Sunfield Masterplanned Community

Preliminary Transportation Assessment Report

28 February 2024

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Final report	Leo Hills	Leo Hills	
			

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EXECUTIVE SUMMARY

Sunfield Developments Limited is proposing to rezone a parcel of land to allow the development of the Sunfield masterplanned community. Sunfield is designed to be a 15-minute sustainable neighbourhood to provide residents access to most, if not all, resident needs within a short walk or bike ride from their home, including schooling, employment, medical services, restaurants and bars, recreational spaces, retail, and food supplies. Sunfield is designed on eight core principles, with the most fundamental principle being to enable 'Car-less Living'. Upon its completion, Sunfield will provide for:

- 4,000 healthy homes, consisting of 3,400 individual homes and 3 retirement villages of approximately 600 independent living units and care beds.
- 72.5 hectares of employment, healthcare, and education zoned land with a total of 460,000 sqm of floor space.
- A school.
- A further 5 retail hubs located throughout the community.
- A 5-hectare town centre.
- Permanent jobs for over 11,000 people.
- 27.7 hectares of open spaces, green links, recreation parks and reserves and ecological offsets.
- Extensive restoration and native planting of the core stream and wetland network.
- The establishment of the Sunfield renewable solar energy network for the community.
- The Sunbus electric shuttle fleet.

Critical to achieving a 'car-less' community are:

- Significant limitations in the number of cars on the site (generally 10% of a more standard development).
- Provision of a frequent and privately funded public transport system linking both internally within the site and the wider network (including town centres and major train stations).
- Encouraging active transport modes through reduction in car ownership.

It is anticipated that any future development, would provide the transport network upgrades described in this assessment including:

- Provision (including funding) of a public transport network with a fleet of vehicles that operate continuously within the site and linking to Papakura and Takanini Train Stations / town centres.
- Local intersection upgrades (roundabouts and signalised intersections), subject to future traffic modelling.
- Provision of upgraded cycle lanes linking the site to Papakura rail station and town centre and Takanini rail station and town centre by way of cycling / pedestrian facilities

It is recognised that this development is essentially a first for New Zealand. As a result, it is considered that carefully monitoring of initial stages of the development is needed to ensure the measures proposed have the desired result of significantly reducing private car travel (both internal and externally).

1 INTRODUCTION

Commute Transportation Consultants (Commute) has been engaged by Sunfield Developments Limited to prepare a Preliminary Transport Assessment Report for the proposed rezoning of a parcel of land to allow the development of a master planned community which borders Papakura and Takanini in South Auckland (known as "Sunfield").

The site is zoned Future Urban Zone and Mixed Rural Zone under the Auckland Unitary Plan – Operative in Part (Unitary Plan) and has an approximate area of 244.5 hectares.

As detailed within the Context and Executive Summary, a key design principle of Sunfield is to create a masterplanned community that enables 'car-less living, which significantly reduces the reliance on private cars within the development.

The proposal involves the rezoning of the site to provide for[1]:

- 57.4 hectares of light industry;
- 2.2 hectares healthcare;
- 81.6 hectares of residential;
- 13.2 hectares of retirement;
- 5.3 hectares of local centres;
- 7.6 hectares of town centre;
- 4.0 hectares of school
- Remaining land consisting of roads, open space, streams, parks, and stormwater management.

Vehicle access to the site to / from the wider roading network is proposed to be via Mill Road (at the Mill Road / Walters Road intersection), Old Wairoa Road (at the Old Wairoa Road / Okawa Avenue intersection), Hamlin Road (east), Airfield Road (north), and Cosgrave Road (west). Each of the accesses will connect to the internal road network. As part of the proposal Hamlin Road (western end) will be re-aligned within the Sunfield site to directly connect to Walters Road.

Key transportation considerations of Sunfield are:

- The accessibility of the site to various modes of transport; and
- The ability of the surrounding road network to safely and efficiently accommodate traffic generated by potential development.

These and other transportation issues will be addressed in this report.

[1] Sunfield Masterplanned Community | February 2023

2 CONTEXT

The following section provides context of the proposal as provided by Winton Property Limited (Winton) which is the parent company of Sunfield Developments Limited.

"Winton and the design team were presented with an opportunity to explore a new approach to development that moves away from a reliance on private motor vehicles toward a future-thinking people centric collection of liveable neighbourhoods. This approach has unlocked a number of doors that will lead to healthier and more sustainable outcomes for now and the future. Meeting the needs of our communities requires that the Sunfield concept masterplan considers all aspects of life and integrates housing, employment opportunities, amenity and open space as we look to our neighbourhoods to become more self-sufficient and provide for higher standards of living in compact ways.

The 15-minute sustainable neighbourhood is designed to provide residents access to most, if not all, resident needs within a short walk or bike ride from their home, including schooling, employment, medical services, restaurants and bars, recreational spaces, retail, and food supplies. The 15-minute sustainable neighbourhood concept serves as an organising principle for urban development and urban life. It makes life more liveable for residents so they can live and work locally, increasing their quality of life with better air quality, safer neighbourhoods that are quieter, more diverse, inclusive, economically vibrant and not reliant on cars.

Considering transport and buildings together through the process has been integral to the design of the Sunfield concept masterplan. By focusing on people not cars, Sunfield enables car-less living by innovatively designing the concept masterplan to remove the challenges usually incurred in leading a car-less lifestyle while improving resident quality of life. Using ground-breaking technology for transport, residents will be able to jump on the Sunfield autonomous electric bus that continuously runs to link with the train station, the central Sunfield Village, small neighbourhood hubs, and stop anywhere in between, along with dedicated bus and bike lanes, wider footpaths and shared vehicles for those times when car use is unavoidable.

***Sunfield is designed on eight core principles, with the most fundamental principle being to enable 'Car-less Living'**.*

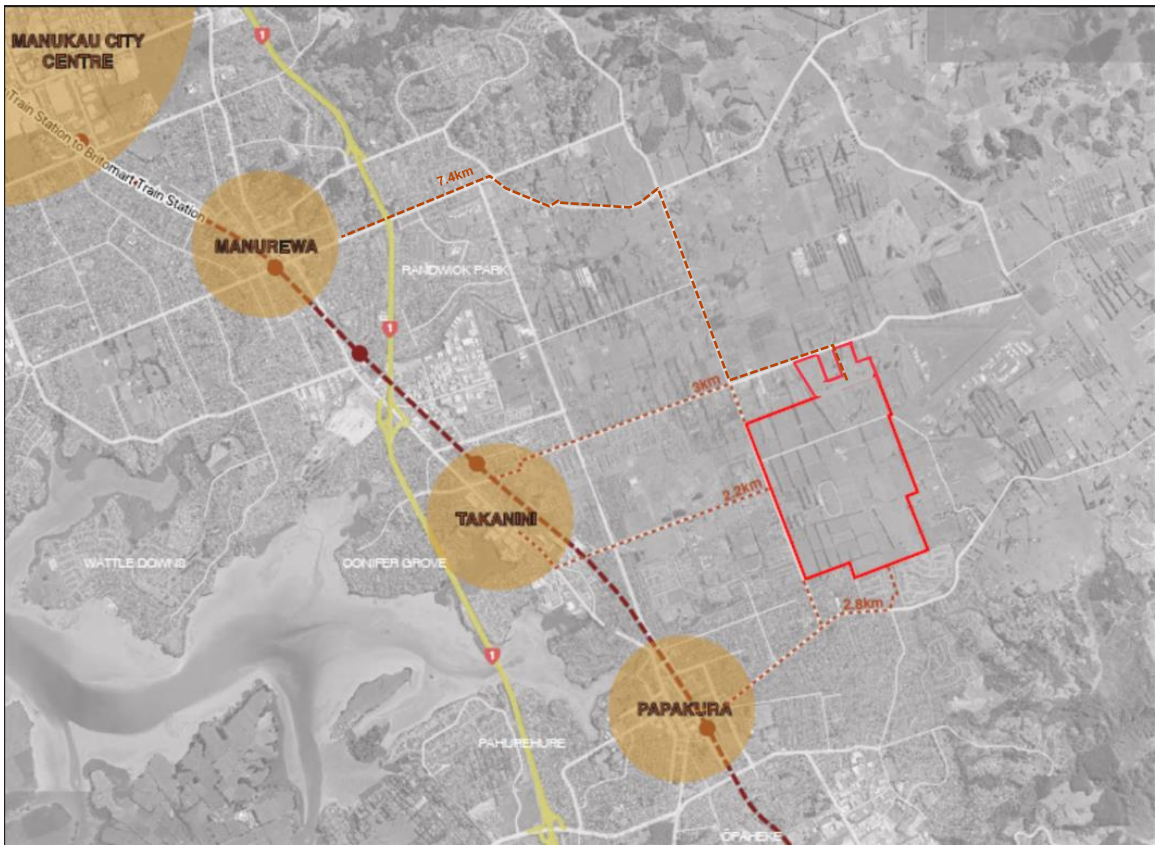
'Car-less Living' is the ability to live without a private motor vehicle. Households living without their own car is both a realistic and achievable possibility if the right ingredients are provided. Sunfield's ambition is to provide a significant step change in people's perceptions and behaviours. The benefits of car-less living are many, and a reduction in internal combustion engine vehicles will be a significant component in achieving New Zealand's goal of carbon neutrality by 2050. Aside from the obvious environmental benefits and the reduction of pressure on Auckland's already overloaded roading network, removing cars from the equation unlocks many positive social benefits through the creation of safe and walkable neighbourhoods. Enabling car-less living requires embedding the requirements for daily life within close proximity to minimise the need for longer distance travel, and where travel is required by providing viable, efficient, and affordable alternatives that are preferable to owning and running a private motor vehicle"

3 EXISTING ENVIRONMENT

3.1 SITE LOCATION

Figure 3-1 shows the location of the site in relation to the surrounding environment.

