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A24075–Pukekohe Park Private Plan Change

Integrated Transportation Assessment Report

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Contents

Executive Summary

The proposed rezoning of the PPC Site will enable the development of approximately 500 residential dwellings across two sub-precincts within the Pukekohekohe Gateway Precinct — Sub-Precinct A in the western section and Sub-Precinct B in the south-eastern section. Access to Sub-Precinct A and Sub-Precinct B will be provided via a roundabout at the Buckland Road and PU-NS-2 Road intersection, and a priority-controlled intersection, respectively. The proposed PPC also seeks to include existing Business – General Business zoned land (rezoned under PC30) within a third sub-precinct, the Pukekohekohe Gateway Precinct — Sub-Precinct C. This inclusion incorporates key transport infrastructure upgrade requirements, currently required by way of an existing covenant, into the proposed Pukekohekohe Gateway Precinct.

Traffic modelling has accounted for several approved nearby plan changes, including PC30, the Buckland Road Precinct (PC87), and the Golding Precinct (PC74). Sensitivity testing was also undertaken to understand the traffic related impacts of the proposed development in the PPC Site if the PC30 and PC87 developments do not occur. Analysis indicates minor queuing at the Kitchener Road/Buckland Road/Manukau Road intersection, with negligible impact on the wider transport network.

The development will deliver enhanced active transport connections, including a shared path along the southern section of Buckland Road, which will connect to future shared path infrastructure required as part of PC87. The internal road network will also include active mode facilities, supporting direct and safe connections for walking and cycling between the Pukekohe and Buckland townships.

Overall, the assessment confirms that there are no transport or traffic-related reasons preventing the proposed PPC from proceeding.

1 Introduction

CKL has been engaged by Auckland Thoroughbred Racing Incorporated ("ATR") to provide an Integrated Transportation Assessment ("ITA") for a proposed private plan change ("PPC") at 222 – 250 Manukau Road, in Pukekohe, Auckland with its boundary outlined in yellow in Figure 1 below. The site is currently known as the Pukekohe Park Precinct site with a total area of 72.5ha and is currently zoned primarily as 'Special Purpose – Major Recreation Facility Zone' with the western corner zoned 'Business – General Business Zone' within the Auckland Unitary Plan (Operative in Part) ("AUP") planning maps. The existing Pukekohe Park Precinct site currently operates as a horse training and racing venue and hosts trial events which can attract public audiences of between 500-2,500 people. Until recently, the site also accommodated motor racing, but that activity has ceased and most of the motor racing infrastructure has now been removed from the site.

The proposal comprises of a PPC to rezone 22.96ha of the existing Pukekohe Park Precinct site ("PPC Site") from the existing Special Purpose Zone into a new 'Pukekohekohe Gateway Precinct' area consisting of the Residential - Mixed Housing Urban Zone and Open Space – Informal Recreation Zone, as shown in Figure 2. The new residential zoning proposed under the PPC will enable the future development of approximately 500 dwellings.

The PPC also seeks to incorporate the existing 'Business – General Business' zoned land at 222 – 250 Manukau Road into the Pukekohekohe Gateway Precinct. This land, referred to herein as the "PC30 land," was rezoned from 'Special Purpose – Major Recreation Facility Zone' to 'Business – General Business' under Plan Change 30 ("**PC30**") to the AUP and as shown in Figure 2. The PC30 land is subject to a private covenant to Auckland Transport, which requires a series of transport infrastructure upgrades to be completed as development progresses, including:

- Prior to any development within the PC30 site occurring, the provision of a minimum 1.8m wide footpath along the site frontage of Manukau Road, between the intersection of Kitchener Road / Buckland Road / Manukau Road / Gate B of the PC30 site.
- Prior to any development within the PC30 site that would generate greater than 75 trips per hour turning right from the site onto Manukau Road, the provision of an upgrade of the Kitchener Road / Buckland Road / Manukau Road / Gate B of the PC30 site to a roundabout or traffic signals.

The PPC proposes to incorporate these key transport upgrades required by the covenant into the Pukekohekohe Gateway Precinct. No further changes are proposed to the zoning or land use framework applicable to the PC30 land. Further detail on the inclusion of the PC30 land to the PPC is provided in the Section 32 Report prepared by Barker & Associates.

This report assesses the key transportation matters and potential infrastructure requirements that would relate to the future development of the site.

This ITA addresses the transportation matters of the PPC and includes the following:

In relation to proposed Residential - Mixed Housing Urban Zone and Open Space – Informal Recreation Zone:

- Levels of vehicular traffic likely to be generated by the approximately 500 dwellings enabled by the PPC;
- Associated effects on the performance and safety of the surrounding road network;
- Active mode accessibility;

- Adequacy and function of the parking and access provisions;
- An assessment against relevant transport policies; and
- Consideration of the transportation related provisions within the AUP.

In relation to the PC30 land:

- The appropriate transport infrastructure upgrades for inclusion in the PPC and Pukekohekohe Gateway Precinct.

These and other matters will be addressed in the detail of the report that follows. By way of summary, it is concluded that the development enabled by the proposed PPC can be established such that there will be negligible effects to the function, capacity and safety of the surrounding transportation network.

2 Background

The existing Pukekohe Park Precinct site is located at the southern end of the Pukekohe township with its boundary outlined in red in Figure 1 below. The existing Pukekohe Park Precinct site has an approximate area of 67.18ha and is bounded by Manukau Road/Buckland Road along its western boundary, the North Island Main Trunk line (NIMT line) to the east, a General Business area to the north and the Buckland township at its southern end.

As shown in Figure 2, the PPC Site is currently zoned as 'Special Purpose Zone' within the Auckland Unitary Plan (AUP). Figure 2 also shows neighbouring land to the north and west of the PPC Site which has recently been rezoned Business - General Business Zone as part of PC30 and Plan Change 87 (PC87) respectively. These Plan Changes are discussed in further detail in section 4.1 below.

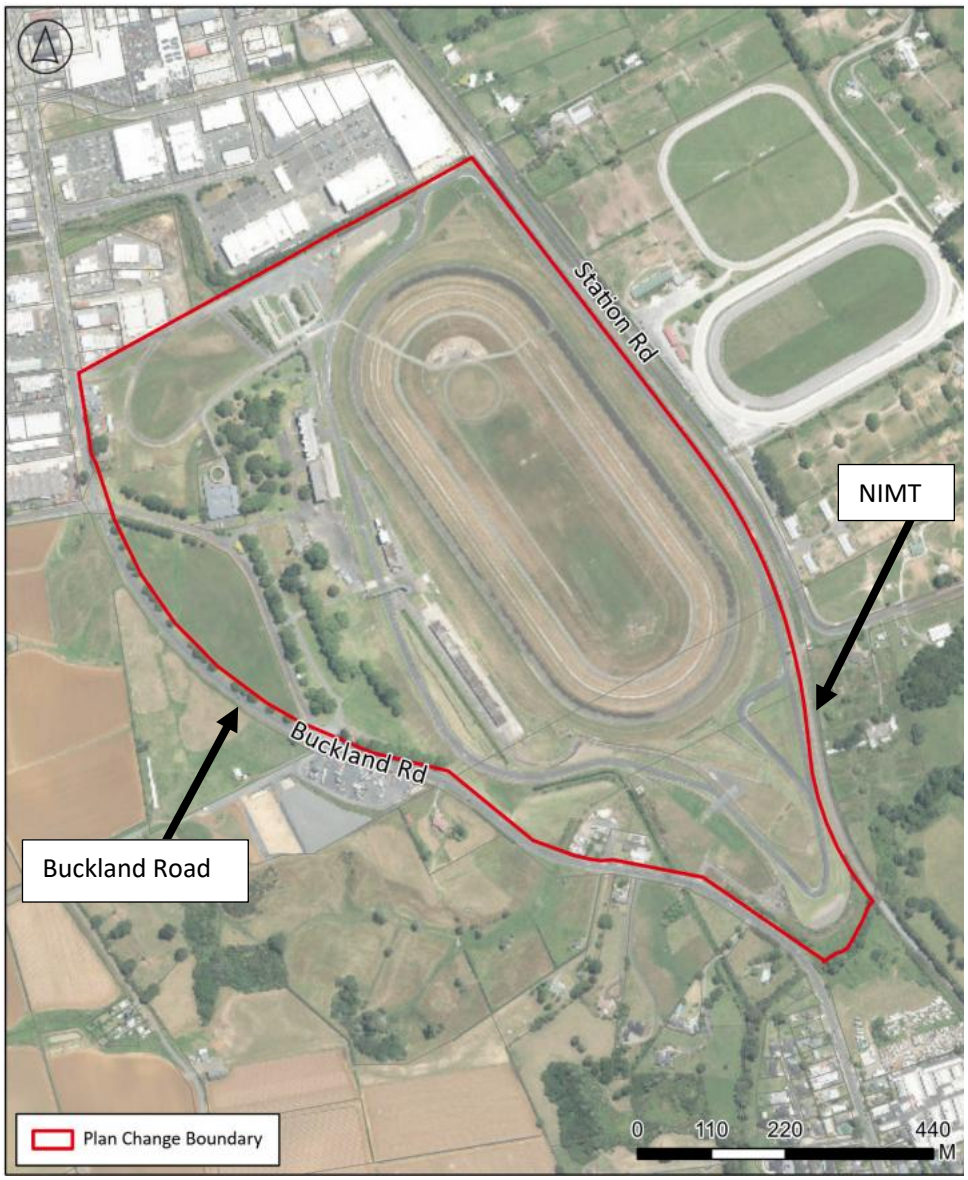

FIGURE 1: AERIAL PHOTOGRAPH OF THE PLAN CHANGE AREA

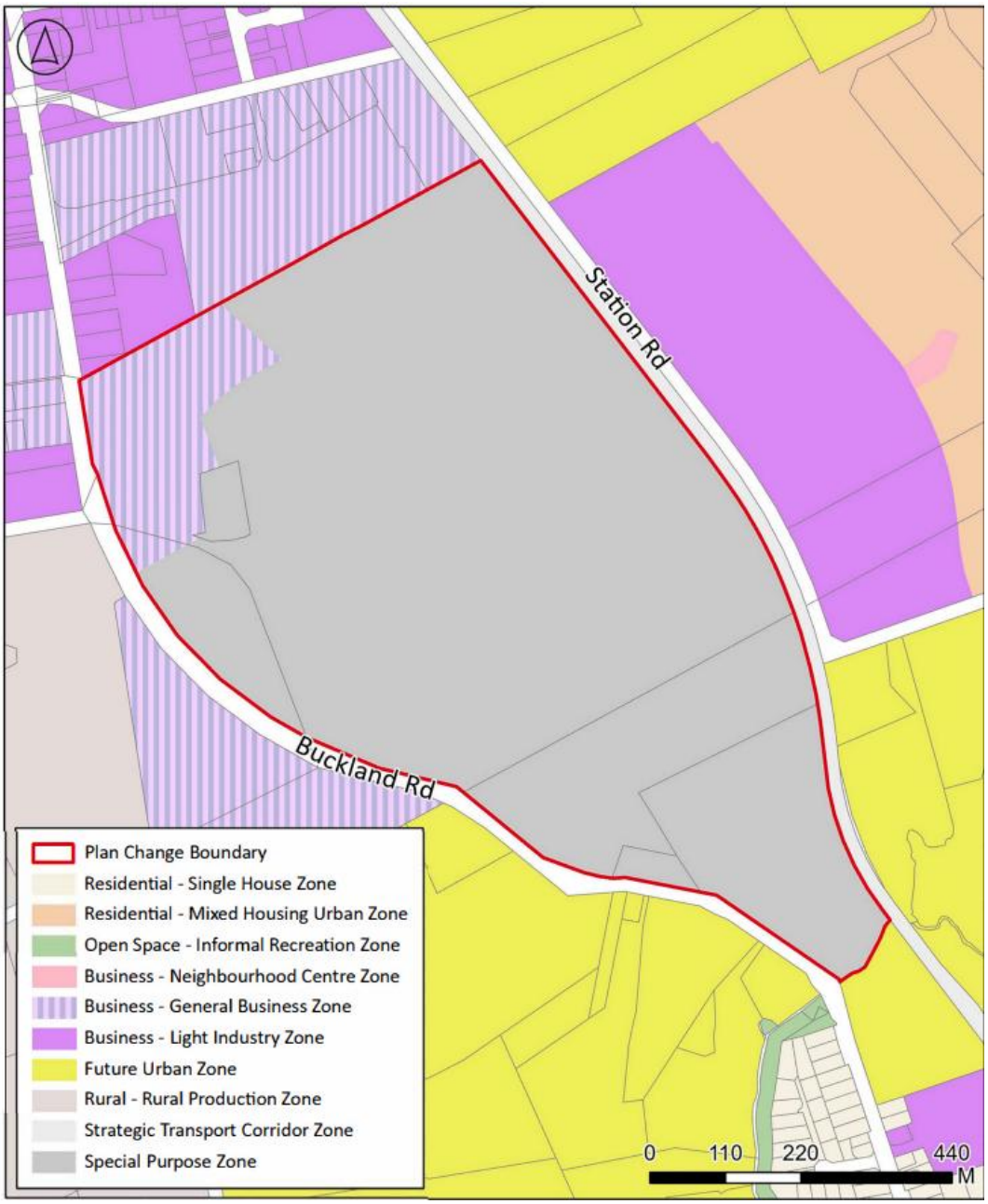

FIGURE 2: EXISTING ZONING OF THE PLAN CHANGE AREA

3 Existing Transport Environment

3.1 Existing Environment

The PPC Site is located at the southern end of Pukekohe and extends between Buckland township to the south and Pukekohe township to the north. The PPC Site is currently predominantly used as a horse training and racing ground, containing seven training tracks and stabling for 46 horses.

The surrounding areas to the west (opposite side of Buckland Road) are currently rural in nature apart from one construction company occupying an industrial yard directly opposite the PPC Site. The land to the north is a combination of industrial and commercial in nature with various businesses having factories, storage yards and commercial/retail stores on either side of Manukau Road. The land to the south is a combination of industrial (eastern side of Buckland Road) and residential (western side of Buckland Road). As stated

above, the NIMT line extends along the entire eastern boundary of the PPC Site. The Station Road corridor and the Franklin Trotting Club are located further east of the NIMT line.

