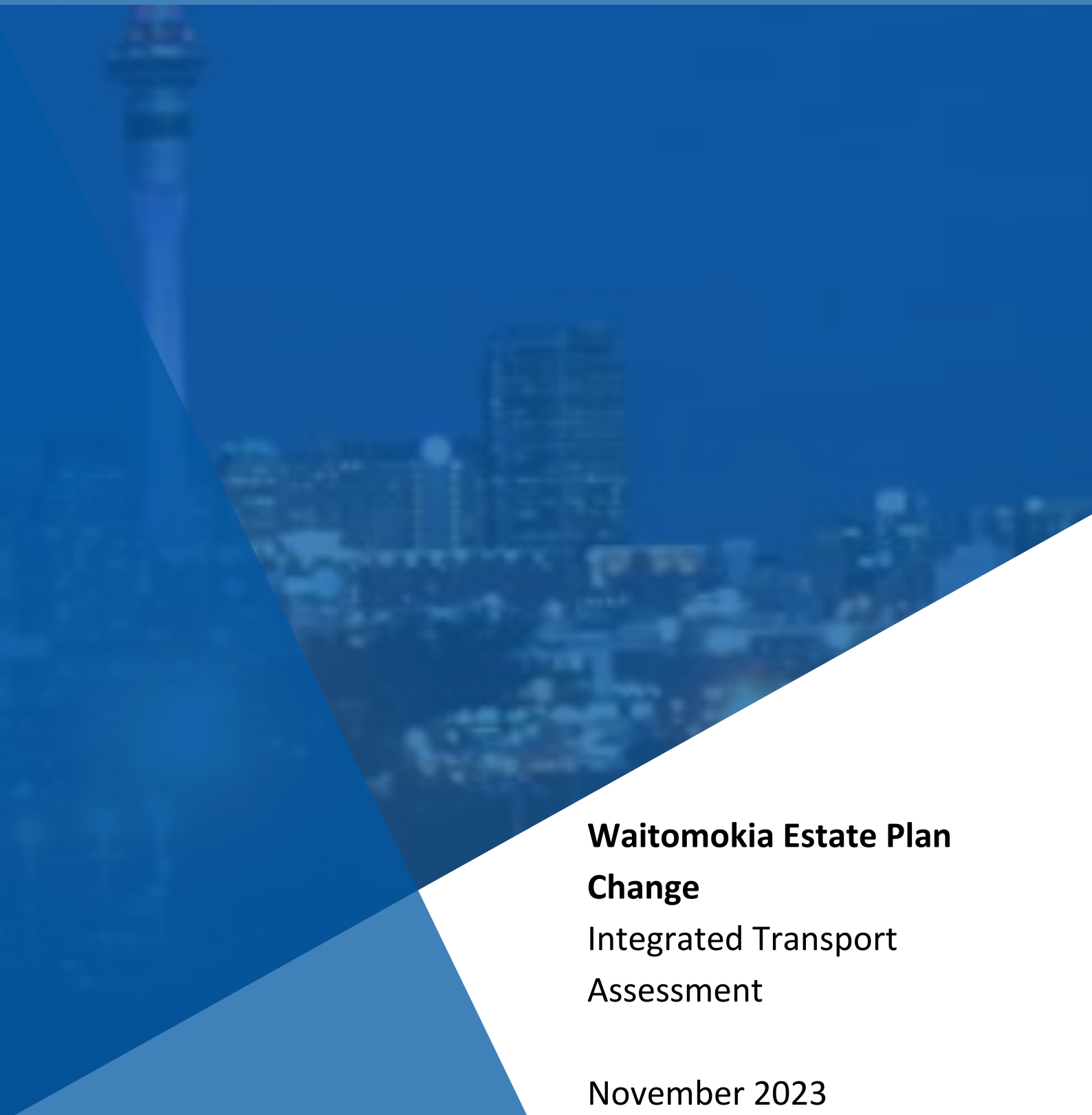

# Waitomokia Estate Plan Change

Integrated Transport Assessment

November 2023

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TRANSPORTATION SPECIALISTS

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TRANSPORTATION SPECIALISTS

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| **Reviewed by:** | **Terry Church** |

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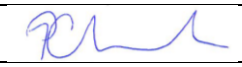
| 16 November 2023 | E | R1E231116 | T Church |  |

# SUMMARY OF OUR ASSESSMENT

Flow Transportation Specialist Ltd (Flow) has undertaken an Integrated Transport Assessment (ITA) of Goodman's proposed private Plan Change (PC) at 118 Montgomerie Road (the Site) in Māngere, Auckland. The private PC is to introduce a precinct overlay that reflects the Site's cultural significance according to the Auckland Unitary Plan (AUP). The site's existing zoning, which is classified as Light Industry Business zone, will remain unchanged. The Site could facilitate approximately 15 warehouse buildings alongside corresponding office space.

Based on our assessment, we do not expect the proposed PC to adversely affect the surrounding transport network. In addition, The PC will generally be aligned with the outlines of AUP E27 matters.

The PC area has predicted hourly trips of 807 and 723 vehicles during the morning and afternoon peak periods, respectively. We note that this includes the Indevin site trips associated with the potential redevelopment of the site. While including Indevin site trips within the assessment, we note that Indevin intend to retain their current access from Oruarangi Road.

We have conducted a SIDRA Intersection analysis of the main Montgomerie Road access. The results demonstrated that there are no adverse effects on the intersection's operation and that it will continue to operate sufficiently with the additional traffic demand added. The Pavilion Drive/Montgomerie Road intersection will experience a low increase in traffic demand as a result of Pavilion Drive having a secondary access function. We consider this small increase in demand to be negligible on its operation.

The predicted increase in traffic demand at the Ascot/Montgomerie Road and Pavilion/Renie Drive roundabouts is still within the operational bounds of a single-lane roundabout. We consider these roundabouts to continue to operate with acceptable capacity.

The proposed PC is not expected to substantially increase pedestrian, cycling, or micromobility traffic due to the industrial nature of the area, and safety issues are not anticipated. Footpaths will be included in the access road design to accommodate low-demand facilities. During resource consent phase, careful design will ensure safe intersections and support potential warehousing development.

Recognising the above, we have identified a series of transport interventions recommended to manage the effects of the proposed PC below

- A public walking connection/crossing at the Montgomerie Road access point should be provided to the existing facilities on the eastern side of Montgomerie Road
- The walking connection along the proposed access road should facilitate future industrial development connectivity and will be evaluated during subsequent land use consent stages
- An appropriate intersection connecting the access road to Montgomerie Road, meeting sight distance requirements, will be evaluated during subsequent land use consent stages.

Should the recommendations set out above be implemented, we are of the view that there are no transport planning or engineering reasons to preclude the implementation of the proposed PC (a precinct overlay) as set out in this ITA.

# CONTENTS



# APPENDICES

# 1 INTRODUCTION TO THIS REPORT

Flow Transportation Specialists Ltd (Flow) has undertaken an Integrated Transport Assessment (ITA) for Goodman Nominee (NZ) Limited's proposed private Plan Change (PC) at 118 Montgomerie Road (the Site) in Māngere, Auckland.

This ITA provides the following information

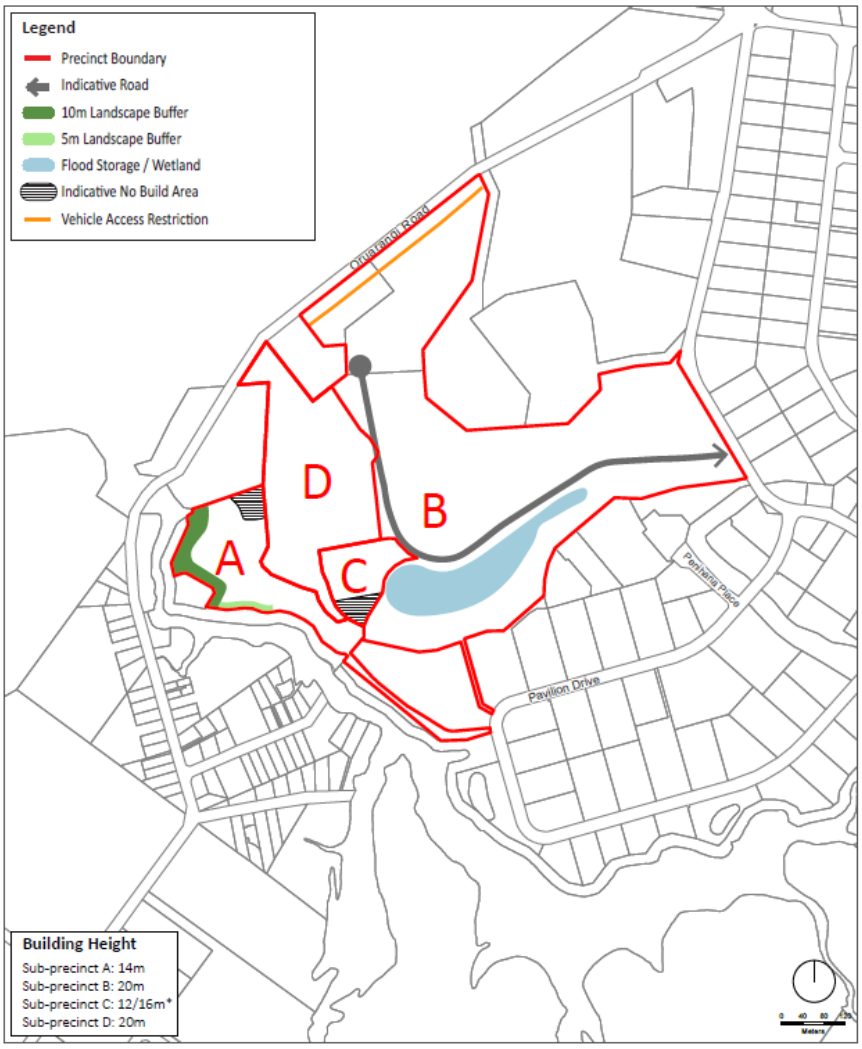
- A description of the proposed PC
- A description of the existing and future transport environment, including
  - the site location and surrounding land use activities
  - the surrounding transport networks
  - an assessment of the historic crash record in the vicinity of the PC area
  - accessibility for all modes of transport
- Commentary on relevant Local and Central Government land use and transport planning matters
- An assessment of the potential transport effects, including
  - estimated trip generation
  - potential effects on safety, walking, cycling, public transport, general traffic, and parking
- Commentary on relevant Chapters of AUP
- Any recommended interventions.