Figure 3-1: Site Location



The site is located on the fringe of the suburbs of Papakura and Takanini, with residential dwellings to the west and south, and the surrounding area to the north and, east and south being primarily rural in nature. It is also noted that the Adrmore Airport is located to the east.

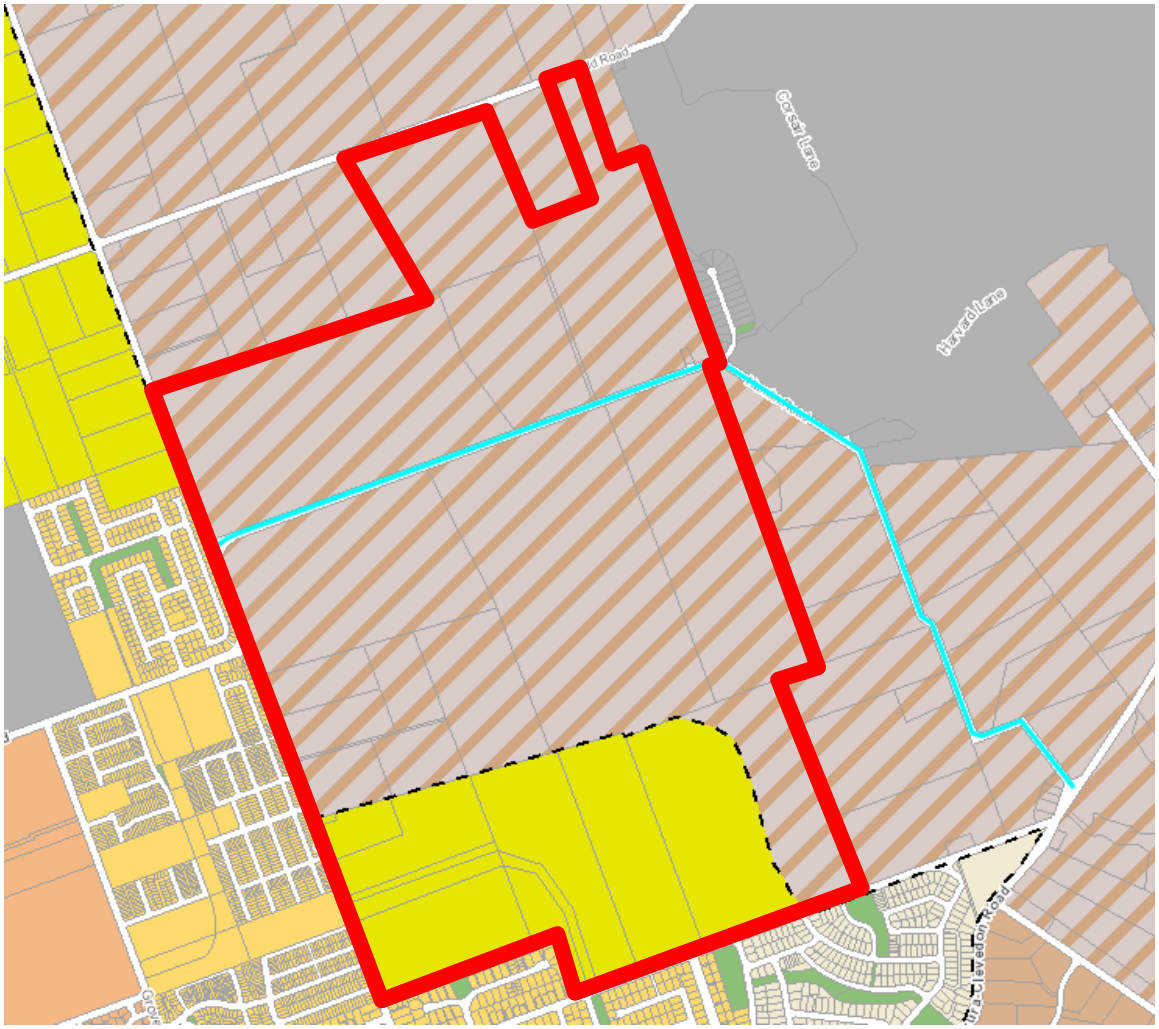
The site is proposed to have a total of seven connections (six intersections) to the local road network, via Mill Road (at the Mill Road / Walters Road intersection), Old Wairoa Road (at the Old Wairoa Road / Pakaraka Drive intersection), via Hamlin Road (east) to Ardmore airport, via two new roads from within Sunfield to Airfield Road, and via two connections to Cosgrave Road also from within Sunfield. As previously noted, the western end of Hamlin Road will be re-aligned within the Sunfield site to directly connect to Walters Road.

3.2 ZONING

The existing Unitary Plan Zoning for the site is shown in Figure 3-2. The yellow zoning represents 'Future Urban Zone', while the brown striped zoning represents 'Mixed Rural Zone'.

There is estimated to be approximately 56.5 hectares of 'Future Urban Zone' and 188.0 hectares of 'Mixed Rural Zone' within the subject site.

Figure 3-2: Unitary Plan Zoning



3.3 ACCESSIBILITY

3.3.1 WALKING AND CYCLING

Table 1 summarises the nearby attractions within walking and cycling distance of the site.

Table 1: Nearby Attractions (Measured from nearest point of Plan Change as per Figure 3.1)

Nearby Attractions	Distance	Walk Time	Cycle Time
Kauri Flats School	~ 0.2 km	~ 5 mins	<5 mins
Bruce Pullman Park	~ 1 km	~15 mins	5-10 mins
Takanini Town Centre & Train Station	~ 2 - 3 km	~ 30 - 40 mins	5-15 mins
Papakura Metropolitan Centre & Train Station	~ 3 km	~ 40 mins	10-15 mins

The site is located on the fringe of residential suburbs and rural land and therefore there are currently limited existing attractions within walking distance. There are a number of attractions within cycling distance of the site including education, employment, retail, and recreational.

As detailed within the Context and Executive Summary, Sunfield is a 15-minute sustainable neighbourhood designed to provide residents access to most, if not all, resident needs within a short walk or bike ride from their home, including schooling, employment, medical services, restaurants and bars, recreational spaces, retail, and food supplies.

Where the land to the west and south of the site has been developed with residential subdivisions there are footpaths, however many of the roads in close proximity to the site do not have a kerb, channel or footpath. Similarly, there are no dedicated cycling facilities near the site.

3.3.2 PUBLIC TRANSPORT

The current bus routes nearest to the site travel along Cosgrave Road and Clevedon Road, and provide the following services:

- Bus Route 372, a connector service[2] between Papakura Station, Willis Rd, Sheehan Ave, Dominion Rd, Clevedon Rd, Papakura Station. (Papakura Shops To Keri Hill Loop)
- Bus Route 365, a connector service[3] between Botany, Kilkenny Dr, Middlefi eld Dr, Mission Heights, Ormiston, Manukau.
- Bus Route RBS/33, a frequent service[4] between Papakura, Great South Rd, Manurewa, Manukau, Ōtāhuhu town centre, Ōtāhuhu Station.

Figure 3-3 shows the public transport services in the local area[5].

