New Bus Network for Epping

Key Land Use Opportunities to Facilitate Sustainable Transport

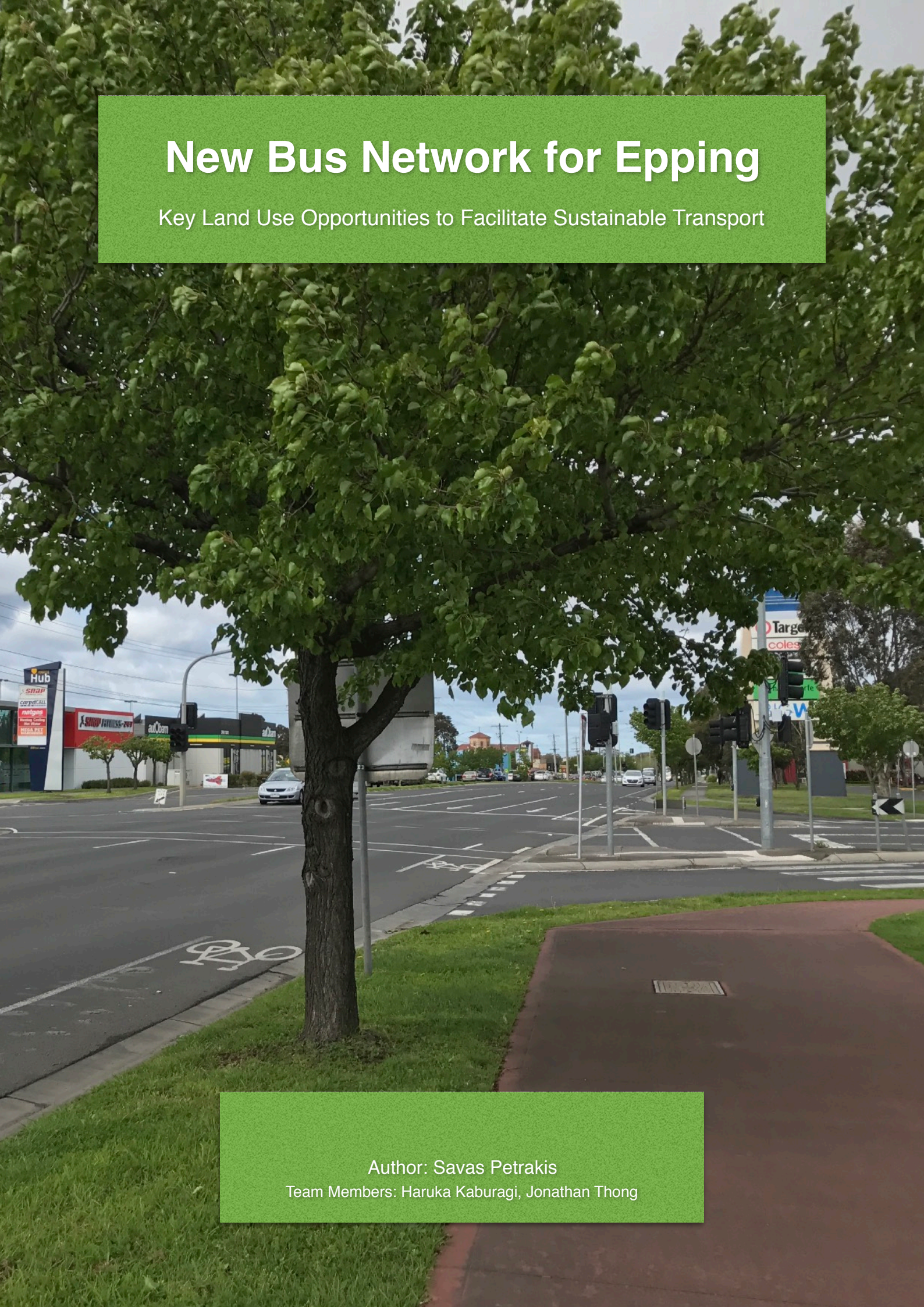

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Table of Contents

Introduction

Sustainable transport will be a major part of working towards a more sustainable future, to mitigate the devastating threats posed by climate change and environmental degradation. The social impacts of automobility, from social isolation and poorer health outcomes to a loss of community with car-centric developments also leads to significant reductions in quality of life (Vigar 2013). Furthermore, the global challenge of peak oil is projected to have devastating impacts on the global economy, and will likely lead to economic collapse with a “continuous recession” unless action is urgently taken to find alternative energy sources (Ahmed 2013).

While electric vehicles may mitigate some of the environmental and economic impacts of automobility, they do not address the fundamental social challenges of car-dominated cities and lifestyles. Doubts also remain as to whether there are enough natural reserves to provide global energy storage needs from battery storage technology (Moriarty & Honnery 2013).

In the early 21st century, there has been a resurgence of interest in active and public transport, with recognition of its wide ranging benefits to cities and their populations. These range from improved health and reductions in stress, a greater sense of community, as well as time and budgetary savings (Public Transport Victoria 2016a). Active and public transport also encourages better built form outcomes for cities, and contributes to substantial economic growth (Department of Prime Minister and Cabinet 2016).

In Victoria, public transport has come to dominate the past two state elections, and has been a deciding factor in who forms government (ABC 2014), underlining the criticality of public transport to the average voter. However, much of this debate has been focused on the provision of fixed rail. Although fixed rail can be a fast and reliable option to transport people longer distances, it is highly costly and can consume the majority of urban transport budgets, leaving little room for investment elsewhere in the public transport system (Mees 2008), whilst not adequately addressing local travel needs.