# 2 THE PROPOSED PLAN CHANGE

The purpose of the proposed PC is to introduce a precinct overlay that reflects the cultural significance of the Site according to the Auckland Unitary Plan (AUP).

The existing zoning of the Site, which is classified as Light Industry Business zone, will remain unchanged. The precinct overlay itself will comprise three distinct sub-precincts. An illustration of the envisioned Precinct Plan is provided in Figure 1.

**Figure 1: Proposed Precinct Plan**




In terms of transportation considerations, the proposed precinct plan features an access road that will connect with Montgomerie Road at its eastern end. This access road will end in a cul-de-sac at its northwestern terminus, offering ample space for large trucks to manoeuvre. Additionally, a smaller portion of the Site situated west of the existing Indevin site will be accessed via an easement connection to Pavilion Drive. Indevin intend to retain access with Oruarangi Road.

There is a vehicle access restriction proposed on the northern side of the site along Oruarangi Road as illustrated in Figure 1 to prevent motorists from using this road to access the site.

A development example includes

- Warehousing mainly to the north and east of the proposed access road
- A connection to the existing Indevin site off the access road
- Access to the wider road network from
  - Montgomerie Road, via a new access road
  - Pavilion Drive, via an access easement
- Pedestrian connection to Montgomerie Road

- car parking and loading areas serving the warehousing.

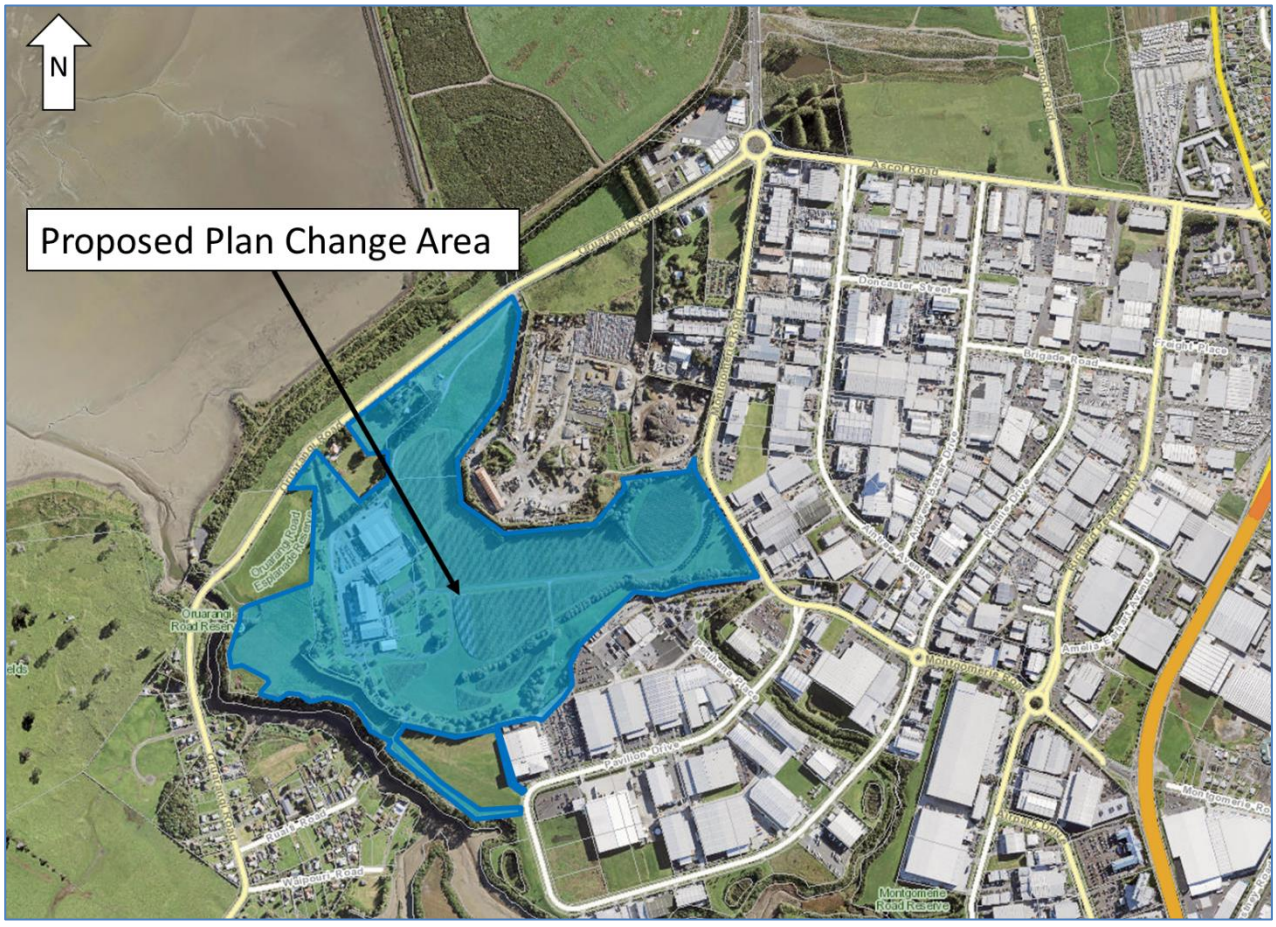
# 3 THE EXISTING ENVIRONMENT

## 3.1 Site location and existing activities

The private PC area is enclosed by Oruarangi Road, Montgomerie Road, and the Oruarangi Creek. It is located in Waitomokia, Māngere, Auckland. The location of the PC area in relation to nearby land uses is illustrated in Figure 2.

This area for the PC is largely open land without any existing buildings, except for storage warehouses on the western edge of the zone at the existing Indevin site.

**Figure 2: Proposed PC Area**




The existing Indevin site is located to the western end of the PC area and accessed via Oruarangi Road.

## 3.2 Surrounding land use and zoning

The surrounding land use is shown on Figure 3 and includes

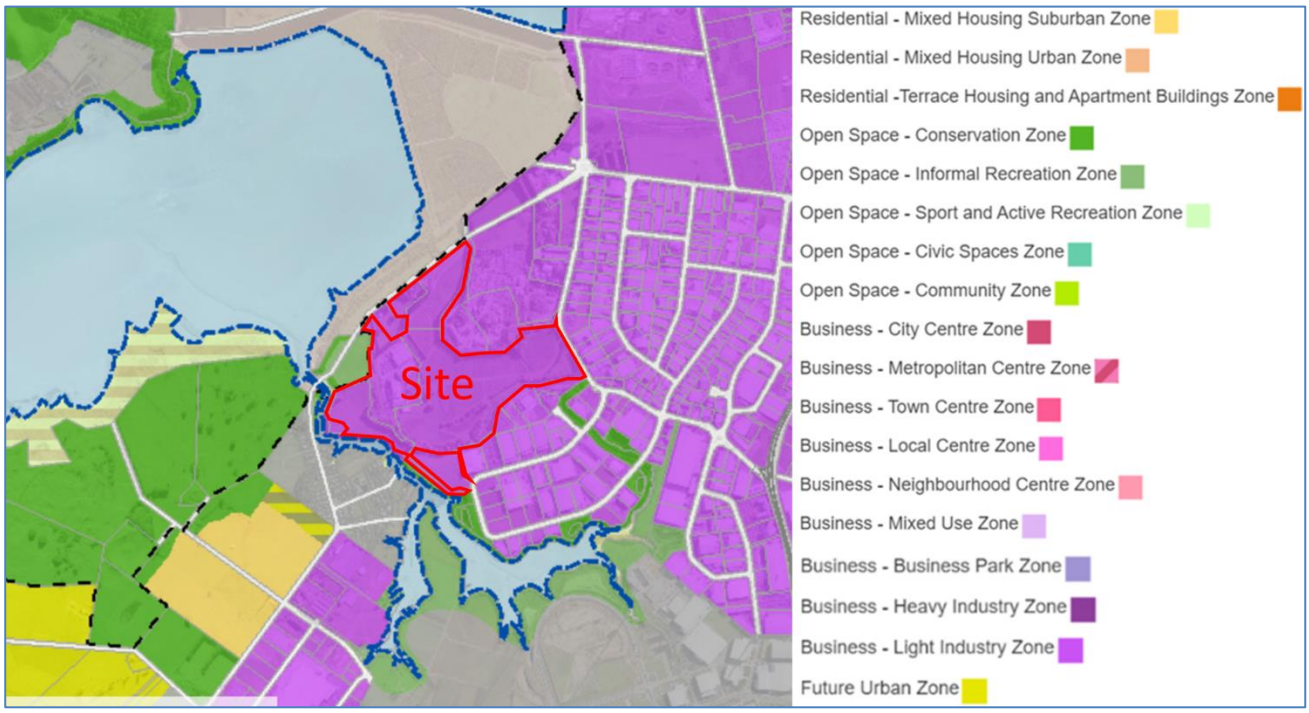
- The entire site holds a Light Industry Business zone classification as specified by the AUP
- Within the site, there are storage warehouse buildings
- Towards the north and west of the Site, there exist several Open Space zones

- To the north of the Site, there is a Special Purpose Zone – Māori Purpose.

The Site is close to various light-industrial activities, including:

- To the south and east of the immediate vicinity of the site, there are numerous business and retail properties with an industrial focus
- Along Pavilion Drive and Montgomerie Road, there are several automotive businesses.

**Figure 3: Existing surrounding Land use zones**




## 3.3 A description of the Roads

### 3.3.1 Montgomerie Road

According to the Auckland Unitary Plan, Montgomerie Road holds a classification as a Non-Arterial Road. The road configuration features a two-way layout with two lanes, and includes a wide carriageway of approximately 9 meters. While there is a centerline, no edge lines are marked apart from no-stopping lines at some sections. On-street parking bays are provided along much of its length. At its north end Montgomerie Road connects to Oruarangi Road, Ascot Road, and Mark Ford Drive via a 5-legged roundabout. At its southern end it is linked to Richard Pearse Drive by a 4-legged roundabout. Montgomerie Road has a posted speed limit of 50km/h.