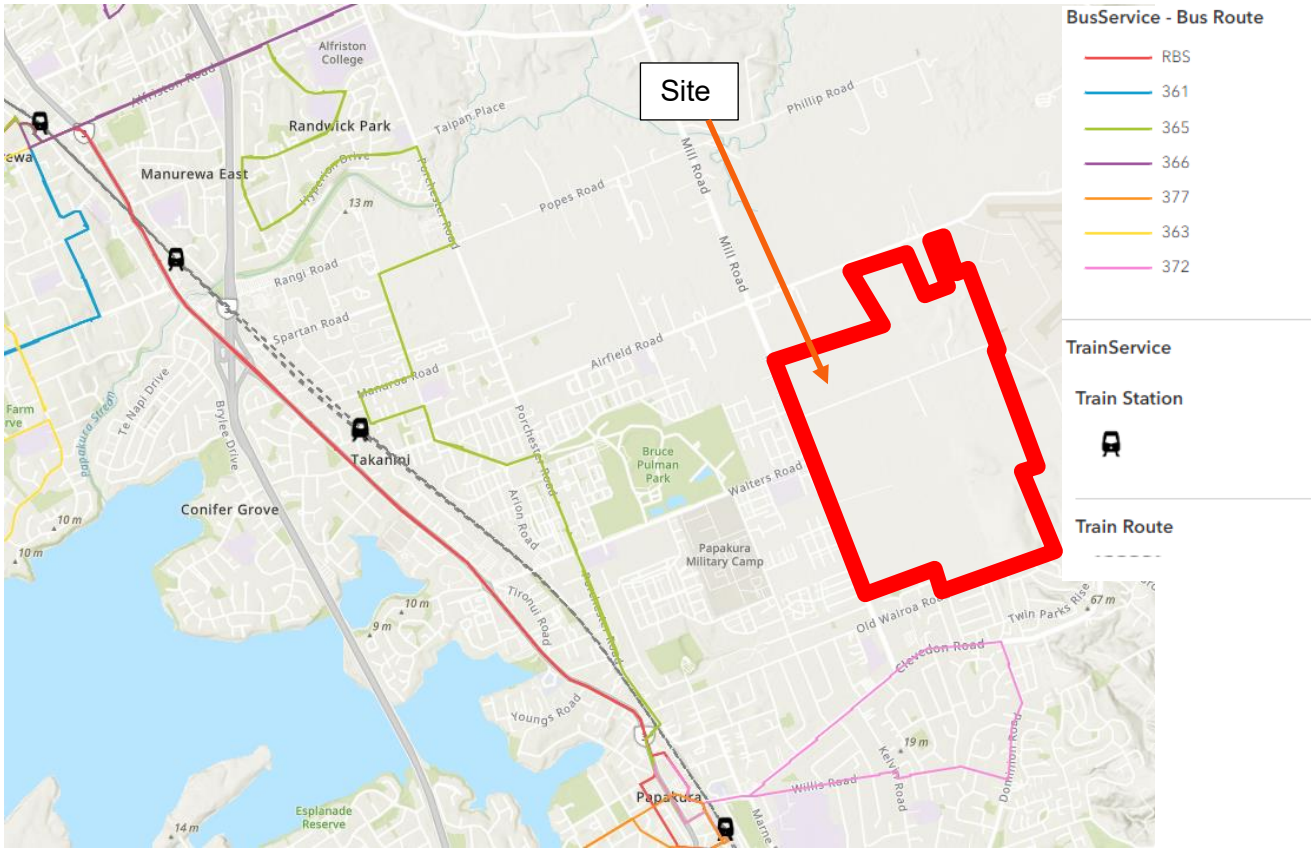
[2] At least every 30 minutes, 7am – 7pm, 7 days a week. Frequencies may be lower early mornings and evenings.

[3] At least every 30 minutes, 7am – 7pm, 7 days a week. Frequencies may be lower early mornings and evenings.

[4] At least every 15 minutes, 7am – 7pm, 7 days a week. Frequencies may be lower early mornings and evenings.

[5] AT Open GIS Data December 2023.

Figure 3-3: Public Transport Routes



It is also noted that Papakura and Takanini Train Stations are located approximately 3.1-4 km from the site. Both of these train stations are located on the southern line, which connects Pukekohe in the south to Britomart (being the Auckland CBD) in the north. Southern line train services operate with a 10-minute frequency in both directions from 7am to 7pm, and 20-minutes frequencies in the early mornings and evenings.

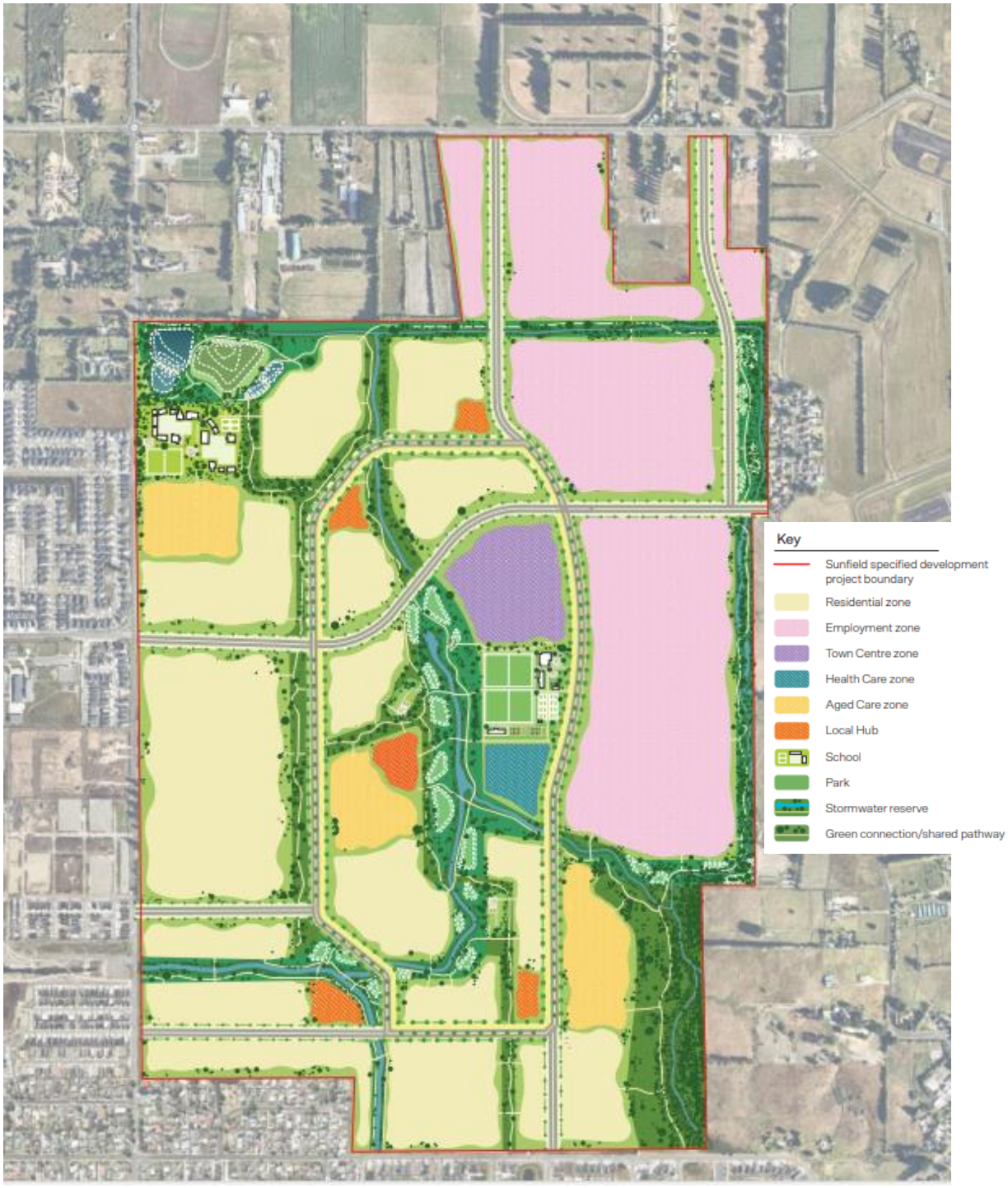
4 PROPOSED DEVELOPMENT

4.1 GENERAL

Sunfield Developments Limited is proposing to rezone a parcel of land to allow the development of the Sunfield masterplanned community. Sunfield is designed to be a 15-minute sustainable neighbourhood to provide residents access to most, if not all, resident needs within a short walk or bike ride from their home, including schooling, employment, medical services, restaurants and bars, recreational spaces, retail, and food supplies. Sunfield is designed on eight core principles, with the most fundamental principle being to enable 'Car-less Living'.

Figure 4-1 shows the proposed development, where the cream colour shows the residential areas, lilac shows employment, orange shows neighbourhood local centres, and green shows park / school space.

Figure 4-1: Proposed Development



Upon its completion, Sunfield will provide for:

- A community designed to enable “car-less” living.
- 4,000 healthy homes, consisting of 3,400 individual homes and 3 retirement villages of approximately 600 independent living units and care beds.
- 400,000 sqm of employment, healthcare and education buildings.
- A 7.6-hectare town centre.
- A school.
- A further 5 retail hubs located throughout the community.
- Permanent jobs for over 11,000 people.

- 27.7 hectares of open spaces, green links, recreation parks and reserves and ecological offsets.
- An extensive restoration and native planting of the core stream and wetland network.
- The establishment of the Sunfield renewable solar energy network for the community.
- The Sunbus electric shuttle fleet.