Meanwhile, there is increasing recognition of the potential for buses to provide a cost effective and reliable service offer, when implemented according to best practice principles. However buses in Melbourne are generally viewed unfavourably. They are seen as slow, run confusing routes with poor information, and have poor infrastructure (Public Transport Users Association 2012). In addition, the cost of running Melbourne’s bus system is extremely high by world standards, with little over one passenger per bus kilometre over metropolitan Melbourne (Low 2016a).

This Plan will develop a new bus network for Epping that is more effective, efficient and reliable, and complements the existing fixed rail system while providing opportunities for integration with active transport to facilitate sustainable travel. A network of high frequency, high capacity buses running on major roads will be proposed, together with a network of smaller feeder buses to replace the existing network. This will be accompanied by a series of complementary infrastructure improvements.

Key to the success of this network will be a range of land use and policy measures to redevelop Epping Central into a vibrant, mixed use community along the principles of Transit Oriented Development. This will help reduce car dependency, and contribute to wide-ranging social, economic and environmental benefits. The urgency to kickstart redevelopment will be emphasised, in face of a growing population, changes in industry and employment, and the poor social and built form outcomes in Epping Central.

Background

About Epping

Epping is located approximately 30 kilometres north of Melbourne in the City of Whittlesea, which is one of the fastest growing municipalities in metropolitan Melbourne (City of Whittlesea 2016a). Epping was established in 1839 as a small farming settlement, and was gradually absorbed into Melbourne's northern suburbs over the latter half of the 20th century.

Epping is primarily residential, with significant areas of industry in the centre, dominated by automotive related businesses. Significant areas of vacant land exist in Epping, most of which is zoned for future residential and industrial growth, although there is little publicly accessible open space for recreation.

Residential growth is currently focused in the northern and eastern fringes of the suburb, extending to Wollert in the north, and South Morang and Mernda in the northeast (Figure 1). The industrial precinct is gradually expanding towards the Northern Industrial Precinct in Campbellfield and Somerton in the west, separated by a grassland reserve being increasingly encroached on by industrial development. Epping is bordered on the south by the residential suburbs of Lalor and Mill Park.

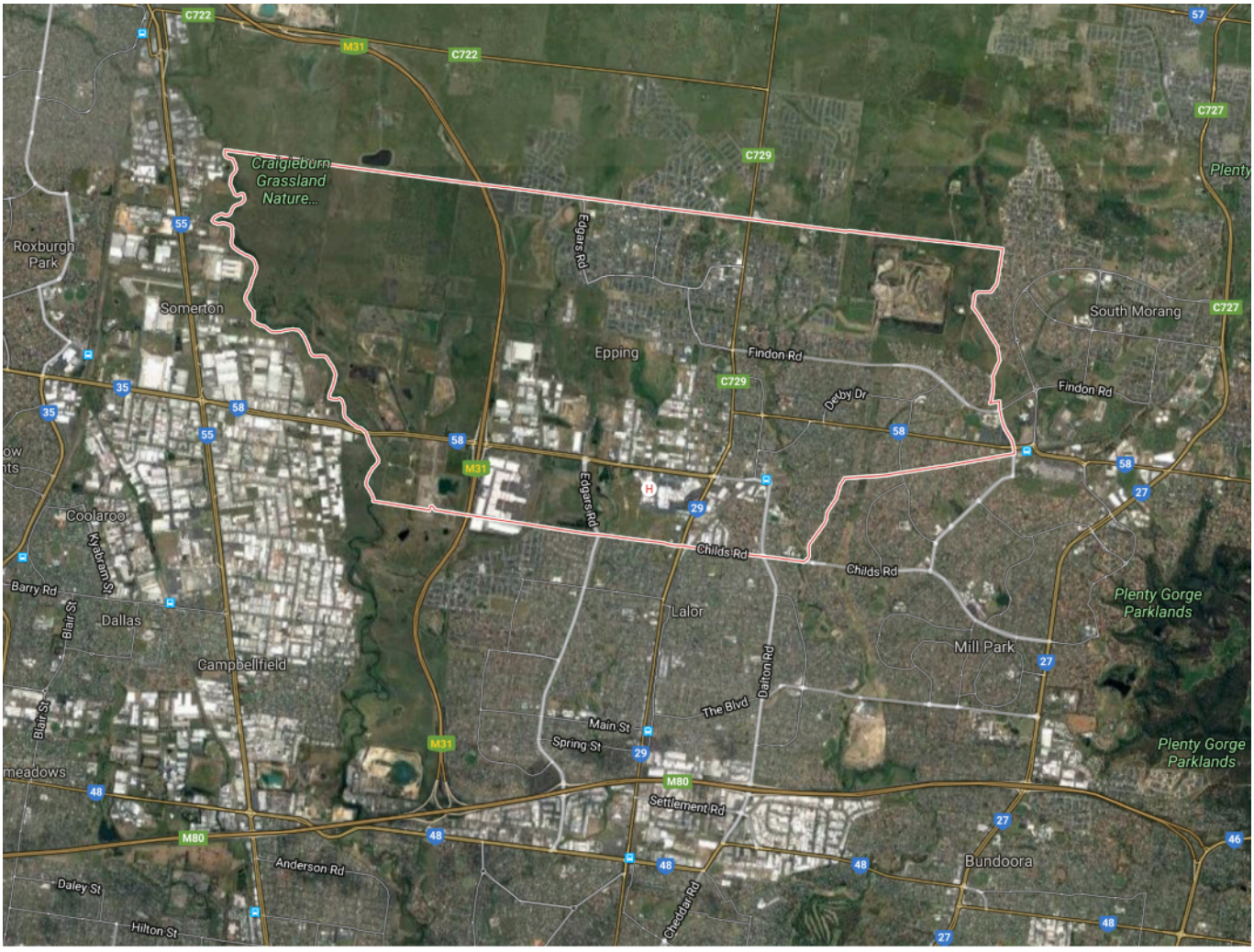

Figure 1: Epping highlighted in red, in context with surrounding area (Google Maps 2016).

