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Technical Note

To	Auckland Transport	From	**A2B Project Team**
Copy		Reference	**502334-7000-TEC-NN-0033**
Date	**29/01/2021**	Pages (including this page)	**91**
Subject	**Transit Oriented Development Land Use Study**		

1 Introduction

This technical note identifies opportunities for transit-oriented development (TOD) within the 1km straight-line catchment of each proposed station location to complement the Airport to Botany Rapid Transit Single Stage Business Case (A2B SSBC) (Reference: 502334-7000-REP-JJ-0001).

TOD is supported by, and encourages a mix of, land use activities near high-frequency public transport stations. The A2B SSBC presents an opportunity to enable TOD surrounding proposed stations.

The Auckland Plan 2050 seeks to better integrate land-use and transport, specifically stating that "unlocking growth around rapid transit corridors and stations is essential to address Auckland's housing and transport challenges. It will also maximise the benefits from the large investment required to build and operate rapid transit."

The Government Policy Statement (GPS) on Land Transport 2018 also emphasises the need to encourage integration between land use and transport planning, and the delivery of transport investments.

Auckland Transport's Statement of Intent 2019-2022 also notes a commitment to assisting and supporting Auckland Council and central government. Responsibility for land use decisions sits with Auckland Council, and it is envisaged this initial study will help inform future discussions with Auckland Council. Future investigations are expected to study the commercial viability of intensification around stations in more detail, informing TOD and growth opportunities.

This note is structured as follows:

- Methodology
- Strategic need for TOD near A2B stations - review of the strategic need for TOD based on central government, local government, and AT strategies
- Overview of findings
- Detailed analysis of TOD opportunities in each proposed station area
- Equity considerations
- Staging considerations
- Summary and recommended next steps
- Appendix – Auckland Unitary Plan (AUP) zones legend

1.1 Nomenclature and acronyms

A2B	Airport to Botany
A2B Corridor	The preferred route for the A2B corridor runs from Auckland Airport, along State Highway 20B and Puhinui Road, to Puhinui Station. It then turns, via Lambie Drive, toward Manukau Centre, travels along Davies Avenue and stops again at Ronwood Avenue. The route then travels to Botany via Great South Road and Te Irirangi Drive.
ANNA	Aircraft Noise Notification Area
ATAP	Auckland Transport Alignment Project
AUP	Auckland Unitary Plan (Operative in part)
Destination station	A station likely to generate trips to the station due the amenities/development surrounding the station, such as retail, services or employment opportunities. These trips may also depart from the same station, or continue onwards via other modes.
HANA	High Aircraft Noise Area
Intensification	Development at higher densities than those currently in place in a particular area
MANA	Moderate Aircraft Noise Area
Origin station	A station expected to be the starting point for many journeys, due the to the nature of the development surrounding the station. For example, a high number of residents living near the area and travelling to/from work via public transport. It is understood that this will also mean the same group is expected to return to the station.
RTN	Rapid Transit Network
Station straight-line catchment	An exact 1km radius around each station, calculated using a straight line, rather than accounting for the street network or accessibility.
Station walking catchment	Calculated based on a 1km distance along walkable footpath/road from the station. A 1km distance is roughly equivalent to a 10- to 15-minute walk.
TOD	Transit-oriented development. TOD seeks to encourage a mix of land uses and support higher-density development near frequent public transport stations. This technical note uses the term “TOD opportunities” to refer to both opportunities for TOD and growth opportunities.

2 Methodology

This technical note considers TOD within the 1km straight-line catchment of each proposed station location and identifies opportunities for further study.

Section 5 includes high-level analysis of TOD opportunities for further investigation and their feasibility in the context of existing land use and zoning.

Table 2-1 outlines the data sources and method used to consider TOD at each proposed station.

Table 2-1: Method used for each topic

Topic	Method overview	Data source
Existing zoning	▪ Desktop review of the existing AUP zoning	▪ AUP
Major projects and strategic plans	▪ Review of relevant plans/documents for major plans for station areas ▪ Expected timing of A2B infrastructure implementation as it relates to each station	▪ A2B draft Corridor Strategy ▪ Relevant strategic plans from Auckland Transport, Council, Local Boards, Panuku Development Auckland ▪ A2B Preferred Options Horizon work (as of October 2020)
Future core transport functions and operations	▪ Analysis of the future core functions of each station and their role in the overall corridor ▪ Review of major destinations in the station catchment that could influence ridership ▪ Review of operational transport aspects of the proposed stations – frequency of bus services, walkability, cyclability and how they are integrated, based on the Station Access Study ▪ Analysis of the walking catchment, as defined in the Station Access Study, which measures the portion of the 1km straight-line catchment accessible within 1km by foot (travelling along the road network) ▪ Analysis of modelled land use change from A2B compared to Auckland Council land use scenarios as it informs expected demand for living near stations ▪ Transport accessibility based on GIS data analysis of jobs accessible within a 15-minute, 30-minute, and 45-minute catchment by public transport. This data should be viewed as an approximate tool to provide a high-level indication of transport accessibility only. Section 2.1 provides more detail on this methodology.	▪ A2B Station Locations Technical Note Reference: 502334-7000-TEC-KK-0004 ▪ A2B High Level Walking and Cycling and Access Station Access Assessment Reference: 502334-7000-REP-KK-0028 ▪ A2B Detailed Walking and Cycling Station Access Assessment Reference: 502334-7000-REP-KK-0029 ▪ Auckland Council's Land Use Scenario i11 v5 ▪ Auckland Transport GTFS data for the New Network

Topic	Method overview	Data source
Portions of catchment with potential TOD opportunities	▪ Analysis of expected demand for intensification in different areas within 1km-straight line station catchment. Analysis based on: – comparison of existing zoning and density levels with analysis of each station's future transport functions and accessibility levels, as described above – proximity of catchment areas to centres, where closer proximity to larger centres can support TOD opportunities making goods and services available by non-car journeys. ▪ Possible limitations to TOD and land use opportunities based on desktop analysis, including based on AUP overlays and desktop analysis of recency of existing developments.	▪ Auckland Unitary Plan (Operative in part) maps – Auckland Council ▪ Auckland Unitary Plan (Operative in part) zoning overlays – Auckland Council
Property information near stations	▪ A high-level desktop analysis using LINZ data to identify sites larger than 1000m^2 and number of owners. 1000m^2 was chosen to provide an approximate threshold at which multi-unit buildings can be built, but it should be noted that the property size upon which multi-unit buildings can be developed varies significantly. As such, the 1000m^2 threshold should be viewed only as a high-level indication of sites that may be large enough to warrant further investigation. ▪ Some sites smaller than 1000m^2 may also be worthy of investigation but are not identified in this technical note.	▪ Land Information New Zealand (LINZ) property data

2.1 Explanation of public transport accessibility analysis from each A2B station

Public Transport accessibility from each A2B station has been analysed in this assessment using Auckland Council public transport scheduling data in the form of General Transit Feed Specification (GTFS) feeds, and Auckland Council's Land Use Scenario i11 v5 forecasting.

Public transport catchments were calculated using network analysis of the expected timetable of the A2B RTN. Catchments were calculated using the distance a passenger could travel within 15 minutes, 30 minutes, and 45 minutes along the public transport network, away from the origin station, starting from 7am on a weekday.

This network included the City Centre to Māngere light rail, but not the City Rail Link. Though the future of CC2M is uncertain at time of writing and the CRL is under construction, this network is consistent with analysis used on the wider A2B project and was developed to include other likely projects geographically relevant to the A2B project. The City Rail Link is considered too geographically distant from the A2B route to have a significant effect on the catchments presented in this piece of work.

Employment and residential population counts were then estimated using these catchment sizes combined with Auckland Council's Land Use Scenario i11.5 population modelling. It should be noted that this analysis only considers public transport accessibility for jobs and residential population, and

does not assess access to education or social/community infrastructure. Further explanation of modelling used for this study is included in Section 4.

2.2 Limitations and exclusions of this study

This technical note represents an initial, high-level study to inform opportunities for further investigation. It is likely that more detailed study, stakeholder engagement, and consultation would be required before TOD could be undertaken. Further investigation will be needed to identify market demand for intensification near stations.

Limitations and exclusions of this study are as follows.