As detailed within the Context and Executive Summary, a key design principle of Sunfield is to create a masterplanned community that enables 'car-less Living, which significantly reduces the reliance on private cars within the development. This is to be achieved by way of a number of measures including:

- Only 1 in every 10 dwellings will be able to park in the Sunfield site;
- No dwellings will have car parks (either in each lot by way of garage or parking pad, or on nearby streets);
- Visitor parking will be provided at the same 1 in every 10 dwelling ratio;
- Parking for both residents and visitors will be provided at the neighbourhood hubs (rather than on each lot);
- Provision of the Sunbus electric bus fleet that operate continuously. These vehicles will travel around internally as well as linking the site to Takanini rail station and town centre and Papakura station and town centre.
- Provision of schools, town centre, local centres and employment zone to encourage residents to live, shop, play and work in the Sunfield area;
- Provision of an upgraded cycle / pedestrian network both internally and linking to the Papakura and Takanini town centres

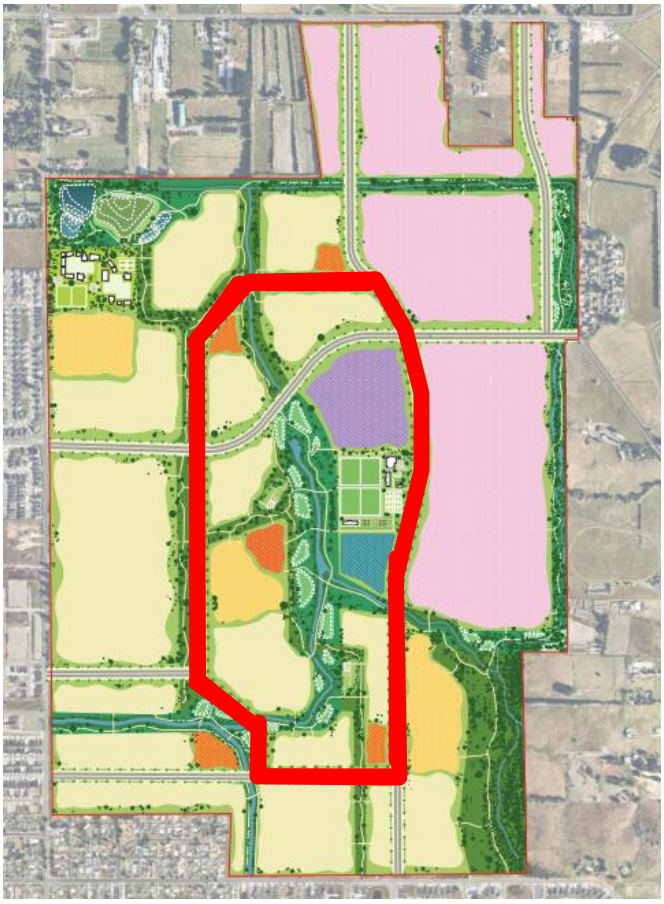
These concepts are discussed further in the following sections.

4.2 ROAD LAYOUT

4.2.1 SUNFIELD LOOP

A loop road is proposed to be the primary road within the development area as shown in Figure 4-2.

Figure 4-2: Indicative Loop Road Layout



The Sunfield Loop is a 32m wide transport corridor conceived as a distinctive internal feature that prioritises active and shared transport modes to provide easy access throughout the site and enable the concept of 15 minute walkable neighbourhoods. Community transport (bus or vehicle service) operates on its own dedicated and separated corridor with stops at local hubs and 400m intervals.

Figure 4-3 shows the indicative cross section of the loop road.

Figure 4-3: Indicative Loop Road cross section

Generous separated and dedicated cycle lanes and footpath allow for active modes as priority. A separated two-way bus vehicle facility is provided. Private vehicle access is restricted to the separate two-way corridor to avoid conflict and minimise crossing points. The loop is the primary movement corridor through the site.

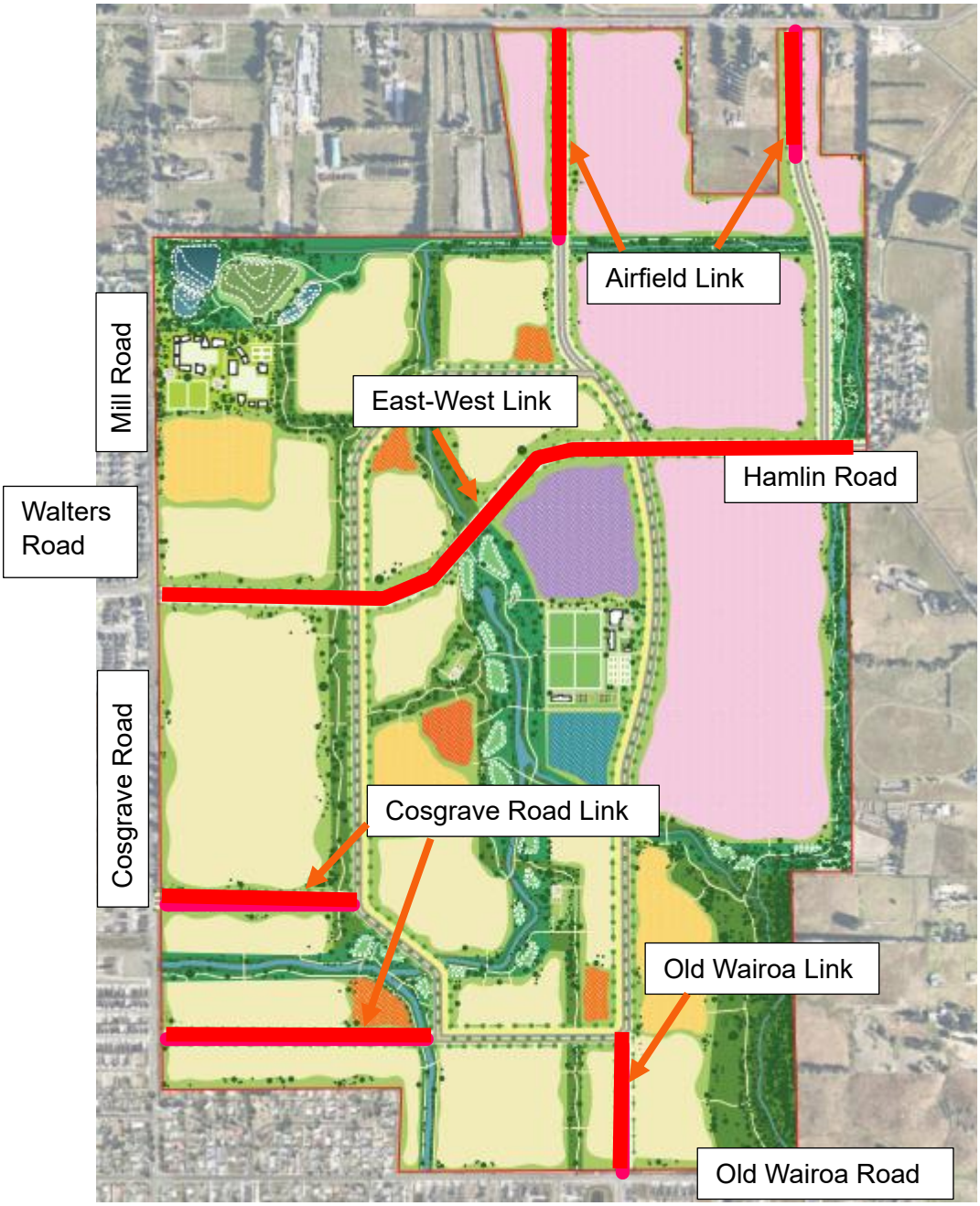
4.2.2 LINKS TO WIDER NETWORK

Six links to the wider roading network are provided including:

1. Realigned Hamlin Road: An east-west road is proposed to bisect the development area with a connection to Walters Road/Cosgrave Road in the west and Hamlin Road in the east.
2. Cosgrave Road Link: Three separate east-west Cosgrave Road Links that connect up to the Sunfield road loop.
3. Old Wairoa Road link: A north-south connection is also proposed to connect to the loop road at the southern end of the site, with a connection to Pakaraka Drive/ Old Wairoa Road in the south.
4. Airfield Road: Two new east-west roads proposed from the employment land across a parcel of land owned by Sunfield Developments Limited with two connections to Airfield Road.

These are shown in Figure 4-4.