### 3.3.2 Pavilion Drive

In the Auckland Unitary Plan, Pavilion Drive carries a classification as a Non-Arterial Road. The road is two-way with two lanes within a wide carriageway of around 12.5 meters. Although on-road parking is available, no designated parking bays are marked. Pavilion Drive forms a crescent connecting to Montgomerie Ave at each end at a priority junction at the northern end and a roundabout connecting Montgomerie Road and Rennie Drive on its eastern end. Pavilion Drive has a posted speed limit of 50km/h.

### 3.3.3 Oruarangi Road

In the Auckland Unitary Plan, Oruarangi Road is categorized as a Non-Arterial Road. The road is two-way with two lanes, yet the carriageway is relatively narrow at about 7.5 meters. On-road parking is not permitted on Oruarangi Road. Oruarangi Road has a posted speed limit of 60km/h.

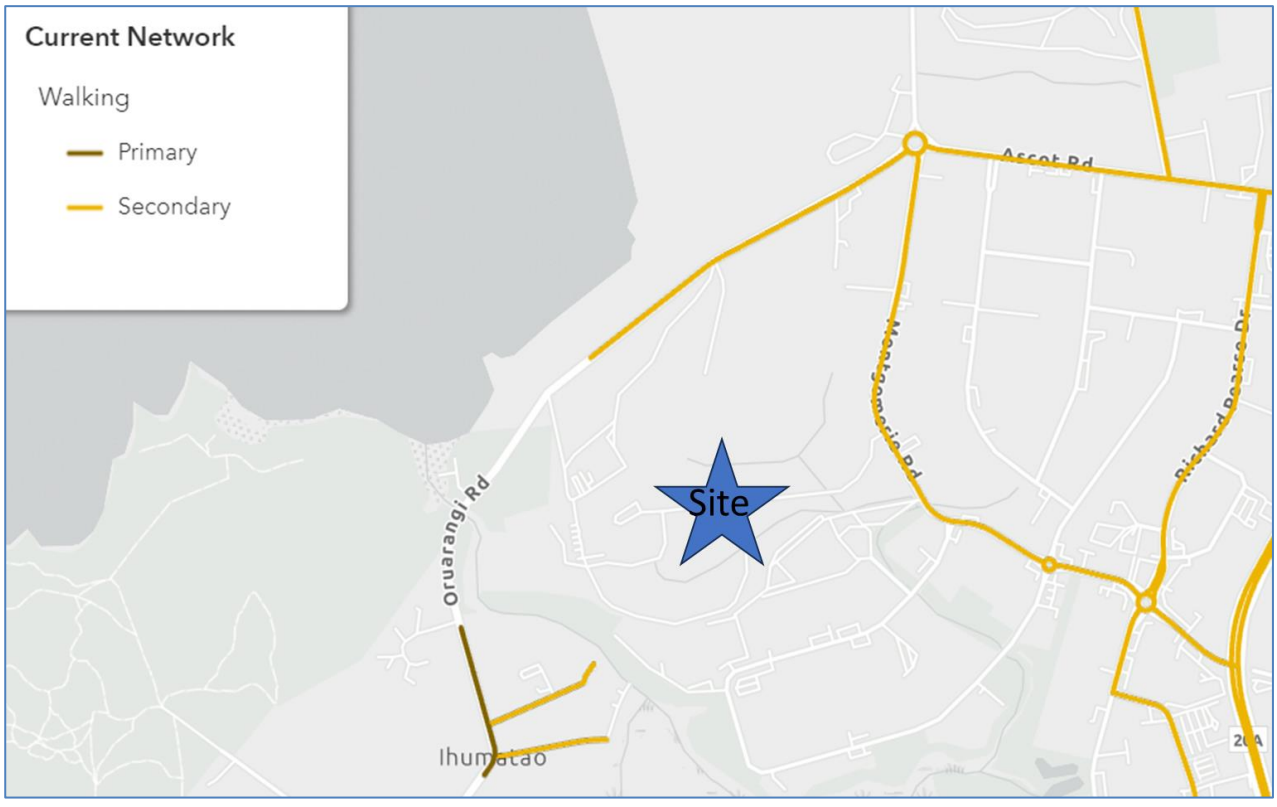
## 3.4 Transport accessibility

### 3.4.1 By foot, bike and micromobility

There is limited pedestrian connectivity in the vicinity of the site, as indicated by AT's Future Connect Strategic Current Walking Network, shown in Figure 4. Montgomerie Road is classified as part of the secondary walking network. Parts of Oruarangi Road are classified as both primary and secondary walking routes. Given that the Site is currently mainly composed of open land, there is a private gravel road network that traverses the PC area. Additional specifics are outlined below:

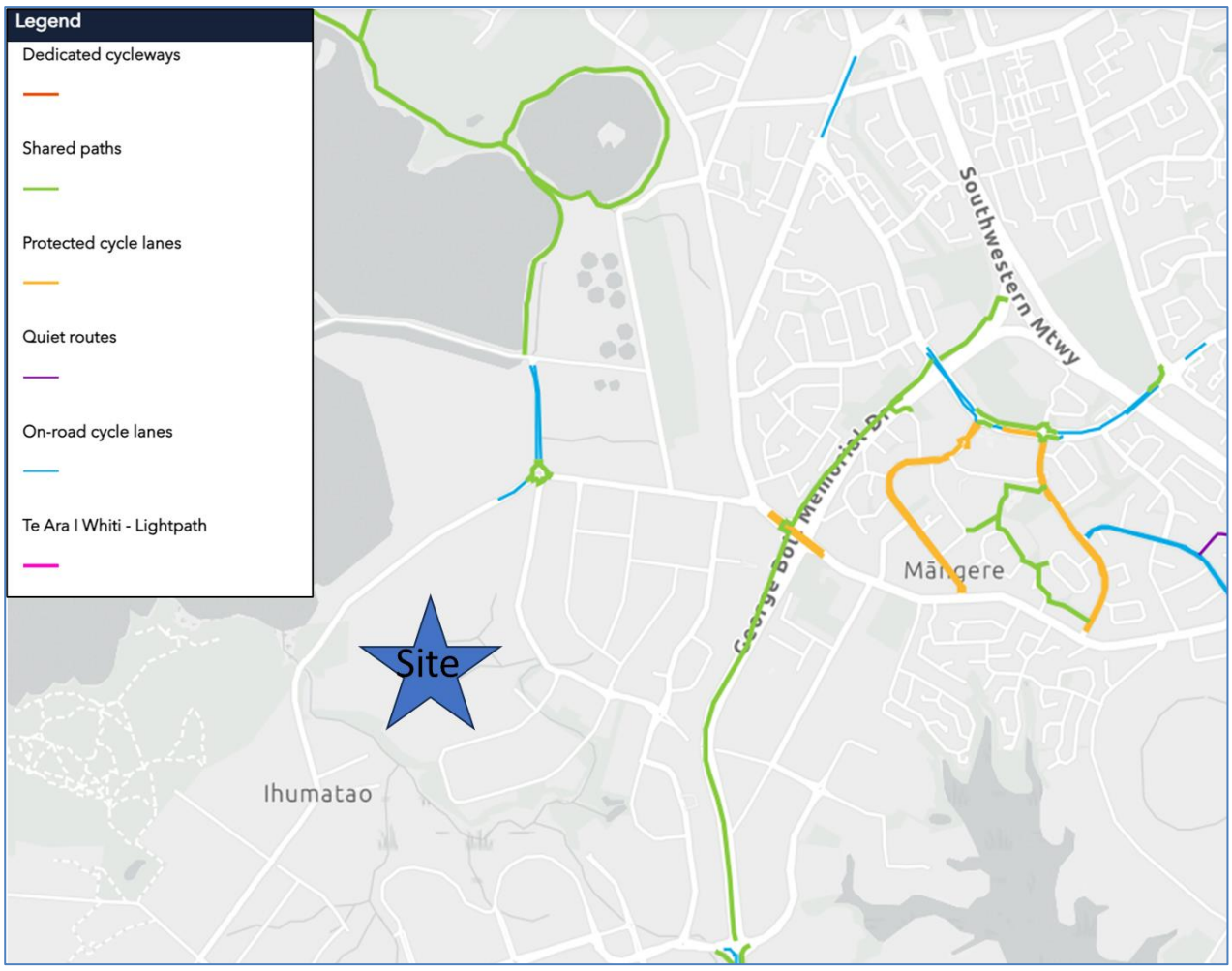
- No footpaths exist along the private gravel roads
- On the eastern side of Montgomerie Road, there is a narrow (approx. 1.5m) footpath with multiple vehicle crossings that serve business and industrial properties. There is no footpath on the western side apart from along the frontage of #180 and south of the entrance to #110.
- Both sides of Pavilion Drive feature relatively narrow (approx. 1.5m) footpaths, along with multiple vehicle crossings
- A new (approx. 1.8m wide) footpath has been constructed on the western side of Oruarangi Road between Montgomerie Road and just north of Ruati Road.

**Figure 4: Future Connect Current Walking Network around the site**



Cycling facilities in the vicinity of the site are shown in Figure 5 below. There are no direct cycle routes connecting to the immediate vicinity of the site. However, an off-road shared path runs alongside George Bolt Memorial Drive (or SH20A). Additionally, there are on-road unbuffered cycle lanes located at the northern end of Oruarangi Road, as well as along the entire length of Mark Ford Drive.