- It is expected that land use change associated with A2B will occur over a long timeframe, and the types and scale of development considered appropriate or desirable as TOD may vary over time as market demands change throughout Auckland.
- It is expected that most A2B stations will be in the centre of the street corridor and unlikely to be appropriate for oversite development. As such, this technical note excludes an investigation of potential oversite development opportunities above A2B stations.
- This technical note is desktop-based and is based on publicly available information.
- Engagement with Auckland Council, Council Controlled Organisations and Kāinga Ora regarding population and land use change / strategies is yet to occur.
- This study excludes a detailed review of resource consents near stations. This study considers recent building activity at a high-level based on 2013 and 2018 census data, building consent data by local board from 2010-2020 from Statistics New Zealand, and 2018-2019 building consent data mapped across Auckland from the Auckland Plan Monitoring Report.

3 Strategic need for TOD near A2B stations

There is strategic agreement among key stakeholders for the need to support transit-oriented development around Auckland's frequent public transport network. With significant population forecasts for Auckland's future, and both housing and transport identified as key areas of focus for Auckland Council, development plans for Auckland's future focus both on increased density and access to public transport. TOD offers to serve both of these outcomes while aligning with local and central government policy around land use and transport integration. Both central and local government planning and transport strategies point to the need to integrate housing and transport to encourage public transport use, increase economic access, and create more liveable cities.

The following outlines the strategic need for TOD near A2B stations consistent with the Auckland Plan 2050, the Government Policy Statement on Land Transport 2018, Auckland Transport Alignment Project 2018, Auckland Transport's most recent Statement of Intent and the Auckland Unitary Plan (Operative in Part).

National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development (NPS-UD) was gazetted on 23 July 2020. It takes effect on 20 August 2020 when it replaces the National Policy Statement on Urban Development Capacity 2016.

This study was authored almost entirely before the NPS-UD was gazetted, as such it does not account for its impacts. **It should be noted, however, that the NPS-UD will have significant implications for TOD opportunities near A2B stations.**

The NPS-UD is highly applicable to the A2B project and supports TOD around A2B stations.

Understanding the full implications of the NPS-UD for TOD opportunities near A2B will require extensive additional work. At a high level, the NPS-UD is expected to trigger changes in allowable building heights and densities near existing and planned rapid transit stations. This will impact the types of zoning permissible under the Auckland Unitary Plan near A2B stations.

Policy 3 of the NPS-UD states that in tier 1 urban environments (of which Auckland is considered one), regional policy statements and district plans must enable "building heights of at least 6 storeys within at least a walkable catchment of the following:

(i) existing and planned rapid transit stops
(ii) the edge of city centre zones
(iii) the edge of metropolitan centre zones"

'Rapid transit service' is defined as a "any existing or planned frequent, quick, reliable and high-capacity public transport service that operates on a permanent route (road or rail) that is largely separated from other traffic," which is expected to apply to A2B. This provision will thus significantly impact the allowable zoning near A2B stations. Currently, Terraced Housing and Apartment Building zoning enables buildings up to five, six, or seven storeys, whereas Mixed Housing Urban and Mixed Housing Suburban zoning is more restrictive of building heights. Existing zoning near expected A2B station locations is detailed throughout section 5 of this study.

As stated above, Policy 3 of the NPS-UD will also impact allowable zoning in station catchments that include "the edge of metropolitan centre zones." Portions of the walkable catchments for Lambie Drive Station, Manukau Station, and Ronwood Station are on the edge of Manukau Metropolitan Centre, while Smales Station and Botany Station have portions of their catchment near or on the edge of Botany Metropolitan Centre.

It is recommended that further analysis is completed to analyse the impacts of the NPS-UD on allowable zoning under the Auckland Unitary Plan and its implications for TOD opportunities.

3.1 Auckland Plan 2050

The Auckland Plan 2050 (2018) sets out Auckland Council's long-term spatial plan for the city, including approaches to enabling high levels of population growth in the city over the next 30 years. The Auckland Plan takes a "quality compact" approach to growth and plans for up to 70 percent of new dwellings to be built within Auckland's existing urban area.[1]

The Plan's Transport and Access Outcome, Focus Area 5, "Better Integrate Land-use and Transport", specifies the importance of unlocking growth around rapid transport. The emphasis of this focus is to address transport and housing challenges in Auckland, and to maximise the benefits of large-scale investment in public transport infrastructure. This focus includes supporting intensification in existing urban areas, and encouraging housing and employment growth in areas with good transport connections. Within the plan, it is clearly articulated that "because transport and land use are so strongly connected, all decisions need to consider their impact on the other."

The Auckland Plan 2050 further develops a strategic need for TOD within its Development Strategy. Auckland could grow by 720,000 residents over the next 30 years, with a requirement for 313,000 more dwellings and space for 263,000 jobs, according to the strategy. The Development Strategy sets out the need for this growth to occur by way of significant redevelopment and intensification in already developed areas, and a multi-nodal model where particular catchments will accommodate significant portions of growth and act as hubs for employment and business. Manukau is identified as one such node. The Development Strategy also outlines the importance of future growth in Auckland being compact, bringing people closer to frequent public transport services.

In addition to the above, the Development Strategy specifies that "when infrastructure is provided, it needs to be co-ordinated with growth."

All stages of the Airport to Botany project are listed as enabling infrastructure projects relevant to the Development Strategy with the Airport to Manukau bus improvements, including Puhinui interchange, listed as relevant within the first decade of the strategy, and the Botany to Manukau improvements listed as being relevant within the second decade.

3.2 Auckland Unitary Plan (Operative in Part)

The Auckland Unitary Plan (Operative in Part) acts as Auckland's statutory rulebook for planning, detailing what land use types are permitted and where. The Unitary Plan itself recognises the need to integrate the provision of transport infrastructure with growth, including through "encouraging land use development and patterns that reduce the rate of growth in demand for private vehicles, especially during peak periods."

The Auckland Unitary Plan (AUP) Operative in part enables intensive development around most stations on Auckland's rapid transport network (RTN). Common zoning near RTN stations across Auckland includes Metropolitan, Town, or Local Centre zoning, Terrace Housing and Apartment Buildings (THAB) zoning, and Business – Mixed Use Zone. Figure 3-1 below shows this being applied in the land areas around New Lynn station, as one example. New Lynn is the subject of a TOD programme run by Auckland Transport.

[1] *Auckland Future Urban Land Supply Strategy, Auckland Council. Available at: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/housing-plans/Documents/future-urban-land-supply-strategy.pdf*

