and proposed electric vehicle charging stations.	Short	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	5. Environment/Sustainability	5b	Ensure green power offsets are purchased for electric vehicle charging as well as completing investigations into solar power generation for electric vehicle charging stations as well as for vehicles.	Medium	Further funding required

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4e	Review key travel pattern objectives and outcomes outlined in Willoughby Economic Development Study and develop formal innovative Parking Management Plans, which includes parking pricing, for Chatswood CBD and St Leonarsd strategic centres utilising information contained in Street Parking Strategy and off-street parking locations.	Medium	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2b	Develop and Implement enhanced safe pedestrian network plan that encourages district / regional walking trips through the provision of: - pedestrian weather shelters on key high pedestrian activity streets in CBD and Local centres - Increased footpath linkages and lighting (Zone 1) - Development of pedestrian overhead bridge plans for key priority routes - Implementation of actions as outlined in Chatswood CBD PAMP - new pedestrian link between Chatswood interchange and new plaza on Help St - aligning crossings and removing obstacles to connectivity - Pedestrian crossing improvements at Albert Avenue / Thomas Lane, Chatswood - Footpath infrastructure improvements along Pacific Highway through St Leonards and Chatswood - PAMP for Sailors Bay Road and Willoughby Road	Long	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2c	Encourage district / regional cycling trips through the implementation of priority actions for enhanced safe bike network and facilities as outlined in Council's Bike Plan including: - Increase kms of bike paths and bicycle lanes through the implementation of various secondary bicycle infrastructure projects - Increase footpaths, bike racks and drink stations within the CBD and Town centres - explore foldaway bikes / scooters scheme	Long	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2i	Encourage district / regional cycling trips through the implementation of priority actions for enhanced safe bike network and facilities as outlined in Council's Bike Plan including: Design and implementation of the Chatswood to St Leonards shared path along the Pacific Highway	Long	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2j	Encourage district / regional cycling trips through the implementation of priority actions for enhanced safe bike network and facilities as outlined in Council's Bike Plan including: Design and implementation of the Castle Cove to High Street shared paths and bike paths.	Long	Further funding required

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2k	Encourage district / regional cycling trips through the implementation of priority actions for enhanced safe bike network and facilities as outlined in Council's Bike Plan including: Design and planning of the Chatswood to St Leonards bike path via Artarmon. Construction funding of $6.0M potentially 100% funded by TfNSW.	Medium	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2l	Encourage district / regional cycling trips through the implementation of priority actions for enhanced safe bike network and facilities as outlined in Council's Bike Plan including: Plan and investigate for the development of a shared path from Chatswood to St Leonards within the rail corridor.	Medium	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7b	Implement driver awareness/education programs that encourage drivers within the Chatswood CBD to utilise real time digital inventory of on-street parking supply and information that can better inf orm drivers of the location and availability of car parking spaces and any time/fee restrictions. This education program to align itself with the timing of implementation of parking guidance (technology) app.	Medium	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7c	Determine the provision of and undertake assessment on feasibility and safety of exisiting and proposed designated accessible parking in Willoughby LGA in: - Retail Activity Centres - Residential Areas	Medium	Further funding required
Liveable	Our transport system will support community needs while enabling development of places	6. Place Development	6a	Deliver multi-modal transport plans for recreational venues including: - Willoughby Park - Bicentennial Reserve Oval - provision of a shuttle bus for workers from outside the Chatswood CBD - provision of shuttle bus workers from CBD to Artarmon Industrial Area - Lane Cove National Park	Long	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	6. Place Development	1b	Incorporate the principles of the Government Architect NSW and TfNSW Movement and Place framework into future Council capital works roads programs	Long	Further funding required

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1c	Develop and Implement priority Active Transport plan and actions which include: - creation of mobile app highlighting locations, modes and connections for all active transport modes in Willoughby LGA. - Deliver annual marketing and education campaign on active and public transport options - Installation of signage across the city to encourage active transport routes throughout the LGA	Long	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4f	Investigate and prepare a report on the benefits of car share participation and car pooling	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4g	Lobby TfNSW for a bus route to be installed along Mowbray Road. Pending any consideration/approval for a bus route then consider through Council's Local Traffic Committee (LTC), a dedicated bus lane in peak hour times on Mowbray Road as a means of reducing congestion and encouraging greater use of public (bus) transport. Further projects may flow from this action.	Short	Funded
Liveable	Our transport system will support community needs while enabling development of places	9. Safety	9b	Complete study and develop priority actions that create 40km/h shared zones in high pedestrian areas within Chatswood CBD; Artarmon; St Leonards; Northbridge and High Street;	Short	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	3. Choice	3a	Implement trial of Mobility as a Service (MaaS) in Chatswood CBD in conjunction with the program currently being trialled by TfNSW across Sydney. Trial to take into consideration walking, cycling, taking the bus, catching the train, driving, riding as a passenger, taxi, renting a car, carsharing, bikesharing, ridesharing, ridesourcing.	Medium	Further funding required
Liveable	Our transport system will support community needs while enabling development of places	9. Safety	9c	Develop and Deliver priority Local Road Safety Action Plan actions including: - Road safety audit plan for Archer Street between Mowbray Street and Boundary Street - Develop and Implement an annual Transport Operations Performance Report by monitoring transport performance using throughput and service data such as road safety infrastructure measures and road safety technology intiatives.	Short	Further funding required
Liveable	Our transport system will support community needs while enabling development of places	6. Place Development	6b	Lobby TfNSW to implement use of public buses fitted with bike loading racks.	Short	Funded

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1d	Install new bus shelters on high priority local road routes linking Chatswood, Artarmon, St Leonards and Northbridge in Council's Annual Capital Works program over the next 5 years.	Long	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4h	In conjunction with the State Government (TfNSW), undertake a study that highlights the cost and benefits of implementing wi-fi roll out at technology kiosks and at key transport nodes. Further projects may flow from this action.	Long	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4i	Lobby TfNSW to investigate expanding peak am and pm tidal flow on Pacific Highway north of Albert Avenue to Boundary Street. Further projects may flow from this action.	Short	Funded
Green	Our transport system will be sustainable and minimise negative impacts on the environment	5. Environment/Sustainability	5c	Implement 2 electric vehicle charging stations (which address public safety issues) both on-street and in public car parks per year with the following locations listed for 2020/21: - McIntosh Street and Brown Street , Chatswood.	Short	Further funding required
Effective and Accountable	Our transport system will align to ours and State Government strategies and respond to customers needs	8. Regulation	8b	Revision of schedule of works program for Voluntary Planning Agreement policy to incorporate sustainable active and public transport options	Medium	Funded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2d	Work with Sydney Trains to enable and install end-of-trip facilities incorporating secure bicycle parking at the following locations: - Artarmon Streetscape upgrade - Hampden Road - Willoughby Park - Bicentennial Park	Long	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4j	Lobby TfNSW to consider improving traffic flow by: - All traffic lights on non-state roads turned off / amber between the hours of 11pm and 4am - Reduce the number of lights or phasing of lights on Pacific Highway - turn off red arrows in low flow locations or at low flow periods. Further projects may flow from this action.	Short	Funded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1e	Develop and Implement Accessible Parking Space Policy and Guidelines	Medium	Funded

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Green	Our transport system will be sustainable and minimise negative impacts on the environment	5. Environment/Sustainability	5d	Develop a transport resilience plan to ensure transport system sustainability and resilience is undertaken as part of overarching LGA Traffic and Transport Studies. For a transportation system, resilience is the capability to recover from a disruption to an operational level similar to prior the disruption in a timely manner. The longer and deeper the impact of the disruption on operations, the less resilient a transport system is.	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4k	Lobby TfNSW for upgrades, including detailed designs, to Chatswood and St Leonards Transport Interchanges so that the interchanges continue to be premium multi-modal hubs, supporting journeys to local and regional destinations and increasing use of Public Transport. Further projects may flow from this action.	Long	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7d	Determine priority actions based on Street Parking Study recommendations that determines whether any increase in parking supply in CBD and Local Centres only is warranted; with the objective that any existing and future on and off road car parking is managed in a way that sustains and enhances the economic and environmental qualities of Willoughby.	Long	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7e	Implement parking guidance system consisting of variable message boards across the Chatswood CBD to guide parking to off-street carparking stations.	Medium	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and support our future growth	7. Parking	7f	Undertake a review of fees and charges for on-street parking prices in Chatswood CBD that enables off-street parking to become a more attractive option for motorists and encourages freer flow of traffic on street and regular turnover of vehicles.	Medium	Funded

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4l	Develop and complete priority actions highlighted in Chatswood CBD Study which include: - converting the eastbound traffic lane of Victoria Ave to a bus lane (i.e. bus, taxi, motorcycle and cyclist permitted) between Anderson Street and Archer Street - converting the kerb side parking in Victoria Avenue, prior to Archer Street Eastbound, to a taxi zone - relocating the westbound bus stop in Victoria Avenue/Neridah Street intersection from the approach side to the departure side of the intersection - undertake studies investigation options of a short term by-pass of the CBD - undertake studies, in conjunction with TfNSW that review and optimise the Transport Interchange infrastructure; - liaise with Westfield Shopping Centre executive with regard to improving the operation and efficiency of the Westfield Shopping Centre car park on Victor Street;	Long	Further funding required
Prosperous and Vibrant	Our transport system will make life easier by utilising smart city technology and	7. Parking	7g	Undertake feasibility study of expanded commuter parking at Artarmon and advocate to the State Government for development.	Medium	Further funding required
Effective and Accountable	Our transport system will make life easier by utilising smart city technology and support our future growth	8. Regulation	8c	Undertake review of DCP to incorporate consent provision restricting heavy vehicle (freight) access in CBD and Local Town Centre areas during peak am and pm periods and the specification of maximum vehicle sizes.	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4m	Liaise with TfNSW on possible improvements to traffic flow on Pacific Highway by removing bus stops out of through traffic lanes and creating indented bus layby areas. Further projects may flow from this action.	Medium	Further funding required
Liveable	Our transport system will support community needs while enabling development of places	9. Safety	9d	Continue the development and implementation of annual road safety education programs across the LGA relating specifically to: •Child Restraint Checking Days •Community Road Safety Presentations •Motorcycles •Pedestrians •Safety Outside Schools •School Zones •Seniors Road Safety •Speeding •Supervising Learner Drivers	Long	Funded

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	6. Place Development	1f	Develop: - Movement and Place Local Area Plans for all Local Town Centres; Chatswood CBD and St Leonards Strategic Centre, and - Vibrant Street Corridor Plans for Willoughby Road, Penshurst Street and Sailors Bay Road incorporating the movement and place framework, balancing the amenity of the street with the need for traffic movement; both which incorporate the principles aligned with Government Architect NSW and TfNSW Council's Movement and Place framework.	Medium	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1g	Set out minimum objectives and standards for the provision of parking for people with disablities	Medium	Funded
Effective and Accountable	Our transport system will align to ours and State Government strategies and respond to customers needs	8. Regulation	8d	Develop and Implement a GIS land use plan and development application monitoring and reporting system to track the locations and size of transport changes impacting on land use in Willoughby LGA.	Medium	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4n	Lobby TfNSW for the provision of: - Dedicated bus lanes in peak hour times on Eastern Valley Way - Creation of bus only traffic lanes at all dedicated signals on Pacific Highway Further projects may flow from this action.	Short	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1h	Complete all actions associated with dedication of road widening at Pacific Highway and Mowbray road at the dive site	Short	Funded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2e	Lobby TfNSW to address barriers to walking and cycling caused by major transport corridors such as the Pacific Highway, Gore Hill Freeway and North Shore Rail Line, with request to provide specific details on what locations, actions proposed, likely cost and estimated time frame.	Short	Funded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2f	Complete study and develop priority actions that highlight the feasibility of widening all footpaths listed in Council's Annual Footpath Plan priority list to 1.8m to better cater for mobility scooters, disabled access. Further projects may flow from this action.	Long	Further funding required
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	1. Accessibility	1i	Lobby TfNSW to bring mobility/disabled parking and motorcycle parking on footpath restrictions in line with other States. The main factor being fee exemption but time restricted. Further projects may flow from this action.	Short	Funded

CSP	Transport Strategic Direction	Transport Strategy	Action Reference Number	Action	Time Frame	Funded / Unfunded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2g	Develop program of infrastructure, incorporating drink stations, toilets, rest stop areas and lighting for all Footpath capital works projects on key routes listed in Council's 4 year capital works program .	Medium	Further funding required
Liveable	Our transport system will support community needs while enabling development of places	9. Safety	9e	Prepare report on feasibility of having CCTV cameras installed within the road reserve on designated streets within Chatswood CBD	Short	Further funding required
Green	Our transport system will be sustainable and minimise negative impacts on the environment	4. Congestion	4i	Lobby TfNSW to incorporate upgraded traffic control sensor systems and pedestrian count down timers on all traffic signals installed within Willoughby LGA. Further projects may flow from this action.	Short	Funded
Connected and Inclusive	Our transport system will link our people from CBD to the local centres and villages and provide alternate choices for all	2. Active Transport	2h	Prepare report on feasibility of all Council vehicle fleet to become Electric Vehciles, this could include a mix of fully electric vehiclse and hybrid heavy fleet, plant and equipment.	Long	Further funding required

Integrated Transport Strategy 2019

Attachments

DRAFT FOR PUBLIC EXHIBITION

Contents

Attachment 1:

Engagement Results

The community have told us their feedback on transport related matters through a variety of surveys or through the consultation and development process of various documents. The most relevant results are highlighted below.