3.2 Road Network

Figure 3 below shows the existing surrounding road network.

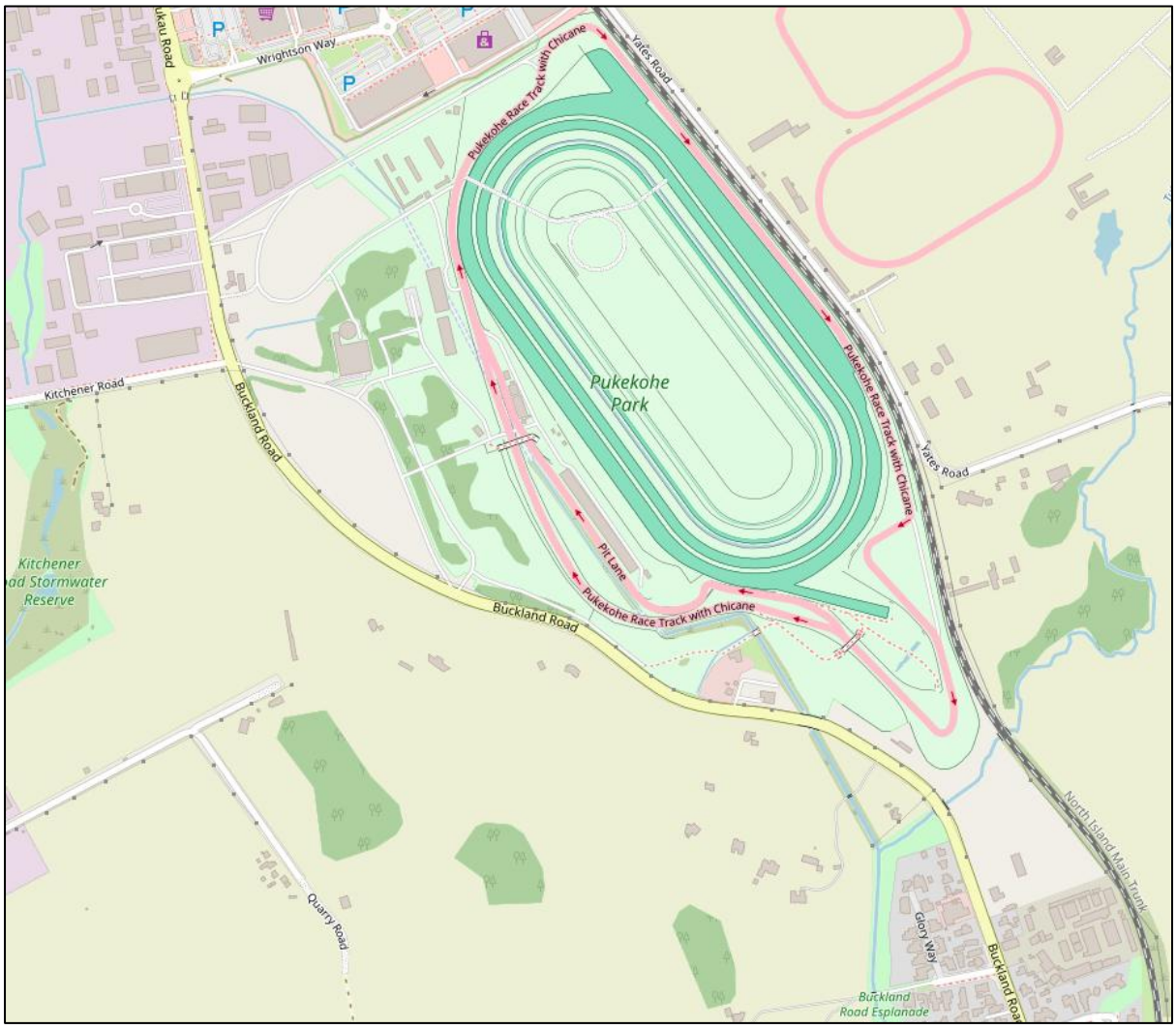

FIGURE 3: SURROUNDING ROAD NETWORK

3.3 Buckland Road

As shown in Figure 3 above, Buckland Road extends along the western frontage of the PPC Site. The road is classified as an arterial road corridor within the AUP. As defined by Auckland Transport, "Regional arterial roads link districts or urban areas within the region, connect regionally significant facilities, and play a critical role in the movement of people and goods within the region" (Auckland Transport, Regional Arterial Road Plan, page i).

Adjacent to the PPC Site, Buckland Road comprises a two-way, two-lane road corridor with marked centre-lines, and edge lines. The road corridor width varies between 20m and 35m, while the sealed road has a width of approximately 11m, consisting of 3.5m wide traffic lanes, and 2m sealed shoulder in each direction. No footpath or cycling facilities are provided along the Buckland Road corridor. The corridor is also marked with No Stopping At All times (NSAAT) lines on both sides between 303 Buckland Road and 501 Buckland Road. North of 303 Buckland Road, on-street parking facilities are provided within the sealed shoulders on both sides of the road corridor.

The road corridor has a posted speed limit of 80km/hr which reduces to 50km/hr on approach to the Pukekohe and Buckland townships to the north and south respectively. Kitchener Road intersects Buckland Road at a priority-controlled T-intersection at the northern end of the PPC site, with Buckland Road existing as the major approach as shown in Figure 5 below.

FIGURE 4: BUCKLAND ROAD CORRIDOR (LOOKING SOUTH)

FIGURE 5: BUCKLAND ROAD/MANUKAU ROAD/KITCHENER ROAD INTERSECTION

3.4 Manukau Road

Manukau Road connects to Buckland Road as the northern leg of the Kitchener/Buckland/Manukau Road priority-controlled intersection. It is also classified as an arterial road corridor within the AUP Planning Maps. The roadside environment along Manukau Road is primarily industrial and commercial in nature.

The road corridor has a sealed width of approximately 12.6m consisting of approximately 4m wide traffic lanes, and 2.3m on-street parking lanes on both sides of the corridor. 1.2m wide footpaths are provided along both sides of the road corridor. However, south of 220 Manukau Road, the footpath on the eastern side of the road ends.

Manukau Road is a two-way, two-lane road extending in a north-south alignment connecting to Buckland Road at its southern end and Massey Avenue at its northern end. The road corridor has a posted speed limit of 50km/hr along its entire length.

FIGURE 6: MANUKAU ROAD PHOTOGRAPH (LOOKING NORTH)

3.5 Kitchener Road

Kitchener Road is a two-way, two-lane road corridor providing an east-west connection between Manukau Road/Buckland Road at its eastern end and Rowles Road/Blake Road at its western end respectively. It is not classified as an arterial road in the AUP. Near its eastern end, the surrounding land use is currently rural on the southern side, and a combination of industrial and residential on the northern side. Near its western end, the surrounding land is zoned Residential – Single House Zone and Residential – Mixed Housing Suburban Zone in the AUP.

Kitchener Road has a road corridor width of 20m consisting of 3.5m wide lanes in both directions, unsealed road shoulders and grass berms on both sides of the road corridor as shown in Figure 7 below. A 1.2m wide footpath exists on the northern side of the road corridor along its entire length. West of the Tuakau Road intersection, a 1.2m wide footpath, and an exposed stormwater channel drain also exists on the southern side of the road corridor. The entire northern side of the road corridor contains a kerb and channel, however the southern side of the corridor contains an unsealed gravel shoulder east of Tuakau Road and a kerb and channel edge west of this intersection.

FIGURE 7: KITCHENER ROAD PHOTOGRAPH (LOOKING WEST)

3.6 Public Transport

3.6.1 Bus facilities

The closest public transport (bus) facilities in vicinity of the PPC site are shown in red (with the PPC site shown within the red border) in Figure 8 below. The closest bus stop to the south is located within Buckland township, approximately 1.6km south of the PPC site and serves route 399. The closest bus stop to the north is located along Kitchener Road approximately 1.2km north-west of site and serves route 393.

FIGURE 8: PUBLIC TRANSPORT FACILITIES IN VICINITY OF THE PPC SITE

All local bus travel routes, including the 393 and 399 are shown in Figure 9 below. As shown, route 399 travels along the Buckland Road frontage of the PPC Site connecting to the Pukekohe Train Station and Tuakau townships at its northern and southern ends respectively. This bus route only operates once a week on a Thursday. Bus Route 393 does not travel along the road frontage of the PPC Site, however, it does provide a connecting bus loop around south Pukekohe including a bus stop at the Pukekohe Train Station. This bus service operates on a 30-minute frequency between 6AM - 10PM on weekdays and between 7AM – 8:30PM on weekends. Previously route 398 also used to operate during the peak period on weekdays, however it is understood that this route has now been discontinued.

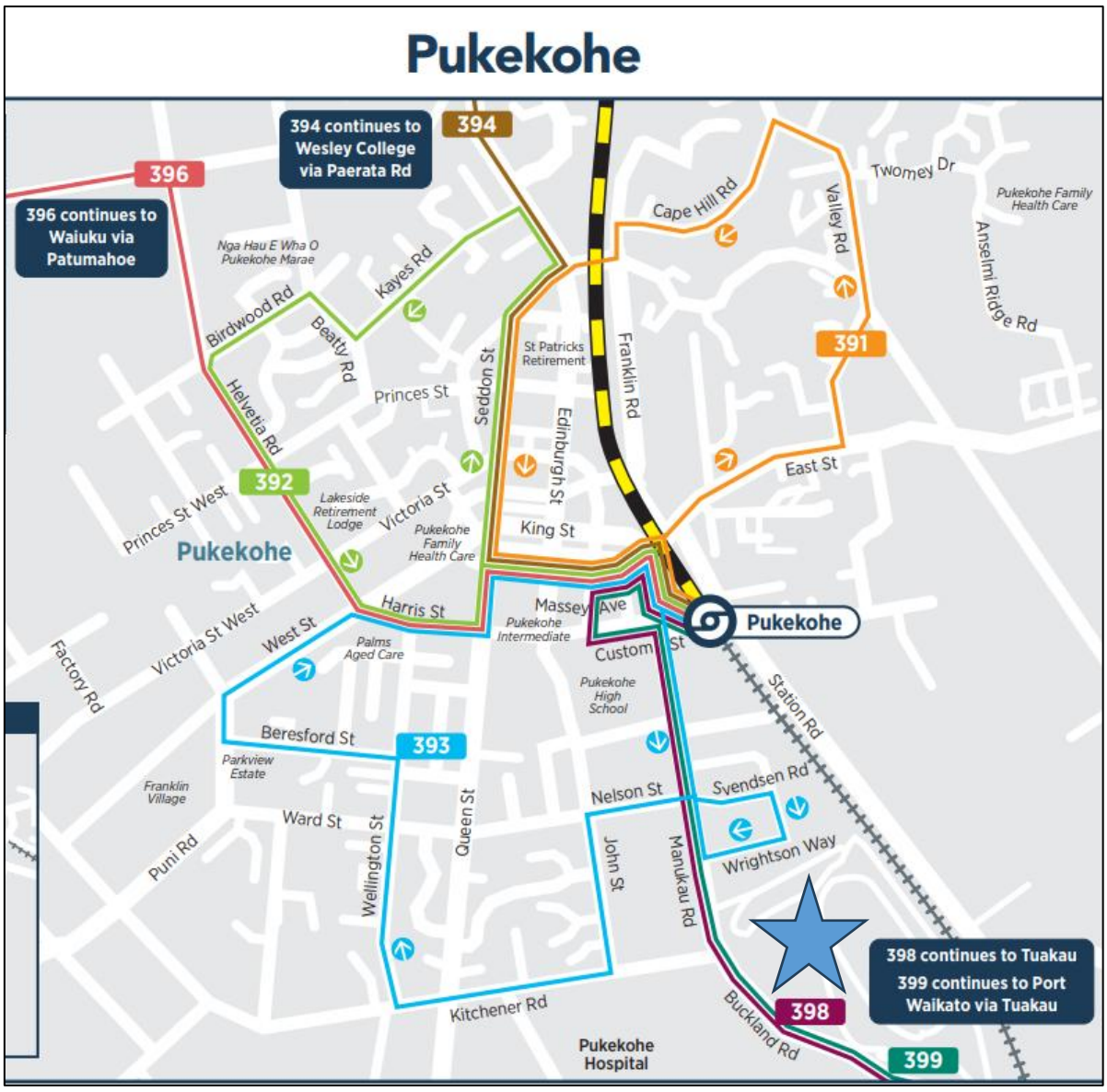

FIGURE 9: PUBLIC TRANSPORT ROUTES IN VICINITY OF THE PPC SITE (SHOWN WITH STAR)

In summary, the existing public transport connectivity to the PPC Site is considered to be poor due to the low frequency of buses past the PPC Site and distance to closest regular bus stops.

However, the Auckland Regional Public Transport Plan (2023-2031) states that services 393 and 399 are set to be replaced by AT Local services by 2025, understood to be on an initial trial basis. AT Local is an on-demand bus service that enables passengers to order a bus via an app, rather than services following a set route and timetable. This service replaces regular routes in areas of lower population, such as rural and semi-rural areas. The AT Local service is already provided in the southern Auckland suburbs of Conifer

Grove, Waiata Shores, Takaanini, Kauri Flats and Papakura Town Centre. Once the current Pukekohe bus services are transitioned to the AT Local system, it is anticipated that public transport access in and around Pukekohe, including to/from the PPC Site, will significantly improve.

3.6.2 Rail Network

The Pukekohe Rail Station is located approximately 2km north of the PPC Site. Previously this train station was only served by diesel locomotives, however extensive work has been undertaken to upgrade the Pukekohe Train Station to accommodate electric trains. The completed works include upgrades to the overhead power system, existing track, signals and level crossings, and also new shelters, AT HOP machines and other accessibility improvements. All these upgrades are expected to make rail journeys a more attractive transportation mode for people commuting to and from Pukekohe. The upgraded Pukekohe Train Station was opened in August 2024 and provides an electric rail connection between Pukekohe and Papakura, then onwards to Auckland.