Key Features

Epping Central is home to several destinations of regional and metropolitan significance, located along the east-west Cooper Street corridor depicted in Figure 2. The Pacific Epping shopping centre has around 240 tenants, comprising of a food court, large anchor retailers including supermarkets and department stores, and a range of smaller speciality stores (Pacific Epping 2016).

The adjacent Northern Hospital is a large 300-bed public hospital, treating nearly 70,000 patients every year (Northern Health 2016). Epping is also home to the recently relocated Melbourne Market - a wholesale fruit, vegetable and flower trading centre closed to the public. The Market is of metropolitan significance, used by over 4,000 business to trade produce between growers, wholesalers and retailers (Melbourne Market 2016). Meanwhile, Melbourne Polytechnic, located opposite Epping Station, provides a range of vocational courses for industry related trades (City of Whittlesea 2016a).

Figure 2: Key destinations of regional and metropolitan significance in Epping Central (Google Maps 2016).

Demographics

As of 2011, the population of Epping, including the locality of Epping North was approximately 27,633, rising to an estimated 38,597 in 2015. This is projected to grow to 75,743 by 2036, with most growth concentrated in Epping North (Population Experts 2016a). As will be discussed, population growth and projected changes in employment will have significant implications for planning infrastructure, while land use changes will provide significant opportunities for increased usage of the proposed bus network.

Policy Context

Under *Plan Melbourne*, the strategic planning document guiding Melbourne's future growth, Epping is designated as one of eleven Metropolitan Activity Centres in the city. These activity centres have been recognised for their role as major providers of services, employment, housing, social activity and as transport interchanges (State Government of Victoria 2015). As a Metropolitan Activity Centre, significant intensification is projected in Epping Central to accomodate future population growth, with the intention of providing greater local employment and housing options, and reducing reliance on Melbourne's Central Business District.

The Whittlesea Planning Scheme (City of Whittlesea 2016b) guides the use and development of land within the municipality, and contains a range of policies encouraging further suburban expansion, the ongoing development of industrial precincts, as well as a structure plan for the redevelopment of Epping as the municipality's key activity centre.

The Epping Central Structure Plan envisions medium density development in Epping together with a range of infrastructure improvements, conceptualised in Figure 3. The Plan proposes a new train line from Lalor to Epping North, the redevelopment of Pacific Epping (formerly Epping Plaza) and the Northern Hospital, and significant intensification around the Epping Central precinct. Higher quality public space and the rehabilitation of Darebin and Edgars Creeks is also envisioned, although redevelopment of the precinct is suggested to take place over the medium to long term.

Figure 3: Impression of what Epping Central could look like in 2030 (City of Whittlesea 2013).

The importance of industry to Epping for employment and economic growth is emphasised in the Planning Scheme with the designation of the Cooper Street Employment Precinct as an area of ongoing development. The proximity of Cooper Street to Epping Central and the Hume Freeway, together with an increasing residential population is used to justify the merits of expanding industry in the area.

Furthermore, a range of zoning mechanisms have been put in place to facilitate growth in Epping Central and the Cooper Street Employment Precinct. Epping Central has been rezoned to an Activity Centre Zone, and contains a range of provisions to encourage more flexible land use, with a focus on higher density redevelopment. Meanwhile, the Cooper Street Employment Precinct has been rezoned to a Comprehensive Development Zone, with Schedule 2 to the zone identifying the area as the preferred location for light and general industry, business and offices, as well as other employment generating uses (City of Whittlesea 2016b).

Existing Transport Networks

Roads

Epping is well served by roads, and is connected to surrounding areas by an extensive freeway and arterial road network, depicted in Figure 4. The M80 Metropolitan Ring Road facilitates orbital travel from Greensborough in the east to the western suburbs, freight for the Port of Melbourne as well as travel to western Victoria. The M31 Hume Freeway facilitates travel to northern Victoria, and is a major freight truck route to Sydney.

Key arterial roads include High Street/Epping Road, a major road originating in the inner northern suburbs of Melbourne and through Epping, which is used predominantly for personal car travel. Cooper Street is a major freight road which crosses through the Northern Industrial Precinct and Sydney Road to Greenvale. Edgars Road runs parallel west of High Street from Thomastown to Epping, and runs primarily though residential areas, although it is currently being extended through to Epping North and Wollert, to facilitate connectivity through the Cooper Street Employment Precinct and the Epping North residential estates (Places Victoria 2016). Dalton Road provides a connection between Epping and Reservoir, and traverses mainly residential areas, while Childs Road connects Epping to Mill Park.