1.1 Surveys

Community Strategic Plan (Our Future Willoughby 2028)
Very strong support received for the Community Priorities around traffic, transport and parking.

Transport issues emerged clearly through the development of the CSP from the community. Two of the outcomes focus heavily on improved transport and traffic issues:

A City that is Connected and Inclusive (Outcome 2)
- Enhance transport choices and connections throughout the city.
- Reduce parking and traffic congestion.

A City that is liveable (Outcome 3)
- Foster feelings of safety, security and cleanliness.
- Promote an active and healthy lifestyle.
- Improve access to digital services in public places.

93.7% of 175 respondents Strongly Agreed or Agreed with the Community Priority 2.1 Enhance transport choices and connections throughout the City.
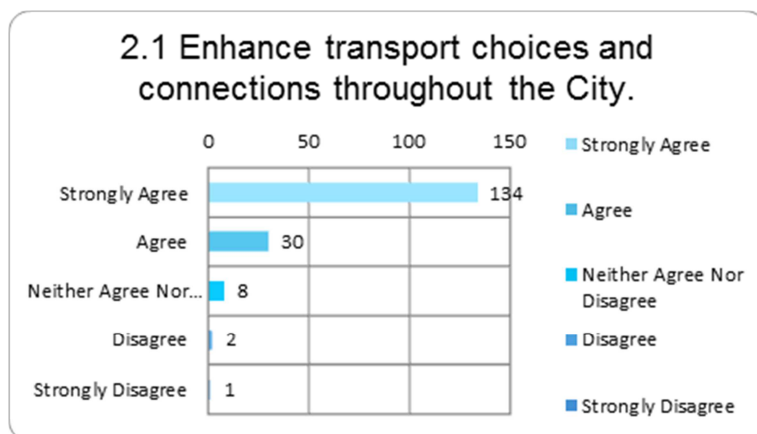
92.5% of 173 respondents Strongly Agreed or Agreed with the Community Priority 2.4 Reduce parking and traffic congestion
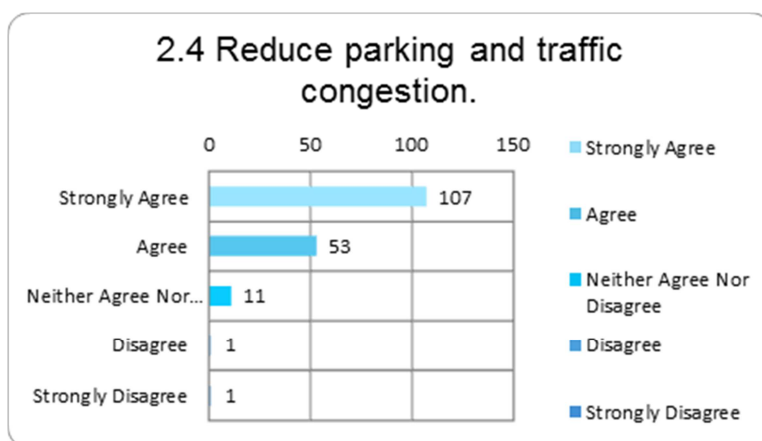
Community Perception Survey 2018

Traffic and parking emerged as the main negatives with living in the Willoughby area.

The service areas with the lowest perception ratings were:
- Management of local traffic flow (31% poor/very poor).
- Providing parking facilities (27% poor/very poor).

Sample comments:
- "the best way to reduce on-street parking and traffic congestion must surely be more underground parking throughout the area"
- "Increase amount of connected bike paths into Chatswood CBD to reduce amount of traffic into Chatswood CBD."
- "The current methodology must change by removing all parking along these arterial roads and fully focus on making public transport the number one mode of transport."
- "More bicycle paths need to be provided. There are some but for many journeys there is just not a safe bicycle route."
- "Our city has become overcrowded and congested."
- "Public transport at night should be improved."
- "Transport links that are speedy and reliable are a key to a thriving city."
- "Permits discriminate families whose dependent children also have cars"

Community Wellbeing Survey (2019)

Across survey respondents, 97% felt safe walking alone in their local area during the day and 76% at night. Female and older residents felt significantly less safe than men walking around their local area at night 'What do you believe would need to change in order for you to feel more connected to or engaged in your local area?' 5% of the 178 who wanted a change said improved transport was a reason.

When asked 'Are you considering moving out of the Willoughby area in the next five years or so?' Of those who responded No (61% of respondents), 5% said it was because of proximity to quality public transport. The biggest response was 28% with the rest being under 9%.
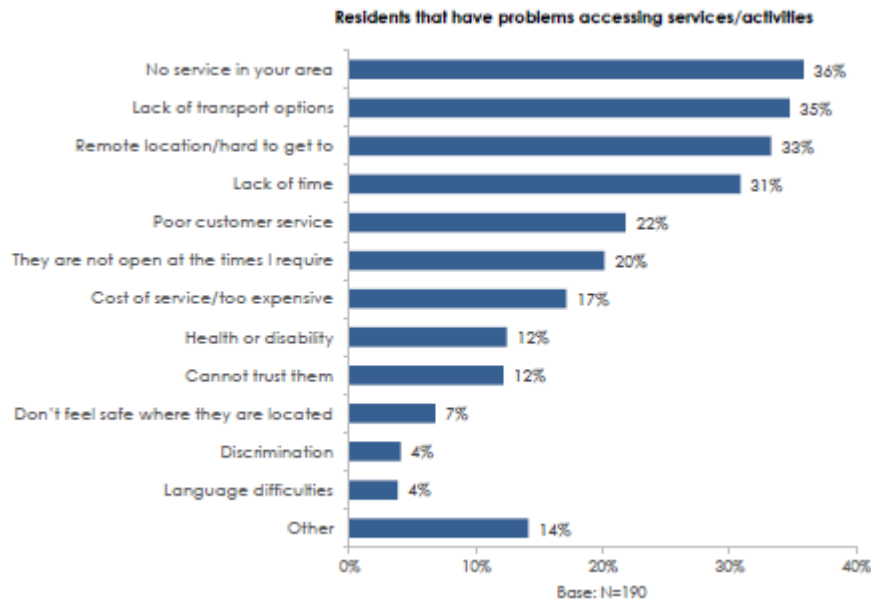
5% of residents do not have access to a car, neither their own nor someone else's in their household. The likelihood of having access to a car decreased with age. If a car was not available, the most common alternative transport method was a bus or train. 8% of residents stated they would not have a suitable transport option to access health services and government services.

'Are there non-car transport options you could realistically use to get to the following locations? If yes, what non-car transport options would you use? How?'
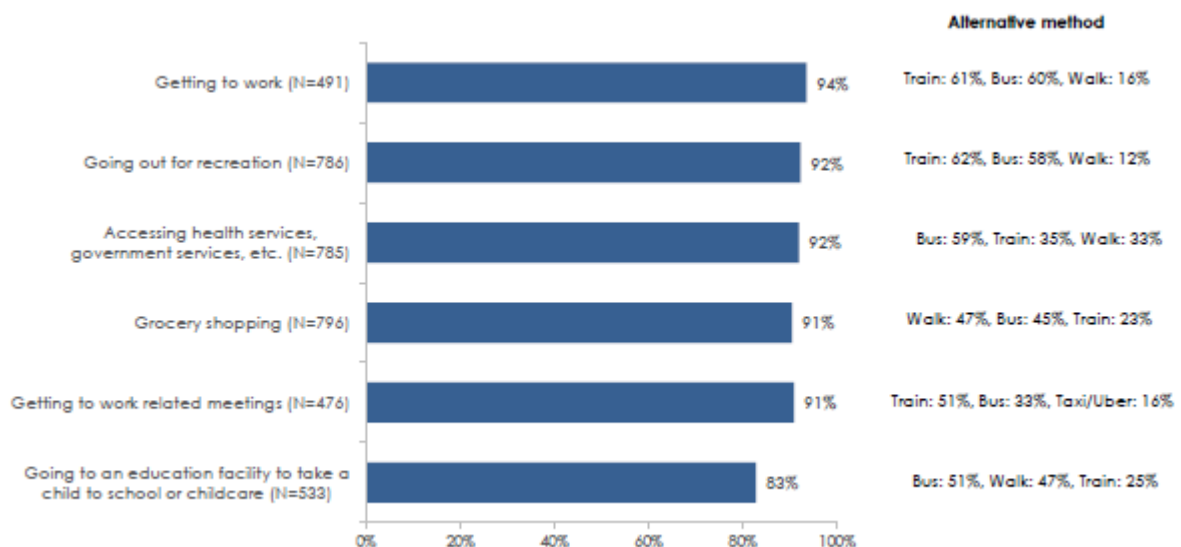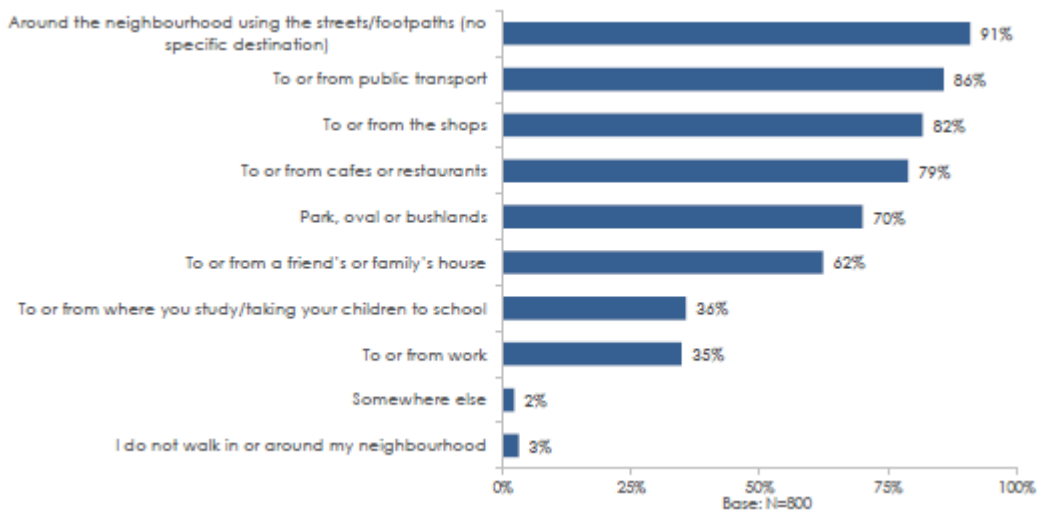
The most dominant reasons for having problems accessing services/activities was a general lack of services and transport options in the area, along with locations that are difficult to get to.

'You mentioned that you have problems accessing one or more services or activities. Which, if any, of the following explain why you have problems accessing those services?'

Residents that have problems accessing services/activities

Reason	%
No service in your area	36%
Lack of transport options	35%
Remote location/hard to get to	33%
Lack of time	31%
Poor customer service	22%
They are not open at the times I require	20%
Cost of service/too expensive	17%
Health or disability	12%
Cannot trust them	12%
Don't feel safe where they are located	7%
Discrimination	4%
Language difficulties	4%
Other	14%

Base: N=190

'Which, if any, of these places in or around your neighbourhood do you walk to or through in a usual week?'

Place	%
Around the neighbourhood using the streets/footpaths (no specific destination)	91%
To or from public transport	86%
To or from the shops	82%
To or from cafes or restaurants	79%
Park, oval or bushlands	70%
To or from a friend's or family's house	62%
To or from where you study/taking your children to school	36%
To or from work	35%
Somewhere else	2%
I do not walk in or around my neighbourhood	3%

Base: N=800

1.2 Documents

Disability Inclusion Action Plan

The Disability Inclusion Action Plan process identified particular issues related to transport including:
- Advocate for improved access and inclusion outcomes in policy settings
- Collaborate with Transport for NSW for improved transport equity, including Community Transport options, within the Willoughby LGA.
- Council owned premises, paths and open space are barrier free and inclusive of people with disability where the site allows.
- Review the Footpath Policy to identify assessment processes for upgrade works, footpath furniture guidelines to ensure consistent clear paths of travel, tactile indictor placement, pram ramp grade compliance and vegetation placement.
- Review audit of bus stops to identify access features and barriers in line with the Disability Standards for Accessible Public Transport.
- Continue to conduct an awareness campaign for cyclists for safe use of shared pathways.
- Facilitate access to local community transport services which enable people with a disability to participate in Willoughby community.
- Ensure that accessibility is a key criterion in Council's community transport services.
- Promote and support other accessible and affordable transport providers for local people.