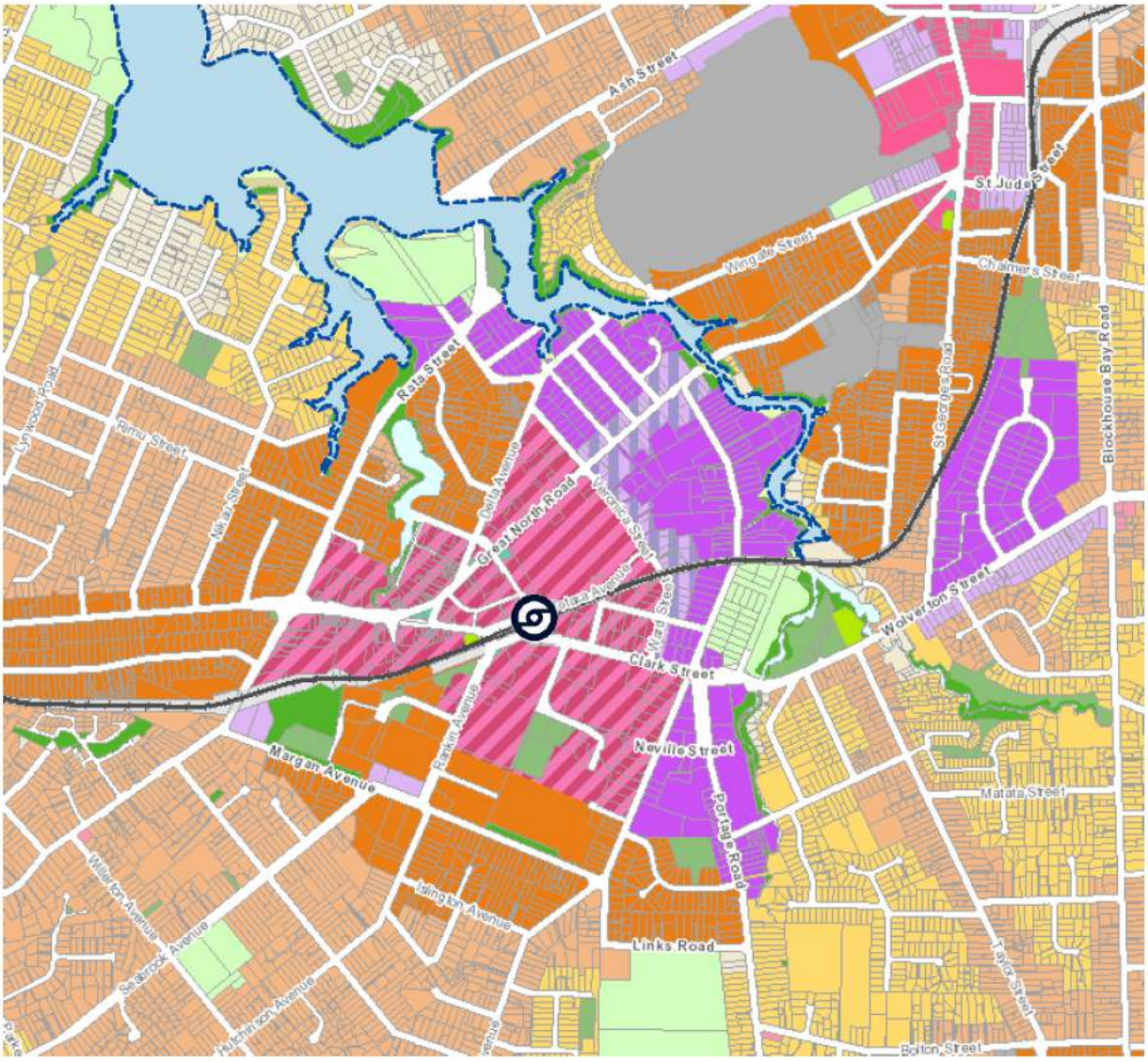


Figure 3-1: Auckland Unitary Plan Zoning around New Lynn Station

Relevant Unitary Plan Zones shown here:

3.3 Government Policy Statement on Land Transport 2018

The Government Policy Statement (GPS) on Land Transport 2018 outlines the need to invest "for improved access." Specifically, the GPS on Land Transport states that it supports increased economic access in high growth areas by:

- "encouraging integration between land use and transport planning and the delivery of transport investments"; and
- "supporting new mixed-use housing developments"; and
- "supporting the implementation of the Auckland Transport Alignment Project."

3.4 Draft Government Policy Statement on Land Transport 2021

The recently released draft Government Policy Statement (GPS) on Land Transport 2021 continues the strategic direction of GPS 2018, and builds on the strategic priorities of the 2018 policy.

In particular, the draft GPS 2021 highlights the role of the transport system in improving people's wellbeing, and the liveability of places. The GPS draws on the Ministry of Transport's Transport Outcomes Framework, one element of which is Inclusive Access, defined as "Enabling all people to participate in society through access to social and economic opportunities, such as work, education and healthcare."

This includes providing transport options to access social and economic opportunities.

Specifically, the draft GPS highlights the new relationship with the Ministry of Housing and Urban Development and Kāinga Ora Homes and Communities, and the intention to provide "consistent strategic direction across the spectrum of transport and land-use policy."

3.5 Auckland Transport Alignment Project 2018

Under the Auckland Transport Alignment Project 2018 (ATAP)[2], the need for TOD is clearly outlined as a necessary intervention to support ATAP's investment priorities.

Specifically, the project's 2018 report states that one such intervention is "updating land-use plans to enable and foster growth around key rapid transit corridors and housing developments, including those led by the public sector."

Further, the 2018 ATAP report specifically identifies the A2B corridor as an area where land-use policies enabling substantial growth around the rapid public transport line are critical.

An ATAP study which sought to understand potential growth in areas within walking distance of three corridors (City to Airport, Airport to Botany and the Northwest Rapid Transit Corridor) found that "substantial capacity [for increased development] exists under the current Unitary Plan in residential, business mixed use and centre zones along these corridors." The same study also identifies the potential for further rezoning or master planning in key strategic areas along these corridors, "but the main intervention to unlock growth in these rapid transport corridors will be to realise capacity that already exists."

3.6 Auckland Transport Statement of Intent (2019-2020)

Auckland Transport's most recent Statement of Intent outlines the organisation's approach to deliver both on the Auckland Plan 2050 (Auckland Council), and Auckland Transport's Regional Land Transport Plan. AT states that its approach to contributing to the outcomes of both documents includes (among others) improving access to frequent and attractive public transport, and supporting growth, urban redevelopment and regeneration.

[2] https://www.transport.govt.nz/assets/Uploads/Land/Documents/7bbf7cd0db/ATAP2018.pdf

Auckland Transport's Statement of Intent 2019-2022 notes a commitment to assisting and supporting Auckland Council and central government on the development and application of TOD.

AT's Statement of Intent makes clear that "the RLTP programme will also enable Auckland Transport to make progress in improving accessibility to services, amenities and jobs, supporting the development of housing in areas with good transport links, and enabling Aucklanders to get where they want to go more easily, safely and sustainably."

3.7 Transform Manukau

Manukau has been identified as a Transform location within Auckland and is currently being regenerated by Panuku Development Auckland. As a major activity hub along the A2B route with existing connection to the RTN and already seeing significant change and investment, Manukau has existing TOD opportunities. Under the Transform Manukau plan, the residential population of Manukau is expected to increase from 6,000 to 20,000, and Manukau Central is to become "the gateway to affordable and sustainable urban living; a meeting place and a hub for learning, leisure, cultural experiences' surrounded by healthy neighbourhoods."[3]

Two of the strategy's key moves in particular feed into the strategic case for TOD at Manukau and further along the A2B line. Key Move Two: "Creating a vibrant heart – redeveloping multiple sites throughout Manukau Central, overhauling the public realm, and creating places to live, work, play and celebrate"; and Key Move Five: "Enhancing community connectivity – further developing the public transport network, and spreading a safe cycling and walking network, to improve community connections, near and far." Additionally, the A2B line itself is identified as a project that strategically aligns with the wider Manukau redevelopment.

[3] *Manukau Framework Plan (part one). Panuku Development Auckland. Available at:* ***https://www.panuku.co.nz/downloads/assets/5304/1/manukau%20framework%20plan%20(part%20one).pdf***

4 Overview of findings

This initial study identifies that there are extensive opportunities for TOD near the proposed stations.

The following section summarises the findings for existing zoning, public transport accessibility, timing and land use along the A2B line. Table 4-2 and Figure 4-8 provide suggested prioritisation of proposed stations for further investigation of TODs. Table 4-3 provides an overview of relevant characteristics of each station, and analysis of how well the current zoning supports TOD.

Existing zoning

This initial study found that most stations along the A2B line have at least some surrounding land use zoning under the Auckland Unitary Plan Operative in part (AUP) which does not currently enable TOD or densification.

As discussed in Section 3, the AUP enables intensive development around most stations on Auckland's rapid transport network (RTN). This often includes Metropolitan, Town, or Local Centre zoning, Terrace Housing and Apartment Buildings (THAB) zoning, and Business – Mixed Use Zone.

Though most rapid public transport stations are closer to Auckland city centre than those on the preferred A2B corridor, this range of zoning is also common around existing RTN stations that are further from the city centre, such as Albany, Sunnyvale, and Manurewa.

By contrast, other than Manukau and Botany Metropolitan Centres, most areas around the proposed A2B stations are primarily zoned Mixed Housing Urban, Mixed Housing Suburban, and Industrial zoning.

Public transport accessibility to employment

With A2B and the interrelated 20Connect roading project, the proposed stations would have similar levels of public transport accessibility to employment as other RTN stations throughout Auckland that are zoned for more intense development. For example, Sunnyvale and New Lynn—which are both areas along the Western train line zoned for high-intensity development—are projected to have about 200,000 jobs in their 45-minute PT catchments by 2048. All A2B stations are projected to have, as a minimum, 200,000 or more jobs in their 45-minute PT catchment by 2048, including more than 450,000 for Puhinui Station, Manukau Station, and Lambie Drive Station (Auckland Council i11.5 population and employment projections).

Figure 4-1, Figure 4-2 and Figure 4-3 show projected public transport accessibility from each station by 2048 within 45 minutes, 30 minutes, and 15 minutes, with and without A2B and 20Connect. This data should be viewed as an approximate order-or-magnitude projection. It should be noted that this analysis only considers public transport accessibility for jobs and does not assess access to education or social/community infrastructure. The data behind these Figures is shown in the Appendix in Section 10.

This analysis also shows a large variation in public transport employment accessibility levels between some A2B stations. For example, Puhinui Station, Lambie Drive Station, and Manukau Station are expected to have nearly twice as many jobs in their 45-minute PT catchments as many other A2B stations by 2048, including Botany Station.