Figure 4-4: Link roads

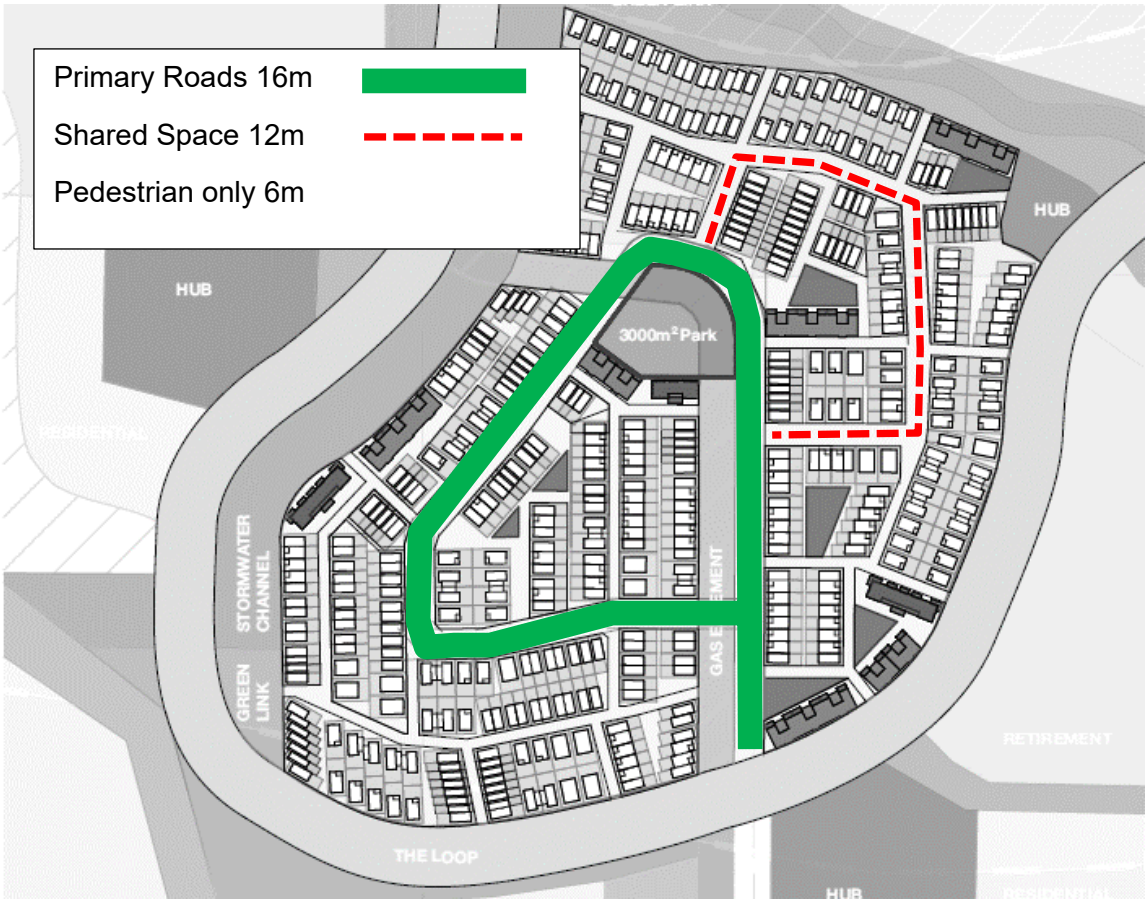


4.2.3 INTERNAL ACCESS ROADS

Additional access roads are proposed within the development area including 16m wide primary roads, 12m wide shared space corridors, and 6m wide pedestrian lanes.

These are indicatively shown in Figure 4-5 below in an indicative neighbourhood.

Figure 4-5: Internal roads



4.3 VEHICLE PARKING

The proposal includes residential vehicle parking at a maximum rate of 1 per 10 dwellings (i.e. 10% of dwellings have a parking space).

In typical residential developments in Auckland, most / all dwellings provide one parking space under the Unitary Plan (dependent on future zoning and size of dwellings), and therefore this is 10% of parking typically provided. It is noted that the National Policy Statement on Urban Development (NPS-UD) required Auckland Council to remove car parking minimums from the Auckland Unitary Plan. The removal of minimums occurred on 11 February 2022.

Residents and visitors parking will be provided within the neighbourhood centres. It is understood that the neighbourhood centres will be generally 700 m or less from any point within the site and therefore at most approximately a 10-15 minute walk.

5 TRAFFIC GENERATION

5.1 PREVIOUS PLANS

A framework plan for the Future Urban Zone (FUZ) part of Sunfield has previously been developed by Auckland Council. This showed approximately 1,200 dwellings however this is not across the entire FUZ zone but rather only 75% of the site that is zoned FUZ. Using all land in the FUZ zone this translates to approximately 1,600 dwellings.

Councils 'Future Development Strategy' (FDS) dated July 2018 identified the FUZ land in the 2023 – 2028 "development ready" time period. The FDS was updated in November 2023, with the current FDS identifying the FUZ land to be development ready in 2050+.

A "standard" subdivision of 1,600 dwellings in this environment would typically generate 0.5-0.65 traffic movement per dwelling in the peak hour. This would assume some improvement in public transport / walking / cycling as would be considered typical of a residential development in FUZ land. This totals some **800-1,040** movements in the peak hour (two-way).

5.2 PROPOSAL

5.2.1 TRIP RATES

5.2.1.1 RESIDENTIAL

Sunfield proposes around 4,000 dwellings (residential and retirement) highlighted by the following:

- Parking is only provided in the order of 10% (excluding visitors) of a more typical development.
- Sunbus electric bus fleet providing continuous and reliable connection to the Papakura and Takanini Train Stations,
- The ability for residents of Sunfield to 'Live Local' and 'Work Local',
- The ability to walk and / or cycle to the Papakura and Takanini Train Stations.
- 600 of the dwellings will be retirement units.

While only 10% of dwellings own a car, it is considered that the car traffic generation rate is not going to reduce completely to 10% of typical due to:

- More likely the cars provided will be more utilised than a typical subdivision (ie you will only have one if you really need it)
- UBER etc will also be used by residents thereby creating traffic in the peak periods (and these create two trips of one entering and one exiting)

It is considered a more reasonable assumption is the traffic generation will be 20-25% of typical so 0.1-0.16 trips per dwelling. This is **400-640** movements in the peak hour.

5.2.1.2 EMPLOYMENT

The site also has 57.4 hectares of employment which will also generate traffic outside the site (the town centre and hubs should not generate external traffic as they will serve Sunfield).

The following has been assumed in this assessment, based on the proposed masterplan for the warehouse distribution and office facilities which has been developed for the property:

- Site coverage of 60% (being 345,000 sqm in total)
- 48,300 sqm of office (being 14%), and
- 296,700 sqm of warehouse distribution (being 86%).

A standard employment peak hour trip rate would be 2 trips / 100 sqm for office and 0.75 trips per 100 sqm for the manufacturing. If this were a standard site it would therefore generate in the order of 966 trips for the office and 2,225 trips for the warehouse distribution (3,191 total).

As per Section 6 the parking provided for the employment zone is also proposed to be carefully managed to limit private vehicle usage. This will encourage workers to live in the area and promote public transport / active modes.

Again, the parking rates have been assumed to be approximately 10% of typical. As per residential, with parking constraint to 10%, it is considered that the car traffic generation rate is not going to reduce completely to 10% of typical due to;

- More likely the cars provided will be more utilised than a typical subdivision
- UBER etc will also be used by employees thereby creating traffic in the peak periods (and these create two trips of one entering and one exiting)
- Freight will still need to occur via truck / road

The site is however located so that the residents of Sunfield are more likely to work in Sunfield. As such external traffic (i.e. that outside Sunfield) will also significantly reduce. It is therefore considered that a more reasonable assumption is that the office peak hour traffic generation will be 20-25% of a typical development.

Further as is detailed later in this assessment, it is envisaged that a Traffic Plan be created for the employment zone. A key part of this Traffic Plan would be the requirement for 75% of the movements relating to the warehouse distribution operation to be confined to off-peak only (being the hours outside of Monday to Friday 7-9am and 4-6pm).

It is therefore considered that a more reasonable assumption is that the warehouse distribution peak hour traffic generation will be 10-15% of a typical development.

The total for the employment zone is therefore **416-575** movements in the peak hour.

5.2.1.3 MEDICAL CENTRE

The site also has 2.2 hectares for a proposed a medical centre of up to 3,500 sqm. The following has been assumed:

A medical peak hour trip rate would be 8.8 trips / 100 sqm. If this were a standard site it would therefore generate in the order of 308 trips per hour.

As per Section 6 the parking provided for the medical centre is also proposed to be carefully managed to limit private vehicle usage.

Again, the parking rates have been assumed to be approximately 10% of typical. As per residential, with parking constraint to 10%, it is considered that the car traffic generation rate is not going to reduce completely to 10% of typical due to;

- UBER etc will also be used by patients outside the Sunfield area thereby creating traffic in the peak periods (and these create two trips of one entering and one exiting)
- Often patients are dropped-off / picked-up at medical centres

The site is however located so that the residents of Sunfield are more likely to use the medical centre. As such external traffic (ie that outside Sunfield) will also significantly reduce. It is therefore considered that a more reasonable assumption is that the traffic generation will be 25-30% of a typical development. This is **77-92** movements in the peak hour.

5.2.1.4 LOCAL / TOWN CENTRE / SHOPPING

The uses in the local and town centre are intended to serve the Sunfield area and not those outside. They will also have very limited parking provision and as such external traffic generation to these areas is expected to be minimal.