Our Green City Plan 2028

The Our Green City Plan consultation identified specific transport issues focused on:
- Reduce the greenhouse gas emissions associated with transport.
- Increased dedicated bike infrastructure.
- Access to public transport.
- Car share.
- Electric vehicle charging stations.
- Traffic management to reduce delays and stop/ start conditions.

Chatswood CBD Planning and Urban Design Strategy to 2036

Identified that a balanced approach will be adopted, with travel demand management at its core to address future transport needs in line with growth while ensuring sustainable outcomes for Chatswood. A Transport Strategy to support the Chatswood CBD Strategy would:
- encourage public transport use;
- promote walking and cycling;
- manage growth in parking; and,
- Develop parking directional signage.

Local Centres Strategy to 2036 (Draft)

Feedback throughout the development of the Draft Local Centres Strategy has identified desire for:
- improved cycling opportunities;
- better management of parking and local traffic; and,
- promoting local centres as a focus for local shopping (hence reducing travelling further distance) and promoting active transport.

Attachment 2:

Planning and Policy Context

2.1 Council Policy Context

Community Strategic Plan – Our Future Willoughby 2028

The Community Strategic Plan (CSP) identifies the vision the community has for Willoughby LGA, as *'Willoughby's diversity underpins our liveable and prosperous City'*. The document identifies a number of outcomes and priorities, some of which are transport focused or have an impact on transport.

There is a focus on sustainable transport options, greater connections, reduced parking and traffic congestion and better access. Along with priorities to improve the economy, balancing assets and development and maintaining a positive quality of life, which all can be influenced by the transport system and services on offer. Operational Plan and Delivery Program

In response to the CSP, Council develops an annual plan and four year program. Within these documents there are a number of transport orientated projects highlighting modal infrastructure improvements and planning studies

Other Council Plans and Strategies

Willoughby Bike Plan (and subsequent review 2017)
The Bike Plan provides a plan for the provision of cycling infrastructure and facilities throughout the LGA. The overall goal is to respond to the needs of the community and encourage greater cycling participation in Willoughby and to ensure that cycling is a viable, safe and attractive transport option. The Bike Plan will provide a total of 25kms of new bike paths across the City.

Willoughby City Council Street Parking Strategy 2017
The Street Parking Strategy sets out an evidence based approach to where and when pricing and time restrictions need to be introduced or adjusted based on the particular land use activities of the different suburbs and neighbourhoods.

The Street Parking Strategy provides a flexible, responsive and consistent approach to the management of available street space for parking of private motor vehicles, delivery vehicles, taxis, car share vehicles, bicycles and motorcycles. The intent is to retain, optimise and increase turnover of available street space for parking, for the maximum benefit of all parking user groups.

The implementation for actions are categorised into short (1-3 years), medium (3-5 years) and long term (5 years +).

Pedestrian Access Mobility Plan (PAMP)
A PAMP provides a framework for developing pedestrian routes or areas identified by the community as important for enhanced, sustainable safety, convenience and mobility. PAMPs can provide wide transportation, environmental and social benefits to the community, such as: more appropriate pedestrian facilities, especially in busy areas; improved access for mobility-impaired groups in the community, including older persons; safe and convenient crossing opportunities on major roads; reduced injuries to pedestrians; links with other transport services to achieve an integrated land use and transport facilities network; integration with planning instruments (e.g. Council's planning documents); links with existing vulnerable road user plans such as bike plans, maintenance programs and accessible public transport and meeting the special event needs of pedestrians.

Council has developed a PAMP for the Chatswood CBD, completed 2019, and is in the process of completing additional PAMPs for Willoughby Road between Gore Hill Freeway, Naremburn and Chandos Street, St Leonards; Sailors Bay Road between Alpha Road Willoughby and Kameruka Road, Northbridge; Victoria Ave at the intersection with Bertram St, Chatswood and Victoria Ave at the intersection with Anderson St, Chatswood.

Disability Inclusion Action Plan 2017 - 2021
Respondents to an online survey for the DIAP identified more public / private transport options in the top seven priorities for Council in addressing access and inclusion issues. This Plan identified a focus on public transport and bike paths, shared paths and footpaths to improve access and for Council to improve accessible transport options for the community.

Our Green City Plan 2028
This Plan also responds to the community priorities required to achieve the *Green City* outcomes of Our Future Willoughby 2028. It builds on the Sustainability Action Plan 2014-18 and present how we will achieve environment protection for, and with, our community.

It is recognised that transport has a significant and direct impact on the environment, including on local air quality, noise levels, water quality, biodiversity and greenhouse gas emissions. The Green City Strategy identifies a range of actions that will be undertaken by 2028 with a focus on electric cars, increasing bike paths and cyclists.

Planning Instruments

Planning and land use strategies aim to provide a broad direction for the future growth and development of the local government area. Council has a number of strategies and plans adopted in development that influence and support the way Council is planning for and managing transport across the City.

Local Environmental Plan 2012 (LEP)
The LEP provides the statutory framework for land use planning within the area. It is made up of a written instrument and maps and allocates land for specific purposes through zoning and development controls.

Development Control Plan (DCP)
The DCP supports the LEP and details the guidelines and environmental controls to guide development. The aim of the Transport Chapter (C4) is to provide safe, efficient and convenient traffic solutions that minimise the adverse environmental effects and sustains and enhances the economic and environmental qualities of Willoughby. It also stipulates the requirements regarding car parking in developments after consideration of traffic volumes, environmental impacts and the impact of not providing the parking.

The Transport DCP is currently under review and will be completed by September 2019.
Strategic Planning Documents

DRAFT Willoughby Local Centres Strategy to 2036
The draft Willoughby Local Centres Strategy aims to promote a network of thriving, attractive and distinctive neighbourhood throughout the Council Area. It provides the framework for future planning controls and public domain improvements for 8 local centres (with Willoughby South was added to the original 7 centres as a result of community feedback, and the potential for a further centre in the area west of the Pacific Highway) to prepare them for growth and renewal over the next 20 years. Council adopted a Local Centres Position Statement and established a set of Principles, some of which focused on pedestrian and cycle links.

Local centres include: Artarmon, Northbridge, East Chatswood, Penshurst Street, High Street, Castlecrag and Naremburn (with Willoughby South and West Chatswood to be considered too).

Willoughby Economic Development Study 2016
This study reviewed the factors affecting the future growth and economic sustainability of its employment hubs with the intent to ensure Council's economic development policies and land use planning provisions: support the retention of existing employment and services in the LGA; assist in the achievement of the growth targets identified for the City by the State; and, cater for global and local trends as well as the land use requirements of modern businesses and the expectations of customers. It particularly highlighted the need to reduce Chatswood pressures and congestion by facilitating mixed use elsewhere and constraining traffic growth.

DRAFT Willoughby Housing Strategy To 2036
This Strategy is a 20 year plan to guide future housing in Willoughby LGA. It guides the quantity, location and type of future residential development. Specifically related to transport infrastructure, it highlights that planned areas for population growth have been identified because of their current proximity to public transport. Higher patronage of these services will be encouraged in order to reduce the number of car trips. Further studies are required to assist in guiding transport provision, including car use, parking provision and management, public transport, pedestrian and cycle use and links.

Chatswood CBD Planning and Urban Design Strategy to 2036
The Chatswood CBD Strategy aims to establish a strong framework to guide future private and public development as the CBD grows over the next 20 years. It aims to provide capacity for future growth, achieve exceptional design and a distinctive, resilient and vibrant CBD. A key principle identified in this Strategy is sustainable and active transport – A balanced approach will be adopted with travel demand management at its core to achieve more desirable transport, social, economic and environmental objectives and that future transport needs are in line with growth while ensuring sustainable outcomes for Chatswood.

DRAFT Willoughby Local Strategic Planning Statement (LSPS)
The Willoughby Local Strategic Planning Statement (LSPS) sets a 20-year vision with priorities and actions for land-use planning in the Willoughby Local Government Area. This vision considers the economic and social needs of the Willoughby community and how they will change in the future, as well as how to protect and improve Willoughby's natural environment. To achieve this, the LSPS addresses what should stay the same and what will need to change in Willoughby's housing, centres and environment in response to local, metropolitan, national and global challenges and trends.

2.2 Regional and State Context

Regional

Northern Sydney Regional Organisation of Councils
NSROC provides local government leadership for the area and works cooperatively and advocates on agreed regional positions and priorities for the benefit of the region. A key priority focus for 2018 - 2022 is Subregional Infrastructure (Transport, Social & Cultural) - 'To achieve priorities and directions on regional advocacy and improved urban planning and infrastructure for the future.'

Given the State Government plan and operate many of the public transport options within Willoughby and across Sydney, it is essential that Council understand their future planning approach and focus.

State Context

The Greater Sydney Region Plan, A Metropolis of Three Cities
This document from The Greater Sydney Commission provides a 40 year vision and actions for managing Greater Sydney's growth and advocates a 30 minute city where jobs, services and public spaces are within easy reach of people's homes. To meet the needs of the growing population, the vision seeks to transform Greater Sydney into a metropolis of three cities: The Western Parkland City; The Central River City; The Eastern Harbour City. Willoughby is located in the Eastern Harbour City, with a population of 2.4 million people in 2016 projected to grow to 3.3 million people by 2036.

The North District Plan
The North District Plan is a regional guide for implementing A Metropolis of Three Cities at the local level. The District Plan informs local strategic planning statements which set out the intended objectives of local environmental plans, the assessment of planning proposals as well as community strategic plans and policies. The District Plan provides planning priorities consistent with the Objectives of the Region Plan. The District Plan provides a 5 year Housing Supply target 2016-2021 of 1,250 for Willoughby Council.

Eastern Economic Corridor
The Eastern Economic Corridor from Macquarie Park to Sydney Airport contains close to one-third of Greater Sydney's jobs[13]. It has been established to enhance transport connectivity to and within the Eastern Economic Corridor and remove the barriers to investment and business in the strategic centres along the Corridor, which will strengthen Greater Sydney's global competitiveness.

Figure 16: A metropolis of three cities

St Leonards and Crows Nest 2036
The State Government is preparing a draft planning package for the St Leonards and Crows Nest Planned Precinct given the opportunity to rejuvenate this area with the new Metro Station being developed by 2024 in Crows Nest.

Future Transport 2056

Future Transport 2056 is a State Government overarching strategy, supported by a suite of plans to achieve a 40 year vision for the transport system. The vision is *'Transport is an enabler of economic and social activity and contributes to long term economic, social and environmental outcomes'*. The vision is built on six outcomes to guide investment, policy and reform and service provision: Customer Focused; Successful Places; A Strong Economy; Safety and Performance; Accessible Services; and Sustainability. These outcomes provide a framework for planning and investment aimed at harnessing rapid change and innovation to support a modern, innovative transport network.

With a focus on a metropolis of three cities, where people can access the jobs, education and services they need within 30 minutes by public or active transport. There is also significant future regional connectivity to assist in achieving this vision including the Northwest Metro, the proposed new tunnel from the Northern Beaches and North Connex. There is an opportunity to leverage off these projects and support improvements to the transport system in Willoughby.

Figure?: State Government's approach to the future of transport in NSW

Road Safety Plan 2021

Road Safety Plan 2021, a State Government plan that will focus on six priority areas to move towards achieving the NSW Government's State Priority Target to reduce fatalities by 30 per cent by 2021. Our aspirational long-term goal is zero trauma on the NSW road network.

- Saving lives on country roads
- Liveable and safe urban communities
- Using the roads safely
- Building a safer community culture
- New and proven vehicle technology
- Building a safe future.[1]

Council is obliged to work within this framework as we receive part funding for a Road Safety position.

---

[1] https://roadsafety.transport.nsw.gov.au/aboutthecentre/strategies/road-safety-plan-2021/index.html

Attachment 3:

Modes of Transport

3.1 Pedestrians

Willoughby LGA supports pedestrian access and provides 188kms of footpaths across the City. These footpaths are formed and have an ongoing program of works to improve the surface condition and meet access requirements.

Willoughby LGA	Length (metres)	Percentage
No footpaths	41 kms	18%
Footpath on one side of the road	44 kms	19%
Footpath on both sides of the road	144 kms	63%

Figure ? below highlights the location of the footpaths. Footpath infrastructure improvements are required across approximately 10% of the existing total network (planned over the next 10 years)

Figure?: Footpaths

Although there are many pedestrians in destinations such as key centres working and shopping, walking is usually the first and last mile of a journey and therefore in most cases there are other modes involved. Appropriate pedestrian access provides significant financial, environmental and health benefits. It is an important option for many, including children, elderly and the mobility impaired to access services.

The following needs to be considered:
- Safety and security of people utilising footpaths at all times.
- Illegal / undesirable use of footpaths e.g. bicycling without helmets leading to a reduction in safety and amenity.
- Managing competition for footpath use, bus shelters, outdoor dining, parking, place making.
- Strategic routes should be identified and crossing points facilitated by traffic signals, pedestrian crossings, central refuge islands and possible pedestrian fencing where needed for safety reasons.