Even without A2B and 20Connect, Puhinui Station and Manukau Station are expected to have significant public transport access by 2048 due to their existing connection to rapid transit, highlighting their existing potential for exploring TOD opportunities even without A2B.

Additionally, this analysis highlights that A2B and 20Connect would increase public transport accessibility most significantly at stations that do not currently have access to rapid transit. Lambie Drive Station, Accent Drive Station, Smales Road Station, Dawson Road Station, Diorella Drive Station, Ronwood Station, and Ormiston Station are all expected to see significant increases in accessibility in 15, 30, and 45 minutes by public transport following A2B.

Later in this section, Table 4-3 also provides percentage increases in public transport access to people and jobs in 2048 with and without A2B and 20Connect.

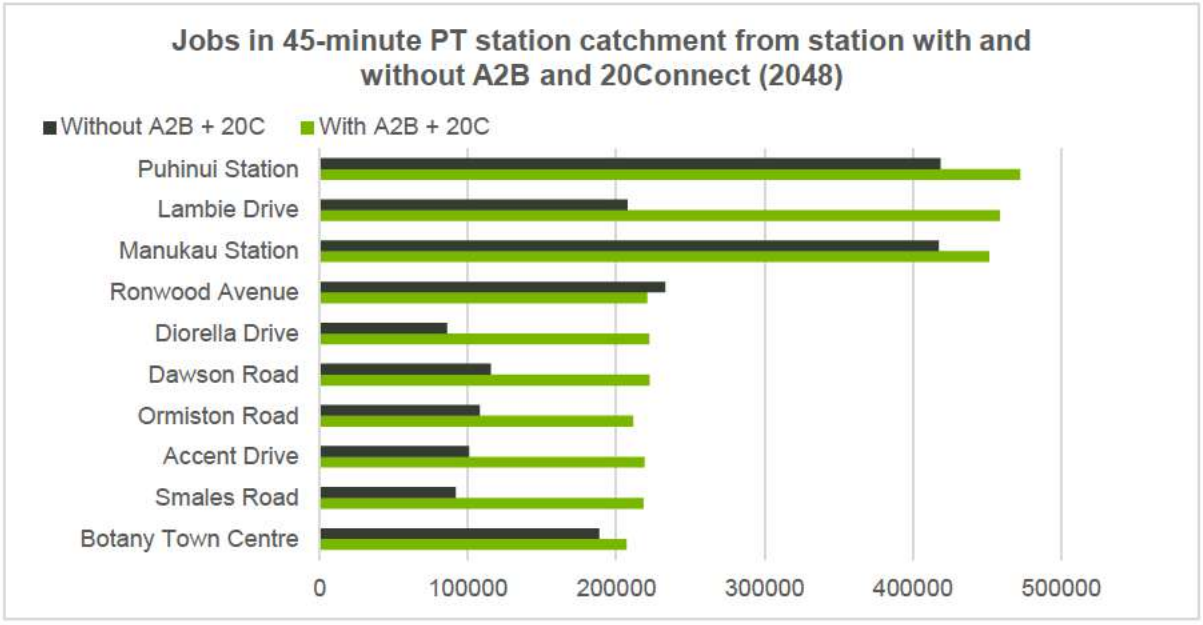


Figure 4-1 Approximate job numbers within 45-minute PT catchments from A2B stations (2048) with and without A2B and 20Connect (2048)

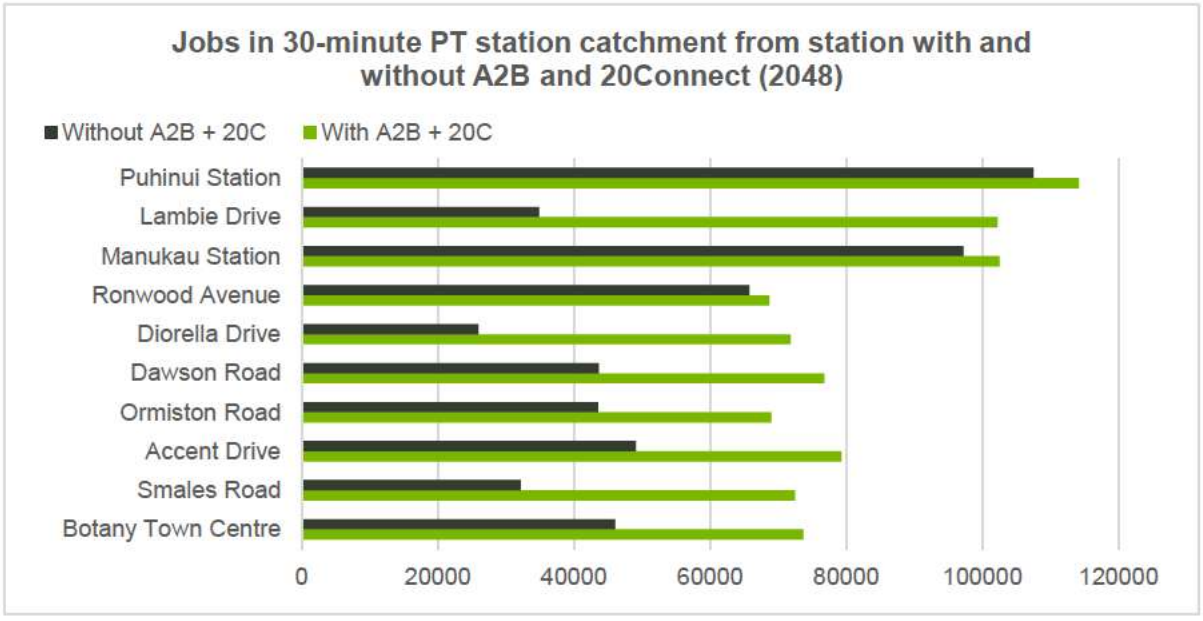


Figure 4-2 Approximate job numbers within 30-minute PT catchments from A2B stations (2048) with and without A2B and 20Connect (2048)

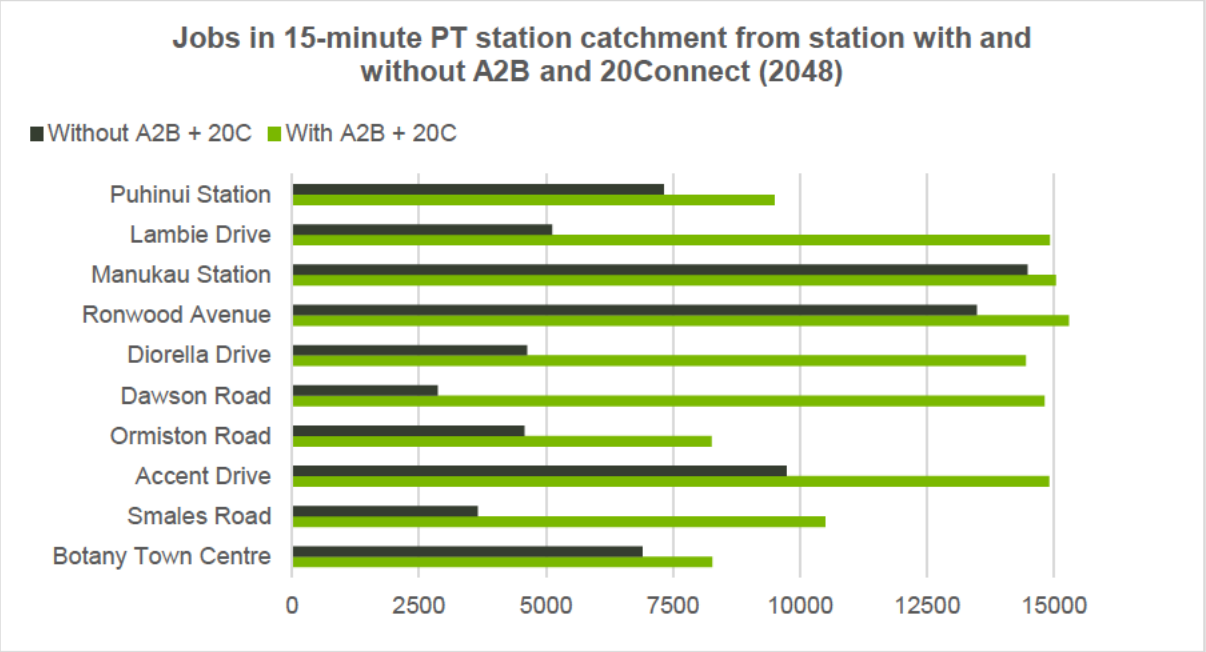


Figure 4-3 Approximate job numbers within 15-minute PT catchments from A2B stations (2048) with and without A2B and 20Connect (2048)

Timing

The A2B rapid transit service will be delivered in stages, as shown in Section 7. This would influence the timing of enabling TOD opportunities at the proposed stations. Puhinui Station and Manukau Station, for example, will benefit from bus priority infrastructure by 2021 as part of the A2B programme. These stations are already connected to the existing rapid transit network and present TOD opportunities which will be strengthened by bus priority infrastructure. Botany Station, meanwhile, will be designed, consented, and delivered as part of the Eastern Busway project to be opened in 2025, which will support TOD opportunities.