5.2.1.5 TOTAL

Based on the above, the total external traffic generation is expected to be 893-1,308 movements in the peak hour (two-way). This is higher than the original FUZ land proposal by between 12% and 26%. However, consideration needs to be given to the facts that:

- Sunfield will be developed over an extended period of time in the range of 10 to 15 years.
- Sunfield is being developed over an area of 244.5 hectares rather than the 56.5 hectare of development on the FUZ land.
- The Sunfield proposal provides an additional 2,400 healthy homes when compared to the development of the FUZ land.
- The Sunfield proposal delivers 76.5 hectares of employment, healthcare and education zoned land which is not considered in the development of the FUZ land and will provide permanent employment for in excess of 11,000 people.

5.2.2 MODE SHARE

A mode share analysis has also been undertaken separately to determine the external traffic generation of the residential / employment zones. This is detailed in **Appendix A** and results in a total of **1,072** external movements in the peak hour (two-way) entering / leaving the Sunfield site. This analysis is based on a number of assumptions including:

- 50% of all employees in Sunfield live in Sunfield (regardless of mode)
- 60% of people use public transport
- Shopping / retail / local centre in Sunfield attracts no external traffic in the peak commuter hours (ie they only attract Sunfield residents)
- Limited / no customer deliveries in peak hours for the commercial/industrial uses (essentially given Auckland's limited spare capacity in commuter peaks)
- 50% of all staff / patients of the medical centre is from Sunfield residents
- 15% walk
- 5% cycle
- 20% use private car (either on their own or share with other)
- 25% of people travel in the peak commuter hour (by some mode)
- Average occupancy of private car is 1.2 people per car

5.2.3 SENSITIVITY

As noted above, the mode split and trip generation are based on an assumption that 50% of all employees in Sunfield live in Sunfield (regardless of mode) and that 60% of people use public transport with only 20% using private vehicles for all trips. It is recognised that this type of mode split is very different to that currently seen across New Zealand.

Sensitivity tests on the mode share targets have therefore been considered, with the transport response of each scenario being considered.

While there may be a concerted effort to reduce car dependency by the developer in creating the community envisaged, should homeowners find alternative means to park a car nearby the number of vehicles generated and therefore effects may be increased.

A more conservative / typical set of assumptions have been also reviewed as follows:

- 50% of all employees in Sunfield live in Sunfield (regardless of mode)
- 15% of people use public transport
- Shopping / retail / local centre in Sunfield do attract external traffic in the peak commuter house in a more typical trip rate
- More standard customer deliveries in peak hours for the commercial/industrial uses
- 50% of all staff / patients of the medical centre are from Sunfield residents
- 15% walk
- 5% cycle
- 65% use private car (either on their own or share with other)

With these assumptions it is recognised that traffic generation could be as high as 6,000 vehicles per hour. This demonstrates the importance of the planning provisions delivering the mode share.

6 REVIEW OF GENERAL MITIGATION

6.1 PARKING

6.1.1 GENERAL

The Sunfield site is proposed to be a car-less development where private car travel is discouraged. One of the ways of discouraging private car travel is to make owning a car difficult in the development and providing a multitude of readily accessible and enabled alternatives (e.g. public transport, walking, cycling, purpose-built neighbourhoods).

6.1.2 RESIDENTIAL

As previously discussed, the parking rates for residential include:

- Only 1 in every 10 dwellings will be able to be able to park one car in the Sunfield site;
- No dwellings will have car parks (either in each lot by way of garage or parking pad, or on nearby streets);

- Visitor parking will be provided at the same 1 in every 10 dwelling ratio;
- Parking for both residents and visitors will be provided only at the neighbourhood hubs. As noted previously, the National Policy Statement on Urban Development (NPS-UD) required Auckland Council to remove car parking minimums from the Auckland Unitary Plan. The removal of minimums occurred on 11 February 2022.

6.1.3 EMPLOYMENT

The current Unitary Plan would have parking for office at 1/45 sqm minimum and 1/30 sqm maximum (depending on zone). The Unitary Plan also has a City fringe at 1 / 60 sqm maximum and City Centre of 1/200 sqm. For industrial the Unitary Plan contains a minimum of 1 per 50 sqm (or a 0.7 per staff). There are no maximum rates in the AUP for industrial use.

Given parking for the residential use only provides 10% of typical parking numbers, it is considered appropriate to consider a similar stance for employment. As such the following is considered appropriate:

- Maximum of 1/300 sqm for office.
- Maximum rate of 1/500 sqm for manufacturing / warehouse / industrial.

6.2 PUBLIC TRANSPORT

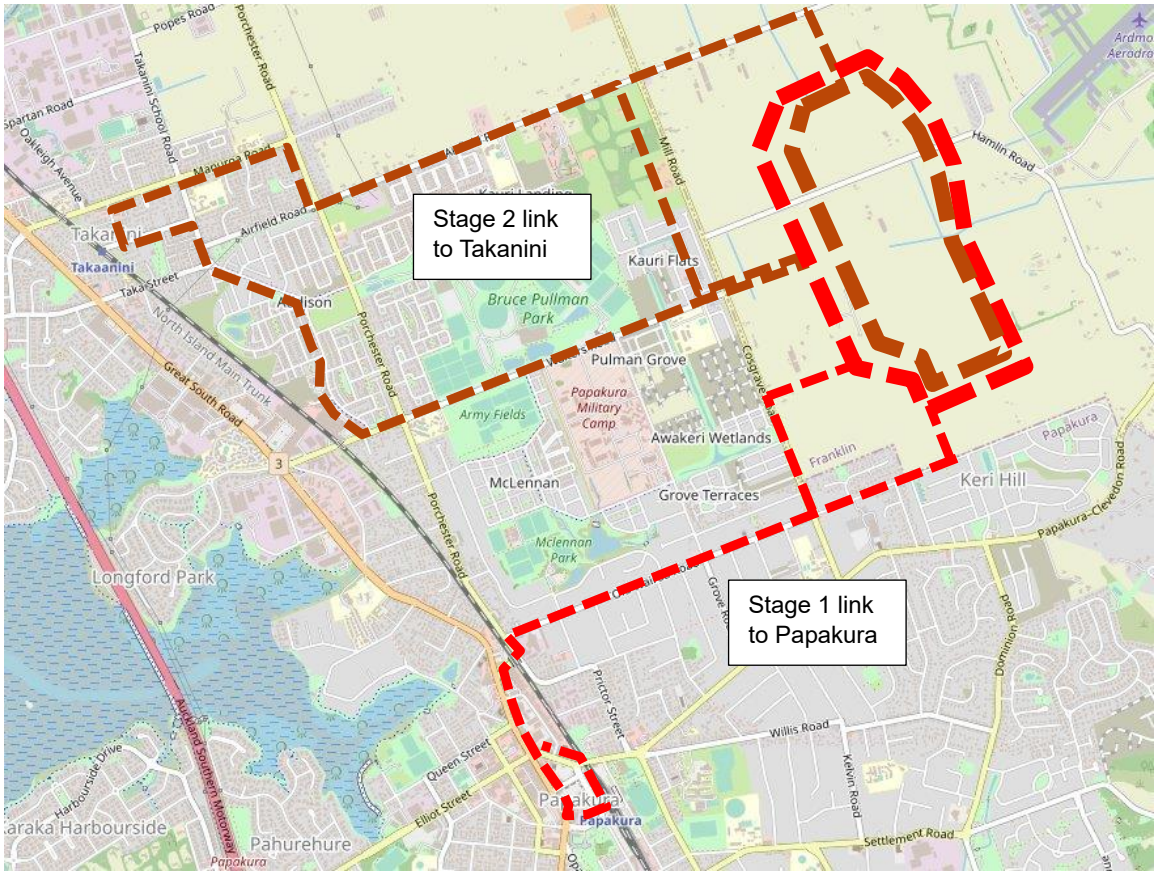
6.2.1 SUNFIELD VISION

A key component of the Sunfield vision is the provision of a public transport network with a fleet of vehicles that operate continuously. The vehicles will:

- travel around internally using the loop road
- link the site (initially) to the Papakura station and town centre and then Takanini rail station and town centre in subsequent stages.
- be operated by Sunfield thereby removing financial requirement of Auckland Transport which so often occurs in other greenfield developments.

Figure 6-1 shows the intended routes of these vehicles.

Figure 6-1: Public transport routes



Based on the modal analysis in section 5.2.2 the public transport provision is expected to cater for a significant proportion of movement throughout Sunfield (and external). The analysis shows that up to 60% of all movement will need to be made using public transport.

The analysis shows that this equates to about 3000-3500 people per hour (peak hour) using the Sunfield public transport system (both externally and internally). This translates to around 1,000 people per hour internally and 2,600 externally per hour (both residential and employment). The number of buses required to accommodate this number of people depends on the capacity of the vehicle. Assuming a seating capacity of 40 people this translates to up to 88 bus movements per hour.

The journey from the edge of the site to Papakura train station is likely to take 6-9 minutes in the morning peak period (assuming no stopping) and thus the return journey for the bus will be in the order of 20 minutes.