Walkscore provides a walkability score for streets and neighbourhoods. Key suburbs have been assessed and scores are outlined in Figure ??.

| Walk Score®	Description
90–100	Walker's Paradise Daily errands do not require a car.
70–89	Very Walkable Most errands can be accomplished on foot.
50–69	Somewhat Walkable Some errands can be accomplished on foot.
25–49	Car-Dependent Most errands require a car.
0–24	Car-Dependent Almost all errands require a car.

Figure ?: Willoughby LGA Walkability scores
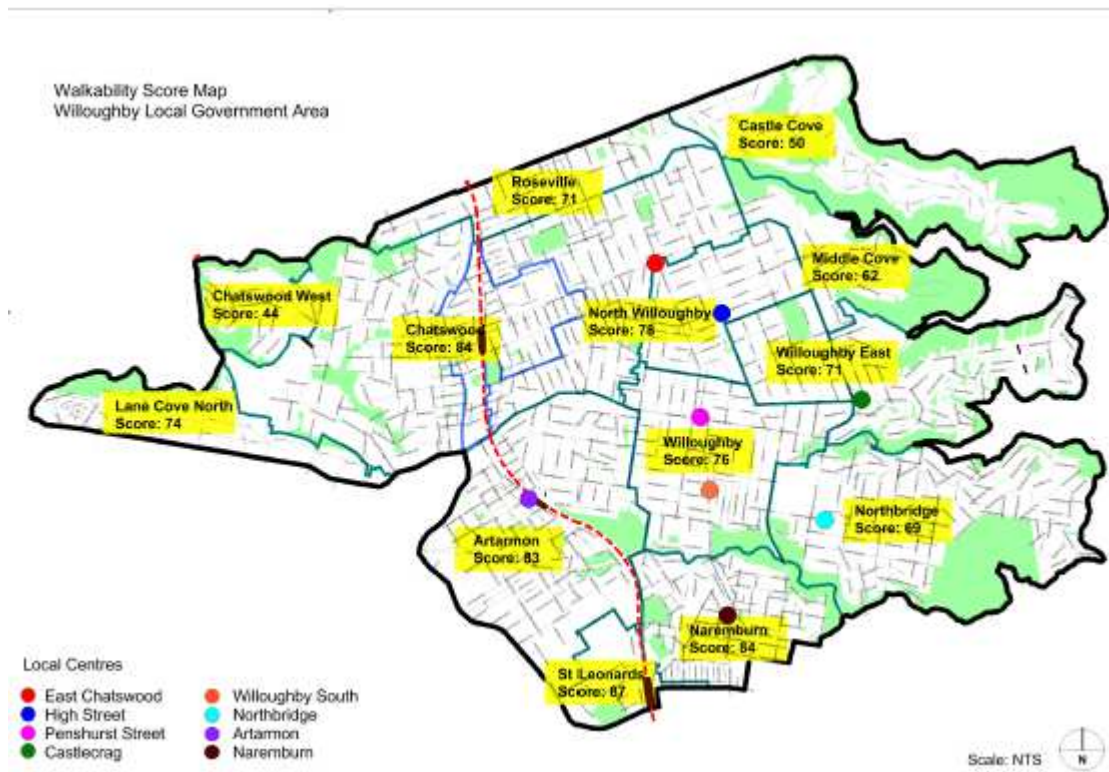
3.2 Bike Paths

Council has a ?? km bike path network which is independent of Council's existing footpath network, with another 13.1kms of new off road bicycle routes planned over the next 15 years. See Figure ?.

Council's adopted Bike Plan aims to increase cycling, reducing the impact of private motor vehicles on the region and promoting greater levels of community health.

The proposed infrastructure will provide much needed connections, storage facility and end of trip facilities throughout the City.   These works are planned and budgeted to be carried out over the next 15 years.

Figure ?: Willoughby LGA Bike Path Network
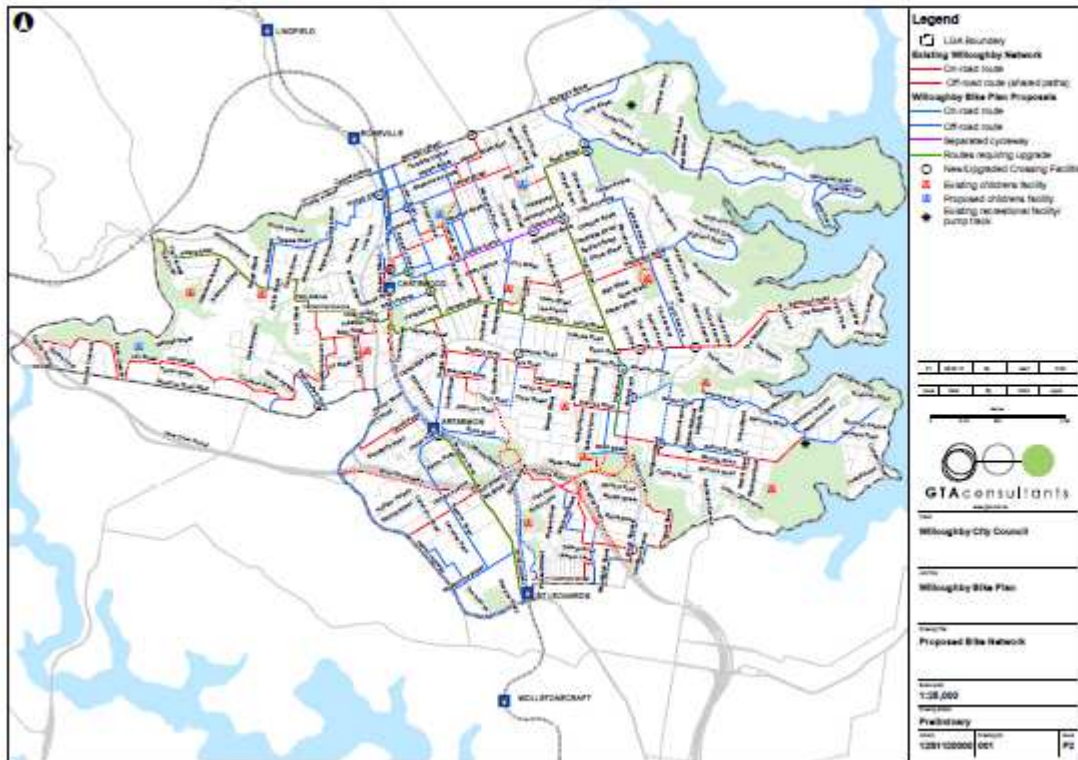
Bicycle racks are provided across the City:
* By Council in ?????.
* The State Government provides secure bicycle lockers for hire at Chatswood, St Leonards, and Artarmon train stations.
* Chatswood Chase provides secure bicycle parking within their car park with free public showers and lockers.

End of trip facilities (lockers, showers) are currently provided in ??? as well as a number of private development sites include these facilities for their workers.

Bike sharing has emerged in many cities as a convenient and cost-effective transport option for individuals, however some cities have also experienced challenges with abandonment of bikes. Council currently does not have any bike share programs within the LGA and there has previously been negative feedback of bikes being abandoned.

Bike share programs typically involve hiring a bicycle for a fee from an operator, which is either collected from a docking station or from the street (dock less bikes). Bike share operators and users must adhere to NSW road and cyclist rules and Council's Bikeshare Guidelines. Bike share programs are entirely managed by commercial operators, including: ??? not Council.

3.3 Bus Network

Willoughby has a significant bus network in comparison to many Sydney areas with 163 routes throughout the LGA, offered by both State Transit and private bus companies, see Figure x. These routes allow people within the LGA to access as far north as Elanora Heights, east to Manly and Bond Junction, south to Sydney CBD and west to Chatswood West.

The Chatswood Interchange is a significant bus destination, with 19 bus routes operating out of the Interchange alone, making this site one of the busiest in the region, with more than 30,000 people per day exiting/entering the Chatswood CBD interchange to utilise the bus / train network.

While there are reasonable bus connections to Chatswood via Willoughby Road, Penshurst Street and Victoria Ave (services 257, 343 and 340), these are through multiple routes, reducing the reliability of travel along this corridor. Connections east to Northbridge are indirect, slow and infrequent. From some parts of the Willoughby LGA it is substantially easier to get to the Sydney CBD by public transport than to Chatswood.

The low population densities, steep topography and narrow bands of development along the peninsulas of Castle Cove, Middle Cove, Castlecrag and Northbridge discourage the provision of high-frequency public transport. The size of the roads and road reserves will not be expanded, therefore other modes of transport or smaller buses will be required to provide services in this area.

Future planned enhancements to routes over the next four years include:
- E60 (Mona Vale to Chatswood).
- 144 (Manly to Chatswood).
- 292 (Lane Cove North to the City).
- 533 (Chatswood to Sydney Olympic Park).
- New turn up and go service between Dee Why and Chatswood.

> Cycling is a great way to keep fit, reduce your impact on the environment and is often a faster way to travel when compared to other modes of transport.

Service	Number of routes
Forest Coach Lines - School buses	20
Forest Coach Lines - Sydney Buses Network	15
Hillsbus - Sydney Buses Network	26
Port Stephens Coaches - Private coach services	1
State Transit - School buses	73
State Transit - Sydney Buses Network	45
Transdev NSW - Sydney Buses Network	3

Some of the challenges with buses include:
- Buses stopping on main roads and delaying other traffic.
- Bus layover and circulation issues particularly in the Chatswood CBD is an issue that impacts the buses, vehicles and pedestrians in and around the area.
- Regulations on entering the bus market may limit new providers.
- Bus stop queuing on footpaths.
- There is no spare capacity in the Chatswood Interchange (the bus station accessed from Orchard Road).

Figure xx Bus Operator Maps – Northern Beaches and Lower North Shore Network Map
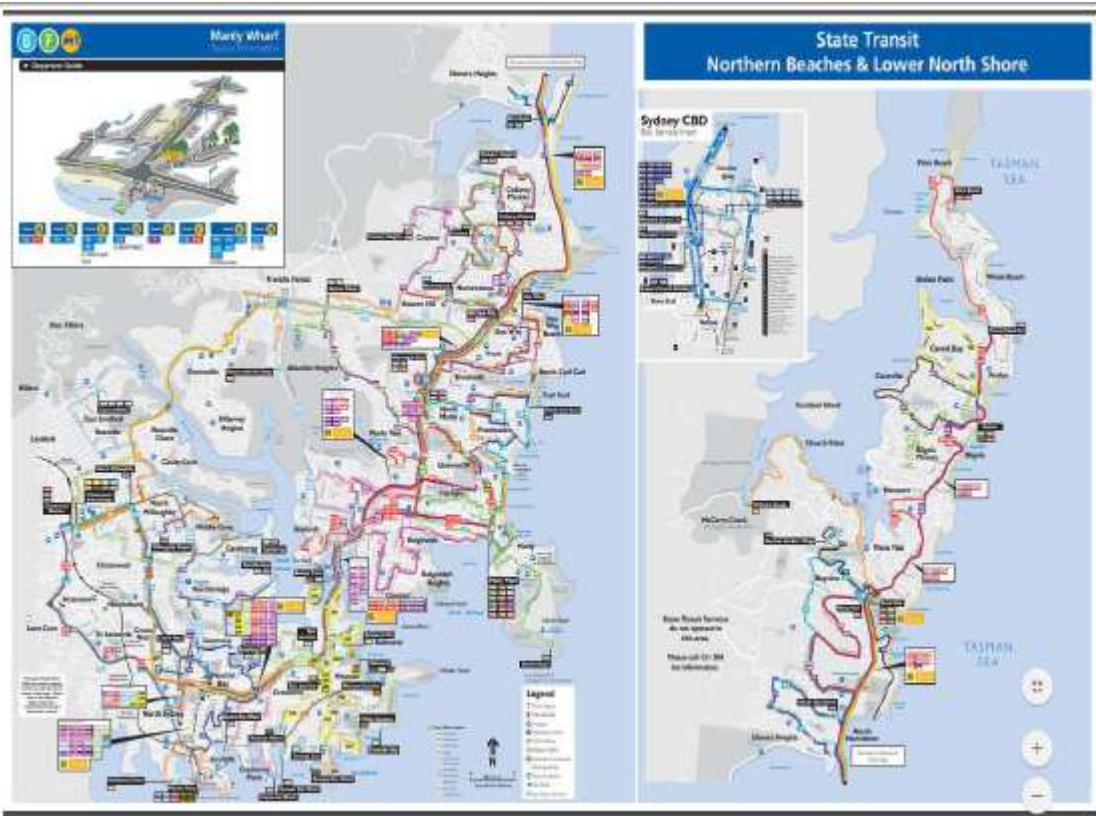
3.4 Train Network

Willoughby LGA has three train stations, Chatswood, Artarmon and St Leonards. Chatswood train station is part of the public transport interchange which also accommodates a significant bus terminal.