A2B rapid transit services will open in 2030 supported by targeted sections of infrastructure, particularly between the Airport and Manukau, with bus priority and interim stations on remaining sections (opening 2025). However, many stations, particularly along Te Irirangi Drive, are not expected to receive rapid transit infrastructure until 2035. It is expected that demand for living near these station locations will grow later than at stations that will receive rapid transit infrastructure sooner. Some opportunities for TOD may exist in the lead up to the opening of rapid transit infrastructure and services, though. Exploration of TOD opportunities to support demand for the ultimate A2B service may be warranted before such services are fully developed.

Car-oriented land use

Existing car-oriented urban design – including through road space allocation favouring car movements, disconnected street networks, car-conducive land use such as big box retail and wide streets, lack of quality walking and cycling facilities, frequent conflict points between cyclists and drivers, and arterial severance for pedestrians – may constrain TOD opportunities near many A2B stations. Favourable conditions for walking and cycling are expected to support TOD opportunities. As described in the Station Access Study (A2B High Level Walking and Cycling and Access Station Access Assessment Reference: 502334-7000-REP-KK-0028), infrastructure changes to address barriers to walking and cycling and improve station access for pedestrians and cyclists would be expected to support nearby TOD opportunities.

Local bus network

The local bus network will be realigned to serve A2B stations, facilitating transfers between A2B and local services and providing important access to jobs and opportunities. Specific details of the lines expected to serve each station are outlined in Section 5.

Aircraft noise overlays

Some parts of the A2B RTN route lie near Auckland Airport and, as a result, are also affected by the Aircraft Noise Areas identified by Auckland Airport. There are three categories of noise area surrounding the airport that may influence development in station catchments, as shown in Figure 4-4:

- High Aircraft Noise Area (HANA), 65 dB Ldn (Decibels experienced over a 24-hour period)
- Moderate Aircraft Noise Area (MANA), 60 dB Ldn
- Aircraft Noise Notification Area (ANNA), 55 dB Ldn

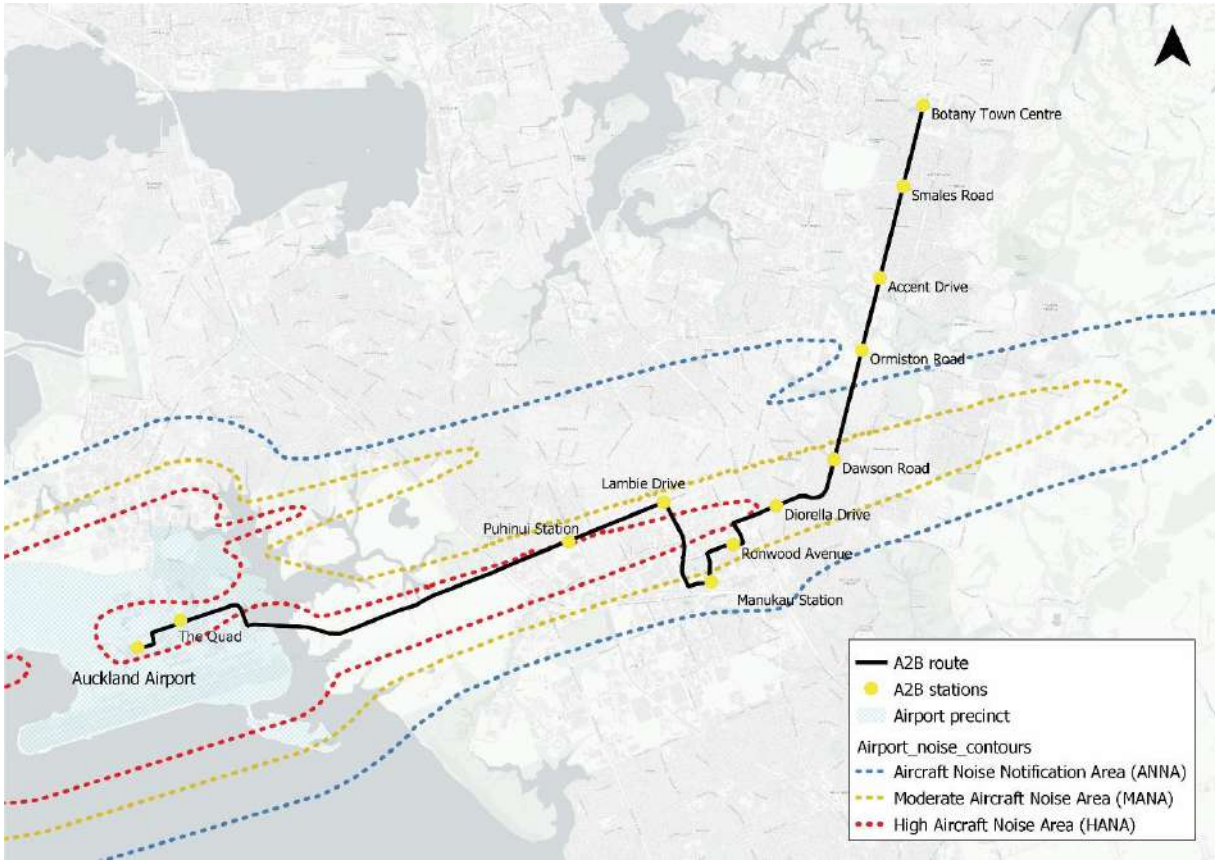


Figure 4-4: Auckland aircraft noise overlays

Source: Annual aircraft noise contours, October 2019, available at https://corporate.aucklandairport.co.nz/corporate-responsibility/managing-aircraft-noise/understanding-aircraft-noise/annual-aircraft-noise-contours, map generated by author.

The following station catchments overlap with aircraft noise overlays:

- Puhinui Station: HANA to the south of the proposed station location, MANA from about Puhinui Road to about 200-500m north, and ANNA throughout the remainder of the straight-line catchment
- Lambie Drive Station: HANA in the industrial zone to the south of the station and north of Manukau Metropolitan Centre, MANA about 100-200m north and south of Puhinui Road, and ANNA for the remainder of the straight-line catchment

- Manukau Station and Ronwood Station: HANA in the industrial zone north of the Manukau Metropolitan Centre, MANA in large portions of the Metropolitan Centre, and ANNA for most of the remainder of each station's straight-line catchment
- Diorella Drive Station and Dawson Station: MANA for most of each station's straight-line catchments
- Ormiston Station: ANNA for the southern portion of the straight-line catchment

Each of these aircraft noise areas entails standards that may impact development densities or type of activities permitted within the zone, which will affect TOD.

Section D24 of the Auckland Unitary Plan sets out the objectives and policies around what activities can be carried out within each of these zones.

In particular, section D24.3 states requirements to:

- "Avoid the establishment of new activities sensitive to aircraft noise (except tertiary education facilities) within the 65dB Ldn [HANA] noise contour in the Aircraft Noise Overlay."
- "In relation to Auckland International Airport, avoid establishing new residential areas (except within the area included within I412 Flat Bush Precinct) or other areas that would contain activities sensitive to aircraft noise by rezoning land within the area between the 60dB Ldn and 65dB Ldn [MANA] noise contours."
- "Manage residential intensification and activities sensitive to aircraft noise within areas identified for accommodating urban growth in a way that avoids reverse sensitivity effects as far as practicable, including reverse sensitivity effects between those land uses and such effects on Auckland International Airport, Ardmore Airport, Whenuapai Airbase and North Shore Airport, and that avoids, remedies or mitigates adverse aircraft noise effects on people and communities." [4]

Activities sensitive to aircraft noise are defined as:

"Any dwellings, boarding houses, marae, papakāinga, integrated residential development, retirement villages, supported residential care, care centres, education facilities, tertiary education facilities, hospitals, and healthcare facilities with an overnight stay facility."