Despite the train station currently being operational, it is understood that Stage 4 of the Rail Network rebuild is currently being undertaken which involves rebuilding sections of the Southern line to improve reliability and train speeds. Electric trains to and from the Pukekohe Train Station are expected to be operational from February 2025 once the Stage 4 Rail Network rebuilt works are completed. It is expected that the upgraded Pukekohe Train Station and rail network will result in faster and more frequent trips to/from Pukekohe.

As mentioned above, with the AT Local on-demand service occurring in Pukekohe from 2025 onwards, access to and from the train station is also likely to be significantly improved, as will travel to destinations further afield.

3.7 Walking and Cycling

As stated above in section 3.1, Buckland Road does not currently provide any active mode facilities for pedestrians or cyclists. Footpaths are provided on the western side of Buckland Road south of 387 Buckland Road and on both sides of Manukau Road north of 231 Manukau Road. As such, there is currently no active mode facilities connecting the Pukekohe and Buckland townships.

3.8 Traffic Volumes

The Auckland Transport Open GIS Database includes existing traffic count data for Buckland Road, Kitchener Road and Manukau Road. These traffic count volumes and locations are summarised in Table 1 below.

TABLE 1: SUMMARY OF TRAFFIC VOLUMES

Road	Date	Location	Daily (vpd)	% of Heavy Commercial Vehicles	Peak Hour (vph)
Buckland Road	19th March 2022	South of Kitchener Road intersection	7,467	10%	869
	6th March 2024	Outside #503 Buckland Road	7,941	12%	953
Manukau Road	4th April 2024	Outside #200 Manukau Road	12,009	11%	1,360
Kitchener Road	21st February 2024	Outside #144 Kitchener Road	7,073	15%	804

3.9 Road Safety

3.9.1 CAS Analysis

A search was made of the NZTA Crash Analysis System (CAS) for all reported crashes that have occurred within a 50m buffer along the PPC Site frontage over the last full five-year period (2020-2024). The search found that three crashes had been reported within the study area as shown in Figure 12 below.

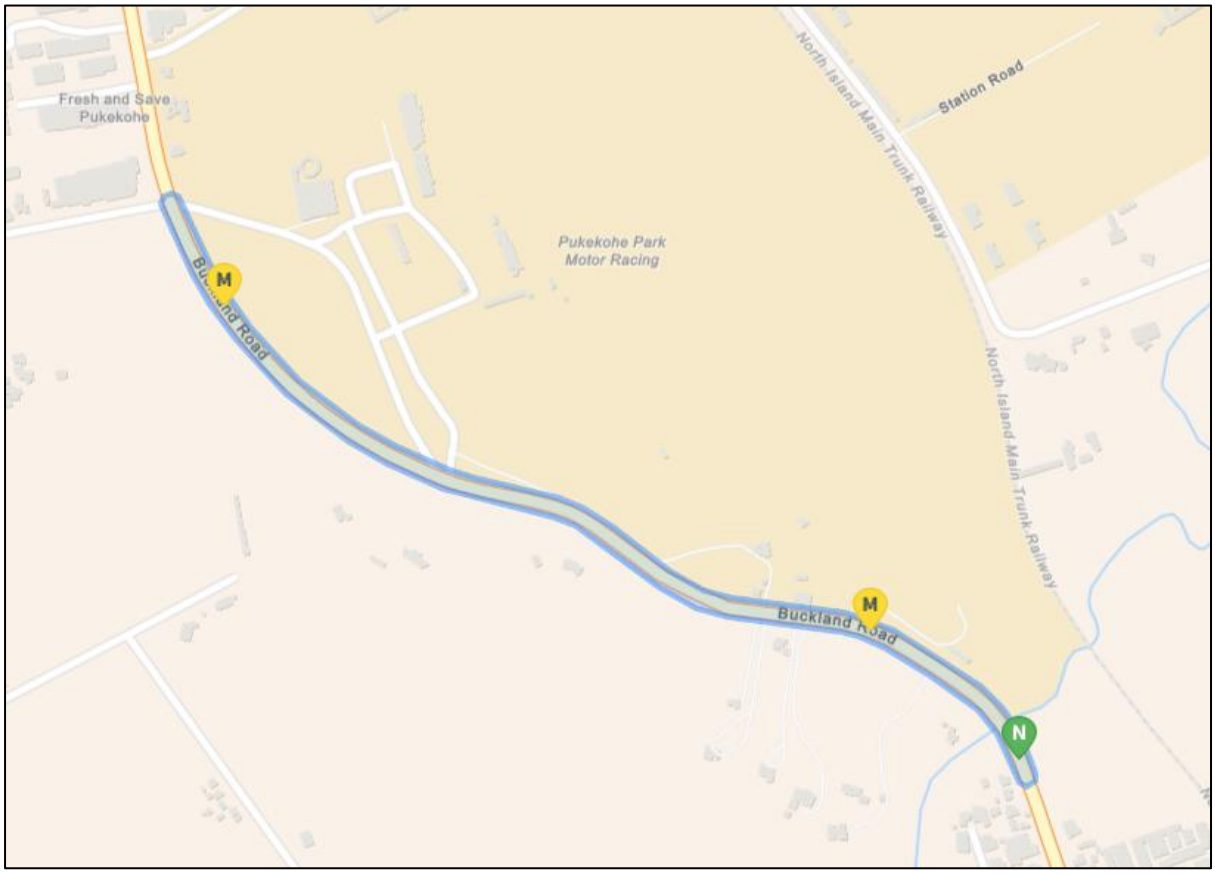

FIGURE 10: CAS ANALYSIS OF SURROUNDING ROAD NETWORK

Of the three reported crashes, two resulted in minor injuries, and one resulted in damage to property only. The first minor injury crash (near Kitchener Road intersection) occurred due to the driver being blinded by the sun, resulting in them crossing the centre line and colliding with an oncoming vehicle. The second minor injury crash occurred due to an intoxicated driver losing control of their vehicle crashing into the berm on the left-hand side of the road. No crashes involved vehicles accessing/egressing the PPC Site. No common crash trends or factors have been identified and as such, no specific road safety issues have been identified in relation to the PPC Site.

The Waka Kotahi MegaMaps database has been used to identify both the personal and collective risk ratings for the roads described above.

- Collective risk is the measure of how likely a crash is to happen along a given stretch of road network.
- Personal risk relates to the chance that if a crash does occur that it involves a given individual. It is not unusual to see higher personal risks on a road, particularly when there are low traffic numbers.

Table 2 below shows a summary of the MegaMaps Risk Ratings for surrounding roads.

TABLE 2: MEGAMAPS RATINGS

Road	Location	Collective Risk	Personal Risk
Buckland Road	Between Pukekohe and Buckland township	Low	Low
Manukau Road	South of Svendsen Road	Low	Low
	Between Subway Road and Svendsen Road	Low Medium	Low Medium
Kitchener Road	Between Queen Street and Manukau/Buckland Road	Low	Low

The associated collective and personal risk ratings of Low along Buckland Road and Kitchener Road, and Manukau Road (south of Svendsen Road) aligns with the observed crash history given the low number of injury crashes occurring along these corridors.

4 Committed Environmental Changes

4.1 Surrounding Plan Changes

As stated previously, three other private plan changes are located within the vicinity of the PPC Site. The locations of these plan changes are shown in Figure 2 above.

PC30 was undertaken in 2019/2020 and became operative in February 2021. PC30 successfully rezoned approximately 5.8ha in the north-western corner of the Pukekohe Park site from Special purpose – Major Recreation Facility Zone to 'Business - General Business' allowing a combination of retail, commercial and light industrial activities to be established within the PC30 site. As described earlier, PC30 is subject to a private covenant with Auckland Transport that requires transport infrastructure upgrades, including the upgrade of the existing priority-controlled Kitchener Road / Manukau Road / Buckland Road intersection to a roundabout intersection, the provision of a footpath along the entire road frontage of the PC30 site (on the eastern side of Manukau Road / Buckland Road), and the reduction of the posted speed limit across the road frontage of the site to 50km/h. At the time of preparing this ITA, no development has occurred within the PC30 site. Although the posted speed limit across the road frontage of the site has been reduced to 50km/h, the footpath and roundabout have not yet been constructed as those upgrades are only required once development occurs within the PC30 site. The PPC proposes to incorporate the key transport upgrades required by the covenant into the Pukekohekohe Gateway Precinct.

PC87 was undertaken more recently in 2022/2023 and became operative in April 2024. PC87 successfully rezoned approximately 7.8ha of land at 301 and 303 Buckland Road, Pukekohe from Future Urban Zone to Business-General Business zone. PC87 (Buckland Road Precinct) is required to provide a new Collector Road through the PC87 site connecting Webb Street and Buckland Road, and an upgraded intersection as it meets Buckland Road. PC87 also requires pedestrian and cycling facilities along the site frontage (on the western side for Buckland Road) to be provided, and the posted speed limit across the road frontage of the site to be reduced to 50km/h. The active mode frontage upgrade is expected to be achieved through a shared path, however, this is not yet confirmed. As no enabled development has occurred within the PC87 site, none of these upgrades have yet been undertaken.

Plan Change 74 (PC74) was undertaken in 2021/2022 and became operative in December 2023. PC74 successfully rezoned approximately 82.5ha of land between Station Road and Golding Road in the south-eastern part of Pukekohe from Future Urban zone and Special Purpose – Major Recreation Facility zone to a combination of Business – Light Industry Zone, Business – Neighbourhood Centre Zone and Residential – Mixed Housing Urban Zone (east of the PPC Site on the eastern side of the NIMT line). PC74 (Golding Precinct) requires various upgrades to the transportation network to enable development within the Golding Precinct including upgrades of the Station Road/East Street intersection, Golding Road/East Street intersection, Ngahere Road/East Street intersection and various other intersections in the vicinity of the PPC Site. PC74 does not have any significant traffic related effects of relevance to the proposed development of the PPC Site given the PPC Site only has access from Buckland Road.

4.2 Supporting Growth Alliance – Pukekohe Transport Network

Supporting Growth Alliance (SGA) has prepared several Notices of Requirement (NORs) for nine new arterial roads in the Pukekohe area and between Pukekohe and Drury to respond to the future expected growth in the Drury, Paerata and Pukekohe growth areas. The NORs enable future strategic arterial corridors to enable future construction of transport infrastructure in these areas. Once the roading infrastructure is upgraded as part of these NoRs, traffic patterns in Pukekohe, Paerata, and Drury are expected to change significantly compared to the existing as the new routes will provide quicker, and more direct routes connecting to the wider South Auckland region including SH1. The location of these NoRs is shown in Figure 11 below.

The PPC Site is located in close proximity to Pukekohe South-East Arterial – NoR 5 which will provide a new transport corridor between Golding Road to the east and Station Road to the west. This new corridor will bridge across Station Road and the NIMT to connect to the existing industrial development on Crosbie Road and onto Svendsen Road. The existing Golding Road corridor will also be upgraded towards Pukekohe East Road to the north. The proposed road corridor will include two lanes for general traffic with active mode facilities on the southern side of the corridor on Pukekohe East Road and on both sides elsewhere on the corridor.

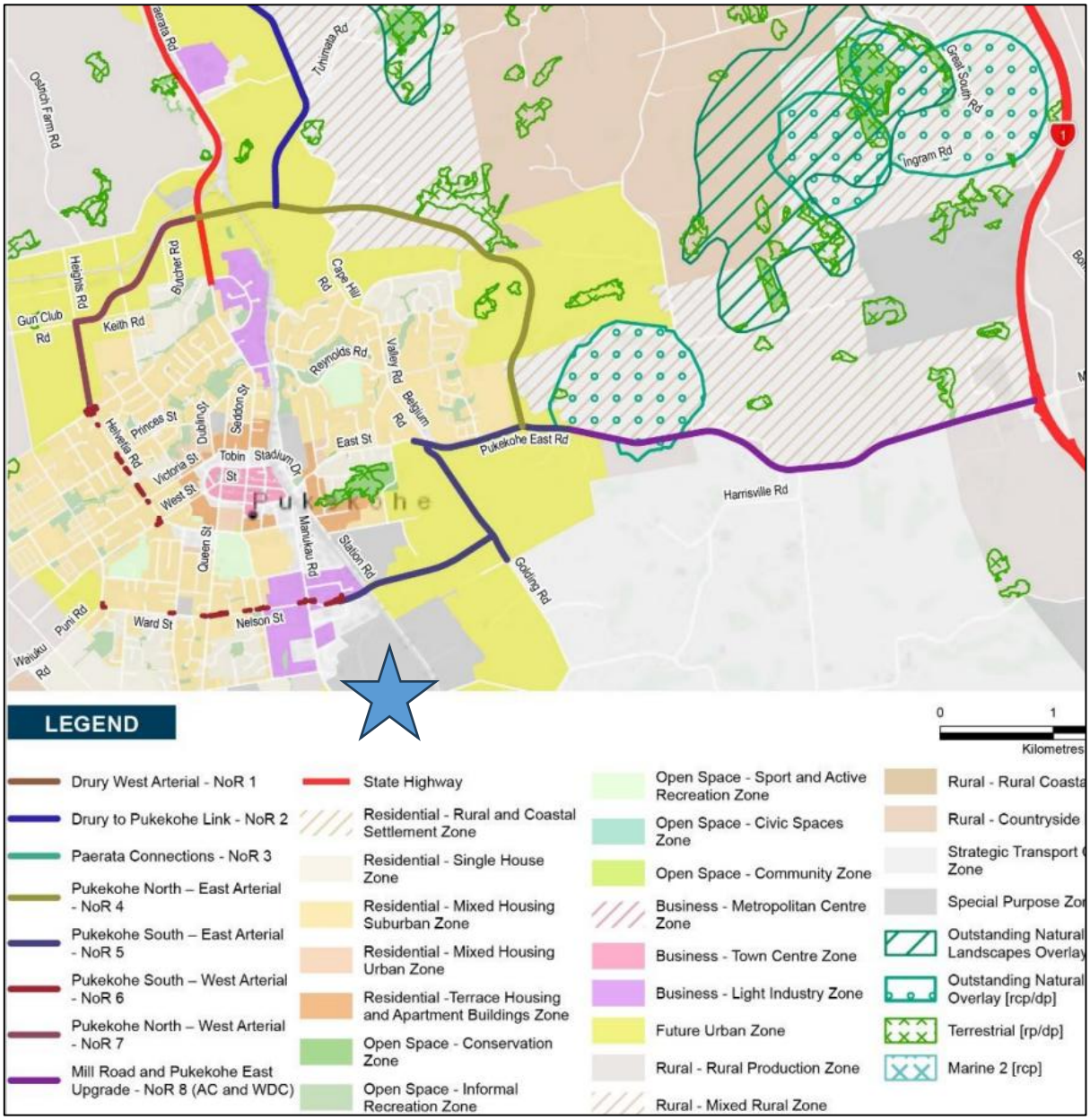

FIGURE 11: PROPOSED PUKEKOHE ARTERIAL TRANSPORT NETWORK (PPC SITE MARKED WITH STAR)

The SGA *Pukekohe Transport Network – Assessment of Transport Effects* report that accompanied the NOR applications states that future (2048) traffic volumes along several roads in the Pukekohe region will reduce once the proposed NoR projects are constructed and commissioned. Figure 12 below shows an extract of Table 5-3 from the SGA report which states that Buckland Road would have an average annual daily traffic (AADT) volume of 9,500vpd without the NoR projects which reduces to 8,000vpd with the NoR project. As such, it is expected that background traffic volumes along Buckland Road and other existing roads in the vicinity of the PPC Site will reduce once the new roading infrastructure is built as part of the NoR projects.