**Figure 5: Existing cycle network near the site**



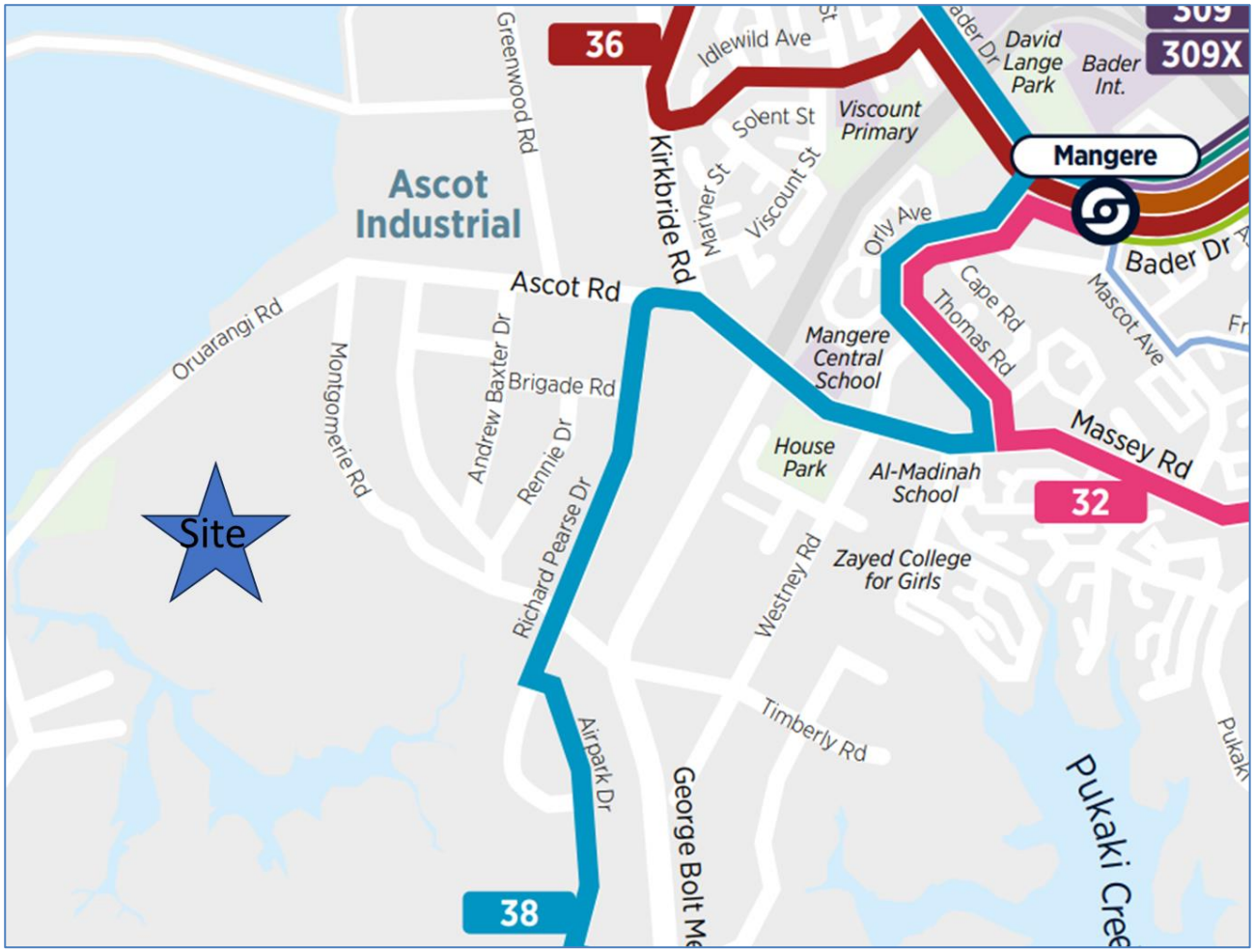

### 3.4.2 By public transport

The Site has limited access to bus services, with the closest bus route being route 38 that traverses Richard Pearse Drive. This bus route has the following features

- Bus route 38 is a frequent service, serving Onehunga, Mangere Bridge, Mangere Town Centre, and the Airport
- It operates at intervals of no more than 15 minutes
- Several bus stops are situated along Richard Pearse Drive, which requires an approximate 1km (15-minute) walk from the site.

Figure 6 below indicates the bus routes in the vicinity of the Site.

**Figure 6: Bus routes serving the vicinity of the PC area**




### 3.4.3 By private car

The PC area is accessible by private vehicles through connections from Montgomerie Road and Pavilion Drive.

Pavilion Drive forms a circular route, looping back to the roundabout at the intersection of Montgomerie Road and Rennie Drive on its eastern side. Montgomerie Road establishes connections to Richard Pearse Drive and Ascot Road. Richard Pearse Drive links Montgomerie Road and Ascot Road, running parallel to George Bolt Memorial Drive/SH20A. Ascot Drive connects to Kirkbride Road at its eastern end.

For access to SH20A, there's connectivity via Kirkbride Road interchange, situated approximately 1.8 km to the east of the PC area. SH20A, in turn, connects to SH20, which provides a route to the Northwestern Motorway (SH16) through the Waterview Tunnel. This, subsequently, leads both eastwards to Auckland city centre and westwards to the northwest.

Access to the site from the south/east (including to SH1) is provided via SH20/20A, however access from the site to the south and east is not provided at the SH20/20A interchange, but can either be via Massey Road to SH20 or via SH20A and 20B through the Airport precinct.

## 3.5 Existing traffic patterns

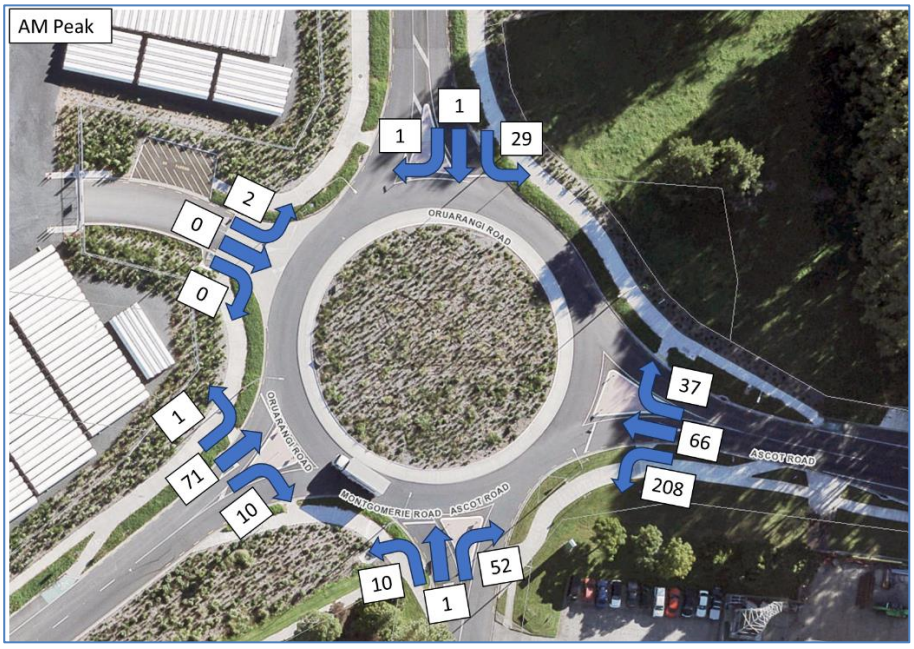
Traffic volume data has been obtained from Auckland Transport's traffic count database[1] for Montgomerie Road. The average daily traffic volume (between the two ends of Pavilion Drive) in vehicles per day (vpd) is 2,850, as recorded in July 2021. During the AM and PM peak hours, the traffic volumes reach around 325 vehicles per hour (vph) in both directions. These traffic levels are consistent with those typically observed in a light industrial area. There is ample capacity available to accommodate any increased demand resulting from the PC area.

The PC site mainly impacts two key existing intersections

- the Montgomerie Road/Oruarangi Road/Mark Ford Drive/Ascot Road roundabout (Montgomerie Road roundabout), and
- the Montgomerie Road/Pavilion Drive/Rennie Drive roundabout (Pavilion Drive roundabout).

To assess the current turning movements at these intersections, we conducted a survey during both the AM and PM peak periods. The results of these surveys are shown in Figure 7 through Figure 10.

**Figure 7: Existing turning movements -Montgomerie Road roundabout – AM peak hour (vph)**




[1] *https://data-atgis.opendata.arcgis.com/datasets/average-daily-traffic-counts/explore?location=-36.957029%2C174.833199%2C16.85*