An additional Auckland Council practice and guidance note published in 2019 relating to new dwellings within the HANA overlay specifies that the AUP regulates dwellings in the HANA overlay as follows:

- "(A29) New activities sensitive to aircraft noise (excluding tertiary education facilities) are prohibited activities; and
- (A31) Additions or alterations to an existing dwelling are restricted discretionary activities."[5]

Activities permitted within the HANA zone are mostly commercial services, dairies or food services up to 100m2, show homes and storage facilities.

Due to these restrictions, areas directly within the HANA zone are unlikely to be suitable for TOD. This includes the area between Puhinui Road and Cavendish Drive, and will therefore influence the choice of TOD locations for Puhinui Station, Lambie Station and, to a lesser extent, Manukau and Ronwood Stations. It should be noted that this does not extend to the entire station catchment.

Areas located within the MANA zone are also subject to development restrictions and, in some cases, density standards, which may affect the type of TOD that can be implemented. The potential impact of

[4] D24. Aircraft Noise Overlay, Auckland Unitary Plan Operative in part. Available at: https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20D%20Overlays/6.%20Infrastructure/D24%20Aircraft%20Noise%20Overlay.pdf

[5] Practice and Guidance Note. New Dwelling in the High Aircraft Noise Area (HANA), Auckland Council, September 2019. Available at: http://content.aucklanddesignmanual.co.nz/regulations/practice-notes/Documents/RC%203.3.6%20New%20Dwellings%20in%20the%20High%20Aircraft%20Noise%20Area%20(external).pdf

this overlay will need to be thoroughly explored as part of further work. This includes understanding what noise mitigation may be permissible for developments within this zone. Sites located partially within the ANNA zone and partially within the MANA zone are affected by the MANA restrictions entirely.

It is recommended that the limitations of the MANA and HANA zones are further investigated before TOD plans are made. This includes the potential for the use of noise mitigation technology.

Recent building activity

Recent building activity is considered by this study at a high-level based on 2013 and 2018 census data[6], building consent data by local board from 2010-2020 from Statistics New Zealand, and 2018-2019 building consent data are mapped across Auckland from the Auckland Plan Monitoring Report.[7]

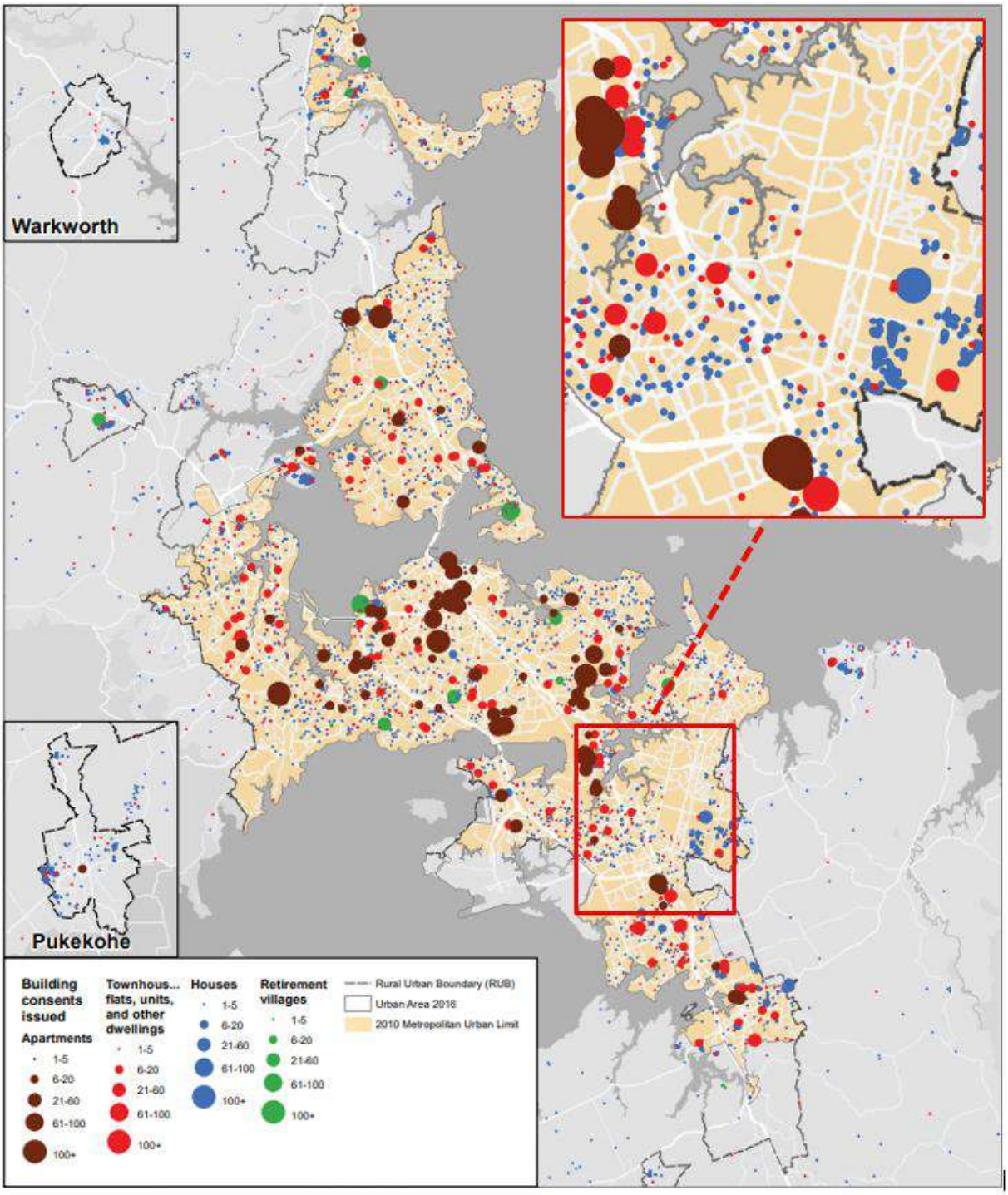
The A2B station catchments are largely contained in the Howick local board area, with the area north of Puhinui Station and Lambie Drive Station within the Ōtara-Papatoetoe local board. According to 2013 census data, the number of private dwellings had grown slowly from 2013 – 2018 in the Ōtara-Papatoetoe local board area (at a rate less than half of the Auckland average). Consistent with trends for the rest of Auckland, building consents have accelerated in recent years in this area. In 2019, most building consents for attached dwellings within this local board were concentrated in town centres in Papatoetoe. Consents nearer to the expected Puhinui Station and Lambie Drive Station locations were more limited, and largely consisted of detached units.

The number of private dwellings grew at a similar (or slightly higher) rate in the Howick local board area to the Auckland average from 2013 – 2018. Building consents have also accelerated dramatically in the Howick local board area in recent years, though most new development appears to be in the Flatbush area, most of which is outside A2B station walking catchments.

As shown in Figure 4-5, building consent data from 2019 shows very few consents were issued near expected A2B station locations in this local board area.

[6] 2018 Census Results, Local board and special information sheets, Research and Evaluation Unit, October 2019. Available at https://www.knowledgeauckland.org.nz/media/1181/auckland-area-2018-census-info-sheets-all-local-boards.pdf

[7] *Auckland Plan 2050 Development Strategy Monitoring report, October 2019, available at https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/about-the-auckland-plan/Documents/ap-ds-monitoring-report.pdf, author edits to map made to highlight A2B study area*



Source: Auckland Plan 2050 Development Strategy Monitoring report, October 2019, available at https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/about-the-auckland-plan/Documents/ap-ds-monitoring-report.pdf, author edits to map made to highlight A2B study area

Figure 4-5: Dwellings Consented by type and size of consent (number of dwellings), Auckland urban area, 1 July 2018 – 30 June 2019

High-level land use modelling

Residential and employment growth projections used in this study come from three sources and are used in the following ways throughout this study:

1) **Auckland Council i11.5 population and employment projections** were used throughout Section 5, which presents analysis of TOD opportunities near each A2B station. These station analyses include the base estimated increases in residential population and employment within the stations' 1km walking catchments. For example, the 1km walking catchment around the expected Botany Station location currently accommodates 4,600 residents and 2,400 jobs (2013 Census). It is projected by Auckland Council's Land Use Scenario i11.5 to have a resident population of 9,500 and to accommodate 3,800 jobs in 2048.

    a. **Value to this study:** Auckland Council population and employment projections provide context for expected population and employment trends near stations given a variety of transport and land use projects. These projections use a medium-growth scenario.