Chatswood's interchange is already a substantial transport hub in the metropolitan area providing direct connections to the Sydney CBD and other centres, including two major health and education precincts through its train services. Chatswood Station has the 4th largest 24 hour ins/outs (excluding individual Sydney CBD stations) and the third highest outside the Sydney CBD (2018).

Majority of users come from the Greater Sydney area.

The Chatswood to Sydenham component of Sydney Metro City & Southwest involves the construction and operation of a 15.5 kilometre metro line from Chatswood, under Sydney Harbour and through Sydney's CBD out to Sydenham. The time frame for completion is expected 2025.

Figure ?: Sydney Trains Network

Figure xx and Figure xx below show peak am and pm passenger loading on the North Shore line which incorporates Willoughby LGA and stations. As highlighted in the graph, Chatswood Station rates as one of the highest used stations in terms of patronage during the peak am and pm periods. The completion of the next stage of the Sydney Metro City & Southwest line by 2025 is expected to increase these numbers.

Figure ?: Progressive Passenger Loading on T1 North Shore, Northern and Western Line AM Peak North Shore Line
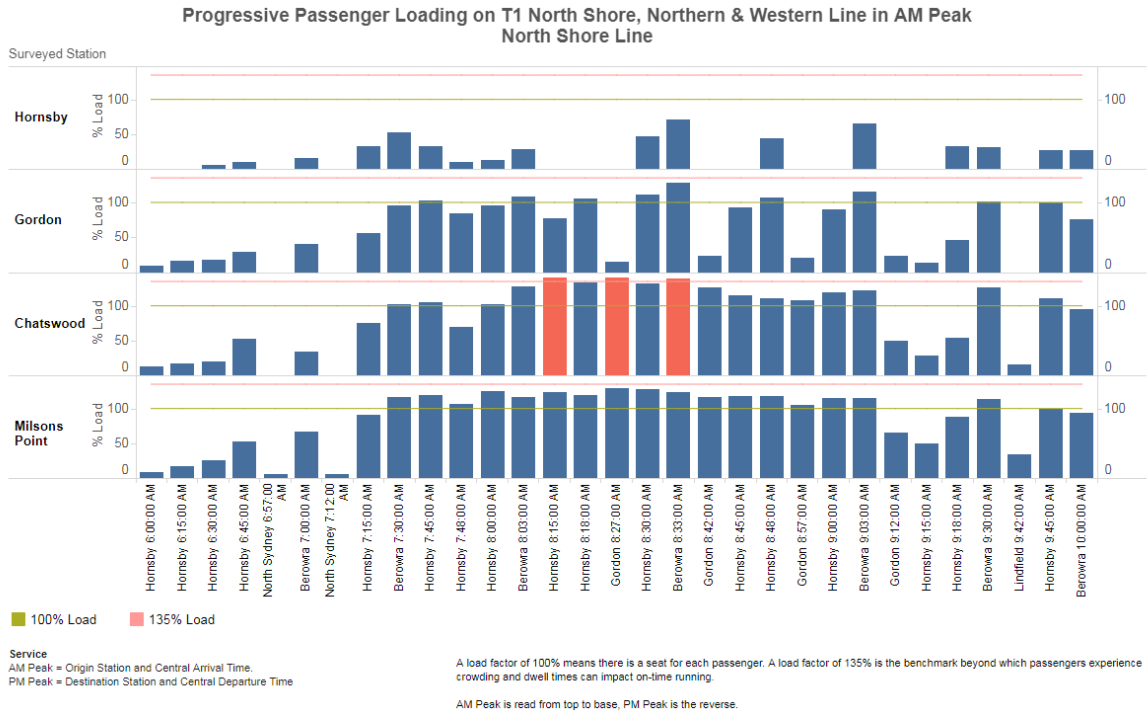

Figure ?: Progressive Passenger Loading on T1 North Shore, Northern and Western Line PM Peak North Shore Line
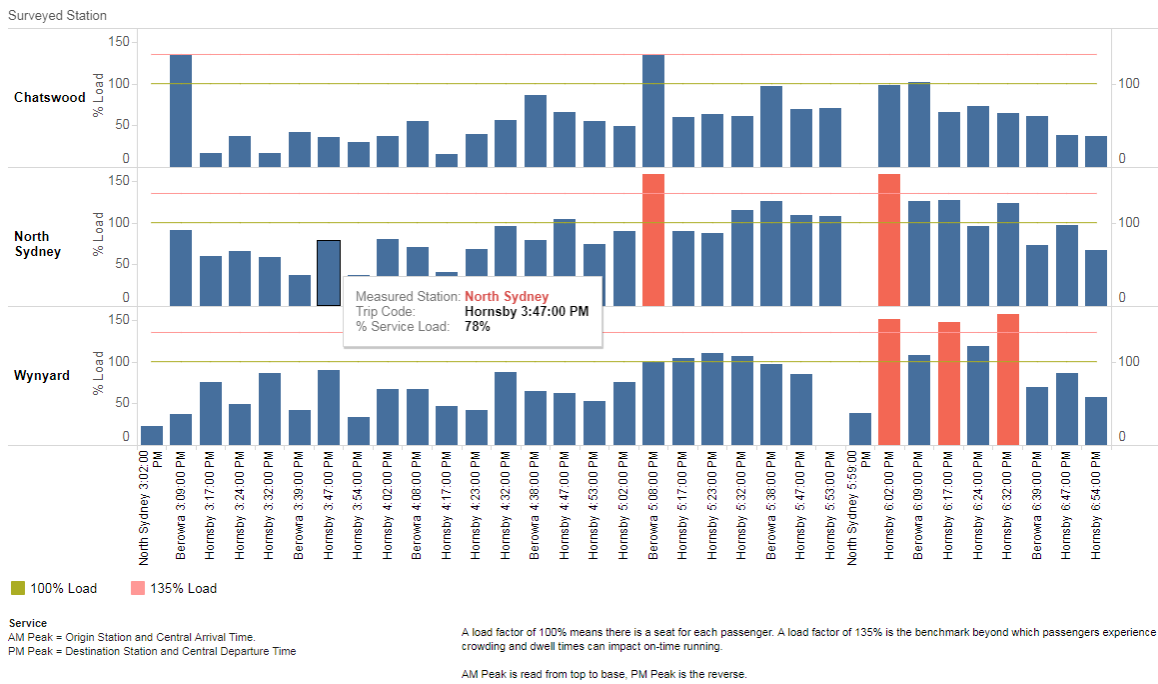
Figure <mark>xx and Figure xx</mark> below show passenger growth on NSW Stations over a 14 year period up to 2018. Chatswood Station has experienced over 20% increase in passenger numbers over this period. It is anticipated that given the additional services through Chatswood this trend will continue.

Figure<mark>?:</mark> Passenger growth on NSW stations from 2004 to 2012 (excluding CBC stations)

RANK	STATION	LINE	GROWTH
4	Macquarie University	Northern via Macquarie Park	8,820
5	North Sydney	North Shore	6,500
7	Chatswood	North Shore	4,920
8	Parramatta	Western	4,620
9	Rhodes	Northern via Strathfield	4,570
11	Hurstville	Illawarra	4,100
12	Mascot	Airport	3,700
13	Macquarie Park	Northern via Macquarie Park	3,390
14	Auburn	Western	3,270
15	Strathfield	Inner West	3,190

Figure<mark>?:</mark> Passenger growth on NSW stations from 2012 to 2018 (excluding CBC stations)

RANK	STATION	LINE	GROWTH
1	Town Hall	CBD	28,960
2	Wynyard	CBD	26,040
3	Central	CBD	25,180
4	Parramatta	Western	15,440
5	Mascot	Airport	10,420
6	Green Square	Airport	8,700
7	Redfern	CBD	8,050
8	Circular Quay	CBD	7,930
9	Bondi Junction	Eastern Suburbs	7,480
10	Chatswood	North Shore	6,330

3.5 Road

The road network has the most diversity of users including vehicles, pushbikes, car sharing services, taxis, buses and freight. It is made up of state, collector, and local roads and in Chatswood, includes the following major transport corridors:

- The Pacific Highway south of Albert Avenue, Chatswood.
- Victoria Avenue west of Penshurst Street.
- Willoughby Road.
- Strathallen Avenue.
- Penshurst Street south of Victoria Avenue.
- Sailors Bay Road.
- Eastern Valley Way.

Council is responsible for the care and control of approximately 211km of sealed roads, 15km of which are regional roads and the rest being local roads. The total replacement value of this road network is approximately $179.6M.

Road Classification and length	
Type of Roads	Total Length (kilometres)
Local	196
Regional	15
State	17

The Pacific Highway is a main road corridor which carries significant through traffic seven days a week and throughout the day. It creates a barrier for cross movement by vehicles and pedestrians as well as limiting the capacity for turning traffic in and out of the Chatswood CBD.

Albert Avenue and Help Street provide the key access road connections from the Pacific Highway with road underpasses of the railway corridor to the Chatswood CBD to the east of the railway line. From the east, primary road access is provided by Victoria Avenue and Archer Street.

The Chatswood CBD road system is heavily utilised seven days a week for access to the retail car parking.

Figure ?: Map of existing peak hour movements (date – ot's from the CBD strategy and there is no date / time ,,,unsure if still valuable)
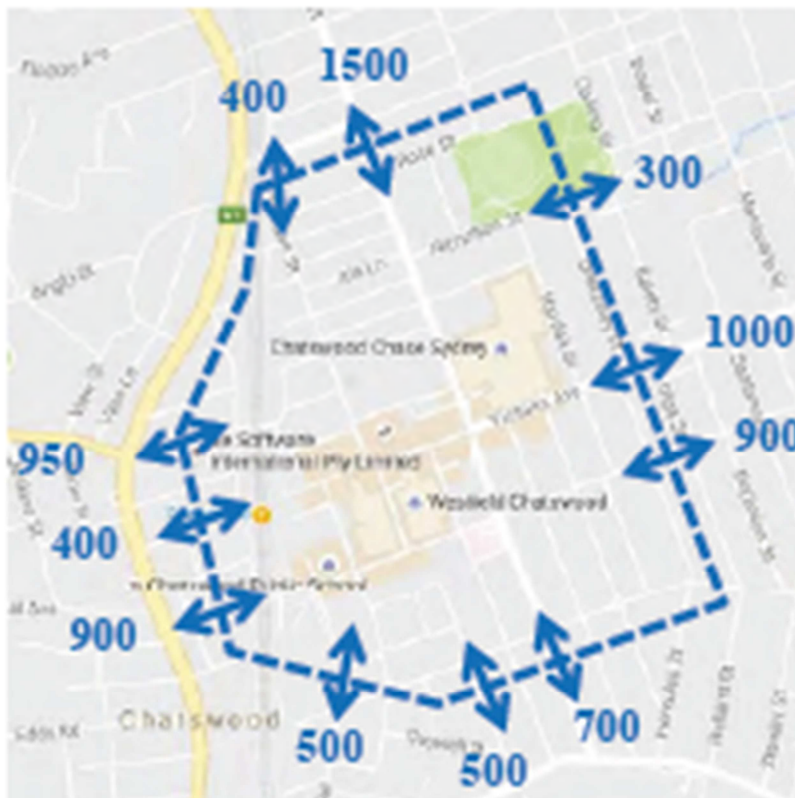
Based on visual and community feedback there are key pinch points across the City.

- Pacific Highway between Albert Street and Fullers Road, Fullers Road, Boundary Street, Victoria Avenue, Albert Street, Archer Street and Mowbray Road.
- Victoria Avenue and Penshurst Street.
- Mowbray Road and Penshurst Street.
- Willoughby Road and Penshurst Street.
- Centennial Avenue/Pacific Highway.
- Mowbray Road /Willoughby Road.