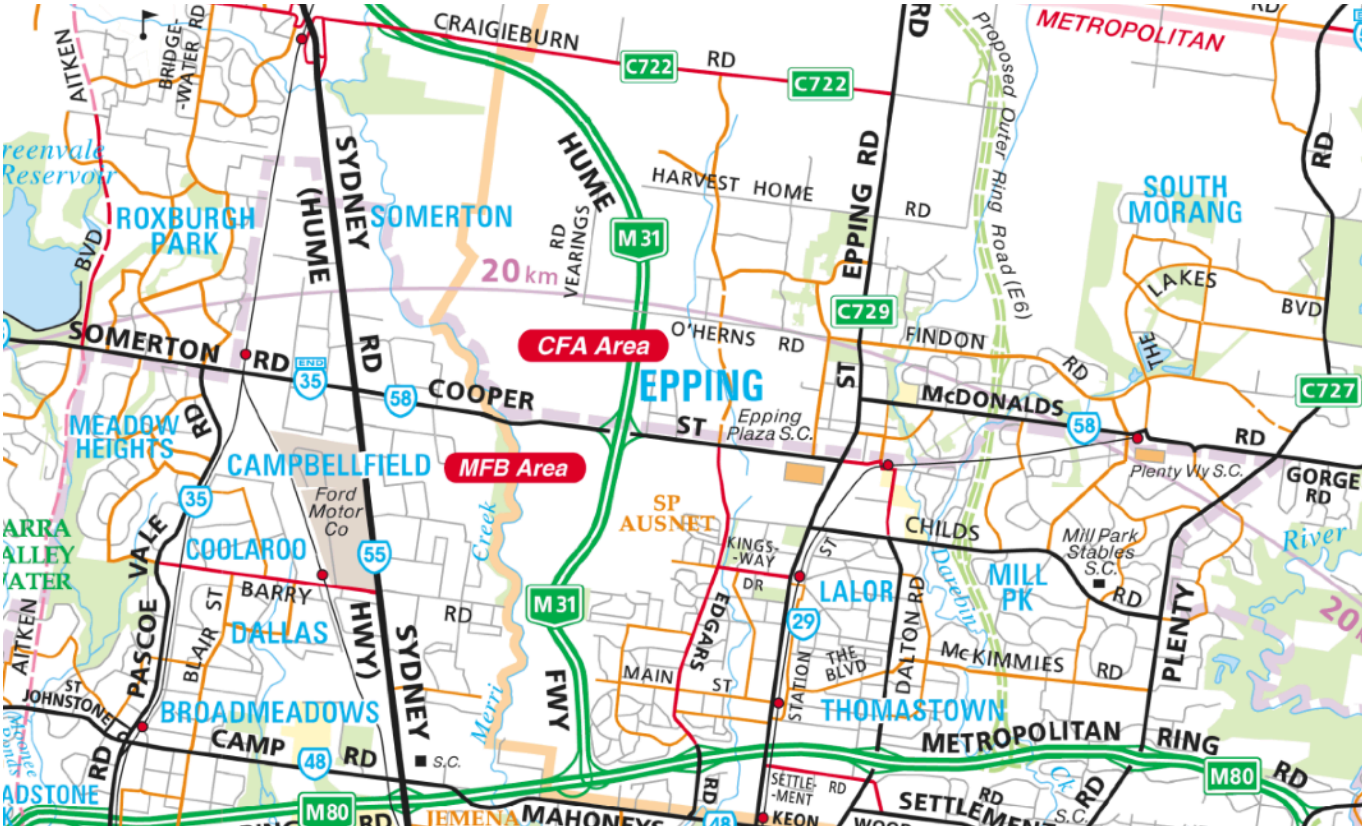

Figure 4: Freeway and arterial road connecting Epping to surrounding areas (Melway 2016).

East of Dalton Road is the proposed 100 kilometre long E6 Outer Ring Road, where a reservation was set aside with suburban development in the late 20th century. The proposed freeway would run from Werribee in the west through to Craigieburn in the north, before joining the current Metropolitan Ring Road at Thomastown (VicRoads 2015). The City of Whittlesea (2016c) also continues to advocate for further road investment from the State and Federal Governments.

Footpaths

Most of Epping Central has footpaths, although they are generally narrow and of poor quality, with few destinations conducive to walking. Car parking dominates Epping Central, with Pacific Epping and the Northern Hospital particularly challenging to access from surrounding areas by foot.

Priority is given to cars travelling at high speeds, particularly in High Street (Figure 5). Few pedestrian lights and zebra crossings exist, and slip lanes dominate at major intersections. The speed limit on High Street is 60km/h, whereas Cooper Street is 70km/h, further contributing to the perception of walking being unsafe.

Figure 5: Typical walking conditions in High Street Epping, looking south towards Cooper Street.

Epping Central also lacks public amenity such as seating, shade and drinking taps, while the lack of public open space, such as playgrounds and sports fields, provides little opportunity for incidental and community activity.

Bicycles

Most of Epping Central has bicycle routes, with dedicated lanes on High Street, Cooper Street, Edgars Road and Dalton Road. However, given these are located on high speed roads, and are only separated from vehicular traffic by a painted line, they are not conducive to safe cycling. Recreational bicycle paths exist along Darebin Creek, although not on Edgars Creek, and connections to on-road paths are lacking.

While some bicycle parking racks have been provided on High Street, there are few at Pacific Epping or the Northern Hospital. Epping Station does have a dedicated Parkiteer bicycle cage which appears well utilised, although a refundable $50 deposit is required for access. While riding to the station is possible from nearby areas, high road speeds make it challenging to ride longer distances.