Road	ADT Volumes without Project	ADT Volumes with Project	Effects of the overall NoRs on Traffic Volumes
Blackbridge Road (North of SH22)	11,600	11,500	Limited changes
Linwood Road/ Hingaia Road	19,900	18,000	Limited changes
Quarry Road	8,900	10,800	Reduced traffic volume benefit
Gun Club Road	1,600	3,300	Minor increase of traffic from west
Waiuku Road	9,600	8,600	Reduced traffic volume benefit
Harrisville Road	6,500	14,100	Significant increase in traffic accessing strategic corridor
Buckland Road	9,500	8,000	Reduced traffic volume benefit

FIGURE 12: TABLE 5-3 FROM THE SGA ASSESSMENT OF TRANSPORT EFFECTS REPORT

4.3 Pukekohe-Paerata Structure Plan (2019)

Auckland Council, Auckland Transport and Waka Kotahi New Zealand Transport Agency have been assessing future transport networks in areas with high expected levels of growth such as Pukekohe. Figure 13 below has been extracted from the Auckland Council Pukekohe-Paerata Structure Plan (2019) and outlines the indicative transport network for Pukekohe, Paerata and the surrounding areas.

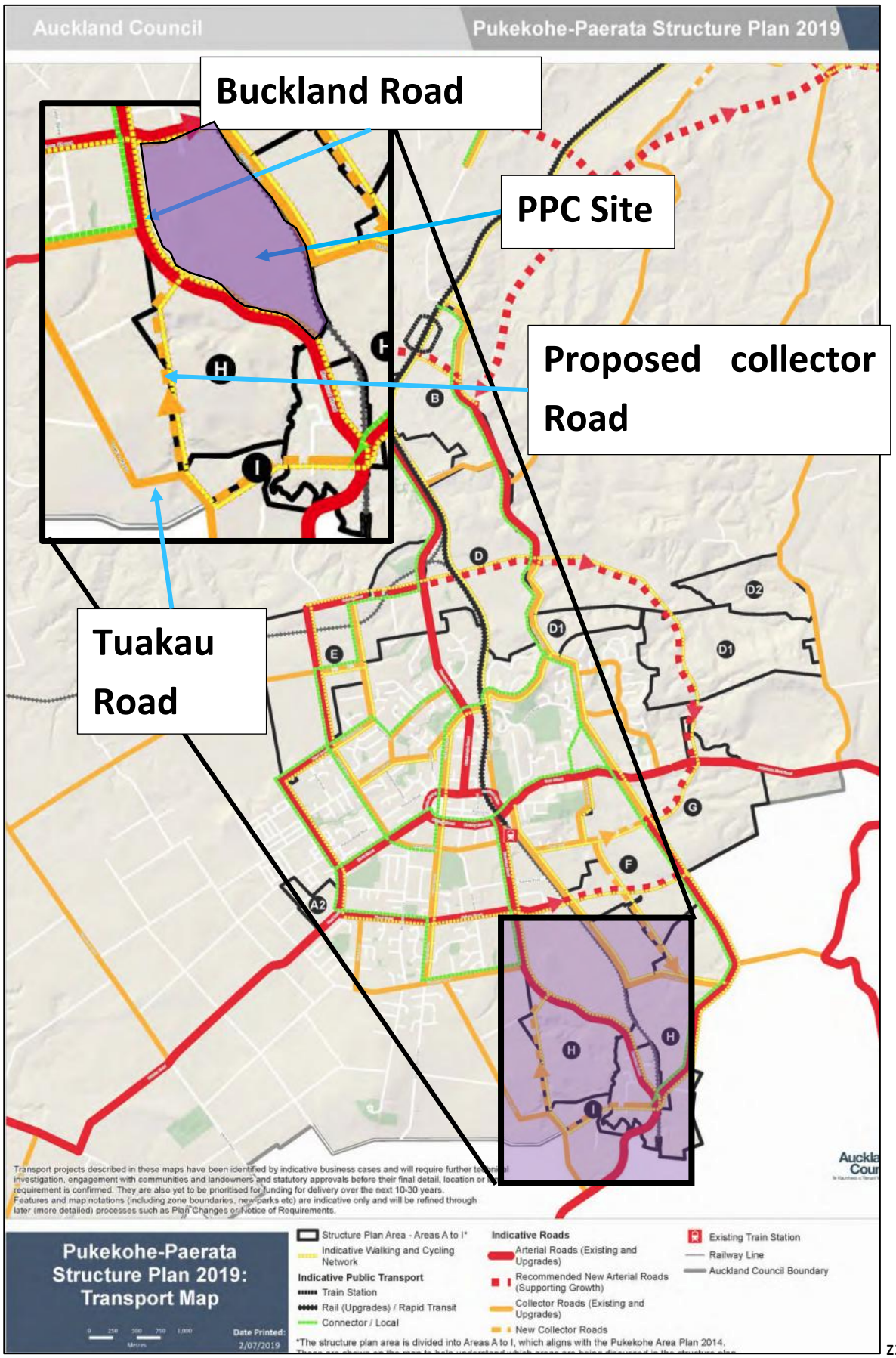

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FIGURE 13: PROPOSED TRANSPORT NETWORK FOR PUKEKOHE (AUCKLAND COUNCIL'S PUKEKOHE-PAERATA STRUCTURE PLAN (2019)

As shown in Figure 13 above, the key transport network improvements identified in the Structure Plan in vicinity of the PPC Site are:

- Retaining Buckland Road / Manukau Road as an arterial road corridor (shown in red);
- New east-west arterial road extending from Svendsen Road (north of the Pukekohe Gateway Precinct site) at its western end, across the NIMT to Golding Road at its eastern end (shown in red and dashed red);
- Providing a new collector road (PU-NS-2 road) which intersects Buckland Road opposite the subject site (shown in dashed orange) and connects to Tuakau Road at its southern end. As discussed earlier, the construction of the eastern-most section of this road plus the upgrade to its intersection with Buckland Road is required to enable development within the Buckland Road Precinct (PC87);
- Providing an integrated walking/cycling network along Buckland Road/Manukau Road to connect with active mode facilities in the wider area (shown in dotted yellow);
- Upgrading the rail network north of Pukekohe with electrification and additional capacity for up to four tracks between Wiri and Pukekohe (shown in bolded black). As discussed earlier, the Pukekohe Train Station upgrade and the Papakura to Pukekohe track electrification has been completed in August 2024. Stage 4 of the Rail Network Rebuild is currently under construction and due for completion in February 2025.
- A new train station at Paerata to enable rapid/frequent rail services. This facility is also fully funded and currently under construction with completion expected in late 2025/early 2026.

5 Proposed Development

5.1 Overview

The PPC proposes to rezone 22.96ha of the Pukekohe Park Precinct site to a combination of Residential-Mixed Housing Urban and Open Space – Informal Recreation Zones and to incorporate the existing PC30 site within the precinct. The residential activities will lie within sub-precincts A and B, whilst the PC30 land will form sub-precinct C. The PPC Site is referred to as the Pukekohekohe Gateway Precinct Area, and is shown in Figure **14** below.

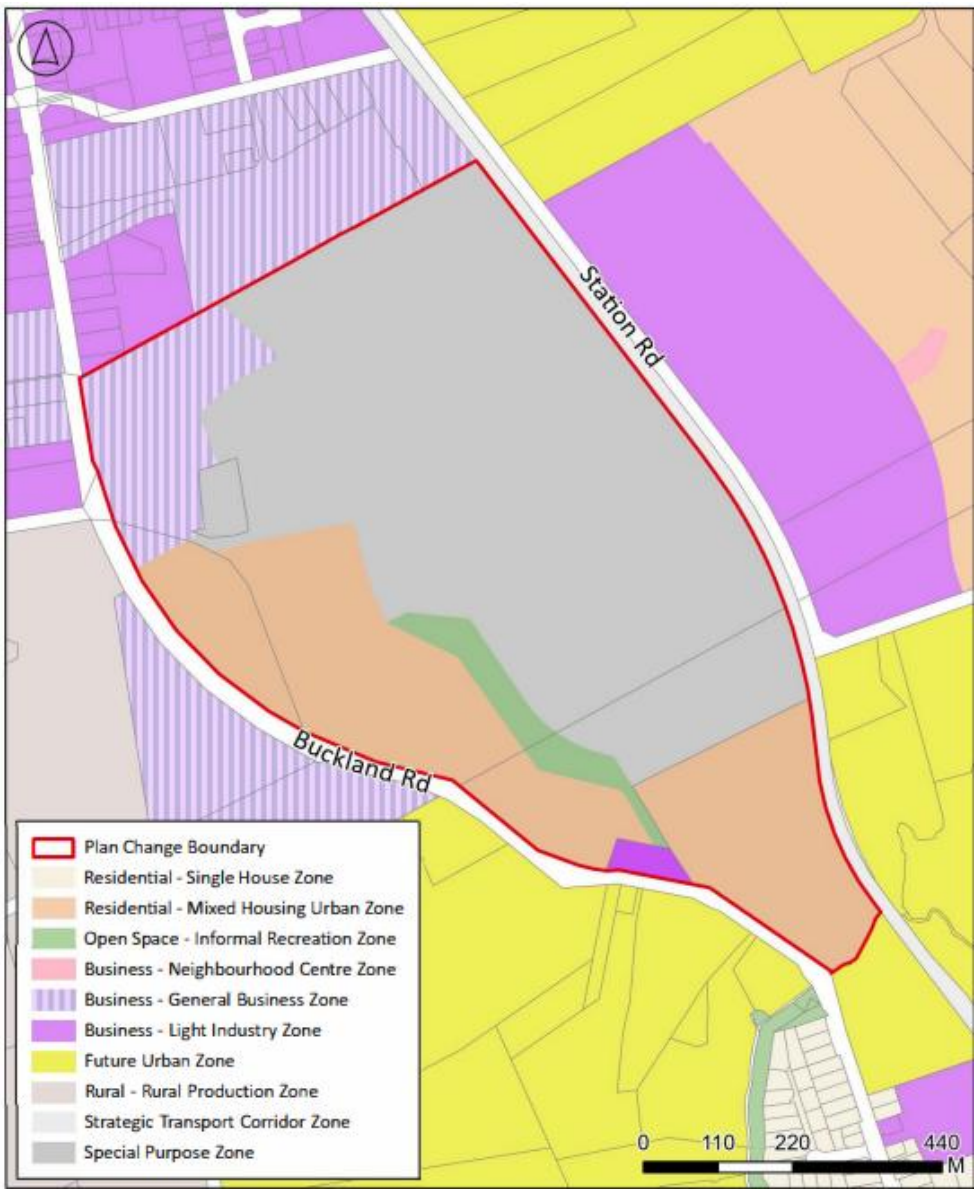

FIGURE 14: PROPOSED ZONING OF THE PPC SITE

As shown in Figure 15 below, the Pukekohekohe Gateway Precinct site will be split into three sub-precincts. Approximately 500 dwellings will be enabled within sub-precincts A and B. Sub-precinct A is located in the western section of the PPC Site and will be accessed via a four-legged roundabout. Sub-precinct B is located in the south-eastern section of the PPC Site and will be accessed via a priority controlled T-intersection. The PC30 General Business land will be incorporated into the Pukekohekohe Gateway Precinct as sub-precinct C, and will be accessed via the existing Kitchener Road / Manukau Road / Buckland Road intersection, which will be upgraded to a roundabout once development occurs within sub-precinct C.

The lot layout and roading alignment within the PPC Site has not yet been confirmed, however the approximate location of the intersections proposed to provide access to the PPC Site are identified in Figure 15. Although not shown on the plan, a new collector road corridor (PU-NS-2 road) will run southwest from the central / sub-precinct A intersection. It will connect to Tuakau Road and Buckland Road at its southern and northern ends respectively, as required to be provided by the Buckland Road Precinct (PC87). Currently, the new collector road corridor is likely to connect to Buckland Road at a three-legged roundabout intersection. As part of the PPC development, it is proposed to construct a fourth (eastern) leg at this roundabout to provide access into sub-precinct A of the PPC Site. These intersections are discussed in further detail in Section 5.2 below.