Figure?: Congestion points in the Willoughby LGA
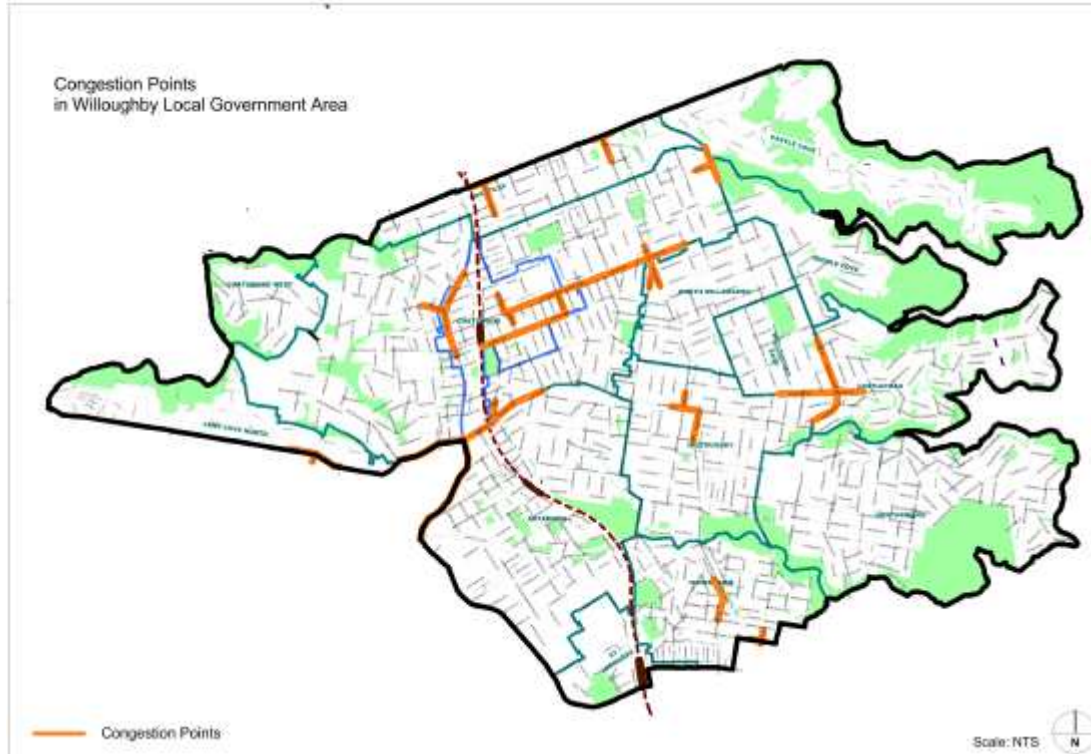
North Connex is a nine kilometre tunnel that will link the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills, removing around 5,000 trucks off Pennant Hills Road each day. There is no data on the impacts of the opening of the North Connex on the through traffic along the Pacific Highway.

There is a proposed new tunnel from the Northern Beaches, under Middle Harbour, connecting to: Gore Hill Freeway for travel between Manly and the Northern Beaches and Chatswood, Macquarie Park and North West Sydney Beaches.   The potential impact of this new infrastructure on Willoughby LGA is not yet known.

Attachment 4:

Transport Services

4.1 Overview of Current Transport Service Providers

Transport Service Providers					
Service Type	Motor Car	Train	Bus	Truck	Bicycle
Public	Nil	Transport for New South Wales / Sydney Trains Transport for New South Wales / Sydney Metro	State Transit Authority (Sydney Buses) Willoughby Council (Artarmon Loop and The Loop Services)	Nil	Nil
Private	Taxis (Various providers) Uber (private individuals) Hire Cars (Various providers), Car Share - GoGet, CarNextDoor	Nil	Forest Coach Lines, Transit Systems, CDC Hills Bus, Coach operators (Various providers), Gore Hill Business Park Shuttle Bus	Couriers (Various providers), Freight Deliverers (Various providers)	See note 1
Community	Out & About with Willoughby (Council Cab) At Home with Willoughby Dept. Veteran Affairs Uber ASSIST Your Side Leukaemia Foundation	Nil	Community Connect Transport The Loop Chatswood RSL Gore Hill Shuttle Bus	Nil	Nil

Note 1
ReddyGo was the only Shared Bicycle private operator with an agreement to operate in Willoughby LGA.
ReddyGo is no longer operating as a business.

4.2 Transport Data Framework for Willoughby LGA

Transport Service								
Data Types	Motor Car	Train	Bus	Truck	Bicycle	Pedestrian	Street Parking	Off-street parking
Volumes	Yes	Yes	Yes	Yes	Yes	Yes	-	-
Speeds	Yes	Yes	Yes	Yes	-	-	-	-
Classification	-	-	-	Yes	-	-	-	-
Occupancy	-	-	-	-	-	-	Yes	Yes
Origin – Destination	Yes	Yes	Yes	-	-	-	-	-
Crash	Yes	Yes	Yes	Yes	Yes	Yes	-	-
Patronage	-	Yes	Yes	-	-	-	-	-
Operator	-	Yes	Yes	-	-	-	-	-
Services	-	Yes	Yes	-	-	-	-	-
Routes	-	Yes	Yes	-	-	-	-	-
Network Classification	Yes	Yes	Yes	-	-	-	-	-
Node	-	-	-	-	-	-	-	Yes
Intersection	Yes	-	-	-	-	Yes	-	-
Link	Yes	-	-	Yes	Yes	Yes	Yes	-
Area	Yes	-	-	-	-	-	Yes	-
Service Provider	Council[1], Private Sector[2], PP/ DA's[3], RMS[4]	TfNSW[5]	TfNSW[5]	Council[1], Private Sector[2]	Council[1], Private Sector[2], RMS[4]	Council[1], Private Sector[2]	Council[1], Private Sector[2]	Council[1], Private Sector[2]
Location/ Type[7]/ Availability[8]	-	-	-	-	-	-	Yes[6, 7, 8]	Yes

Notes

- Collected by Willoughby Council staff
- Collected by specialist private sector data providers engaged by Willoughby Council
- Sourced from traffic studies provided as part of planning proposals and development applications
- Collected and publicly released by Roads and Maritime Services
- Collected and publicly released by Transport for New South Wales
- Chatswood CBD only
- Parking restriction i.e. unrestricted, 1P, Taxi Zone, No Parking
- Hours of operation

4.3 Freight / Service

The major State key freight route through Willoughby LGA is the Pacific Highway.

Servicing and freight are essential to the effective functioning of any commercial centre. In framing the problem for Chatswood, key points include:

- The commercial market in Chatswood is focused primarily on consumption of materials and products rather than distribution of them.
- Servicing and freight is a substantial process. Considering the function of the centre, the key focus should be the stages of this process often referred to as the 'last mile' - from a distribution point to the consumer, this distribution happens mainly at street or basement level.
- The Chatswood office precinct covers a relatively small area.

There are a number of mechanisms that may be considered to improve servicing while minimising congestion:

- Centralised depots.
- Streamlining services to multiple customers.
- Programming outside of peak times.
- Changing the waste infrastructure - for example: in Manhattan, the vacuum waste collection system allows rubbish to be disposed of through a pneumatic tube underground.
- Mode or 'level' shift - for example: drones; the City of Sydney has a plan for connection of the city's private basement areas to allow deliveries to move between buildings without needing to access to the street level.
- Centre design - while many elements of servicing and freight present challenges to a high quality and amenity urban environment, they are essential to support the function of the centre. In the case of Chatswood, Albert Avenue plays a key role in the servicing of the centre. Recognising and supporting this function while applying key urban design principles is essential.

Figure xx – NSW Key Freight Routes

4.4 Parking

There are many parking demands on the LGA, particularly in Chatswood CBD and other centres. The challenge is to successfully balance the many competing demands from residents, local workers, business, visitors and commuters, within the constraints of existing infrastructure. Consequently, there is a need to undertake regular, high visibility parking surveillance operations in the CBD and its immediate surrounds.

Council has adopted a Street Parking Strategy which highlights the following strategic approach to car parking across the City.
- Residential: rates set low recognising good access to public transport and local amenities.
- Commercial: rates set very low recognising good access to public transport.
- Retail: consideration of town centre public parking provision shared by all retail centres with access managed through a parking guidance system. This means that cars only need to travel to the edge of the centre on the ring road and walk within the centre.
- On-street parking limited to loading zones and short parking duration to suit access to services.

Council is currently working on initiatives to reduce the amount of circulation of cars due to parking congestion, through apps, varying prices, wayfinding signage and better understanding the current utilisation of parking at each site.

Across the City there are numerous parking options including:
- On street parking (timed, non- timed, free or fees)
- Council owned car parks
- Privately owned public car parks
- Commuter parking provided by the State

Council also has resident parking schemes in place in St Leonards, Naremburn, Northbridge Willoughby, Willoughby East, North Willoughby, Middle Cove, Chatswood, Chatswood West, Roseville, Lane Cove North and Artarmon.

Parking Spaces Summary (estimated)	
Free on-street parking spaces	studies to be completed by 2020
Free off-street parking spaces	160
Fee based on-street parking spaces	880
Fee based off-street parking spaces	864

Figure xx – On-Street metered parking areas

Off-street car parking spaces (non-metered) are located:
- 31 Victor St car park (Council's Main Building).
- Dougherty Centre car park.
- Chatswood Youth Centre car park.
- 7 Victor St car park.

Weekday parking station price comparison between Council's The Concourse and Albert Avenue Car Park and nine private parking stations across the LGA, highlight that Council is significantly lower in price from the early bird / flat rate to the rate per hour.

Attachment 5:

Willoughby LGA in Context

5.1 Demographic Data

All demographics referred to are 2016 from Australian Bureau of Statistics (ABS), unless otherwise stated. More detailed demographic data can be found on Council's website https://profile.id.com.au/willoughby/home
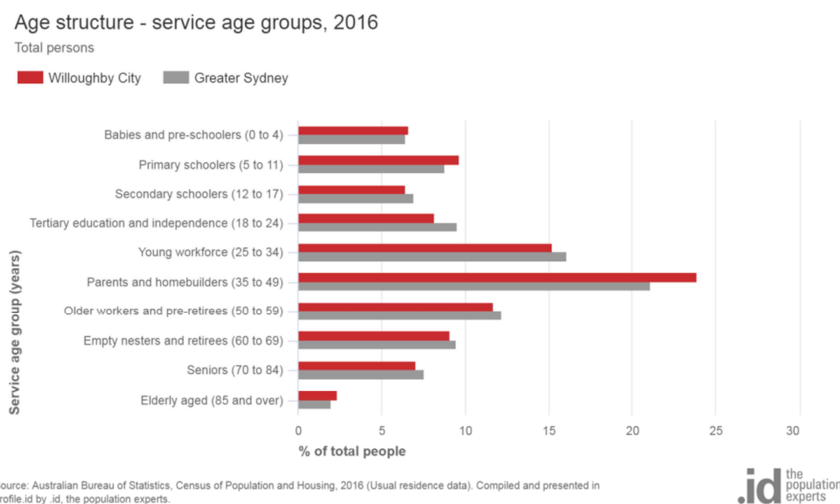
The current and future demographics of the LGA must be considered when planning for a transport network that will cater for the changing needs of our population now and the growing population into the future.

Home to the Cammeraygal and Wallumedegal clans, the Willoughby LGA, has a population estimate of 80,887 (2019), and is forecast to grow to 91,848 by 2036.

The population of Willoughby LGA is diverse with 45% born overseas with the largest age bracket being 35-49yrs. Household income levels compared to Greater Sydney show that there was a larger proportion of high income households and a lower proportion of low income households.

The largest age bracket is 35-49 years (23.9%) with 22.6% of the population aged between 0 and 17, and 18.5% aged 60 years and over.

Figure?: Age structure 2016

Source: Australian Bureau of Statistics, Census of Population and Housing, 2016 (Usual residence data). Compiled and presented in profile.id by .id, the population experts.

Council also has high levels of tourism with a value of $883m in 2016/17, with Willoughby contributing 3.2% to the NSW tourism economy. Nearly 30% of the international visitors are visiting family and friends which is nearly 10% higher than the NSW rate. Willoughby is also ranked 14 across 88 LGAs of Core Night Time Economy establishments density per km2, with 587 establishments.[2]
Housing

As at 2019, more than half the population in Willoughby (55%) live in medium and high density dwellings. The highest population density per hectare is primarily located in Chatswood, Artarmon and St Leonards, where there is access to jobs, regional transport and within walking distance of rail stations. Based on predicted land use development and previous trends, this is projected through to the same three suburbs in 2040.

These suburbs are located within the major transport corridors of the North Shore Rail Line and Pacific Highway within Sydney's Global corridor. These are the areas which are also facing major development resulting in significant infrastructure requirements and subsequently community pressures to limit growth and address the existing and future anticipated transport concerns.

---

[2]Measuring the Australian Night Time Economy 2016-17, Ingenium Research, 2018

Council's Local Town Centres; consisting of Artarmon, Northbridge, East Chatswood, Penshurst Street, High Street, Castlecrag, Naremburn and Willoughby South are all experiencing housing growth, forecast as part of the future housing density growth.

In 2016, the dominant household type in Willoughby City was 'Couple families with dependents' at 37%, and by 2026 the largest forecast increase is expected in 'Lone person households'.

Employment

In 1999 (ABS), 40,000 jobs were located in the Willoughby LGA, a figure that grew by 60% to 64,000 jobs by 2016. This represents 13% of all jobs in Sydney's North District with 26.9% of all Willoughby resident workers employed locally.

By 2036, it is anticipated that an additional 10,600 jobs will be created within Willoughby1, with over 30% of resident workers employed locally.