Trains

The South Morang train line serves Epping, the second last stop on the line, and is approximately 40 minutes by train to the Central Business District. There are 54 car parking spots at Epping, although South Morang has over 450 spots, as well as overflow parking which is generally at capacity during weekdays (Carey 2015). The State Government is currently extending the train line to Mernda, a further 8 kilometres with three new stations (Level Crossing Removal Authority 2016).

Trams

While no trams serve Epping, the Route 86 ends at RMIT University in Bundoora, approximately 6 kilometres southeast. The City of Whittlesea (2015) has long advocated for an extension of Route 86 to South Morang Station and beyond, which would provide increased connectivity to South Morang and allow the repurposing of buses to other routes. The reservation and preferred alignment for the extension along Plenty Road has been in place since suburban development in the late 20th century.

Buses

A number of bus routes serve Epping and its surrounding suburbs (Figure 6). Most routes are local, and travel to the edges of Epping or to the next suburb, such as Route 356 from Epping to Epping North, while few buses are through-run as pendulum lines. The orbital SmartBus Route 901 travels from Frankston to Melbourne Airport via South Morang, Epping and Broadmeadows.

Most bus routes originating from Epping are radial, in that they facilitate travel to Epping Central, but provide poorer connectivity to other areas without having to travel back into the centre. This makes journeys to other areas, such as from Epping North to Craigieburn difficult, without making several transfers along routes that follow indirect paths with poor frequencies and hence long waiting times.

Bus route coverage is also poor in the newly developed areas in Epping North, and communication between developers and the public transport planning agencies appears to be lacking. For example in 2011, the developer of the Aurora estate in Epping North installed bus shelters without consulting the then Department of Transport, and the Department argued the bus shelters “do not necessarily reflect future public transport routes”, despite the developer claiming to adhere to best practice guidelines (Carey 2011). While some of the shelters have since been provided with bus routes, this demonstrates a significant disconnect between the goals of developers and public transport network planners.

In addition, significant gaps have been left in the road network, such as Edgars Road, which is still in the process of being extended. While new roads arguably facilitate easier travel by car, buses ultimately share the same road network. Therefore, if a bus has to take a longer route because direct roads do not exist, private car usage is likely to further be encouraged.

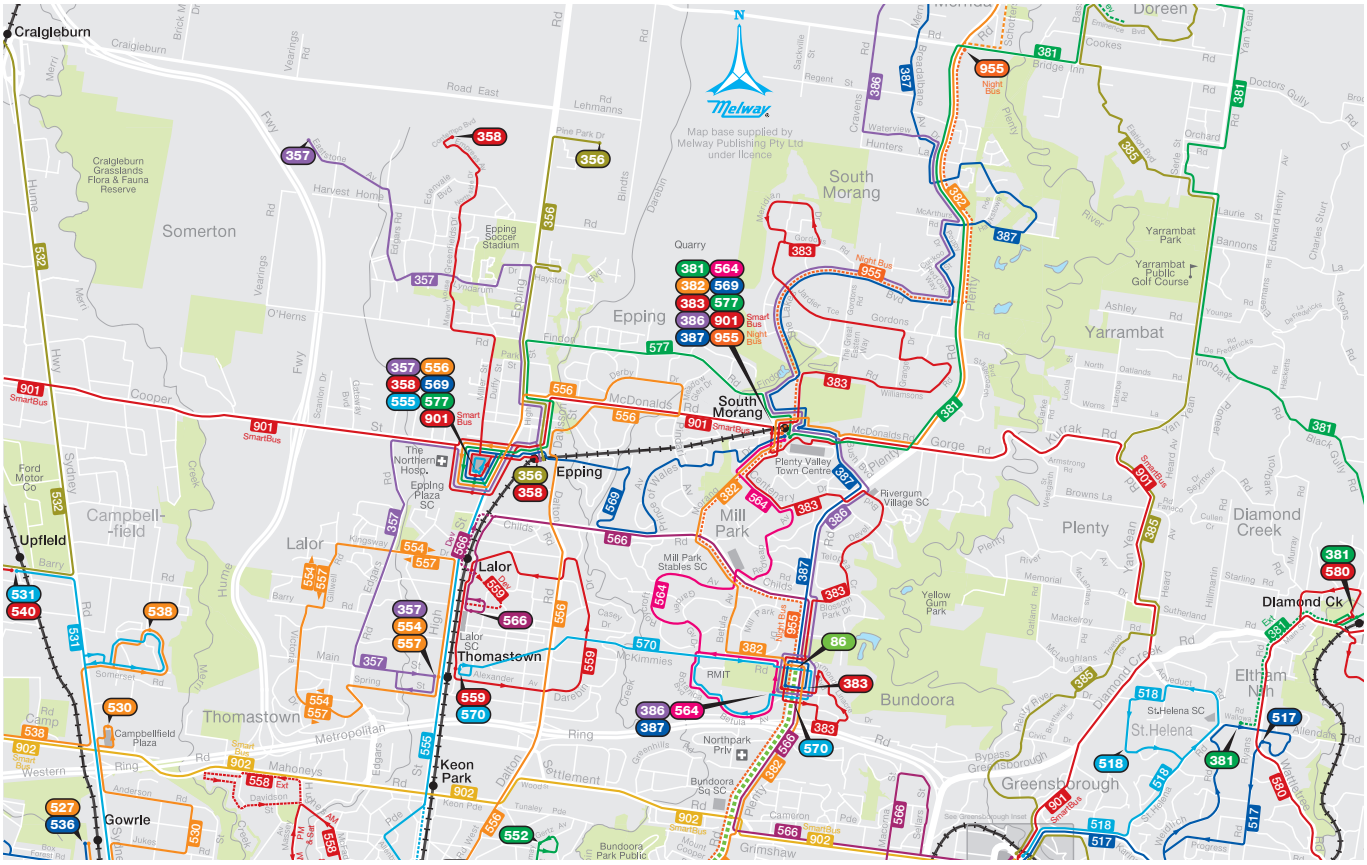

Figure 6: Bus routes in Epping and surrounds, centred on the South Morang train line (Public Transport Victoria 2016a).