The internal loop road is in the order of 3.6km in length. Assuming an average travelling speed of 40km/hr (5.4 minutes), a total of 11 stops taking 20 seconds each (3.5 minutes) the total travel time for one internal bus loop would be 9 minutes. As such the total return journey would be around 30 minutes.

As such each bus would accommodate 2 return journeys. To accommodate 88 bus journeys this would require 44 vehicles. This would be in the long term with the number proposed expected to match demand.

With the total loop being approximately 8.6km (3.6km internally and 5km external) and assuming 22 vehicles in each direction this translates to an average headway (or gap between buses) of 400m.

6.2.2 EXTERNAL DESTINATIONS

Given the high use of public transport anticipated, an assessment of the likely travel times via public transport to larger facilities / destinations has been made. Table 2 summarises key destinations.

Table 2: Public transport

Wider Attractions	Distance	Method	Likely time[6]
Auckland CBD	30 km	Sunfield Bus / train	1 hr 20 mins
Auckland Airport	20 km	Sunfield Bus / train / airbus at Puhinui	1 hr 5 mins
Albany	50 km	Sunfield Bus / train / northern Express	2 hr 10 min
Sylvia Park	25 km	Sunfield Bus / train (swapping train at Otahuhu)	1 hr
Manukau	14 km	Sunfield Bus / Bus 33	55 mins
New Lynn	35 km	Sunfield Bus / train / (swapping train at Newmarket)	1 hr 40 mins

6.3 WALKING AND CYCLING UPGRADES

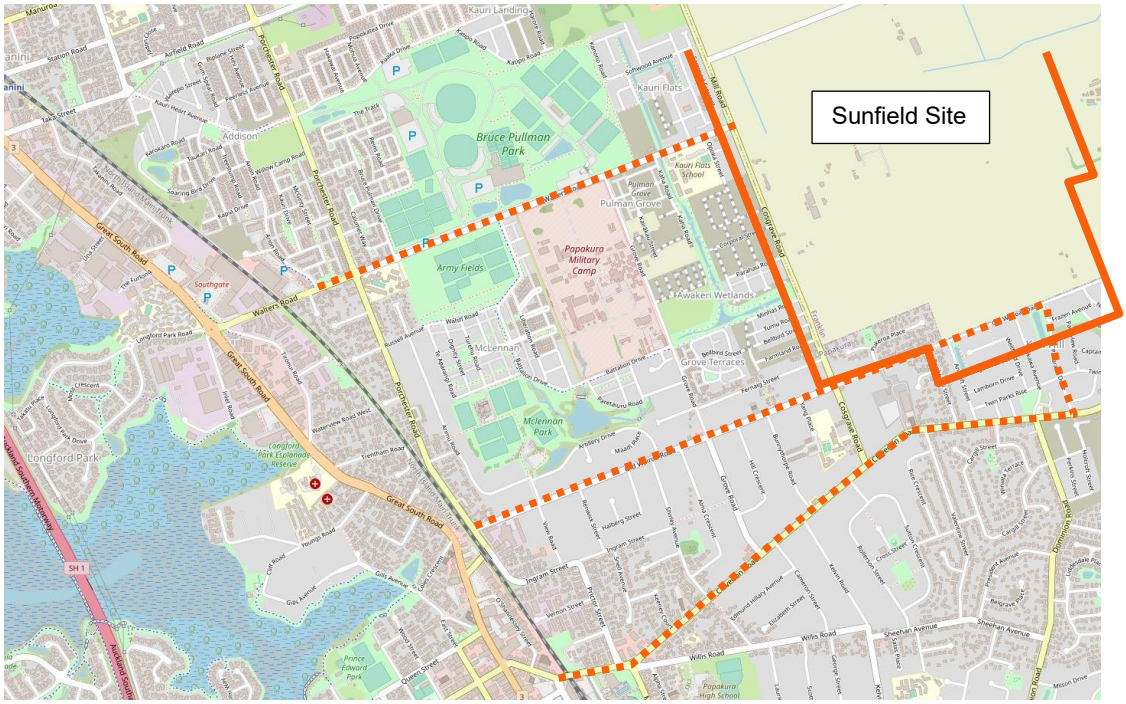
A further key component of the Sunfield vision is the provision of an active transport network both internally and externally to the site. The active modes consist of:

- travel around internally using the loop road as well as the primary roads and shared spaces and off-road paths
- Linking the site to the Papakura rail station and town centre and Takanini rail station and town centre by way of cycling / pedestrian facilities.

Figure 6-2 shows the intended routes of the active transport network.

[6] Assuming 10-minute wait between Sunfield bus and train

Figure 6-2: Active transport network



It is noted that small sections of Walters Road (in particular near Cosgrave Road) already have cycle lanes partly constructed.

The detail of the cycle lanes / upgrades will need to be designed / constructed with Auckland Transport.

Sunfield also proposes to purchase properties in Papakura and Takanini in close proximity to the train stations for the purpose of safe secure bike storage.

6.4 INTERSECTION UPGRADES (LOCAL)

While the emphases will be on public transport and active modes, it is considered that there will likely need to be a number of local network intersection upgrades. These upgrades are to serve both private car but also facilitate public transport and safe active modes. The anticipated upgrades are shown on Figure 6-3 below.

Detailed transportation modelling will need to be undertaken to confirm the extent, nature and design of these intersections. It is however noted that the extent of the upgrades is very much dependent on the success of the measures developed in Sunfield to reduce private car travel.

Figure 6-3: External intersection upgrades

There will also need to be a number of internal controlled intersections within Sunfield. These are likely to be signalised to accommodate both the vehicular movements (including the loop road bus priority) as well as the safe and efficient crossing of roads for active modes.

Figure 6-4: Internal intersection upgrades

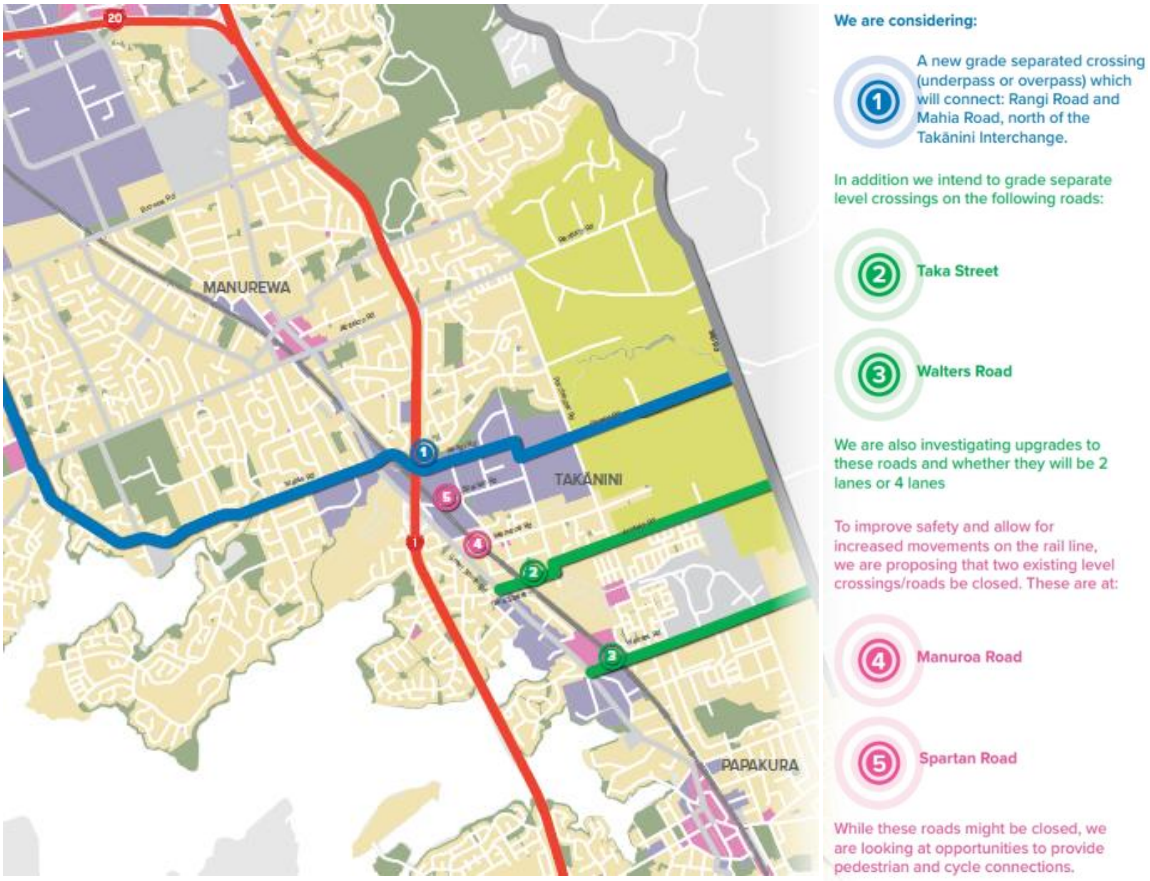
6.5 WIDER ISSUES

Access to the site to the wider network requires all vehicles travelling to the west (to access the Southern Motorway) to cross at-grade rail crossings (at either Manuroa Road, Taka Street, Walters Road). There is currently a focus to remove these level rail crossings due to the safety concerns. As such, additional growth from Sunfield will increase traffic and therefore periods of congestion across the rail tracks. Supporting Growth Alliance (SGA) have released a document as shown in Figure 6-5. This includes:

- Closing the level crossings of Manuroa Road and Spartan Roads

- Grade separating Taka Street and Walters Road
- A new grade separated crossing (underpass or overpass) which will connect Rangi Road and Mahia Road (via Popes Road), north of the Takānini Interchange.