The two highest employment centre precincts within the Willoughby LGA are Chatswood CBD (24,700) and St Leonards (20,000). Willoughby's transport network currently is, and will be further, strongly impacted by the increase in employment density within these two precincts.
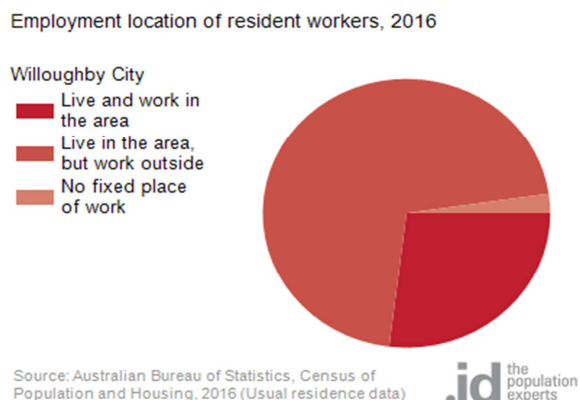
The Industry profile of Willoughby, consisting of Knowledge Intensive, Health and Education, Population Serving and Industrial, is different to the North District, with a higher share of knowledge –intensive and a lower proportion of other kinds of jobs.

A greater proportion of non-Willoughby residents who work in Willoughby compared to residents, work in knowledge intensive jobs.

The strategic centre of St Leonards is a health and education precinct split across three local government areas. St Leonards has a range of significant metropolitan health and education assets, including the North Shore Hospital, North Shore Private Hospital and TAFE NSW St Leonards campus. By 2036 it is anticipated St Leonards employment could grow to 63,500 (increase of 18,500 jobs).
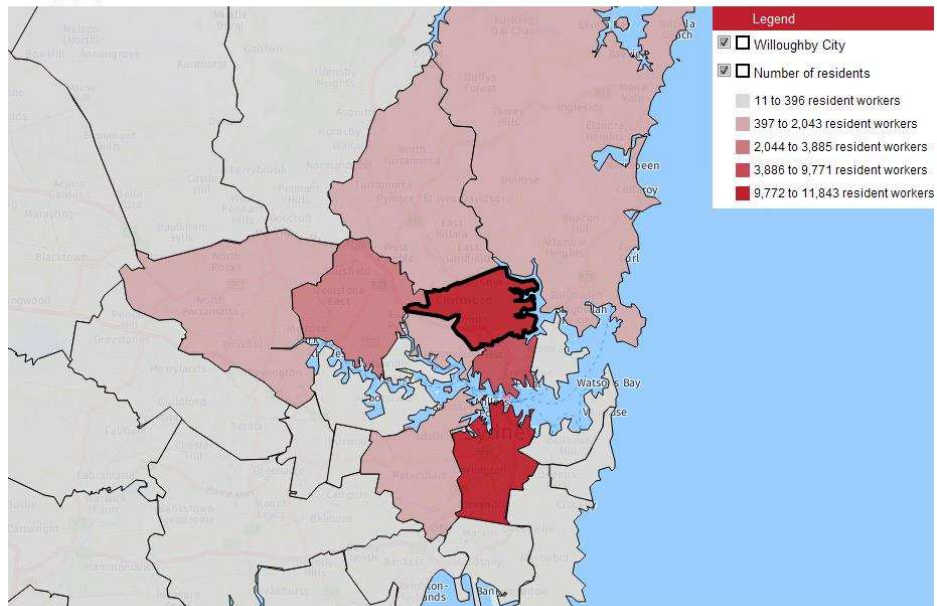
Willoughby residents primarily work in Sydney City, Willoughby and North Sydney. Non-residents who work in the LGA, come from across Sydney, with the highest numbers from Northern Beaches, Ku-ring-gai, Hornsby and Ryde LGAs.

Figure ? : Employment location of resident workers, 2016

Employment location of resident workers, 2016

Willoughby City
- Live and work in the area
- Live in the area, but work outside
- No fixed place of work

Source: Australian Bureau of Statistics, Census of Population and Housing, 2016 (Usual residence data)

.id the population experts

Employment locations of residents by LGA, 2016
Willoughby City

Legend
- ☑ ☐ Willoughby City
- ☑ ☐ Number of residents
- ☐ 11 to 396 resident workers
- ☐ 397 to 2,043 resident workers
- ☐ 2,044 to 3,885 resident workers
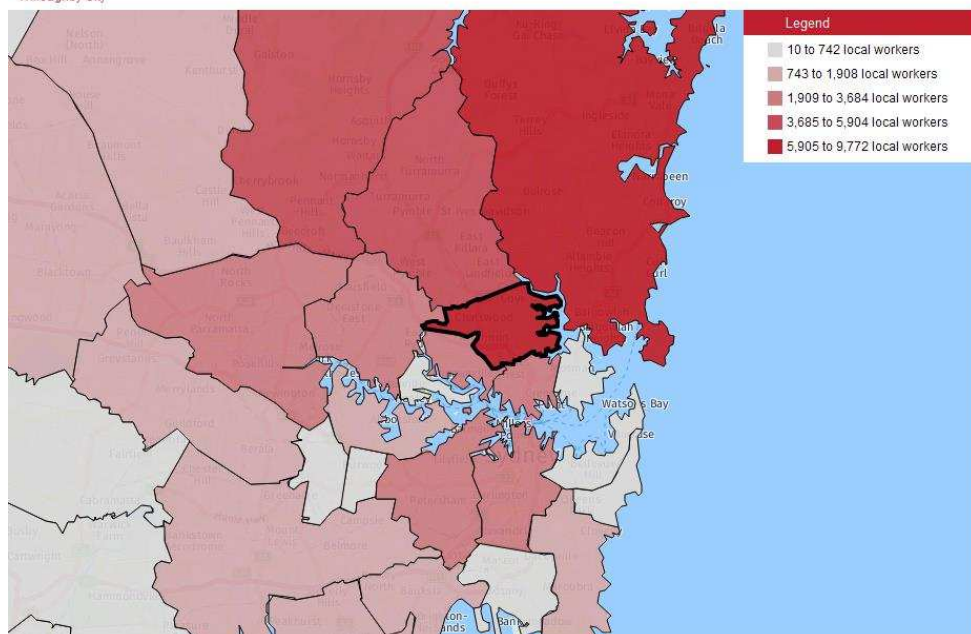- ☐ 3,886 to 9,771 resident workers
- ☐ 9,772 to 11,843 resident workers

Source: Australian Bureau of Statistics, Census of Population and Housing 2016.
Compiled and presented in profile.id by .id, the population experts.

Residential locations of workers by LGA, 2016
Willoughby City

Legend
- ☐ 10 to 742 local workers
- ☐ 743 to 1,908 local workers
- ☐ 1,909 to 3,684 local workers
- ☐ 3,685 to 5,904 local workers
- ☐ 5,905 to 9,772 local workers

Source: Australian Bureau of Statistics, Census of Population and Housing 2016.
Compiled and presented in profile.id by .id, the population experts.

Journey to work

Understanding the nature of where people are coming from and where they are going is an important element to assist in planning appropriate transport infrastructure and services.

Willoughby residents primarily work in Sydney City, Willoughby and North Sydney LGAs being the main work locations. Whereas, for non-residents who work in the LGA, they come from across Sydney, with the highest numbers from Northern Beaches, Ku-ring-gai, Hornsby and Ryde LGAs.

In 2016, there were 12,928 people who caught public transport to work in Willoughby City, compared with 14,572 who drove in private vehicles (car – as driver, car – as passenger, motorbike, or truck). Compared to 2011, a lower proportion of people in the LGA now drive to work (40% down to 36.2%) and a higher proportion of our workers are using public transport (35.5% up from 30.7%. However the number of people cycling to work is down by 10% in 2016 compared to 2011 census.

Analysis of the method of travel to work of the residents in Willoughby City in 2016, compared to Greater Sydney, shows that 35.6% used public transport, while 40.1% used a private vehicle, compared with 22.7% and 58.1% respectively in Greater Sydney. There are a number of reasons why people use different modes of transport to get to work including the availability of affordable and effective public transport options, the number of motor vehicles available within a household, and the distance travelled to work.

Figure ?: Method of travel to work, 2016
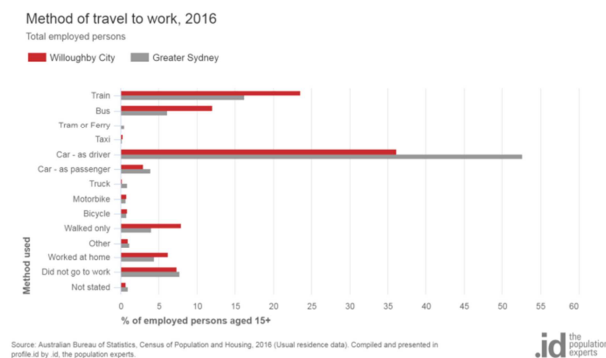
Car ownership

Analysis of car ownership in 2016 indicates 37% of households in Willoughby City had access to two or more motor vehicles, compared to 46% in Greater Sydney.

Of Willoughby residents 87% of households own at least one car which given the income levels is somewhat expected, yet it is surprising given the high public transport systems available.
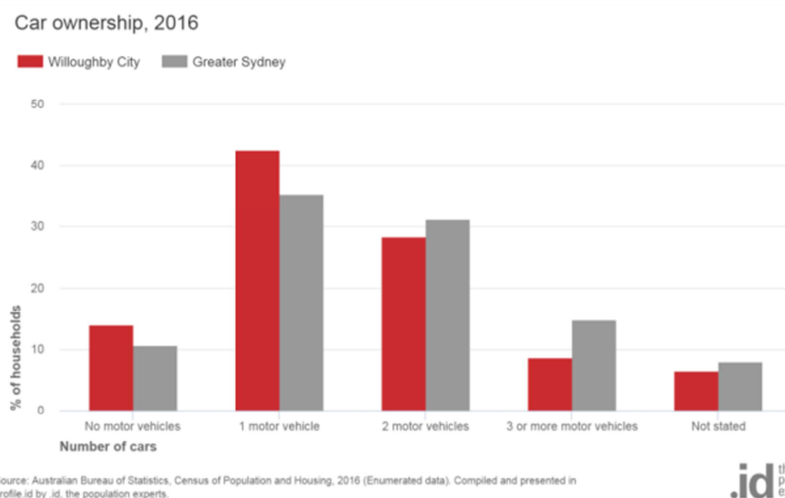
Travel mode

2016/17 data2 highlights that of Willoughby residents 'vehicle driver' (43% of all trips) is the highest percentage travel mode used within the LGA. The next highest travel mode is 'Walk Only' (27% of all trips), highlighting the use, proximity and accessibility of local centres and connections as a positive within the LGA.

Figure ?: Method of travel to work,

Travel by MODE, 2016/17

	Number of Trips	% of Total Trips	Trip Distance (km)	% of Total Distance	Avg. Distance (km)
Vehicle Driver	128,196	43	846,777	59	7
Vehicle Passenger	40,761	14	129,391	9	3
Train	21,944	7	220,007	15	10
Bus	20,272	7	113,739	8	6
Walk Only	79,385	27	62,261	4	1
Other	7,117	2	64,945	5	9
Grand Total	297,675		1,437,120		

Travel purpose

Data from 2016/173 highlights that for residents 'social / recreation' is the highest purpose of trips across the LGA, followed by 'change mode of travel'*, which given the Chatswood Interchange upgrades, is unsurprising. 'Shopping' is the third highest purpose of trip.

The survey also highlights that the trip distance is the highest by far for both commute and change mode of travel indicating Chatswood is clearly a strategic travel destination.

Travel by PURPOSE, 2016/17

	Number of Trips	% of Total Trips	Trip Distance (km)	% of Total Distance	Avg. Distance (km)
Commute	36,056	12	337,180	23	9
Work related business	8,760	3	40,229	3	6
Education/childcare	18,825	6	50,806	4	3
Shopping	47,790	16	101,291	7	2
Personal business	17,576	6	66,094	5	4
Change mode of travel	53,917	18	384,584	27	7
Social/recreation	64,806	22	297,427	21	5
Serve passenger	39,723	13	139,076	10	4
Other	10,223	3	7,452	1	1
Grand Total	297,676		1,437,119		

* Change of mode refers to trips where the primary purpose is to change the mode of travel. For example, walking from home to the bus stop then catching the bus to the cinemas includes two trips. The home to bus stop trip is assigned the purpose 'change mode' while the bus stop to cinema trip is assigned the purpose 'recreation'.

Population growth and change

The population of Willoughby LGA in June 2017 was 79,681 and is anticipated to grow to be 91,848 by 2036, a growth of 15%. This anticipated growth in Willoughby's population of an additional 14,000 people to 2036 will include an increasing number of teenagers and young adults as well as older people.

The number of employment opportunities across the City will increase by over 30,000 jobs, which would be an attractor for residents and visitors. In 2018, 26.9% of Willoughby resident workers are employed locally with over 30% projected for 2036.

Lone person households will become the predominant household type which could mean increase in private vehicles. The five year target to 2021 for increased housing supply in the LGA under the North District Plan is 1,250 new dwellings. Willoughby's draft Housing Strategy goes further to project between 6,000-6,700 new dwellings will be required in response to growth.