Key Challenges and Opportunities

Car Dependency

Epping is extremely car dependent, with approximately 73% of people travelling to work by car, and only 11% by public transport (Population Experts 2016b). This level of car dependency can be suggested to have arisen from extensive policies of automobility, namely freeway and major road building associated with suburban growth from the mid 20th century onwards (Low 2016b). In addition, Melbourne's metropolitan train network is focused on radial travel into the Central Business District, with few lines that provide journeys between suburbs.

In addition, the construction of industrial estates such as the Cooper Street Employment Precinct and the Northern Industrial Precinct have facilitated 'freight sprawl', where relatively cheap land is located close to major freeways and within relatively close proximity to ports and major freight routes (Low 2016c), in this case the Port of Melbourne and Sydney through the Hume Freeway and Metropolitan Ring Road. However this relative proximity is measured in time, rather than distance, and is facilitated by relatively cheap oil, and ongoing publicly subsidised road construction, to continue adding road capacity.

Epping also contains a range of what Vuchic (1999) terms 'automobile incentives', which make automobile travel easier, usually at the expense of active and public transport. Epping has high speed roads and freeways without tolls, slip lanes and ample free car parking. Meanwhile, buses suffer from low frequencies, low route coverage, a lack of dedicated infrastructure and priority on roads, and relatively expensive fares even for short journeys. These are conversely described by Vuchic (1999) as 'transit disincentives', further discouraging public transport use and engraining a culture of car dependency, which will be accentuated if the proposed Outer Ring Road is constructed.

Public transport cannot be said to meet current and future transport needs, and a growing population that is car dependent will bring greater congestion and health risks. In addition, an ageing population will become increasingly isolated and immobile, requiring public transport to get around. Together with reducing car dependency, the challenges of a growing and ageing population present an enormous opportunity to shift people to public transport, if a high quality network is provided.

Industry and Employment

With the end of automobile manufacturing in Victoria, Melbourne's northern suburbs are projected to be significantly impacted by high unemployment, particularly with the long chain of automotive related businesses that supplied parts to Ford in Broadmeadows (Preiss & Gordon 2016). While this will likely accentuate socioeconomic disadvantage in the short term, the end of automobile manufacturing provides an opportunity to retrain workers in new industries, particularly with the rise of high technology industry and the service economy.

Epping Central and the Cooper Street Employment Precinct can become a large provider of employment opportunities in sustainability related enterprises, such as the manufacture of solar panels and wind turbines, as well as creating parts for various industries through 3D printing. A recent report found that one million extra jobs could be created in Australia by 2040 while cutting emissions in line with the Paris Agreement (Hannam 2016).

Moving away from freight based industries can also promote a reduction in emissions, by reducing the distance goods have to travel, together with coordinated logistics bringing improvements in efficiency (Climate Change Authority 2016).

Industrial buildings have great potential to be fitted with solar panels to generate electricity for the region, as well as be equipped with environmentally sensitive design measures. Roofs and other impervious surfaces can harvest water which can be reused, as well as preventing excess stormwater runoff through environmentally sensitive design.

Land Use and Built Form

Given the vast areas of underutilised land in Epping Central, combined with the transport, population and employment challenges outlined earlier, redevelopment in line with the Epping Central Structure Plan must be urgently kickstarted if Epping is to see any meaningful progress towards sustainable transport.

The biggest challenge to implementing the Structure Plan involves regulation and planning processes to stimulate interest from the private sector, given likely unviable returns with current land values. This unviability can be largely attributed to the continual expansion of the urban growth boundary, which although may help create more affordable housing in the short term, directs infrastructure investment towards greenfield developments at the expense of established areas such as Epping Central. The urban growth boundary must be unambiguously capped, if Epping's redevelopment is to become economically viable. This would also preserve more agricultural land, while providing more open space for benefits to human and ecological health.

While Mees (2010) demonstrates a well designed public transport system can work in lower density suburbs, automobile incentives in Epping, particularly ample free parking, and the lack of walkable destinations makes the current network a hard sell. Significant transit incentives, such as more convenient bus interchanges, more affordable short distance fares, and more car disincentives, including limiting parking must be implemented. People will still live in low density suburbs, although a revitalised town centre with mixed land uses and car disincentives will encourage public and active transport use.

A combination of mixed use housing, shops, schools, medical facilities, and other daily needs is essential to creating a liveable community. The large parcel of land currently occupied by Pacific Epping amounts to a monopoly of the public realm, with a privatisation of the majority of Epping's social and economic life. Despite being across the road, the original town centre in High Street is depressed and businesses struggle to compete with the shopping centre, which is not integrated with High Street.

Redevelopment would also provide opportunities for both social and affordable housing, which must be accompanied with the regulatory mechanisms underpinning the wider redevelopment of Epping Central, including revitalising High Street. With the increasing recognition of the role the built environment has on mental and physical health, Epping must also have adequate open space and community facilities, also facilitated by regulatory mechanisms in accordance with best practice standards.