**Figure 8: Existing turning movements -Pavilion Drive roundabout – AM peak hour (vph)**

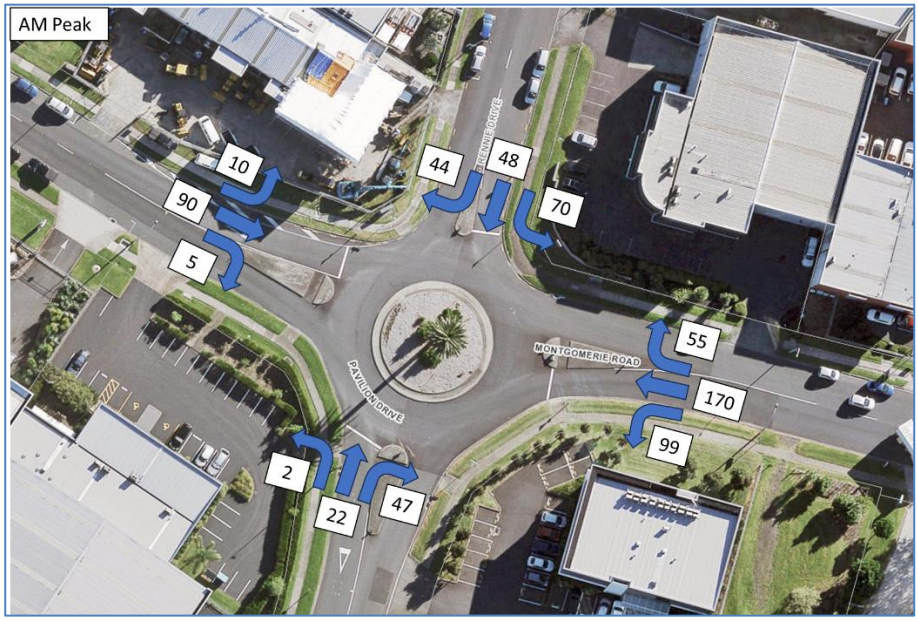



**Figure 9: Existing turning movements -Montgomerie Road roundabout – PM peak hour (vph)**

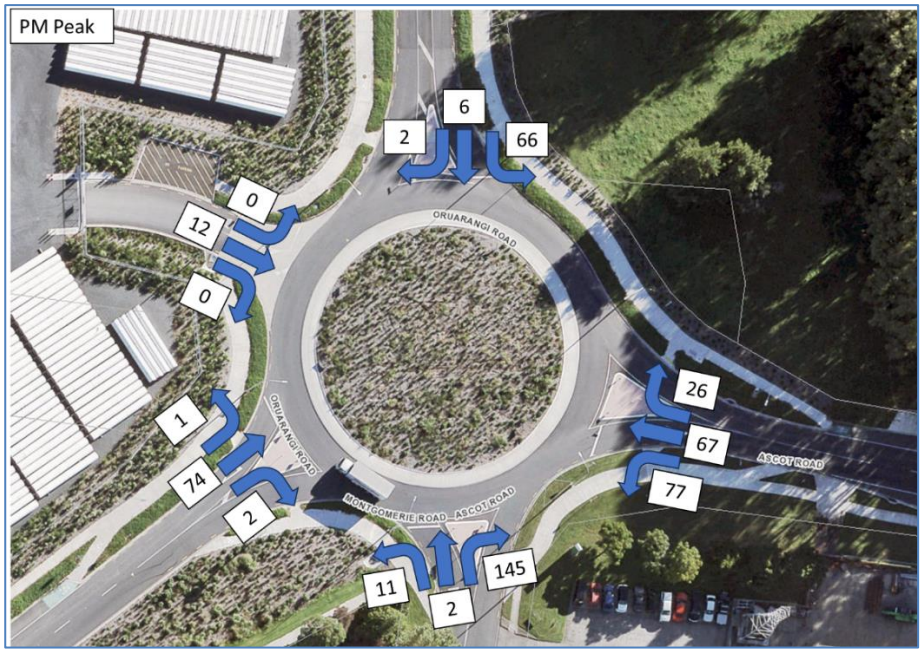
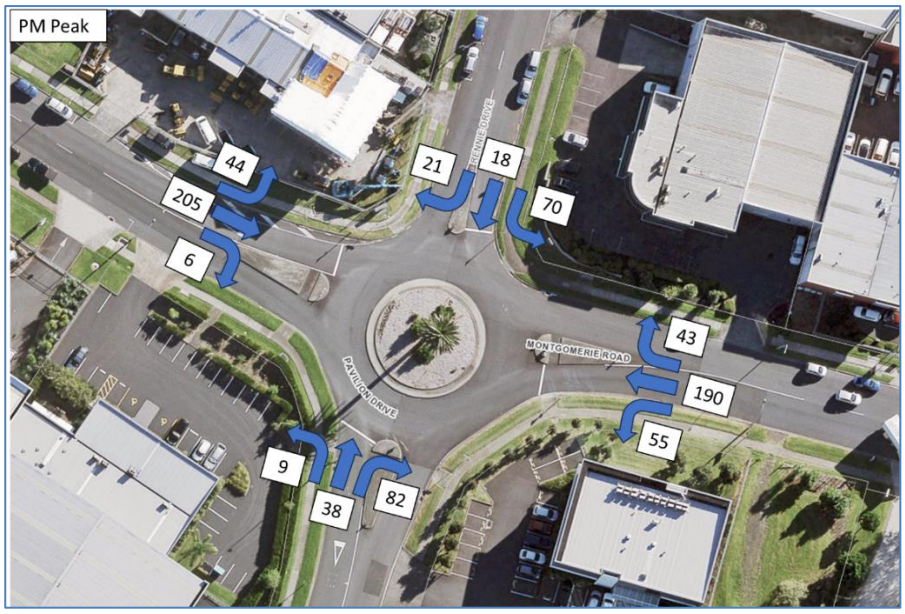


**Figure 10: Existing turning movements -Pavilion Drive roundabout – PM peak hour (vph)**




In addition, we conducted a tube count survey[2] spanning a 7-day duration to collect link traffic volumes along Montgomerie Road, specifically between the Montgomerie Road-Ascot Road roundabout and Pavilion Drive. The average daily traffic volume recorded during this survey is consolidated and presented in Table 1 below.

**Table 1: ADT Volume Data**

| | 5 Day Average | | | | |
|---|---|---|---|---|---|
| | **Northbound** | **Southbound** | **Both** | **%HCV** | **%Split** |
| **ADT (Vehicles per Day)** | 1,393 | 1,459 | 2,852 | 30.2% | - |
| **AM Peak Hour** | 92 | 181 | 273 | - | 33/67 |
| **PM Peak Hour** | 154 | 56 | 21 | - | 74/26 |

## 3.6 What crashes have occurred near the site?

We have completed a thorough historical search of Waka Kotahi's Crash Analysis System (CAS) for the five-year timeframe from 2018 to 2022, as well as all available data for 2023[3]. Our objective was to gather information regarding any recorded crashes on Montgomerie Road and Pavilion Road in the vicinity of the Site.

[2] As undertaken August 2023
[3] As undertaken August 2023

The details of all the recorded crashes, along with the specific search area we examined, are illustrated in Figure 11 below.

**Figure 11: Site/Precinct location and crash search area**


A summary of the key findings is outlined below, with further detailed information available in Appendix A

- A total of 8 crashes have been recorded in the vicinity of the Site. These include 1 serious crash, 3 minor crashes, and 4 non-injury crashes
- The serious crash involved a vehicle colliding with a parked truck on the side of Pavilion Drive. The driver lacked a valid license and showed signs of impairment.

Given that the serious crash was not attributed to road-related factors and considering the infrequent occurrence and relatively low severity of the reported crashes in this area, there are no discernible concerning crash trends.

# 4 FUTURE CHANGES TO THE TRANSPORT NETWORK

Auckland Transport currently has no planned projects that are relevant to the proposed PC area. However, Auckland Transport Future Connect network plan has been considered. Future Connect is outlined below.

## 4.1 Future Connect

Future Connect is Auckland Transport's network plan. It maps the most important network links for all transport modes and identifies the expected network over the next 10 years. Figure 12 and Figure 13 below shows the site in relation to Future Connect proposed strategic connections by different modes.

**Figure 12: Future Connect first decade general traffic (left) and public transport (right) networks.**

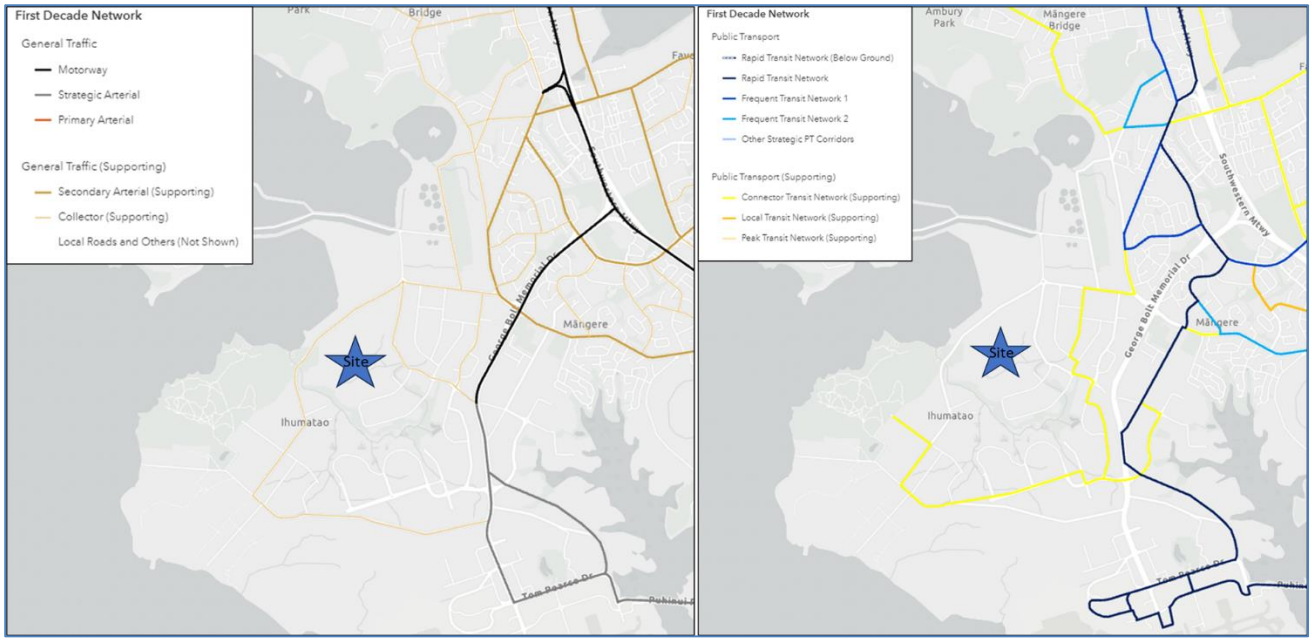
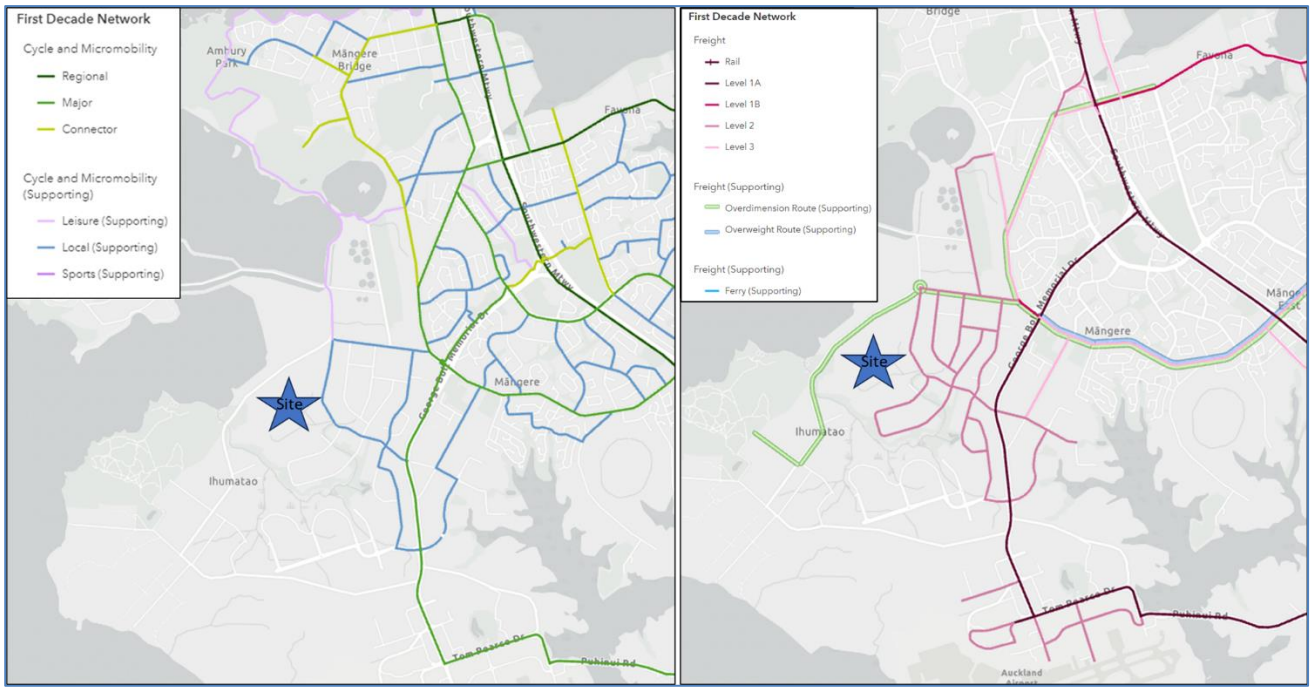