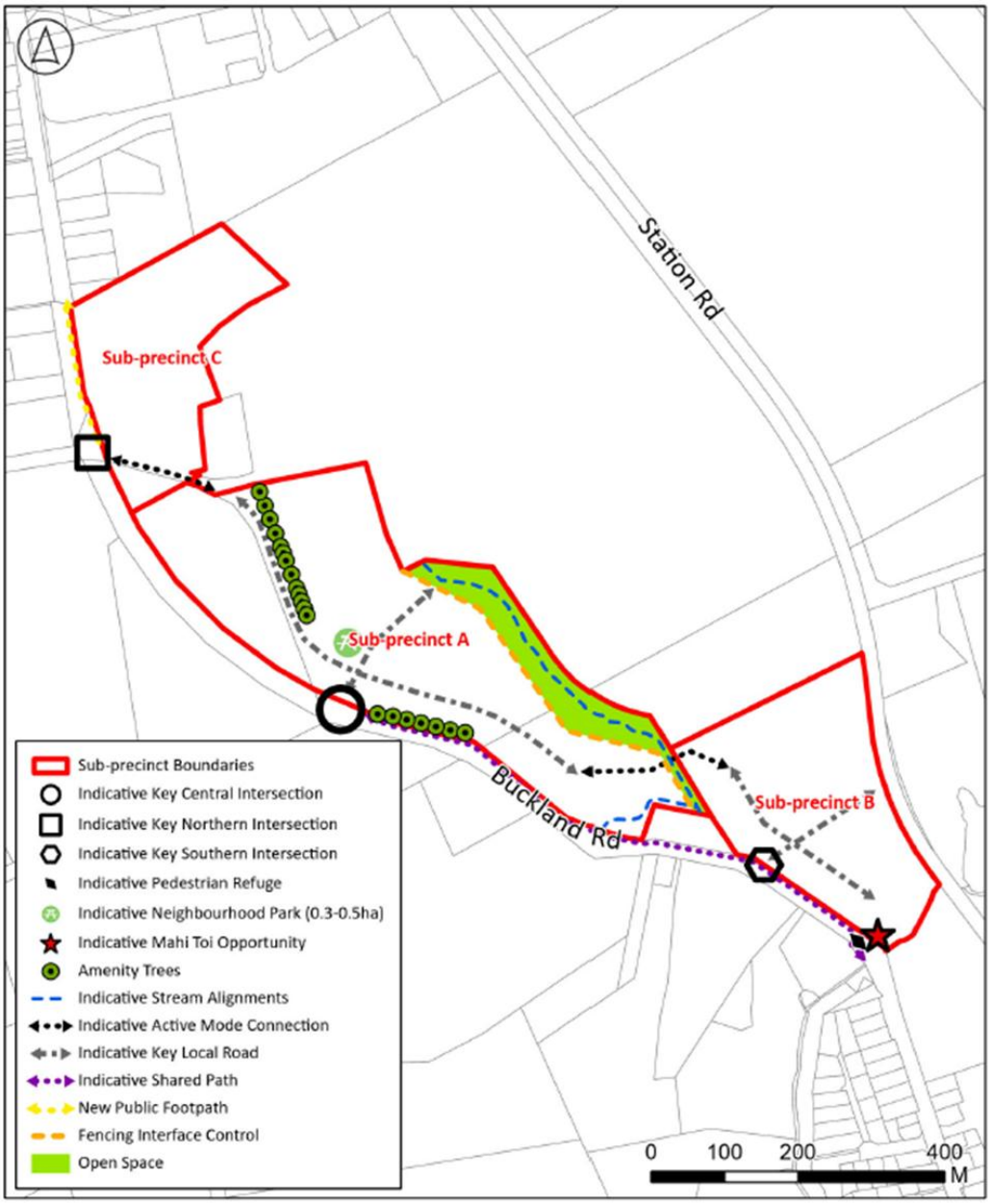

FIGURE 15: CONCEPT MASTERPLAN

As shown in Figure 15, the proposed development includes provision for several internal local road corridors (as grey dashed lines) to provide access to the proposed lots. It should be noted that the proposed alignment of these internal roads are only indicative, and will undergo further refinement in subsequent design stages.

As shown in Figure 15, there will be no internal vehicular connection between sub-precinct A and sub-precinct B within the Pukekohekohe Gateway Precinct. An active mode connection will be provided across the Open Space-Informal Recreation Zone between the two sub-precincts. This active mode facility will connect to the active mode facilities provided internally within the PPC Site and along Buckland Road in both the northern and southern directions. This is discussed in further detail in Section 5.3 below

5.2 Intersections/Access points

A site visit was completed on Friday 16 August 2024 to determine appropriate access locations into the PPC Site. The PPC Site will have three main access points onto Buckland Road as shown in Figure 15 above. As shown, the Indicative key northern intersection will provide access to sub-precinct C, and will be

upgraded to a roundabout once development occurs in that sub precinct. The central access point into the PPC Site (Indicative Key Central Intersection) will consist of a four-legged roundabout. This roundabout will provide access into all future lots within sub-precinct A.

The southern access point (Indicative Southern Intersection) as shown in Figure 15 will facilitate inbound/outbound movements for all dwellings within sub-precinct B located in the south-eastern section of the PPC Site. This access will consist of a priority-controlled T-intersection with Buckland Road being the major approach, and the proposed indicative key local road being as the minor approach. A right-turn-bay will also be provided at this intersection to allow turning right into the PPC Site to safely wait without blocking through traffic. This will minimise disruption for through vehicles travelling along Buckland Road.

5.3 Indicative Active Mode connections

As part of the PPC, it is proposed to provide active mode facilities along the southern section of the PPC Site frontage of Buckland Road as shown in Figure 16 below. This consists of a 3m urban standard shared path on the eastern side of Buckland Road along the southern section of the site (shown in yellow in Figure 16 below).

To the north, the shared path will tie into the (expected) shared path on the western side of Buckland Road which will be provided as part of future development within the Buckland Road Precinct (PC87) (shown in blue) and complete the active mode connection between Pukekohe township and Buckland township. It is likely a raised pedestrian (zebra) crossing will be provided on the northern or southern leg of the proposed roundabout to provide a safe crossing facility for pedestrians/cyclists attempting to cross Buckland Road. Further north of the PC87 shared path, the PC30 site (incorporated as Sub-Precinct C) once activated will provide a 1.8m wide footpath on the eastern side of Manukau Road (north of Kitchener Road) as shown in red in Figure 16 below. An internal active mode connection will also provide a direct connection between sub-precinct A and this proposed footpath.

To the south, the proposed shared path will connect to the existing footpath on the western side of Buckland Road. A refuge island crossing will be provided north of Hamilton's Bridge to provide a safe crossing facility between the proposed shared path and the existing footpath on the eastern and western sides respectively.

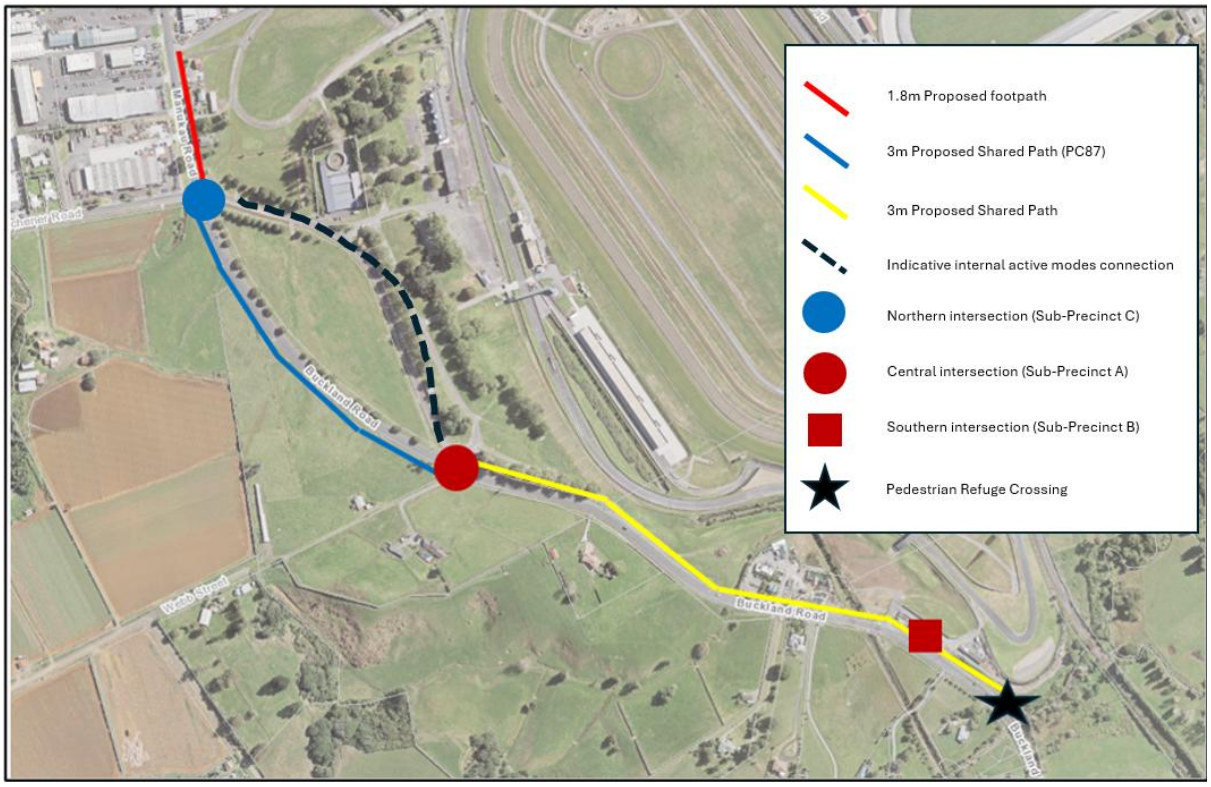

FIGURE 16: ACTIVE MODE FACILITIES

In addition to the proposed shared path along Buckland Road, 1.8m wide footpaths will also be provided on both sides of all local roads within the PPC Site. Despite not having a vehicular connection between sub-precinct A and sub-precinct B, an active mode connection will be provided through the Tutaenui Stream tributary area to increase walking and cycling connectivity within the PPC Site. Similarly, an active mode connection will also be provided at the northern end of the PPC site to connect to Buckland Road near the Kitchener Road intersection. This will connect to the 1.8m proposed footpath on the eastern side of Manukau Road as shown in red in Figure 16 above. Once these facilities are connected, they will provide a significantly improved active mode connection between the PPC Site and the Pukekohe township to the north. Should the PC87 shared path not have been provided in time for development within the PPC Site, internal routes can be used for active modes.

The proposed active mode facilities both within and across the road frontage of the PPC Site will significantly improve connectivity to the recently redeveloped Pukekohe train station and the various bus stops in vicinity of the PPC Site. The Pukekohe Train station is located approximately 1.4km north of the PPC Site and will be accessible to future residents of the PPC Site via the Manukau Road corridor. As stated in section 3.4 above, Manukau Road contains an approximately 1.2m wide footpath on both sides of the corridor. The proposed active mode facilities will connect into these footpaths allowing residents of the Pukekohekohe Gateway Precinct to have an efficient and safe active mode connection to the Pukekohe Train station. It should be noted that dedicated cycle facilities are not currently provided along the Manukau Road corridor, hence cyclists will have to share the live traffic lanes with other vehicles, as they do at present. In addition to the active mode connection between the PPC Site and the Pukekohe train station, residents of the development enabled by this PPC will also be able to utilise the proposed AT Local service as discussed in section 3.6.1.

5.4 Internal Roading Network

The internal road network within the PPC Site is expected to consist of 16m wide road corridors and contain provisions for on-street indented parking facilities/back berm, a 1m back berm for services and utilities, 3m wide traffic lanes, and a 1.8m wide footpath on both sides of the road corridor. Figure 17 below shows the proposed cross-section of the internal road corridors within the PPC Site.

The on-street parking facilities will be indented within the 2.2m wide front berm to maintain a clear 6m wide carriageway which can facilitate two-way movement at all times. The 2.2m wide front berm is also considered to be appropriate for planting and other street furniture such as signs, and light poles where parking is not provided. The back berm is 1m wide which is sufficient for providing utility services.

The 1.8m wide footpaths on both sides of the road corridor are considered to be appropriate given all roads within the Pukekohe Gateway Precinct will be classified as local roads, and pedestrian movements within the PPC Site are only expected to consist of residents of the proposed dwellings.

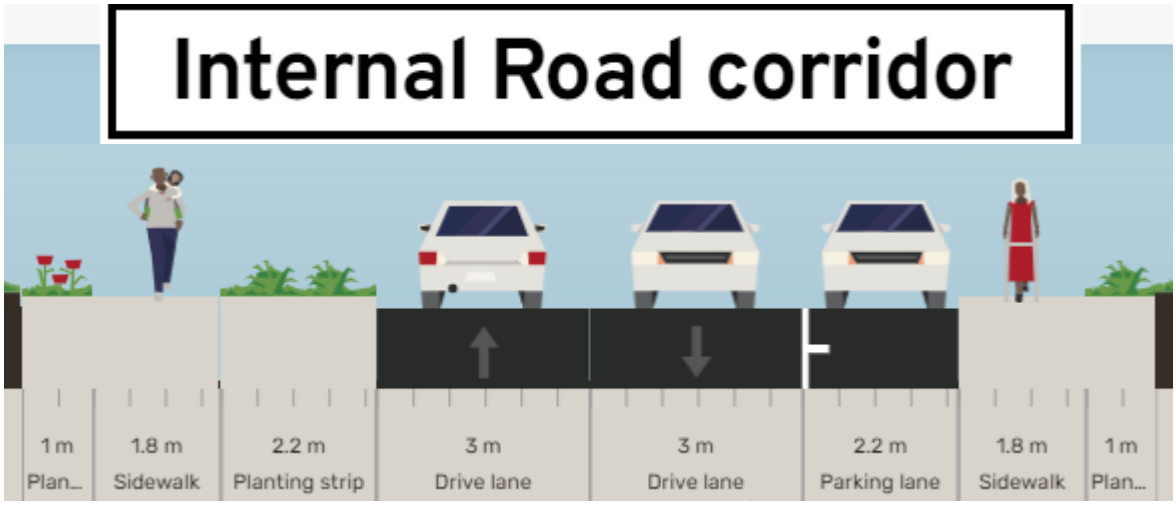

FIGURE 17: PROPOSED CROSS-SECTION OF THE INTERNAL LOCAL ROAD NETWORK

6 Traffic Modelling Methodology

6.1 Modelling Overview

The PPC Site has direct road frontage and access to/from Buckland Road only. Specific modelling has been undertaken using traffic volumes from the AT Traffic Count GIS database, traffic surveys completed on behalf of Auckland Thoroughbred Racing Incorporated and SIDRA modelling software to outline potential adverse effects and identify any further corridor improvements required on the surrounding transport network due to the proposed development of the PPC Site in south-east Pukekohe.