2) **Auckland-wide land use attractiveness modelling** done by the economics workstream in support of the A2B Long Term SSBC (Reference: 502334-7000-REP-JJ-0001_A2BSSBCDraft). An accessibility-density model was developed that estimates the impact of accessibility improvements on population and employment density in 2048.

    a. **Value to this study:** The land use attractiveness modelling estimates how the transport improvements of A2B and 20Connect (which was included in the models alongside A2B as part of the economics workstream) influence demand for living across zones in Auckland. The remainder of this section on high-level land use modelling explains these projections and their value to this study further.

3) **Public transport access modelling from each A2B station** was conducted to estimate the number of jobs and households accessible from each A2B station by public transport in a given time threshold (45-minutes, 30-minutes, and 15-minutes). More information about this analysis is explained in section 2.1, and the results of this analysis are included for each station throughout section 5.

    a. **Value to this study:** This analysis allows for finer-grained comparisons between each A2B station as it relates to public transport access. It helps inform which stations will provide the best access following A2B, and therefore which stations are most likely to experience higher or lower demand for TOD relative to the others. Compared to the land use attractiveness modelling, this analysis provides less insight on the scale of overall land use pattern change likely to be induced by A2B but provides more insight on a station-by-station basis.

The remainder of this section explores implications of the accessibility-density land use attractiveness mode, first at a city-wide level and then at a catchment level.

The land use attractiveness model estimates that A2B and 20Connect will lead to increased population and employment densities near A2B stations and (to a lesser extent) across South Auckland, and reduced densities elsewhere throughout Auckland, on net. These models do not include possible migration to Auckland, so increases in population in one part of Auckland correspond to a shift from elsewhere within the region. The population and employment growth triggered by A2B and 20Connect is above and beyond the growth projected for 2048 in the base i11.5 models.

The land use attractiveness model estimates that A2B and 20Connect will cause a regionwide shift in population and employment demand across Auckland in 2048 of:

- 0.42% shift in population location choices
- 0.46% shift in employment locations

These totals reflect small population and employment reductions throughout many parts of the city and larger population and employment impacts near A2B, as shown by Figure 4-6 and Figure 4-7.

The figures show that relative to baseline projected growth to 2048, A2B and 20Connect are expected to induce:

- Population and employment growth up to about 10% greater in parts of the A2B study area than what would occur without A2B and 20Connect
- Growth across the isthmus 0-1% lower than projected without A2B and 20Connect
- The largest reductions in projected growth of up to 2% (in west Auckland)

Colours in the figures below represent the percentage change in population or employment expected to be triggered by A2B and 20Connect to 2048 for each Macro Strategic Model (MSM)[8] zone – where a the darkest blue MSM zone represents an 11% population increase in Figure 4-6 (and 8% employment increase in Figure 4-7**Error! Reference source not found.**) relative to that zone's base projected p opulation or employment in 2048 without A2B and 20Connect.

As expected, the land use attractiveness models shows the largest increases in demand are induced in MSM zones that closely surround proposed station locations, such as along Te Irirangi Drive. It also shows that A2B is expected to spur some density increase near every station, as well as across the wider area.

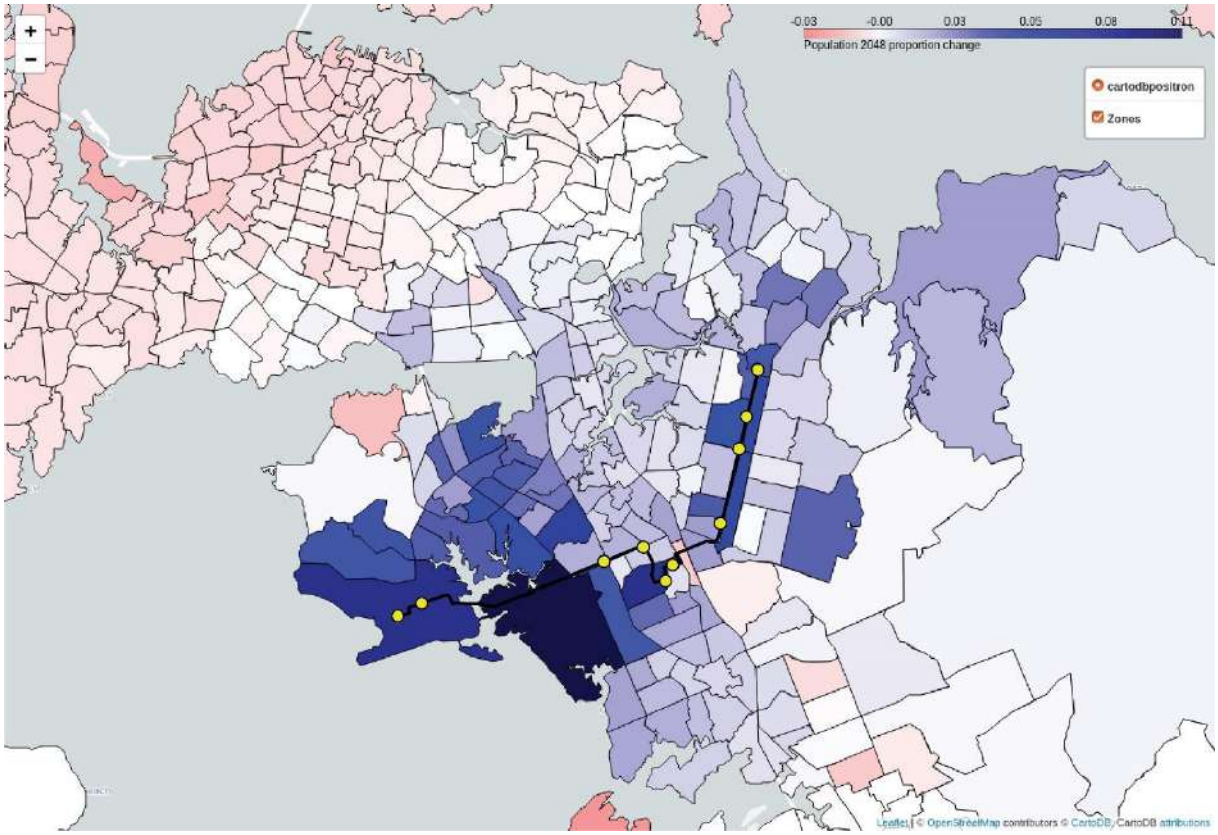


Figure 4-6: Relative population growth effects of A2B and 20Connect, compared to estimates excluding the projects, 2048

[8] Macro Strategic Model (MSM) zones are the area units used in transport modelling conducted by the Auckland Forecasting Centre.