Figure 6-5: Takanini Rail upgrades[7]



Future stages of the project will need to consider the above within analysis of traffic generation.

Further, Mill Road provides northbound and southbound access and connectivity to other centres via various modes. The National Government has indicated Mill Road Stage 1 will be undertaken.

As for the local area upgrades (and a review of wider impacts), detailed transportation modelling will need to be undertaken to confirm the extent, nature and design of upgrades. It is however noted that the extent of the upgrades is very much dependent on the success of the measures developed in Sunfield to reduce private car travel.

7 [7] https://www.greaterauckland.org.nz/2018/10/05/transport-growth-networks-south/supporting-growth-south-takanini/

6.6 TRAVEL DEMAND MANAGEMENT PLAN

Travel Demand Management Plan (Travel Plans) are typically prepared for employment and educational activities with the aim of reducing car dependency, particularly in peak commuting periods. Travel Plans usually include the operational measures that can be put in place to support such a reduction in car dependency. The plans can include matters concerning the management of parking areas, the provision for active transport facilities, the promotion for public transport, and the provision for shared transport programmes.

A Travel Plan sets out how travel demand is to be managed for a particular site or proposal to:

- maximise the efficient use of transport networks and systems;
- promote and enable the use of more sustainable and active modes of transport such as public transport, walking and cycling, and carpooling, ride sharing, car sharing and micro mobility as alternatives to sole occupancy private cars; and
- manage the efficient use of limited resources such as car parking and loading areas.

It is considered that a Travel Plan for the employment zone would be beneficial for both the site and the surrounding transport network. The Travel Plan could be continuously updated and refined based on changes in the area (e.g. changes in bus routes, congestion area), and could consider methods such as minimising freight / deliveries to the area during times of peak network congestion.

As detailed earlier in the assessment, it is envisaged that a key part of the Travel Plan would be the requirement for 75% of the movements relating to the warehouse distribution operation to be confined to off-peak only (being the hours outside of Monday to Friday 7-9am and 4-6pm).

The creation and implementation of Travel Plans within Auckland is common practice and is supported by Auckland Transport.

6.7 MONITORING

It is recognised that this development is essentially a first for New Zealand. As a result, it is considered that careful monitoring of initial stages of the development is needed to ensure the measures proposed have the desired result of significantly reducing private car travel (both internal and externally).

This monitoring should measure the travel modes of residents / workers including a continuous traffic count of the external links to the wider roading network to ensure private car travel is minimised as planned.

7 POTENTIAL ISSUES AND MITIGATION PLANS

7.1 GENERAL

It is recognised that Sunfield proposes a very different way of managing travel (both internally and externally). As a result, there are some very specific and unusual potential issues with the proposal as noted in the following sections.

7.2 ILLEGAL PARKING

It is considered that there is a strong potential for parking in other areas of the site (other than designated areas in the hubs) including over berms and in the shared spaces. In this regard the following measures are anticipated:

- The design of all areas should ensure parking on berms is impossible to occur. This could include planting, bollards and fencing. In this regard with a typical 6m carriageway currently being pursued by Auckland Transport in green field developments, this allows for parking on-street. Based on the Engineering Plan Approval and the resolution process, this suggest ample parking may well exist on-street by the time the road is constructed. This will need to be managed with Auckland Transport to ensure this parking cannot occur.
- Covenants (or similar) to be placed on homeowners/ residents with regards to parking; and
- Enforcement of no parking in the neighbourhoods generally and in the hub areas outside designated parking areas

7.3 PARKING OFF-SITE

With a significantly constrained parking provision there is a strong possibility of residents (and potentially workers) parking in existing residential areas outside Sunfield and then walking / taking the public transport available to / from Sunfield to their car. As a result, the reduction in traffic generation would not eventuate. The residential areas considered most susceptible to this is shown in Figure 7-1 which shows an approximate 2km distance (30-minute walking) from any point on the site.

Figure 7-1: Potential off-site parking

These areas will need to be monitored to ensure no residents from Sunfield park off site.

In this regard it is noted that:

- Covenants (or similar) can be placed on Sunfield homeowners/ residents with regards to parking (i.e. not having a car); and
- There are measures such as resident parking schemes that can be implemented to ensure only local residents park in the areas shown in Figure 7-1.

7.4 LOADING AND SERVICING

All deliveries / loading will primarily occur through the local hubs and from the primary roads within the neighbourhoods. Within these neighbourhoods are service hubs are located within 75 metres of every house. They contain:

- Refuse and recycling
- Cycle Storage
- Loading bays for service vehicles and pick up and drop off services
- Post and courier boxes

7.5 EMERGENCY VEHICLES

Preliminary analysis has been undertaken to ensure a fire truck can access the site through the loop road primary road and shared space. From these locations it is considered that the requirements of the NZ Fire Service “emergency vehicle access guidelines” and “NZ Fire Service firefighting water supply code of practice” can be met.

In particular all houses will be no more than 135m from a fire hydrant / fire truck. This will need to be reconfirmed in detail though later stages of design.

7.6 RIDE HAILING

There will likely be a greater reliance on UBER type vehicles within Sunfield. Dedicated areas (pick-up / drop-off) in all Hubs should be considered for these vehicles as well as shared use vehicles (eg cityhop).

These vehicles will also need to be managed throughout the neighbourhood centres.

8 CONCLUSION

Sunfield Developments Limited is proposing to rezone a parcel of land to allow the development of the Sunfield masterplanned community. Sunfield is designed to be a 15-minute sustainable neighbourhood to provide residents access to most, if not all, resident needs within a short walk or bike ride from their home, including schooling, employment, medical services, restaurants and bars, recreational spaces, retail, and food supplies. Sunfield is designed on eight core principles, with the most fundamental principle being to enable 'Car-less living'.

Critical to this are;

- Significant limitations in the number of cars on the site (generally 10% of a more standard development);
- Provision of frequent and privately funded public transport system linking both internally within the site and the wider network (including town centres and major train stations);
- Encouraging active transport modes through reduction in car ownership.
- The creation and introduction of a Traffic Plan across the employment zone.
- Implementation of the requirement for 75% of the movements relating to the warehouse distribution operation to be confined to off-peak only (being the hours outside of Monday to Friday 7-9am and 4-6pm)

It is anticipated that any future development, would provide the transport network upgrades described in this assessment.

It is recognised that this development is essentially a first for New Zealand. As a result, it is considered that carefully monitoring of initial stages of the development is needed to ensure the measures proposed have the desired result of significantly reducing private car travel (both internal and externally).

APPENDIX A: MODE SHARE ANALYSIS

SUNFIELD MODE SPLIT ANALYSIS

RESIDENTIAL			EXTERNAL TRAFFIC		
Mode Splits			Those to / from Sunfield		
		Movements	% internal	Internal emp	External
Public Transport	60%	1891	50%	945	945
Walk	15%	473	80%	378	95
Cycle	5%	158	70%	110	47
Carshare	0%	0	20%	0	0
Private Vehicle (inc rideshare)	20%	630	20%	126	504
	100%	3151		1560	1591
Dwellings	4000				
Occupancy	3.2				
Trip during peak hour	25%				
Total trips	3151				
Census Data					
Auckland					
Occupied Dwellings	498789				
Aucklnd Population	1571718				
Average Occupancy	3.2				

EMPLOYMENT			33750	office	675
			207000	ind / man	1553
	mode				2228
Public Transport	60%	1337			
Walk	15%	334			
Cycle	5%	111			
Carshare	2%	45			
Private Vehicle (inc rideshare)	18%	401			
	100%	**2228**			

MEDICAL		5000	medical	440
	mode			440
Public Transport	60%	264		
Walk	15%	66		
Cycle	5%	22		
Carshare	2%	9		
Private Vehicle (inc rideshare)	18%	79		
	100%	**440**		

TOTAL

	people				vehicles			people per vehicles	
	TOTAL		int	ext	total	int	ext		EXT VEH
Public Transport	3491		945	2546	87	87	87	40	87
Walk	873		378	495	873	378	495	1	0
Cycle	291		110	181	291	110	181	1	0
Carshare	53		0	0	0	0	0	0	0
Private Vehicle (inc rideshare)	1110		126	984	925	105	820	1.2	984
	5,819		**1,560**	**4,205**	**2,176**	**681**	**1,583**		1072