Given the relatively large scale of the development that will be enabled in the proposed residential zone, it is likely that the proposed development will be staged. It is also unclear when development enabled within the PC30 (new Sub-Precinct C) and Buckland Road Precinct (PC87) sites will occur. However, the modelling assessment completed as part of this PPC considers the traffic flows once the new residential area has been fully developed, and also assumes that the PC30 and PC87 sites have been fully developed, although further testing has also been undertaken without any development within those sites. The traffic volumes associated with the PC30 and PC87 sites have been obtained from their respective transportation assessments completed by Commute. These traffic volumes have been used as the baseline traffic model on the SIDRA 9.1 modelling software. All traffic volumes associated with the PPC Site have then been added

onto this baseline model. This ensures that a robust assessment is being undertaken which accounts for all traffic movements expected to occur in vicinity of the site.

The completed traffic modelling does not take into account the reduction to traffic flow on Buckland Road that was modelled by SGA in its Pukekohe Arterials (NoRs) ITA. This also ensures another layer of conservatism within the traffic modelling methodology.

6.2 Trip Generation

As described earlier, most of the PPC Site is zoned as Residential – Mixed Housing Urban and will therefore be primarily used for residential activities. A small section of the PPC Site (near the Tutaenui Streat tributary planted area) will also be zoned as Open Space – Informal Recreation Zone. The PPC will enable the development of approximately 500 medium-density dwellings within sub-precincts A and B of the PPC site. Trip rates for the proposed residential land uses have been obtained by averaging typical trip rates outlined in the Institute of Transportation Engineers Trip Generation Manual (ITE Manual), and the RTA Guide to Traffic Generating Developments (RMS document), and a traffic survey from an existing residential development located in Auckland. As shown in Table 3, trip rates have been averaged for both low-density and medium-density dwellings, as the lower density dwellings have higher trip rates, hence this ensures a conservative traffic modelling assessment. The trip rates have been calculated as shown in Table 3 below.

TABLE 3: TRIP GENERATION

Activity	Number of dwellings	AM Peak hour		PM Peak hour	
		Trip Rate	Trips	Trip Rate	Trips
Low density dwellings	250	0.80/dwelling	200	0.83/dwelling	208
Medium density dwellings	250	0.65/dwelling	163	0.65/dwelling	163
Total	500	-	363	-	371

As shown, it is expected that the PPC Site will generate a peak vehicle flow of 363 vehicles per hour (vph) in the AM peak and 371 vph in the PM peak hour, once the full extent of the development enabled by the PPC is completed.

6.3 Trip Distribution

The inbound and outbound splits for both the AM and PM peak have been obtained from the ITE manual. The AM traffic flow has an inbound/outbound split of 25%/75%. In the PM peak, the inbound/outbound split is 63%/37%.

As stated above, dwellings within sub-precinct A of the Pukekohekohe Gateway Precinct (western section of the PPC Site) will be accessible via the central roundabout intersection, and dwellings within sub-precinct B (south-eastern section of the PPC Site) will be accessible via the southern priority-controlled intersection. Approximately two-thirds of the proposed dwellings will be located in sub-precinct A with the remaining dwellings located in sub-precinct B. As such, the completed traffic modelling assumes that 66% of all traffic enters/exits the site from the northern intersection, and the remaining 34% from the southern intersection.

Distribution of traffic generated from the proposed development to the wider road network has been based on existing trip distribution patterns in the vicinity of the PPC Site. The northbound/southbound split at both access points serving the site has been adopted from a previously completed intersection count at the Kitchener Rd / Manukau Rd / Buckland Rd intersection. However, for the central access point,

it has been assumed that 5% of all traffic entering/exiting the site will head west towards/past the PC87 site on the proposed PU-NS-2 collector road. As such, to accommodate the additional 5% through movements at the northern access point, the northbound/southbound distributions have been reduced by 2.5% each to allow the distributions to sum to 100%. Table 4 below shows the distribution of trips from each access/egress point in both the AM and PM peaks.

TABLE 4: TRIP DISTRIBUTION

Northern roundabout Intersection (66% of all traffic into/out of site)		
Origin/Destination	**Distribution AM Peak**	**Distribution PM Peak**
North (towards Pukekohe)	63.6%	63.8%
West (PC87 site)	5%	5%
South (towards Buckland)	31.4%	31.2%
Southern priority-controlled Intersection (34% of all traffic into/out of site)		
Origin/Destination	**Distribution AM Peak**	**Distribution PM Peak**
North (towards Pukekohe)	66.1%	66%
South (towards Buckland)	33.9%	34%

7 Traffic Modelling Results

A SIDRA model was developed for the following intersections to assess the effects of anticipated development. These three intersections have also been outlined in Figure 18 below:

- Kitchener Road / Manukau Road / Buckland Road / PC30 proposed roundabout intersection (outlined in yellow);
- PU-NS-2 Road (PC87 – Buckland Road Precinct) / Buckland Road / Pukekohekohe Gateway Precinct indicative central key intersection (outlined in red); and
- Buckland Road / Pukekohekohe Gateway Precinct indicative southern intersection (outlined in blue).

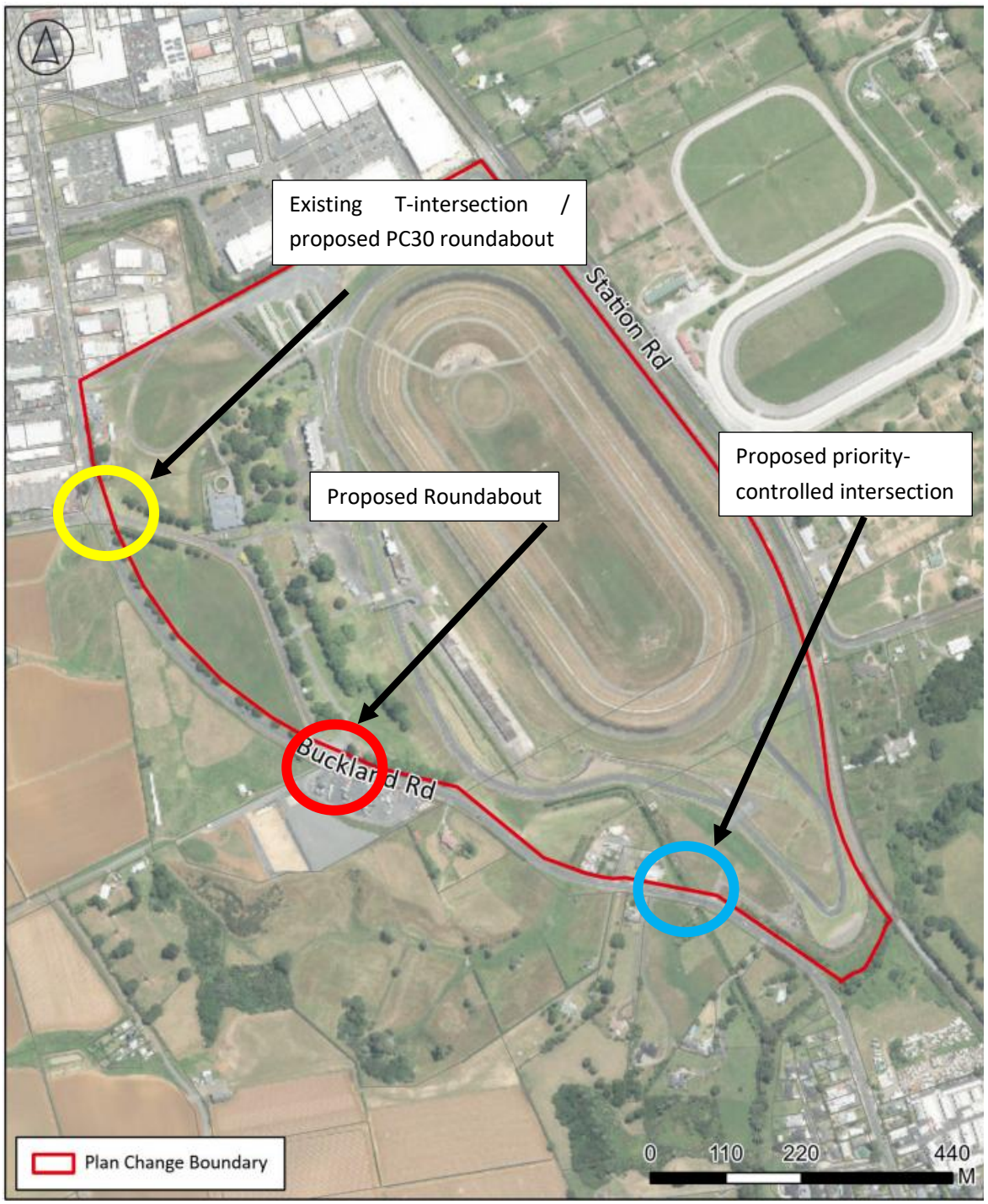

FIGURE 18: MODELLED INTERSECTIONS

As stated above, the baseline model was created using the expected traffic volumes from the Pukekohe Park Raceway (PC30) and Buckland Road Precinct (PC87) sites.

The results presented in this section include the average delay, Level of Service (LOS), and the 95th percentile queue length. The LOS is a generalised function of delay, with LOS A and B indicating 'very good' free flow conditions, LOS C is 'good', LOS D is 'acceptable', and LOS E and F are indicative of congestion and poor traffic flow conditions.

A summary of the key results from the modelling assessment is presented below with the full results included within Appendix A. The summarised results include the average delay, LOS, and the queue lengths.

The queue lengths have been provided in terms of the 'average' queue length, and also the 95th percentile queue lengths in brackets.

7.1 Manukau Road / Kitchener Road / Buckland Road roundabout

Table 5 and Table 6 below show the performance of the Manukau Road/Kitchener Road/Buckland Road intersection. The PC30 covenant requires this intersection to be upgraded to a roundabout (this upgrade has now been incorporated within the requirements for Sub-Precinct C), hence it has initially been modelled as a roundabout only, despite currently existing as a priority-controlled T-intersection.

TABLE 5: BUCKLAND RD/ MANUKAU RD/KITCHENER RD INTERSECTION - AM PEAK

Approach	Movement	Baseline Scenario (PC30 and PC87)			Proposed Scenario (PC30, PC87 and PPC Site)		
		Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)	Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)
Buckland Road (South)	LT onto Kitchener Rd	7	A	22 (54)	12	B	45 (112)
	T onto Manukau Rd	7	A	22 (54)	12	B	45 (112)
	RT into PC30 site	11	B	22 (54)	16	B	45 (112)
PC30 site (East)	LT onto Buckland Rd	7	A	6 (16)	7	A	7 (17)
	T onto Kitchener Rd	7	A	6 (16)	7	A	7 (17)
	RT onto Manukau Rd	11	B	6 (16)	12	B	7 (17)
Manukau Road (North)	LT into PC30 site	5	A	13 (33)	5	A	15 (37)
	T onto Buckland Rd	5	A	13 (33)	5	A	15 (37)
	RT onto Kitchener Rd	9	A	13 (33)	9	A	15 (37)
Kitchener Road (west)	LT onto Manukau Rd	11	B	11 (28)	22	C	20 (51)
	T into PC30 site	11	B	11 (28)	21	C	20 (51)
	RT onto Buckland Rd	16	B	11 (28)	26	C	20 (51)

TABLE 6: BUCKLAND RD/ MANUKAU RD/KITCHENER RD INTERSECTION - PM PEAK

Approach	Movement	Baseline Scenario (PC30 and PC87)			Proposed Scenario (PC30, PC87 and PPC Site)		
		Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)	Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)
Buckland Road (South)	LT onto Kitchener Rd	13	B	39 (97)	20	B	62 (155)
	T onto Manukau Rd	13	B	39 (97)	20	B	62 (155)
	RT into PC30 site	18	B	39 (97)	24	C	62 (155)
PC30 site (East)	LT onto Buckland Rd	18	B	17 (43)	30	C	25 (62)
	T onto Kitchener Rd	18	B	17 (43)	30	C	25 (62)
	RT onto Manukau Rd	22	C	17 (43)	35	C	25 (62)
Manukau Road (north)	LT into PC30 site	8	A	41 (102)	11	B	64 (160)
	T onto Buckland Rd	8	A	41 (102)	12	B	64 (160)
	RT onto Kitchener Rd	13	B	41 (102)	16	B	64 (160)
Kitchener Road (west)	LT onto Manukau Rd	16	B	17 (42)	22	C	22 (55)
	T into PC30 site	15	B	17 (42)	22	C	22 (55)
	RT onto Buckland Rd	20	B	17 (42)	27	C	22 (55)

The above results indicate that with PC30 and PC87 in place, and once the intersection is upgraded to a roundabout, it is expected to operate primarily at a 'good' level of service (LOS B and C). The maximum delay occurs in the PM peak when right-turn vehicles on the eastern approach have an average delay of 33 seconds resulting in a LOS C. During the PM peak, the northern and southern approaches of the intersection are expected to have average queue lengths of approximately 60-65m, with 95th percentile queue lengths reaching between 150 and 155m within the peak hour. It should be noted that despite these queue lengths, the average delay on both these approaches only varies between 10 and 25 seconds for all movements. Two factors are expected to be contributing to these queue lengths:

- the 95th percentile queue length in the peak hour is approximately 160m, however the average queue length is only ~60m. Effectively this means that the typical queue length is ~60m, however it could infrequently increase to 160m during the peak of the peak hour for a short duration, before returning to the average queue length.
- despite the 60m average and 160m and 95th percentile queueing respectively, the average delay on both approaches is less than 25 seconds. This indicates that the queued traffic is likely to be flowing at a speed slower than the posted speed limit, however it will not be at a complete stand still as this would be represented by significantly higher delays along these two approaches.

As such, based on the completed SIDRA traffic modelling and analysis above, the proposed roundabout at the Manukau Rd/Kitchener Rd/Buckland Rd intersection is considered to adequately cater for the additional vehicle movements generated by PC30, PC87 and the development enabled by the PPC.