**Figure 13: Future connect cycling and micromobility (left) and freight (right) networks.**




Future Connect has the following proposed strategic connections

- Montgomerie and Oruarangi Road are both Collector roads and are part of the supporting general traffic network. This also applies for other roads in the vicinity such as Ascot Road and Richard Pearse Drive

- There is a supporting connector PT route towards the east of the site that runs across sections of Montgomerie Road and Richard Pearse Drive. The route connects with the southern end of Oruarangi Road
- North of the site, there is a supporting leisure cycling route that connects across the perimeter of the area, from Mangere Bridge to the Mark Ford Drive – Oruarangi Road – Ascot Road roundabout
- Richard Pearse Drive, Ascot Road and Montgomerie Road are all part of the local supporting cycle network
- Montgomerie and Ascot Road and Pavilion and Richard Pearse Drive are all part of the Level 2 freight network
- Ascot and Oruarangi Road are also classified as over-dimension routes.

Apart from the Future Connect public transport route that would see minor improvements to the connectivity to the site, there will be no significant changes to the other strategic connections that currently exist.

# 5 ASSESSMENT OF POTENTIAL TRANSPORT EFFECTS

## 5.1 Estimated trip generation

### 5.1.1 Trip generation of existing land uses

The existing Indevin site could potentially be redeveloped and leased for vehicle sales, leasing and maintenance facility. As such, we have estimated trip generation of such an increase in activity. We note that the trip generation of the new activity on the existing Indevin site will generate more traffic than the existing activities (the Indevin New Zealand winery operation). While they Indevin site has existing access use rights to Oruarangi Road, this assessment has also accounted for future trips of the site using the new access road should this outcome be sought in the future.

The proposed facility will encompass various traffic categories, including heavy commercial vehicles (HCV) and staff related to a cool store, rental arrivals, customer traffic associated with sales, contractors, and staff movements.

The proposed facility could see up to 920 vpd, of which 220 vehicle trips would be expected in the morning peak hour period and 160 vehicle trips in the afternoon peak hour period.

Allowance has been made for the proposed access road connecting to Montgomerie Road to also serve the existing activities. As such, the assessment of the new connection to Montgomerie Road includes the traffic demand from these activities should they use Montgomerie Road as their access route in the future.

### 5.1.2 Trip generation enabled by the Site

The RTA Guide to Traffic Generating Developments provides weekday peak hour vehicle trip rates for warehouses and office spaces, forming the foundation for calculating the trip generation of the yield within the PC area. This trip generation calculation is categorised based on the two access points,

Montgomerie Road and Pavilion Road, noting the vehicle access restriction proposed along Oruarangi Road (i.e., all the trips enabled by the Site will use the Montgomerie Road and Pavilion Drive accesses, and not Oruarangi Road). Notably, the PC area could facilitate approximately 15 warehouse buildings alongside corresponding office space.

Table **2** summarises the estimated trip generation for the yield enabled by the PC area.

**Table 2: Trip generation forecast (vehicles per hour)**

| Access | Activity | Area ($m^2$) Total GFA | Morning Peak | | Afternoon Peak | |
|---|---|---|---|---|---|---|
| | | | RTA Trip Rate (per 100$m^2$) | Hourly Trips | RTA Trip Rate (per 100$m^2$) | Hourly Trips |
| Montgomerie Road | Warehouses | 88,617 | 0.5 | 443 | 0.5 | 443 |
| | Offices | 5,448 | 1.6 | 87 | 1.2 | 65 |
| | Indevin site (potential new activity) | | | 219 | | 161 |
| | *Sub-total* | | | *749* | | *669* |
| Pavilion Drive | Warehouses | 7,753 | 0.5 | 39 | 0.5 | 39 |
| | Offices | 1,209 | 1.6 | 19 | 1.2 | 15 |
| | *Sub-total* | | | *58* | | *53* |
| **Total trips predicted per hour for the entire PC area** | | | | **807** | | **723** |

Based on our assessment above, we estimate that the proposed PC will result in approximately 658 vehicle trips during the morning peak hour and 631 vehicle trips during the afternoon peak hour. This includes the Indevin site trips.

### 5.1.3 Trip distribution and assignment

We have applied peak period trip distributions from the Institute of Transportation Engineering (ITE) 8th Edition, volume 2, to develop the following distributions

- morning peak hour: 515 inbound vehicle trips (65%), 292 outbound (35%)
- afternoon peak hour: 190 inbound vehicle trips (24%), 532 outbound (76%).

We have assessed the effects of the additional trips generated by the PC area on the operation of the Montgomerie Road access that are proposed to provide primary access to the site.

The methodology used to estimate the trip distribution from the warehouse developments of the proposed PC is summarised below

- We estimated trip distribution for the future trips generated by the proposed warehouse developments to the Montgomerie Road access, assuming that this is the only primary access to the site

- We assumed that vehicles travelling to/from SH20A will use either Ascot Road or Richard Pearse Drive to access the PC area
- The trip distribution was based on the direction traffic distribution as calculated from the 7-day tube count that was undertaken
- The average result was
    - A 70% trip distribution to/ from Ascot Road (to the north)
    - A 30% trip distribution to/ from Richard Pearse Drive (to the south).

The summary of the current turning movements and additional turning movements generated from the proposed PC site at the Montgomerie Road access is shown in Figure 15 and Figure 16 in Appendix B.

We conducted a SIDRA analysis to evaluate the capacity of the Montgomerie Road access. Based on our analysis, we have determined that the anticipated increase in traffic volumes can be effectively managed through the implementation of a T-intersection with stop control. This proposed layout will feature single approach lanes, resembling a similar form than the existing layout of the Pavilion Drive/Montgomerie Road give-way intersection.

For the Pavilion Drive access, the increase in traffic will be relatively low with 58 and 53 vph in the morning and afternoon peaks, respectively. We consider that the effect of this increase in traffic volumes at the Pavilion Drive/Montgomerie Road intersection will be negligible.

We consider that the trip generation associated with the PC area has a negligible effect on the operation of the Ascot/Montgomerie Road and Pavilion/Renie Drive roundabouts, given that the total traffic flows through these roundabouts will be around 900 to 1100 vph, which is within the operational bounds of a typical single-lane roundabout.

We acknowledge that by having a vehicle access restriction on Oruarangi Road, traffic generated by the Site will be restricted to roads which only grant access to the Site, namely Montgomerie Road and Pavilion Drive. This has been reflected in our distributions.

We consider that the trip generation associated with the PC area will not have any noticeable effect on the wider transportation network (i.e., vehicles travelling to and from SH20 and SH20A), given that trips will have further distributed throughout the wider network to and from the State Highway network.

The details of our SIDRA analysis are shown in Appendix C.

## 5.2 Effects on road safety

The proposed PC is not expected to lead to a substantial increase in pedestrian, cycling, or micromobility trips in the vicinity, primarily due to the industrial nature of the PC area. Despite this, the access road linking to Montgomerie Road will feature footpaths that will connect to the broader footpath network in the area (i.e., a pedestrian crossing facility will be provided to cross towards the eastern side of Montgomerie Road to provide connection to the existing footpath network). It's important to note that there's a relatively low demand for such facilities in the area.

Given the existing low demand for active modes, which is anticipated to remain relatively stable even with the implementation of the PC area, no significant safety issues are anticipated for these modes of transport.

We do not foresee any adverse safety impacts on private vehicles, as the projected increase in traffic volumes at the Montgomerie Road access can be well accommodated through the proposed intersection layout.

It's imperative to give careful thought to the design of this access connection, ensuring that safe sight distances are maintained at the intersection, while also considering the operational speed of Montgomerie Road. Preliminary analysis suggests that achieving this is feasible and can be addressed in subsequent design stages, specifically during the resource consent phase. We are of the view that the access road, along with its turning area and pedestrian provision, can be designed in accordance with the appropriate engineering standards during the resource consent stage. This approach is expected to yield an outcome that effectively supports the potential warehousing development.

## 5.3 Effects on public transport

The proposed PC has the potential to lead to a small increase in public transport trips, particularly during peak hours. The distribution of these trips between different bus stop pairs on Richard Pearse Drive, which serves Bus Route 38, will depend on their origins within the PC area and their destinations.

It is considered that these trip demands can be readily accommodated in the capacity of the Bus Route 38 and we do not recommend any mitigation to enable these trips.