With significant investment from the public and private sectors, Epping can become an exemplar of regeneration in the outer suburbs. Significantly more potential exists to revitalise Epping than more established activity centres such as Box Hill, given large amounts of underutilised land, and low density developments such as Pacific Epping and the Northern Hospital can be rebuilt at higher density.

Proposed Bus Network

Overview of Proposal

A complete redesign of bus services in Epping and Epping North is proposed, comprising a hierarchy of three new arterial bus routes, and six new feeder bus routes specifically for Epping, depicted in Figure 7 on the following page. The proposal offers greatly improved coverage and connectivity, in line with best practice guidelines of creating a hierarchy of services with direct routes and high frequencies to key activity centres (Nielsen 2005), avoiding the lengthy detours of former routes.

The consolidated arterial routes provide a faster connection between activity centres in surrounding suburbs along major roads, while the feeder buses offer greater local connectivity between residential areas, schools and local shopping areas without having to travel back into Epping Central. This hierarchy will help achieve the 'network effect' as described by (Dodson et al 2011), where anywhere-to-anywhere travel is made possible by a network of frequent and stable services that are easy to understand. The arterial routes will be run at 10 minute frequencies throughout the day to help achieve the network effect, while the feeder routes will be run at 20 minute frequencies as a pilot, with adjustments made to routes and frequencies depending on usage.

Arterial services will be run as pendulum lines to allow maximum efficiency and greater connectivity between major and local activity centres (Nielsen 2005), whilst allowing more services to be run. The Route 901 SmartBus will also be kept, as it provides a vital link between South Morang, Epping Central, the Cooper Street Employment Precinct and the Northern Industrial Precinct along Sydney Road.

While most bus routes will no longer run directly to Epping, the high frequency of the arterial routes will mean average waiting times of five minutes for services, which in most cases will be less than the routes that originally went to Epping via indirect routes. Pulse timetabling as described by Nielsen (2005) will also be used, to ensure that feeder buses line up with arterial buses and ensure seamless transfers.

Complementary Measures

To ensure a high quality bus network that provides a viable alternative to the car, the following range of complementary improvements are planned to accompany the new bus network:

- Redesigned interchanges where arterial routes meet feeder routes with stops closer to each other, ensuring convenient transfers.
- Engaging urban designers for major interchanges, to ensure they are identifiable, safe and attractive.
- Ensuring buses go first with priority at lights at major intersections such as Cooper and High Streets.
- Dedicated bus lanes along Cooper Street, High Street and Edgars Road during peak periods to ensure reliability of bus services.
- Improved mobile apps that are easy to use, and provide better information on local services.
- Installing inexpensive electronic information displays at every bus stop, to inform passengers of upcoming services and potential connections both on screen and through a loudspeaker, while still retaining paper based bus timetables in case of technical malfunctions.
- Conduct a trial allowing bicycles to be carried on the new arterial routes.
- Extensive marketing of new services online, through letter-drops to local residents and businesses.