7.2 Manukau Road / Kitchener Road / Buckland Road Without PC30 Site (i.e. a retained priority-controlled T-intersection)

Although this PPC proposes to incorporate the key PC30 upgrade requirements within sub-precinct C, the intersection was also modelled with the intersection remaining with its existing T-intersection layout. This traffic modelling has been carried out including traffic volumes associated with PC87 and the PPC Site but without flows associated with the PC30 (sub-precinct C) site. It is also assumed that Gate 2 of the Pukekohe Park site would be closed outside of the racetrack event days, hence the intersection has been modelled as a T-intersection with Manukau Road as the northern approach, Buckland Road as the southern approach and Kitchener Road as the western approach. The results of this traffic modelling are shown in Table 7 below.

TABLE 7: MANUKAU ROAD/BUCKLAND ROAD/ KITCHENER ROAD INTERSECTION AS PRIORITY CONTROLLED (WITHOUT PC30)

Approach	Movement	AM Peak			PM Peak		
		Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)	Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)
Buckland Road (South)	LT onto Kitchener Rd	5	A	0 (0)	5	A	0 (0)
	T onto Manukau Rd	0	A	0 (0)	0	A	0 (0)
Manukau Road (north)	T onto Buckland Rd	0	A	5 (13)	4	A	23 (57)
	RT onto Kitchener Rd	20	C	5 (13)	26	D	23 (57)
Kitchener Road (west)	LT onto Manukau Rd	9	A	3 (7)	9	A	3 (7)
	RT onto Buckland Rd	19	C	3 (8)	74	F	10 (24)

As can be seen above, the northern and southern legs of this priority-controlled intersection operate at a very good level of service in both the AM and PM peaks, however, the right turn movement from Kitchener Road faces a delay of just over a minute in the PM peak. As such, it is concluded that if the roundabout upgrade required by PC30 / sub-precinct C is not constructed, the existing T-intersection can operate at a reasonable level even with the additional traffic volumes associated with development in the Buckland Road Precinct (PC87) and development enabled within the PPC Site.

7.3 PU-NS-2 Road / Buckland Road / Pukekohekohe Gateway Precinct roundabout

Table 8 and Table 9 below show the performance of the PU-NS-2 Road / Buckland Road / Pukekohekohe Gateway Precinct Central intersection for the AM and PM peak hours. The intersection provides access to sub-precinct A and has been modelled as a roundabout given that is the most likely arrangement once development commences within the Buckland Road Precinct (PC87) and the PPC Site.

TABLE 8:PU-NS-2/BUCKLAND ROAD/PPC SITE ROUNDABOUT - AM PEAK

Approach	Movement	Baseline Scenario (PC30 and PC87)			Proposed Scenario (PC30, PC87 and Pukekohe Gateway Precinct site)		
		Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)	Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)
Buckland Road (South)	LT onto PU-NS-2 Rd	4	A	13 (32)	6	A	21 (53)
	T onto Buckland Rd (north)	4	A	13 (32)	6	A	21 (53)
	RT into PPC Site	8	A	13 (32)	10	B	21 (53)
PPC Site (East)	LT onto Buckland Rd (south)	5	A	0 (0)	6	A	4 (10)
	T onto PC87 site	5	A	0 (0)	6	A	4 (10)
	RT onto Buckland Rd (north)	10	A	0 (0)	11	B	4 (10)
Buckland Road (north)	LT into PPC Site	3	A	8 (20)	3	A	9 (23)
	T onto Buckland Rd (south)	3	A	8 (20)	3	A	9 (23)
	RT onto PC87 site	71	A	8 (20)	8	A	9 (23)
PU-NS-2 Road (west)	LT onto Buckland Rd (south)	7	A	3 (7)	10	A	4 (11)
	T into PPC Site	7	A	3 (7)	9	A	4 (11)
	RT onto Buckland Rd (north)	12	B	3 (7)	14	B	4 (11)

TABLE 9: PU-NS-2/BUCKLAND ROAD/PPC SITE ROUNDABOUT - PM PEAK

Approach	Movement	Baseline Scenario (PC30 and PC87)			Proposed Scenario (PC30, PC87 and PPC Site)		
		Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)	Ave Delay (s)	LOS	Ave. Q (95%ile Q) (m)
Buckland Road (South)	LT onto PU-NS-2 Rd	5	A	15 (38)	7	A	24 (59)
	T onto Buckland Rd (north)	5	A	15 (38)	7	A	24 (59)
	RT into PPC Site	9	A	15 (38)	12	B	24 (59)
PPC Site site (East)	LT onto Buckland Rd (south)	8	A	0 (0)	11	B	4 (10)
	T onto PC87 site	8	A	0 (0)	11	B	4 (10)
	RT onto Buckland Rd (north)	13	B	0 (0)	15	B	4 (10)
Buckland Road (north)	LT into PPC Site	4	A	21 (52)	5	A	29 (71)
	T onto Buckland Rd (south)	4	A	21 (52)	5	A	29 (71)
	RT onto PC87 site	9	A	21 (52)	10	A	29 (71)
PU-NS-2 Road (west)	LT onto Buckland Rd (south)	8	A	10 (26)	12	B	16 (39)
	T into PPC Site	7	A	10 (26)	11	B	16 (39)
	RT onto Buckland Rd (north)	12	B	10 (26)	16	B	16 (39)

The above results indicate that once the intersection is upgraded to a roundabout, it is expected to operate primarily at a very good level of service (LOS A and B). The maximum delay occurs in the PM peak when right-turn vehicles on the western approach have an average delay of 16s resulting in a LOS B. As such, once upgraded, the proposed roundabout intersection is considered to adequately cater for the additional vehicle movements generated by PC30, PC87 and the PPC Site.

7.4 Buckland Road / Pukekohekohe Gateway Precinct Southern Intersection

The Buckland Road / Pukekohekohe Gateway Precinct indicative southern connection provides access to Sub-Precinct B. As part of the future development enabled by the PPC, this intersection is expected to be provided as a priority-controlled intersection with Buckland Road being the major approach, and the PPC Site being the minor approach. As stated in Section 6.3, sub-precinct B is expected to contain approximately one third of the total number of dwellings, hence is expected to facilitate a third of all traffic movements into and out of the PPC Site. In the AM peak, this is expected to be approximately 92 vehicle movements out of the PPC Site, and 31 vehicle movements into the site (including 10 right-turn movements into the site). In the PM peak, this is expected to be approximately 79 vehicle movements into the site (including 27 right-turn movements into the site), and 46 vehicle movements out of the PPC Site.

Figure 3.25 of Austroads *Guide to Traffic Management: Part 6 Intersections, Interchanges and Crossings Management* (shown as Figure 19 below) outlines the warrant for a right-turn bay. As stated above, once the PPC Site is developed, the posted speed limit along the Buckland Road corridor will reduce to 50km/h, hence figure 3.25c from Austroads has been used to determine whether a right-turn bay is warranted at this intersection. The estimated peak hour volumes along Buckland Road are expected to be approximately 1370vph. As such, a maximum of six turning movements are permitted per hour before a turning bay is required. As stated above, a total of 27 right-turn movements are expected to occur into the site during the PM peak hour. Based on the graph below, a right-turn bay is warranted and should be provided at the Buckland Road/Road 2 intersection.

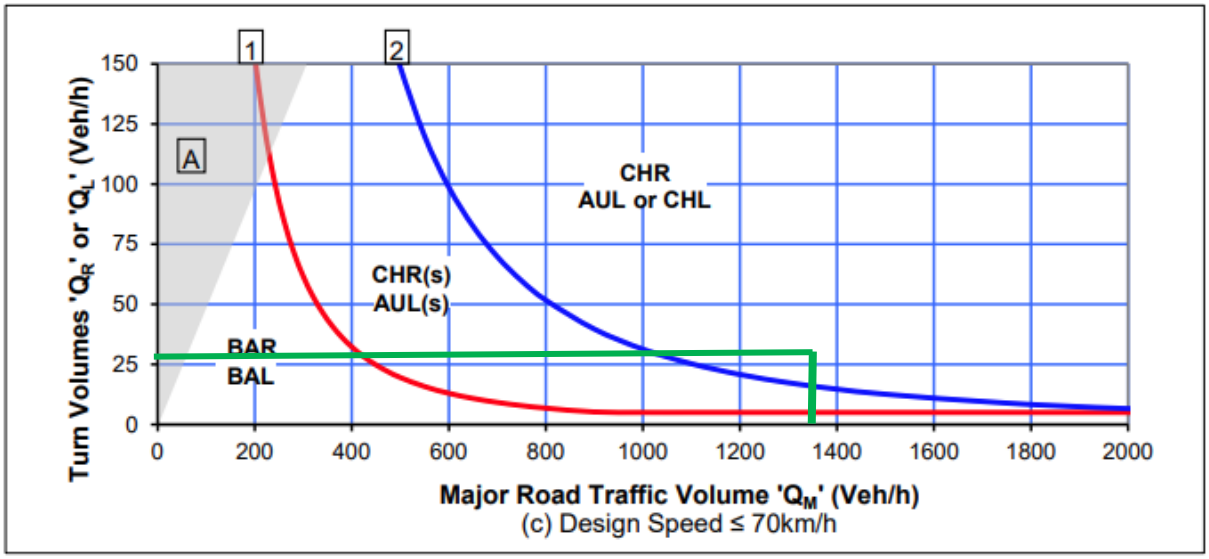

FIGURE 19: FIGURE 3.25C FROM AUSTROADS TO DETERMINE WHETHER A RTB IS WARRANTED

Table 10 below shows the performance of the Buckland Road/Road 2 intersection in its proposed layout containing a right-turn bay.

TABLE 10: BUCKLAND ROAD / PPC SITE INTERSECTION - PRIORITY CONTROLLED WITH A RIGHT-TURN BAY

Approach	Movement	AM Peak			PM Peak		
		Ave Delay (s)	LOS	Average Q (m)	Ave Delay (s)	LOS	Average Q (m
Buckland Road (South)	RT into site	6	A	0	9	A	0
	T onto Buckland Road	0	A	0	0	A	0
PPC Site (East)	LT onto Buckland Road	7	A	1	8	A	1
	RT onto Buckland Road	11	B	1	14	B	1
Buckland Road (north)	LT into PPC Site	5	A	0	5	A	0
	T onto Buckland Rd	0	A	0	0	A	0

The modelling results show that the intersection performs at a 'very good' level of service in both the AM and PM peaks. Additionally, the provision of a right-turn bay ensures that northbound vehicles travelling along Buckland Road are not blocked by vehicles attempting to turn right into the site.

7.5 Summary

Overall, the traffic modelling indicates that there is potential for some queueing in the PM peak at the Kitchener Road/Manukau Road/Buckland Road intersection. In the baseline scenario (PC30 and PC87 traffic), average queue lengths along the northern (Manukau Road) and southern (Buckland Road) approaches of the intersection are expected to be approximately 45m, however, as shown in Table 6, the average queue length increases to approximately 65m in the PM peak with the proposed development of the PPC Site. The 95th percentile queue increases from a length of approximately 100m in the baseline scenario to approximately 160m with the proposed development in the PPC Site. However, as discussed above, the 95th percentile queue length would occur infrequently in the peak of the peak hour scenario, and even then, it is likely to consist of flowing traffic as demonstrated by the relatively low average delays.

The traffic modelling has also shown that if the Kitchener Road/Manukau Road/Buckland Road intersection remains as a priority-controlled intersection due to the lack of development with the PC30 Site, the intersection can accommodate traffic volumes associated with the development proposed in the Buckland Road Precinct (PC87) and PPC Site. Motorists attempting to turn right out of Kitchener Road will experience some delays in the PM peak, but these are considered acceptable.

The roundabout and priority-controlled intersections serving the Pukekohekohe Gateway Precinct sub-precincts A and B perform primarily at a 'very good' level of service in both the AM and PM peaks.

It is reiterated that traffic volumes along Buckland Road are expected to decrease in the future as the Pukekohe Arterial Network is delivered. These projects will provide easier and more direct travel routes across Pukekohe, Drury, and the wider South Auckland region. The traffic modelling undertaken does not account for these factors and as such, the results presented as part of this modelling assessment are considered to be conservative. It is also noted that the transport works identified to enable sub-precincts A and B can be progressed independently of the transport works required to support PC30 land / sub-precinct C.

8 Compliance with Policy and Other Frameworks

8.1 Overview

A Plan Change ITA requires an assessment of compliance with policy and other frameworks, in particular a review against the Auckland Unitary Plan objectives, policies and rules. As such a variety of national, regional and local transport planning and policy documents have been reviewed. The proposed masterplan has been assessed against these documents:

- Government Policy Statement 2024 (GPS 2024)
- Pukekohe-Paerata Structure Plan (2019) (PPSP)
- Auckland Unitary Plan (AUP)
- Regional Policy Statement (RPS)
- Regional Land Transport Plan (RLTP)
- Regional Public Transport Plan (RPTP)
- Transport Emissions Reduction Pathway (TERP)

8.2 Government Policy Statement on Land Transport Funding 2024-2034 (GPS)

The Draft Government Policy Statement (GPS) on Land Transport sets out the Government's desired outcomes and priorities for the land transport sector. It describes what the Government expects to achieve through the National Land Transport Fund and the manner in which funding is allocated to upgrade and maintain the land transport network. It has the following four strategic priorities (Government Policy Statement on Land Transport Funding 2024-2034, page 10):

- Economic growth and increased productivity – reduced journey times, less congestion and increased patronage on public transport, improved access to markets and areas that contribute to economic growth, more efficient supply chains for freight and unlocked access to greenfield land for housing development and supporting greater intensification.
- Increased maintenance and resilience – more kilometres of the road network resealed and rehabilitated each year, fewer potholes, and a more resilient network.
- Improved safety – reduction in deaths and serious injuries and increased enforcement.
- Value for money – better use of existing capacity and less expenditure on temporary traffic management.

Development of the PPC Site will support these national policy directions by meeting each of the four desired outcomes stated above. The proposed development of the PPC Site will also result in a reduced speed limit along Buckland Road which will reduce severity and therefore overall risk of crashes in vicinity of the PPC Site. The PPC Site is also located in proximity to the proposed NoR5 (Pukekohe South-East arterial) network which improves connectivity for residents and visitors travelling to/from the PPC Site, therefore providing better use of the transport network.