The design of the existing bus stops is in line with those typically suited for locations with lower demand. These stops feature designated areas with platforms where pedestrians can wait, integrated with the broader footpath network. Given the expected modest increase in patronage resulting from the PC, there is no expectation that this will necessitate any upgrades to these bus stops.

## 5.4 Effects on walking environment

The proposed PC is not projected to lead to a substantial increase in walking trips; any potential increase would primarily be linked to the walking components associated with public transport, as previously discussed.

We note that the concept development example includes provisions for pedestrian connections between the PC area and Montgomerie Road. This will include pedestrian crossing facilities at the proposed Montgomerie Road access to connect to the existing footpath network on the eastern side of Montgomerie Road. Furthermore, pedestrians and cyclists would have direct access to the SH20A shared path from the eastern end of Montgomerie Road.

## 5.5 Effects on cycling environment

Similarly to walking activity, the proposed PC is not anticipated to result in a significant increase in cycling trips. Any potential new trips would likely utilize the SH20A shared path.

Considering the projected limited increase in cycling trips as a result from the PC, there is no indication that this will prompt any upgrades to the existing cycling network.

## 5.6 Effects on the traffic network

Based on our assessment of the Montgomerie Road access and wider transportation network to the PC area, we do not anticipate any adverse effects on delays or safety. The access road, along with its cul-de-sac, should offer good connectivity to the wider road network.

## 5.7 Assessment of AUP E27 matters

Parking management and supply, including bicycle parking, and associated end-of-trip facilities can help to support the use of more sustainable transport options including cycling, walking and use of public transport. Providing too much parking (on and off-street) can work against the purpose of transit-orientated design developments.

### 5.7.1 Car parking provision

The Auckland Unitary Plan (AUP) at the time of writing applies the below maximum car parking rates to the land uses proposed

- Industrial activities: no maximum applies
- No minimum car parking requirements apply.

### 5.7.2 Bicycle parking

The Unitary Plan requires the following bicycle parking for the land uses proposed.

**Table 3: Bicycle parking requirements**

| Land use | Scale | Visitor (short stay) requirement | | Secure (long-stay) requirement | |
|---|---|---|---|---|---|
| | | Minimum rate | Minimum spaces | Minimum rate | Minimum spaces |
| Industrial activities | Office space generally sized 300m² as per example development concept | 1 space plus 1 space per 750m² GFA of office space | 2 per warehouse | 1 per 300m² of office | 1 to 2 per office |

We anticipate that subsequent land use consent within the proposed PC area will be able to meet the above requirements.

### 5.7.3 End-of-trip facilities

The Unitary Plan requires the following end-of-trip facilities for the land uses proposed.

**Table 4: End-of-trip facilities requirements**

| Land use | Scale | Requirement | |
|---|---|---|---|
| | | GFA | No. of showers and changing facilities |
| Offices | Office space generally sized 300m² as per example development concept, but could be up to double that | Up to 500m² | None |
| | | Greater than 500m² up to 2500m² | One shower and changing area with space for storage of clothing |

We anticipate that subsequent land use consent within the proposed PC area will be able to meet the above requirements.

### 5.7.4 Servicing and loading

The Unitary Plan requires the following loading spaces for the land uses proposed.

**Table 5: Loading space requirements**

| Land use | Scale | Requirement | |
|---|---|---|---|
| | | GFA | Minimum Rate |
| Industrial activities | A range of warehouse spaces as per example development concept | Up to 300m² | No loading required |
| | | Greater than 300m² up to 5000m² | 1 |
| | | Greater than 5000m² up to 10,000m² | 2 |
| | | Greater than 10,000m² | 3 spaces plus 1 space for every additional 10,000m² |

We anticipate that subsequent land use consent within the proposed PC area will be able to meet the above requirements.

We expect that there is adequate space within the PC area to allow for future land use consents to allow for appropriate manoeuvring space for waste collection and for trucks to both enter and exit the site in a forward direction.

# 6 RECOMMENDED TRANSPORT INTERVENTIONS

Based on our assessment, our recommended transport interventions within the proposed PC area include

- A public walking connection/crossing at the Montgomerie Road access point should be provided to the existing facilities on the eastern side of Montgomerie Road
- The above walking connection should run along the proposed access road and be able to provide connection to any future industrial development. The connectivity should be assessed during subsequent land use consent stages

- An appropriate intersection between the access road and Montgomerie Road should be provided. The intersection should achieve the relevant sight distance requirements (including Safe Intersection Sight Distance (SISD), Approach Sight Distance (ASD) and Minimum Gap Sight Distance (MGSD). The intersection should be assessed during subsequent land use consent stages
- An appropriate assessment should be undertaken against chapter E27 of the Unitary Plan for all future developments. This includes provision of accessible parking, bike parking, vehicle accesses and manoeuvrability.

Should the recommendations set out above be implemented, we are of the view that there are no transport planning or engineering reasons to preclude implementation of the proposed PC (a precinct overlay) as set out in this Transport Assessment.

# APPENDIX A Crash History

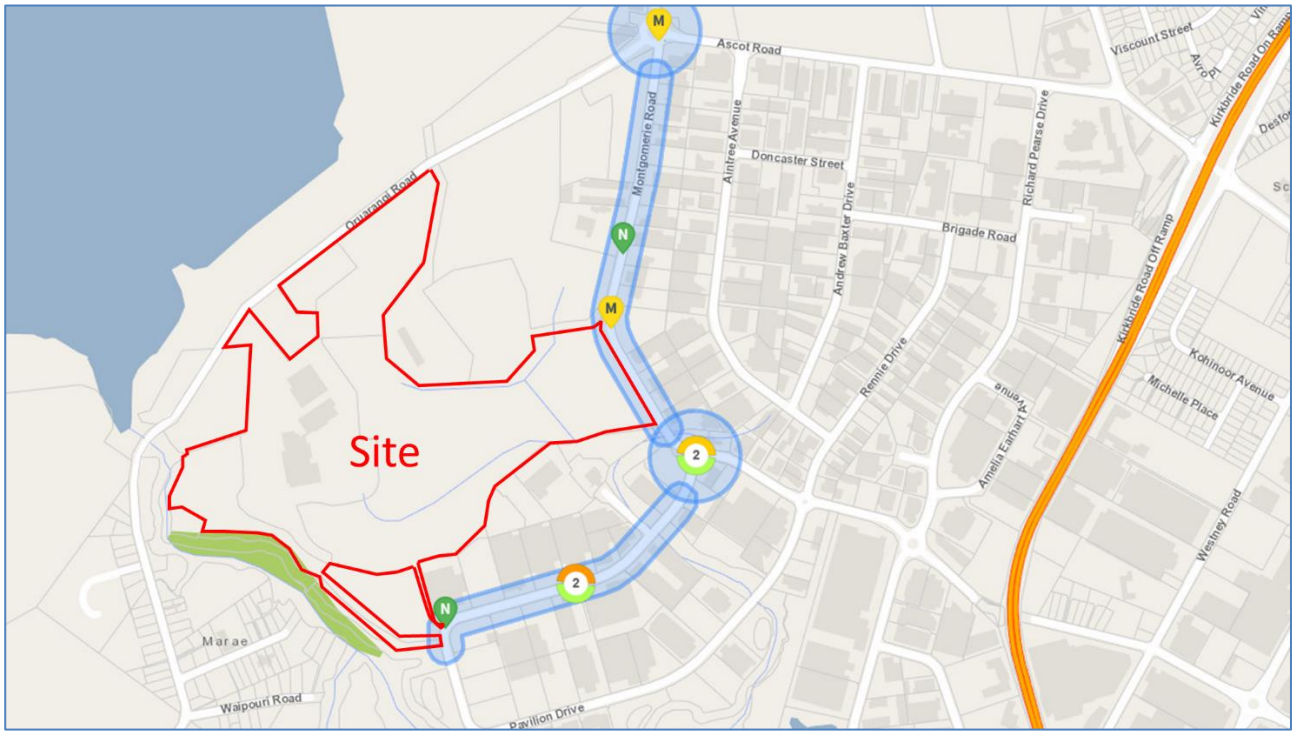
## Crash History Assessment

We have undertaken a search of crash records in the vicinity of the Site using the Waka Kotahi's Crash Analysis System (CAS). The search covered a five-year period from 2018 to 2022, including all available crashes recorded in 2023[4].

The analysis considered various aspects, such as the location of each recorded crash, the level of injury severity (ranging from non-injury to minor, serious, and fatal), crash year, prevailing weather conditions, and road conditions. Our focus was on Montgomerie Road and Pavilion Drive. Additionally, we expanded the search to cover a 100 m radius around the Montgomerie Road roundabout, as well as the T-intersection of Montgomerie Road and Pavilion Drive.

The approximate location of the crashes is shown in Figure 14 below, and corresponding crash numbers can be found in Table 6.

**Figure 14: Crash search data**




[4] As undertaken 23 August 2023

**Table 6: 2018-2023 Crash History**

| Year | Fatal | Serious | Minor | Non-injury | Total |
|---|---|---|---|---|---|
| 2018 | 0 | 0 | 1 | 1 | 2 |
| 2019 | 0 | 0 | 0 | 1 | 1 |
| 2020 | 0 | 0 | 0 | 0 | 0 |
| 2021 | 0 | 0 | 1 | 1 | 2 |
| 2022 | 0 | 1 | 0 | 1 | 2 |
| 2023 | 0 | 0 | 1 | 0 | 1 |
| **Total** | **0** | **1** | **3** | **4** | **8** |

Out of the 8 recorded crashes:

- There were 1 serious, 3 minor, and 4 non-injury crashes; fortunately, no fatalities were reported
- One minor injury crash took place at the Montgomerie Road roundabout. This incident involved two motorcyclists racing through the roundabout and colliding
- Two crashes occurred at the midblock of Montgomerie Road. These comprised 1 minor injury and 1 non-injury crash:
    - The minor injury crash involved a single vehicle losing control on a left-hand bend and colliding with a nearby tree. This crash resulted from a combination of alcohol consumption and speeding
    - The non-injury crash involved two vehicles. One southbound vehicle attempted a u-turn manoeuver without noticing an oncoming northbound vehicle
- Two crashes took place at the T-intersection of Montgomerie Road and Pavilion Drive. These consisted of 1 minor injury and 1 non-injury crash:
    - The minor injury crash involved a two-vehicle t-bone collision. The vehicle turning onto Montgomerie Road from Pavilion Drive failed to yield due to not checking the right for oncoming vehicles
    - The non-injury crash involved two vehicles. A vehicle on Pavilion Drive drove on the wrong side, leading to a head-on collision as the other vehicle turned left onto Pavilion Drive from Montgomerie Road
- Three crashes occurred at the midblock of Pavilion Drive. These consisted of 1 serious injury and 2 non-injury crashes:
    - The serious injury crash involved a collision with a parked truck on the side of the road. The eastbound vehicle's driver was unlicensed and showed signs of impairment
    - One non-injury crash resulted from a two-vehicle collision where one vehicle attempted to pass another during a 3-point turn
    - The other non-injury crash occurred at a bend when a north-eastbound vehicle accelerated and lost control, striking the left kerb.