Proposed Bus Network Map

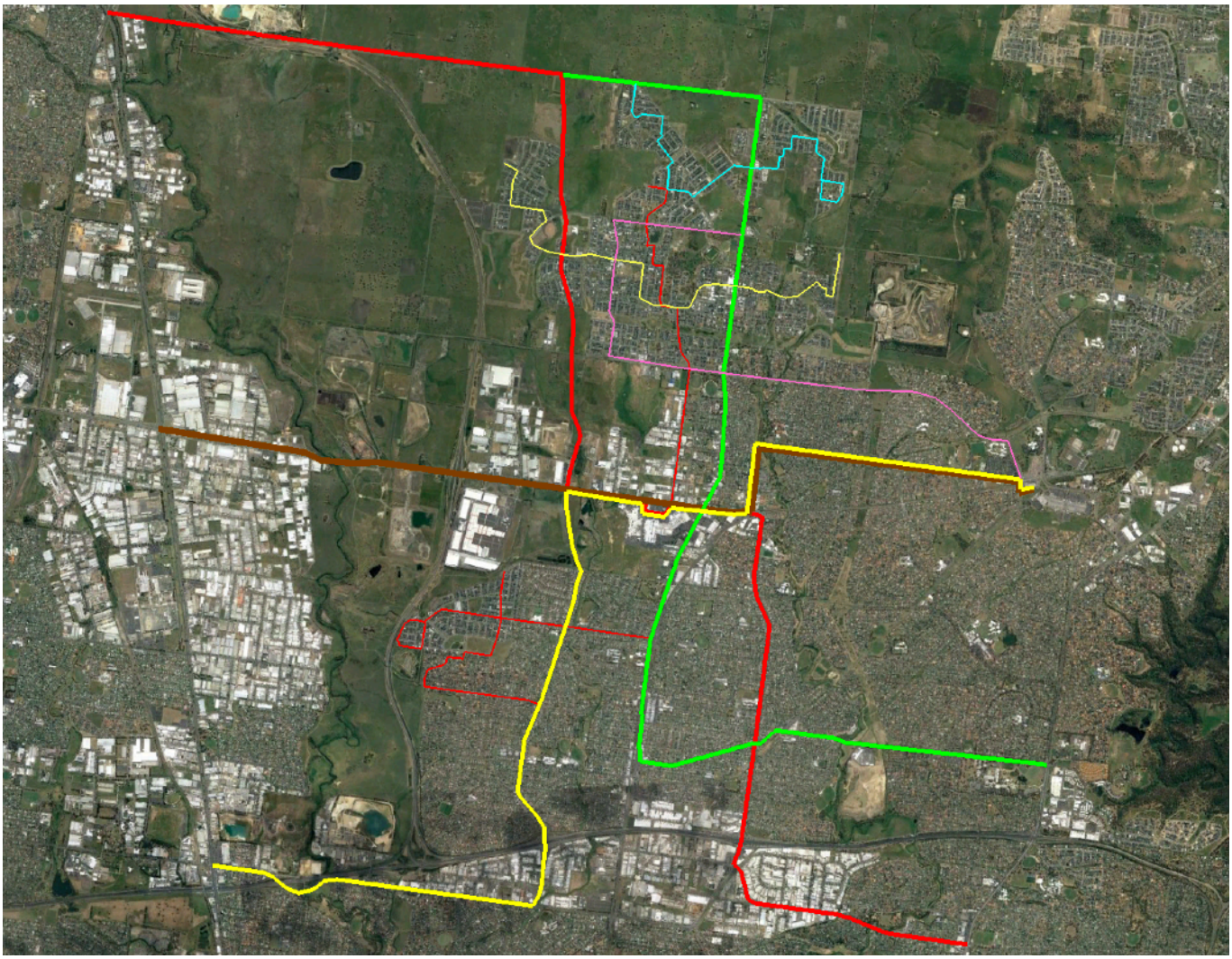

Figure 7: Proposed bus network map, depicting arterial routes with thick lines, feeder routes in thin lines (Google Maps 2016).

Arterial Bus Routes

- ***Craigieburn to Bundoora RMIT*** - Provides a direct service from Epping Road/High Street in Wollert, through Epping, to Thomastown through a major industrial and residential catchment, ending at Bundoora RMIT, where it meets the Route 86 tram at its current terminus.
- ***Campbellfield to South Morang*** **-** Connects Campbellfield Plaza to a large residential catchment along Edgars Road South, the Cooper Street Precinct and residential South Morang.
- ***Craigieburn to Bundoora*** **-** Serves a wide residential and industrial catchment along Edgars Road North, the Cooper Street Precinct and residential Dalton Road.

Feeder Bus Services

Final paths for the feeder routes will involve consultation with the community, along with a clear explanation of why transfers to the arterial services are necessary. Feeder routes will expand with further development, ensuring that residents are served by at least one frequent bus service.

Smaller sized buses will be used on the feeder routes given their likely lower patronage, which will also reduce transport emissions, be quieter, and facilitate easier access through residential streets.

Further Recommendations

The following recommendations are made both to facilitate better usage and performance of the bus network, as well as provide more opportunities to advance sustainable transport in Epping:

- Overhaul the Planning Scheme to facilitate immediate redevelopment of Epping Central, and implement governance arrangements with flexible zoning to kickstart development.
- Conduct a voluntary system whereby users' smartphones can be tracked to determine routes and corridors with high demand and ensure optimum routing and timetabling.
- Make better use of car-share schemes, with parking spaces close to arterial bus routes.
- Trial the use of solar powered buses with localised charging, with a view to expanding to the whole bus fleet in the future when commercially feasible.
- Lower fares for short trips within Epping and surrounding suburbs, and not penalising modal transfers.
- Expand tailor-made community bus services for specialised routes for the mobility poor, taking into account shopping centres, community facilities, medical centres and hospitals. Community buses like the City of Port Phillip (2016) provide significant accessibility and connectivity through the municipality.
- Construct the Epping North train line, which would allow for a redesign of the arterial and feeder bus routes to improve connectivity.
- Extend the Route 86 tram to South Morang Station and through Mill Park Lakes to Plenty Road.
- With ongoing development of Epping Central, relocate Epping Station further south to be closer to High Street, which would also facilitate better bus connections and access to the town centre.
- Revitalise and connect High Street to the redeveloped Pacific Epping, and improve walking and cycling connections throughout Epping Central, particularly in spaces which may lead to conflict with vulnerable users, such as children in playgrounds and open spaces.
- Encourage local employment, particularly in home-based occupations with the internet.
- Allow low quality, underutilised public open space to be rezoned for redevelopment, on the strict condition that higher quality public open space is created in in more appropriate locations with appropriate contributions to public amenity such as seats, drinking taps, shade and public art. The community would be engaged through public forums to ensure design outcomes are favourable and make a positive contribution to the public realm.

Evaluation

Measures for evaluation of the bus network will include patronage data from Public Transport Victoria, as well as feedback from users of the new network. The feeder routes can be adjusted according to local needs, with further routes providing adequate demand, as well as when construction of the train line to Epping North and the Route 86 extension take place.

However the most important indicator of success will be the degree to which Epping Central is revitalised, with mixed use development and car disincentives encouraging use of the bus network.

A reduction of emissions and pollution, measured by the amount of fuel sold and consumed through petrol stations will also assist, as will a network of sensors to measure traffic counts and air quality. Future data from the Australian Bureau of Statistics on health outcomes and employment will also measure the degree to which Epping Central has provided new opportunities for the population.

Conclusion

The land use changes proposed, together with the range of challenges outlined present a timely opportunity to kickstart redevelopment in Epping Central, to facilitate sustainable transport and contribute to a more liveable and sustainable future for the region. Although suburban growth continues, the urban growth boundary must be capped to ensure that redevelopment of Epping can progress as soon as possible, and that bus network changes can become feasible and attract users away from the car.

The proposed bus network provides a simpler, more frequent and direct network of services that provides a viable alternative to the car, addressing a range of connectivity shortfalls in the system, whilst providing for more equitable transport for an ageing and growing population.

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