8.3 Pukekohe - Paerata Structure Plan (2019) (PPSP)

The Auckland Council Pukekohe-Paerata Structure Plan (PPSP) shows the arrangement of different land uses and infrastructure and demonstrates how these different land uses will connect to adjacent urban and rural areas and to wider infrastructure networks. The PPSP has the following six key outcomes (Auckland Council, Pukekohe – Paerata Structure Plan, pages 16 – 18):

- A place for people
- Our shared stories

- A healthy, flourishing and sustainable community
- Valuing our natural environment
- Rural Pukekohe
- Servicing our future community

The future development enabled by the PPC will align with these key outcomes. In relation to the transport-related outcomes, the PPC Site will provide a safe transport network, for vehicles, pedestrians and cyclists with provisions for shared paths along the existing road corridor, and excellent active modal connectivity across the PPC Site.

8.4 Auckland Unitary Plan (AUP)

The AUP has been operative in part since November 2016, and has the following objectives (extracted from AUP E27.2) with regard to the regions transport infrastructure:

- Land use and all modes of transport are integrated in a manner that enables
  - a) The benefits of an integrated transport network to be realised;
  - b) The adverse effects of traffic generation on the transport network to be managed;
- (ii) An integrated public transport, walking and cycling network is provided for;
- (iii) Parking and loading support urban growth and the quality compact urban form;
- (iv) The provision of safe and efficient parking, loading and access is commensurate with the character, scale and intensity of the zone;
- (v) Pedestrian safety and amenity along public footpaths are priorities; and
- (vi) Road / rail crossings operate safely with neighbouring land use and development

Development enabled by the PPC will align with the AUP as it will provide an integrated walking and cycling network both within and around the PPC Site. The PPC Site will provide the key missing active mode connection between the pedestrian and cyclist facilities that currently exist within Pukekohe and Buckland townships. All active mode facilities provided as part of the PPC including crossing facilities, footpaths and shared paths will be constructed to ensure safety is prioritised for active mode users.

As demonstrated in section 7, all adverse effects of the additional traffic generated by the PPC Site can be appropriately managed within the existing road network. Additionally, the proposed PPC Site is located close to public transport infrastructure including bus stops at the southern end of Pukekohe township and the recently upgraded Pukekohe Train Station.

It is also understood that all parking spaces provided will be appropriate for a residential development of this character and scale. The PPC is expected to integrate well with the surrounding transport network and land uses.

8.5 Regional Policy Statement (RPS)

The Regional Policy Statement (RPS) outlines the management, use, development and protection of the natural and physical resources within the Auckland Region and sets in place the policies for promoting the sustainable management of these resources. The RPS states the following transportation related objectives (as outlined in Chapter B3.3 Transport) of the RPS document.

Objectives of the RPS are:

- Effective, efficient and safe transport that:

a) Supports the movement of people, goods and services;
b) Integrates with and supports a quality compact urban form;
c) Enables growth;
d) Avoids, remedies or mitigates adverse effects on the quality of the environment and amenity values and the health and safety of people and communities; and
e) facilitates transport choices, recognises different trip characteristics and enables accessibility and mobility for all sectors of the community.

The proposed development of the PPC Site aligns well with the objectives of the RPS. The proposed shared path and internal local roads within the PPC Site will support movement of people, goods and services, and integrate well with the existing transport environment in vicinity of the PPC Site.

Once constructed, the PPC Site will provide a well-connected transport network for both vehicles, and active mode users. Currently, there are no active mode facilities along Buckland Road. However, as part of the proposed development, all internal local roads will provide footpaths, and a shared path will be provided along the entire frontage of the southern section of the PPC Site resulting in a safe active mode connection between Pukekohe and Buckland townships. This is expected to increase attractiveness of active modes and therefore reduce reliance on private vehicle trips.

8.6 Regional Land Transport Plan (RLTP)

The Regional Land Transport Plan (RLTP) prepared by Auckland Transport with NZTA, KiwiRail and Auckland Council identifies the priority of a number of region-wide transport projects over a 10-year period. The current RLTP was adopted in 2024 for a duration of 10 years, however it is reviewed every three years. The current RLTP outlines the following key items:

- Existing public transport services, along with improvements such as more rail services enabled by the CRL and the expansion of the frequent bus network;
- Completing projects that are already committed to and in progress, for example, the Eastern Busway and CRL;
- Renewals and maintenance of local roads, rail and state highway networks to ensure they remain fit for purpose into the future;
- Larger rapid transit projects that will provide new high-speed public transport links across Auckland, but will cost more and take longer to deliver;
- Smaller projects that can be delivered quickly to improve the speed and reliability of our bus network, including dynamic bus lanes, optimise traffic movement on our road network and motorways, and encourage more sustainable travel from key growth areas;
- Major state highway projects that will improve resiliency, reliability and travel times on the motorway network and enhance our links to other regions;
- Cycling projects that will increase the size of the cycling network; and
- Investment in safety infrastructure to reduce transport related deaths and serious injuries.

The PPC integrates well with the RLTP as it aligns with these strategic themes. The PPC Site is located in close proximity to the Pukekohe Train station, hence allowing residents to capitalise on the more frequent and improved rail services given the recent electrification of the rail network to Pukekohe.

The PPC Site will also benefit from construction of the NoR projects as outlined in the SGA *Pukekohe Transport Network – Assessment of Transport Effects* report. The PPC Site is located in close proximity to

NoR 5 (Pukekohe South-East arterial) route, allowing residents to have more direct access to the state highway network across Auckland.

The proposed shared path along Buckland Road will also increase the cycling network in Pukekohe and contribute to providing a well-connected cycle route to and from the Pukekohe train station.

8.7 Regional Public Transport Plan (RPTP)

The Regional Public Transport Plan (RPTP) outlines how public transport will be managed and improved between 2023-2031, and also states the goals, policies and actions which will shape public transport investment decisions. The vision of the RPTP is "to massively increase public transport use to reduce congestion, improve access for Aucklanders, support the economy and enhance the environment". To achieve this vision, the RPTP outlines five key goals:

- Services providing an excellent customer experience;
- Safe and accessible transport for everyone;
- Funding and delivering public transport transparently;
- Integrating public transport into a growing Auckland; and
- Enhancing the environment and tackling the climate emergency

The PPC complements the vision of the RPTP as with the additional residential development enabled by the PPC, it is expected to increase public transport usage to and from Pukekohe, especially with the recent electrification of the Pukekohe Train Station which will provide more frequent public transport connectivity to the Pukekohe region. Pukekohe is also identified as a satellite town in the Auckland Plan 2050. Given the recent and proposed upgrades to the public transport network in Pukekohe, the PPC Site is located to benefit from the improved facilities.

8.8 Transport Emissions Reduction Pathway (TERP)

The Transport Emissions Reduction Pathway (TERP) provides a high-level framework to respond to the Government's Emissions Reduction Pathway. By signing the 2016 Paris Agreement, the New Zealand Government has committed to becoming net zero in carbon emissions by 2050 and to reduce by 50% by 2030. With Transport representing for over 40% of Auckland's carbon emissions, the TERP targets a 64% reduction in transport emissions by 2030.

The TERP sets out six transformations that will be required to enable Aucklanders to walk, cycle and use public transport more, with the remaining transformations relating to adopting low-emission vehicles. These six transformations are outlined below:

- Supercharge walking and cycling;
- Use public transport much more;
- Prioritise and resource sustainable transport;
- Reduce travel where possible and appropriate;
- Make neighbourhoods safer with less traffic; and
- Put things closer to where people live.

The PPC closely aligns with all six of these transformations. As discussed above, the development of the PPC Site will complete the active mode connection between Buckland and Pukekohe hence increasing pedestrian and cyclist numbers in the area. Internal roads within the masterplan will also provide footpaths and direct connections to Pukekohe and Buckland townships at the northern and southern ends.

The PPC Site is also located in close proximity to the Pukekohe Train Station and several bus stops at the southern end of Pukekohe town, making public transport an attractive mode of transport. Additionally, the PPC Site is located close to several amenities including eateries, takeaways, grocery stores, supermarkets and department stores which will reduce travel times and makes active mode options such as walking or cycling a feasible mode of transport.

9 Construction

For bulk earthworks, it is likely that there would be excess cut and fill in different areas of the PPC Site. This could result in additional traffic generation both within and to/from the PPC Site. It is expected appropriate travel management plans can be introduced at the future consenting stage of development to safely accommodate the additional heavy commercial vehicle (HCV) movements to and from the PPC Site.

It is standard practice as part of the resource consent that a Construction Traffic Management Plan (CTMP) is developed to outline how deliveries to and from the site will be managed and mitigated. It is expected that that this would be part of any future resource consent application, rather than being a specific rule or condition in relation to the proposed Plan Change. The CTMP should include the following:

- Construction dates and hours of operation including any specific non-working hours for traffic congestion, noise, etc;
- Diagrams identifying which routes trucks will use to travel to and from the PPC Site;
- Temporary traffic management signage / details to appropriately manage vehicles and pedestrians in the vicinity of the PPC Site; and
- Details of site access / egress over the entire construction period noting that all access points to be located so that appropriate visibility is achieved onto the adjacent road network.

Based on experience with the construction planning and traffic management associated with similar developments, it is considered that construction activities can be managed to ensure an appropriately low level of construction traffic effects. Of note, the construction activities are temporary and with appropriate measures in place, it is considered that construction activities can be managed to ensure any generated traffic effects are appropriately mitigated.

10 Implementation Plan

As discussed in section 7.5, it is proposed to provide various upgrades to the road corridor and intersections in vicinity of the PPC Site to enable the development. The proposed upgrades, and when these will be triggered, are outlined in Table 11 below.

TABLE 11: IMPLEMENTATION PLAN

COLUMN 1 **Activities or development enabled by Transport Infrastructure in column 2**		**COLUMN 2** **Transport infrastructure required to enable activities or development in column 1**
Sub-Precinct A and Sub-Precinct B		
a)	Prior to the occupancy of any new dwelling within Sub-Precinct A	Provision of a roundabout with a formal pedestrian crossing facility across Buckland Road generally in the location shown in IX.10.1 Precinct Plan 1.
b)	Prior to the occupancy of any new dwelling within Sub-Precinct B	Provision of a priority-controlled intersection with a right-turn bay from Buckland Road, generally in the location shown in IX.10.1 Precinct Plan 1.

c)	Prior to the occupancy of any new dwelling within Sub-Precinct A or Sub-Precinct B	Provision of a shared (walking and cycling) path along the eastern side of Buckland Road between the roundabout required in (a) and the southern boundary of the Precinct, as shown in IX.10.1 Precinct Plan 1; and Provision of the southern refuge island crossing generally in the location shown in IX.10.1 Precinct Plan 1.
d)	Prior to the occupancy of any new dwelling within Sub-Precinct A and Sub-Precinct B	Provision of the active mode connection between Sub-Precinct A and Sub-Precinct B, generally in the location shown in IX.10.1 Precinct Plan 1.
e)	Prior to the occupancy of any new building within Sub-Precinct C	Provision of a 1.8m footpath along the eastern side of Manukau Road for the extent of the Sub-Precinct C frontage north of the intersection of Kitchener Road with Manukau Road and Buckland Road, as shown in IX.10.1 Precinct Plan 1.
f)	Occupied development generating more than 75 vehicle movements per hour turning right out of a single access from Sub-Precinct C	(Provision of a single-lane roundabout at the intersection of Kitchener Road with Manukau Road and Buckland Road (northern intersection), generally in the location shown in IX.10.1 Precinct Plan 1.

As stated above in Table 11, various upgrades are required to the road corridor, and intersections in the vicinity of the PPC Site and, many of these upgrades are to be funded by a third-party private developer. As such, the proposed development of the PPC Site anticipates some of these upgrades being implemented prior to occupation of dwellings within the PPC Site. The main required upgrades are the roundabout onto Buckland Road (funding shared by developers of the Buckland Road Precinct (PC87) and PPC Site and the shared path on the western side of Buckland Road (funded solely by developers of the PC87 site). As explained earlier in this report, the footpath on the eastern side of Manukau Road (north of Kitchener Road) required as part of the covenant of the PC30 site is now proposed to be introduced within this PPC as sub-precinct C. However, should these projects not be completed prior to the construction and occupation of dwellings within the proposed residential zone, it is considered that the assessment criteria outlined below can bridge any gaps on the external network:

Matter of Discretion for New buildings and development prior to subdivision, including private roads:

- *Provision of cycling and pedestrian networks*

Assessment Criteria for New buildings and development prior to subdivision, including private roads:

Sequencing of upgrades to the existing road network

- *Where the active modes on the western side of Buckland Road are not constructed and operational, whether temporary unsealed active modes connections are provided to connect to the existing footpath on the eastern side of Manukau Road.*
- *Where the footpath on the eastern side of Manukau Road (as will be required in accordance with row (e) of Table 11 above) is not constructed and operational, whether a temporary unsealed connection for active modes is provided along the Sub-Precinct C frontage.*

11 Conclusions

The re-zoning of the PPC Site will enable the development of approximately 500 dwellings split across sub-precinct A and sub-precinct B located in the western and south-eastern sections of the Pukekohekohe Gateway Precinct respectively. Future development within sub-precinct A will be accessible via the central roundabout intersection of Buckland Road and PU-NS-2 Road. Future development within Sub-Precinct B will be accessed via the southern priority-controlled intersection.

The proposed PPC also seeks to include existing Business – General Business zoned land (rezoned under PC30) within a third sub-precinct, the Pukekohekohe Gateway Precinct — sub-precinct C. This inclusion incorporates key transport infrastructure upgrade requirements currently required by way of an existing covenant into the proposed Pukekohekohe Gateway Precinct.

The development has taken into account other plan changes in the vicinity which will enable further development, and has also tested the network without those plan changes in place. Overall, traffic effects are considered to be negligible.

A strong active mode network has been proposed both within the site and along its frontage, with the intention of tying into other future upgrades as and when they occur.

Based on the findings from this report, it is concluded that there are no traffic or transportation reasons why the Plan Change application cannot proceed.

CKL