# APPENDIX B Estimated Future Turning Movements at the Intersections

**Figure 15: existing and estimated turning movements at the intersections - AM peak hour**

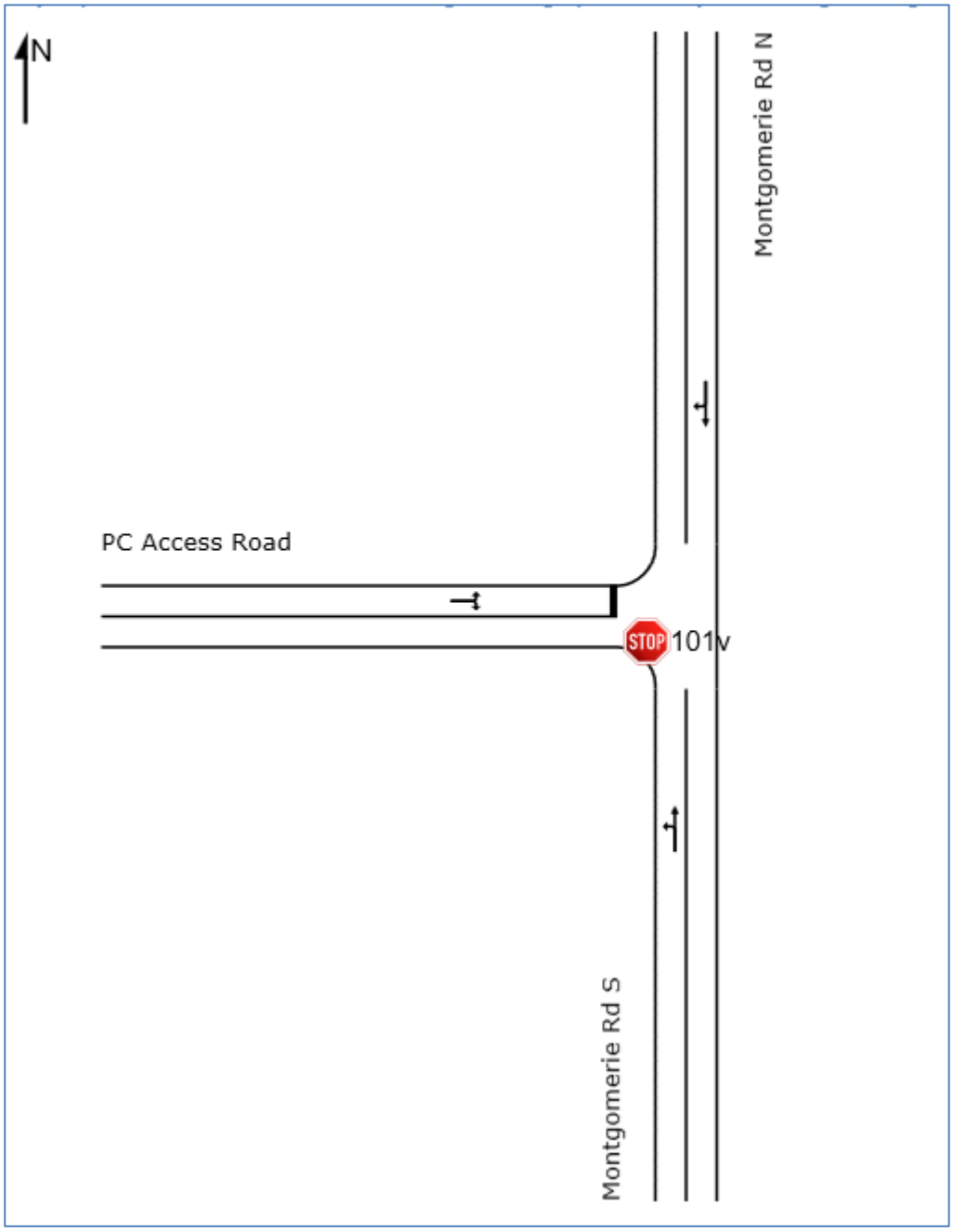
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 190 | L | | | |
| | | | 0 | | 334 | 245 | |
| PC Site | 272 | | 82 | R | R | T | |
| | 478 | L | T | | | | |
| | | 143 | 77 | | | | |

**Figure 16: existing and estimated turning movements at the intersections - PM peak hour**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 344 | L | | | |
| | | | 0 | | 124 | 106 | |
| PC Site | 492 | | 147 | R | R | T | |
| | 177 | L | T | | | | |
| | | 53 | 186 | | | | |

# APPENDIX C SIDRA Results

## Montgomerie Road access layout



## Morning Peak Period Movement Summary – Montgomerie Road access

# MOVEMENT SUMMARY

**Site: 101v [PC Main Access AM - Conversion (Site Folder: General (70/30))]**

New Site
Site Category: (None)
Stop (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Montgomerie Rd S | | | | | | | | | | | | | | |
| 1 | L2 | 143 | 30.0 | 151 | 30.0 | 0.148 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.34 | 0.00 | 47.1 |
| 2 | T1 | 77 | 30.0 | 81 | 30.0 | 0.148 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.34 | 0.00 | 48.0 |
| Approach | | 220 | 30.0 | 232 | 30.0 | 0.148 | 3.2 | NA | 0.0 | 0.0 | 0.00 | 0.34 | 0.00 | 47.4 |
| North: Montgomerie Rd N | | | | | | | | | | | | | | |
| 8 | T1 | 245 | 30.0 | 258 | 30.0 | 0.462 | 2.1 | LOS A | 3.9 | 34.7 | 0.52 | 0.41 | 0.61 | 46.8 |
| 9 | R2 | 334 | 30.0 | 352 | 30.0 | 0.462 | 7.2 | LOS A | 3.9 | 34.7 | 0.52 | 0.41 | 0.61 | 45.5 |
| Approach | | 579 | 30.0 | 609 | 30.0 | 0.462 | 5.1 | NA | 3.9 | 34.7 | 0.52 | 0.41 | 0.61 | 46.1 |
| West: PC Access Road | | | | | | | | | | | | | | |
| 10 | L2 | 190 | 30.0 | 200 | 30.0 | 0.490 | 11.4 | LOS B | 3.2 | 28.0 | 0.31 | 1.00 | 0.47 | 41.3 |
| 12 | R2 | 82 | 30.0 | 86 | 30.0 | 0.490 | 25.4 | LOS D | 3.2 | 28.0 | 0.31 | 1.00 | 0.47 | 41.0 |
| Approach | | 272 | 30.0 | 286 | 30.0 | 0.490 | 15.6 | LOS C | 3.2 | 28.0 | 0.31 | 1.00 | 0.47 | 41.2 |
| All Vehicles | | 1071 | 30.0 | 1127 | 30.0 | 0.490 | 7.3 | NA | 3.9 | 34.7 | 0.36 | 0.55 | 0.45 | 45.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.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## Afternoon Peak Period Movement Summary – Montgomerie Road access

# MOVEMENT SUMMARY

**Site: 101v [PC Main Access PM - Conversion (Site Folder: General (70/30))]**

New Site
Site Category: (None)
Stop (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Montgomerie Rd S | | | | | | | | | | | | | | |
| 1 | L2 | 53 | 30.0 | 56 | 30.0 | 0.156 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.12 | 0.00 | 48.3 |
| 2 | T1 | 186 | 30.0 | 196 | 30.0 | 0.156 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.12 | 0.00 | 49.2 |
| Approach | | 239 | 30.0 | 252 | 30.0 | 0.156 | 1.1 | NA | 0.0 | 0.0 | 0.00 | 0.12 | 0.00 | 49.0 |
| North: Montgomerie Rd N | | | | | | | | | | | | | | |
| 8 | T1 | 106 | 30.0 | 112 | 30.0 | 0.185 | 1.2 | LOS A | 0.9 | 8.3 | 0.41 | 0.34 | 0.41 | 47.4 |
| 9 | R2 | 124 | 30.0 | 131 | 30.0 | 0.185 | 6.4 | LOS A | 0.9 | 8.3 | 0.41 | 0.34 | 0.41 | 46.0 |
| Approach | | 230 | 30.0 | 242 | 30.0 | 0.185 | 4.0 | NA | 0.9 | 8.3 | 0.41 | 0.34 | 0.41 | 46.6 |
| West: PC Access Road | | | | | | | | | | | | | | |
| 10 | L2 | 344 | 30.0 | 362 | 30.0 | 0.669 | 13.7 | LOS B | 7.0 | 61.8 | 0.61 | 1.14 | 1.07 | 41.8 |
| 12 | R2 | 147 | 30.0 | 155 | 30.0 | 0.669 | 18.7 | LOS C | 7.0 | 61.8 | 0.61 | 1.14 | 1.07 | 41.4 |
| Approach | | 491 | 30.0 | 517 | 30.0 | 0.669 | 15.2 | LOS C | 7.0 | 61.8 | 0.61 | 1.14 | 1.07 | 41.7 |
| All Vehicles | | 960 | 30.0 | 1011 | 30.0 | 0.669 | 9.0 | NA | 7.0 | 61.8 | 0.41 | 0.69 | 0.65 | 44.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.


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