Figure?: Change in Household Types 2016-2036
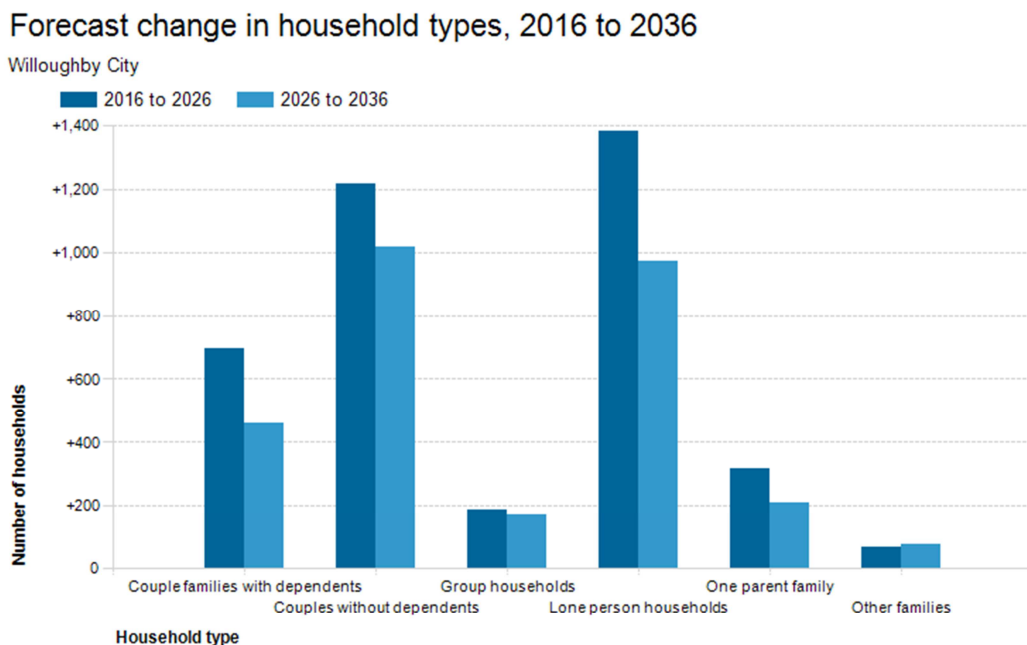
The focus areas proposed are around the highly accessible CBD of Chatswood and to a lesser degree, in and around our local centres such as Northbridge and Artarmon and, in the medium and high density housing zones identified in the Local Environment Plan. With the proposed location of Willoughby's housing growth to 2036, the emphasis is clearly on improved walkability and the increased use of active and public transport.

Figure?: Population Growth and Change

Source: Population and household forecasts, 2016 to 2036, prepared by .id, the population experts, November 2017.

Figure?: Population Growth and Change

Source: Population and household forecasts, 2016 to 2036, prepared by .id, the population experts, November 2017.
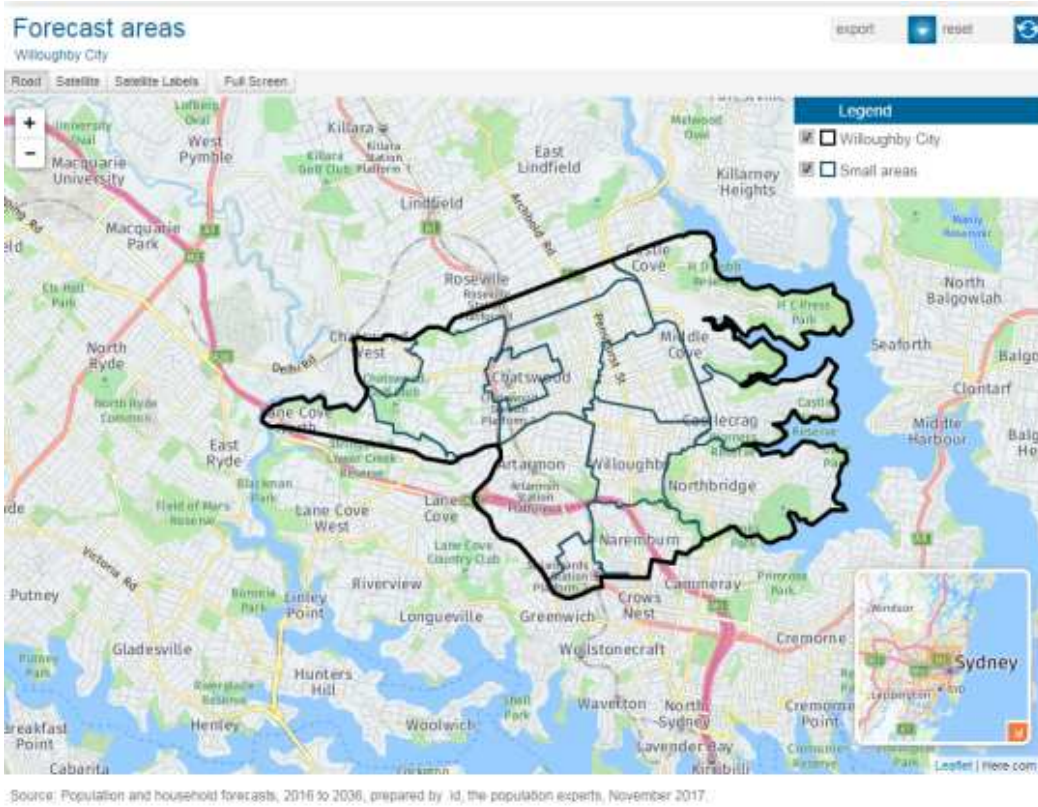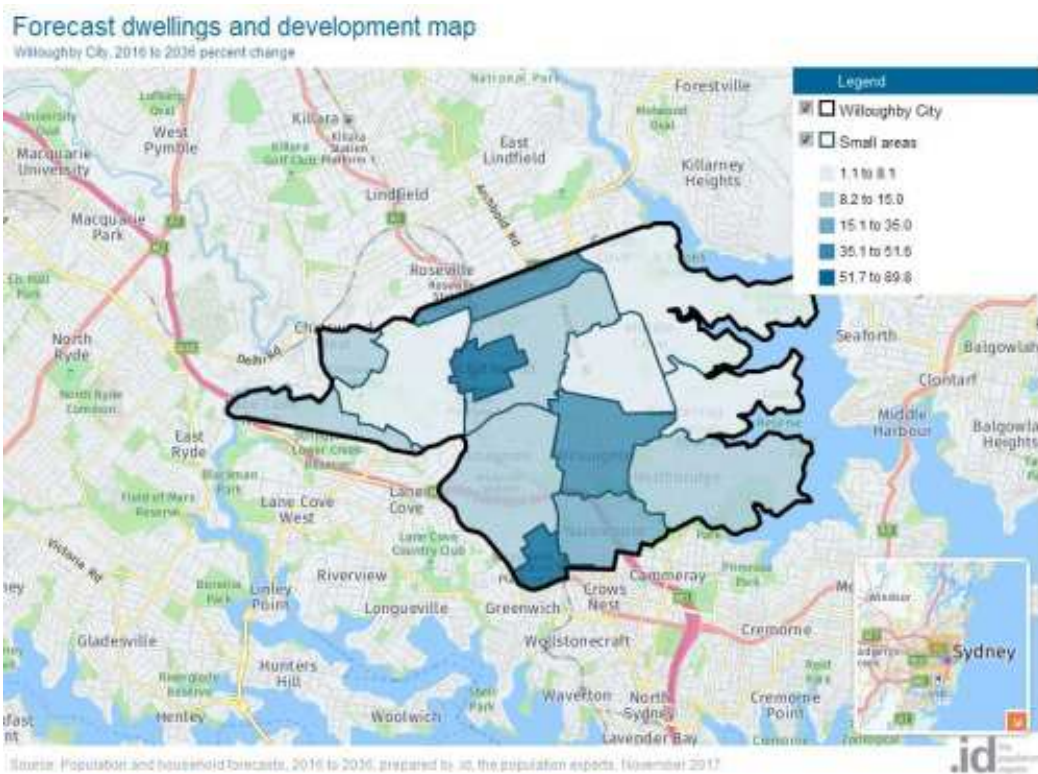
The forecast change is spread throughout the LGA with major changes in the Strategic centres of St Leonards and Chatswood and to a lesser extent on the northern boundary and centrally within the LGA. Existing and new Metro public transport will facilitate transport movement with the growth in demand in the strategic centres. This will need to be supplemented by enhancement to the capacity and connectivity other modes.

The growth in transport demand in areas away from major rail transport modes will require careful planning to ensure the transport system is developed to effectively meet future needs. Buses will need to provide the major transport role with active transport and other modes providing a supplementary transport role.

	Population		
Suburb	2019	2036	% change
Chatswood West – Lane Cove North	3942	4324	9.68
Chatswood - West	8360	8348	-0.15
Chatswood –East	8439	9166	8.62
Artarmon	10276	10420	1.40
Naremburn	6661	7019	5.38
Northbridge	6821	7430	8.92
Willoughby	6930	9301	34.22
Castlecrag	3092	3029	-2.05
North Willoughby – Willoughby East	6208	6127	-1.3
Castle Cove – Middle Cove	4046	3980	-1.64
Roseville	2813	3231	14.85

5.2 Strategic location

Willoughby LGA is in a strategic location: its location in Sydney; recognition as a strategic centre by the State; and, it being both a transitory location and a destination. This provides benefit and also challenges for the creation of a successful transport system.

Willoughby consists of eight4 'Local Centres' and Chatswood and St Leonards are two metropolitan strategic centres located within the LGA. It is also home to industrial centres at Artarmon, East Chatswood and a small area in Lane Cove, as well as commercial, residential centres and development corridors that impact on the wider metropolitan areas.

Willoughby lies at the heart of a dense cluster of strategic centres along the North Shore. The following are reachable by a short rail journey: North Sydney; St Leonards; Macquarie Park; and Sydney. This makes the ease of travel across wider Sydney a significant opportunity.

Willoughby LGA forms part of the Eastern Economic Corridor (EEC). The EEC, which is one fifth of Greater Sydney's population, contributes 10% of Australia's GDP and is the highest performing corridor in Australia in terms of economic return per capita.

These opportunities raise potential for strategic funding and support. Along with these opportunities come challenges, particularly the number of visitors to Chatswood CBD and the amount of through traffic. This contributes to the level of congestion, particularly during weekday peak periods.

5.3 Strategic Centre – Chatswood CBD

Chatswood Central Business District (CBD) is the major centre in the LGA and plays an integral part of the transport system and the growth of the LGA.

Chatswood is the key place for shopping, office employment, professional services, civic, recreation and leisure facilities. Its catchment draws from Hornsby to the north and, Mosman and Milson's Point to the south.

Chatswood has a major transport interchange at the railway station with bus, taxi and private drop-off facilities. It is centrally located and connects directly into the Victoria Avenue pedestrian mall. The Interchange will become increasingly important on the bus network as people will travel to it to access rail and the new Metro.

The CBD is a regional hub and the area experiences a large influx of workers and visitors each day across the LGA. This supports the bustling retail and food sector and the increasing night time economy as well as having a substantial impact on the transport system.

Council has adopted the Chatswood CBD Planning and Urban Design Strategy which aims to establish a strong framework to guide future private and public development as the CBD grows over the next 20 years. It aims to provide capacity for future growth, achieve exceptional design and a distinctive, resilient and vibrant CBD.

Chatswood Station has the 4th largest 24 hour turnover (excluding individual Sydney CBD stations) and the third highest outside the Sydney CBD (2018).

500,000+ visitors per year attending regional cultural and entertainment facilities

Chatswood CBD Traffic Study 2012 identified the following to improve the movement systems in the Chatswood CBD
—–bus priority measures and interchange function.
—–intersection upgrades, one-way and altered traffic directions, conversion of lanes from parking to allow traffic flow and a ring road.
—–preparation of a PAMP
—– removal of on-street parking and implementation of parking guidance system.

20 million shopper visits to Chatswood per annum

5.4 –Major Land Use and Transport Generators

There are many major land use and transport generators bringing high numbers of people or transport services into the LGA. These sites impact planning for infrastructure, service provision, operations management and often exacerbate the transport challenges.

Key sites include:
- Westfield shopping centre.
- Chatswood Chase shopping centre (current DA to expand including 1200 additional car spaces).
- Chatswood transport interchange.
- St Leonards TAFE.
- Artarmon industrial lands.
- The Concourse.
- Royal North Shore Hospital.
- Gore Hill regional sports ground.
- Bicentennial Reserve (weekend sports).
- Shore playing fields (weekend sports).
- Major events.
- Willoughby Leisure Centre.
- Adjacent to the LGA:
  1. Lane Cove National Park
  2. Recreational boating in surrounding LGAs
  3. Macquarie Park and Macquarie University
  4. Macquarie Centre
  5. Major thoroughfare to northern beaches from the lower north shore.

References

1 Transport for NSW Transport Performance and Analytics
2 https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-1

3 https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-1
4 Willoughby City Council Draft Local Centres Strategy February 2019