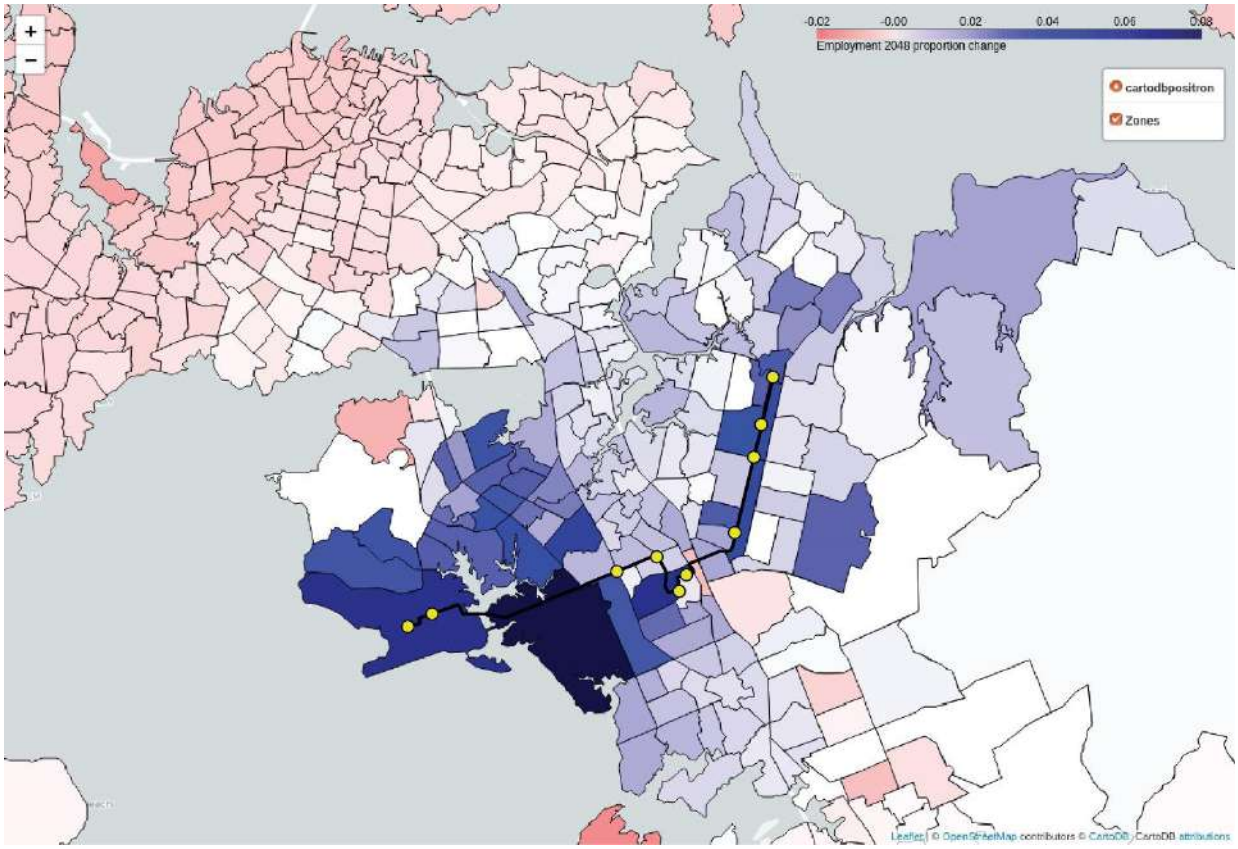


Figure 4-7: 2048 i11.5 + A2B and 20Connect projected employment count change by MSM zone

Catchment analysis of land use attractiveness modelling

These results can also be analysed for each station's walking catchment to obtain a high-level projection of population and employment impacts of A2B near each station.

The following tables compare projected population and employment in 2048 within each station's walking catchment under i11.5 land use modelling with projected population and employment under land use attractiveness modelling, which adds expected impacts of A2B and 20Connect to the i11.5 projections.

Table 4-1 Approximate projected employment and population in walking catchment projection to 2048 (rounded to nearest 10).

	Projected under i11.5 base modelling (2048) (rounded to nearest 10)		Projected by land use attractiveness modelling (2048) (rounded to nearest 10)		Difference*	
Station	**Population**	**Employment**	**Population**	**Employment**	**Population (%)**	**Employment (%)**
Puhinui Station	4500	870	4520	890	0.5%	1.8%
Lambie Station	5210	3300	5250	3400	0.7%	3.1%
Manukau Station	6300	6210	6370	6340	1.0%	2.1%
Ronwood Ave Station	5200	7100	5270	7280	1.2%	2.5%
Diorella Drive Station	4710	1290	4890	1330	3.8%	2.9%
Dawson Road Station	5990	910	6260	950	4.5%	4.4%
Ormiston Road Station	2160	1370	2290	1400	6.2%	2.5%
Accent Drive Station	4090	1660	4270	1710	4.3%	3.4%
Smales Road Station	6370	1810	6640	1870	4.3%	3.3%
Botany Station	9540	3810	9980	3960	4.6%	4.1%

*the percentage difference may differ slightly from the difference in outputs shown due to rounding.

Several points should be noted from this land use attractiveness modelling:

- Projected employment and population increases near A2B represent increased demand for living and working based on improved transport access. Realising this growth would require existence of sufficient buildings to provide capacity for residents and employees.
- These projections model population and employment redistribution across Auckland, assuming the net population and employment do not change.
- The accessibility-density modelling is a demand-side model and does not estimate whether existing zoning around individual stations will accommodate projected demands. It does, however, suggest that A2B and 20Connect may have a material impact on residential and employment demand in the study area that would require non-trivial levels of development to accommodate.
- The modelling also predicts meaningful change in demand for living and working triggered near every A2B station. The stations with smaller projected changes are those that already have access to rapid transit (Puhinui station, Manukau station) where TOD opportunities may already exist and A2B itself is projected to have a less significant proportional impact on accessibility.
- These projections are likely conservative, as developments are more likely to occur close to the stations (such as within the walking catchments), whereas the analysis covers much larger MSM zones and averages the effect of the increased density near the stations across the whole MSM zone.

The remainder of this report investigates expected demand for living and working near each station at a finer geographic scale, along with current zoning around each station, to identify specific opportunities for TOD.

Summary of findings

Table 4-2 summarises possible TOD opportunities and how well current land use zoning supports TOD. These are sorted into approximate levels of recommended priority. A more detailed overview about station characteristics, opportunities, and relevant programme timing is included in Table 4-3. Figure 4-8 shows the recommended level of priority for investigating TOD in each station catchment, along with the AUP zoning around each expected station location. The prioritisations in this table will likely need to be re-assessed at a future project stage to understand the implications of the NPS-UD.

Table 4-2: Opportunities and Prioritisation

Station	Priority areas to investigate how A2B can enable TOD	Potential for growth under existing land use and zoning
Highest priority for further investigation		
Botany Station	Throughout 1km straight line catchment, particularly near station	Moderate – existing zoning surrounding station supports intensification. However Mixed Housing Urban and Suburban zoning on edge of catchment is less supportive.
Manukau Station	Throughout Metropolitan Centre, particularly the areas immediately surrounding the station	High – large proportion of catchment already zoned as Metropolitan Centre
Puhinui Station	Most of 1km straight line catchment worth investigation, particularly near station, and to north nearer to Papatoetoe Town Centre. Airport noise overlays likely prohibit TOD opportunities south of Puhinui Road in the High Airport Noise Area. Airport noise overlays may also impact TOD opportunities north of Puhinui Road, particularly near Puhinui Road in the Moderate Aircraft Noise Area.	Low – currently primarily zoned Mixed Housing Suburban
Ronwood Station	Throughout Manukau Metropolitan Centre, particularly near Ronwood Station	High – existing zoning largely supports intensification
Medium priority for further investigation		
Lambie Drive Station	Near station, and possibly to the east (near to goods and services) and south (nearer to Manukau centre). Airport noise overlays may impact TOD opportunities in catchment, particularly near Puhinui Road in Moderate Aircraft Noise Area.	Moderate/low – existing residential zoning is mainly Mixed Housing Suburban
Ormiston Road Station	Areas to the immediate east of the proposed station location, near Botany Junction and north of Ormiston Road	High – existing zoning allows for some intensification
Lower priority for further investigation		
Accent Drive Station	Residential area to the immediate east of station	Moderate – Mixed Housing Urban zone enables some intensification
Diorella Drive Station	Strongest opportunity expected adjacent to station and along Te Irirangi Drive, particularly to	Moderate/low – currently Mixed Housing Urban and Suburban zoning

Station	Priority areas to investigate how A2B can enable TOD	Potential for growth under existing land use and zoning
	the west of the station (nearer to Manukau). Airport noise overlays may impact TOD opportunities in catchment.	
Dawson Road Station	Strongest opportunity expected adjacent to station and local centre. Airport noise overlays may impact TOD opportunities in catchment, particularly near Puhinui Road in Moderate Aircraft Noise Area.	Moderate – Mixed Housing Urban zone enables some intensification
Smales Road Station	Strongest opportunity adjacent to station and to north of station (closer to Botany Town Centre)	Moderate/low – currently Mixed Housing Urban and Suburban zoning
Other (potential) stations		
Potential futureproofed State Highway 20B Station	Potential for future inclusion of a station at SH20B. Currently not being considered for TOD but should be noted in future planning.	Not being considered at this stage
Airport Station and The Quad	Not explored in this study. See description below for more information.	

Table 4-3 provides an overview of some relevant characteristics of each station catchment with land use/zoning and TOD considerations.

Figure 4-8 maps the stations, recommended priority levels for exploring TOD opportunities, walking catchments, and AUP zoning.

A2B will have two further stations that have not been explored in this study, one at the Auckland Airport and another called "The Quad" at a nearby business precinct.

The Auckland Airport future vision includes a new runway and terminal expansion. Integrating A2B with the airport will help support these expansion plans by improving access for travellers and employees.

The Quad is a precinct adjacent to the airport. According to the Auckland Airport, the area is being comprehensively planned as a pedestrian friendly business precinct with offices, accommodation, and other amenities.[9] This study has not investigated TOD opportunities in this site, though it is expected that A2B will substantially support the precinct's development by providing greater travel choices through reliable and fast rapid transport access to the airport and region. The Quad will serve as a key employment hub within the airport precinct. While the Airport will consent and deliver all A2B infrastructure within its road controlling authority area, AT will look for opportunities to work with the Airport to ensure land use integration outcomes are realised at the two airport stations.

[9] See the following site for more information: https://property.aucklandairport.co.nz/the-quad

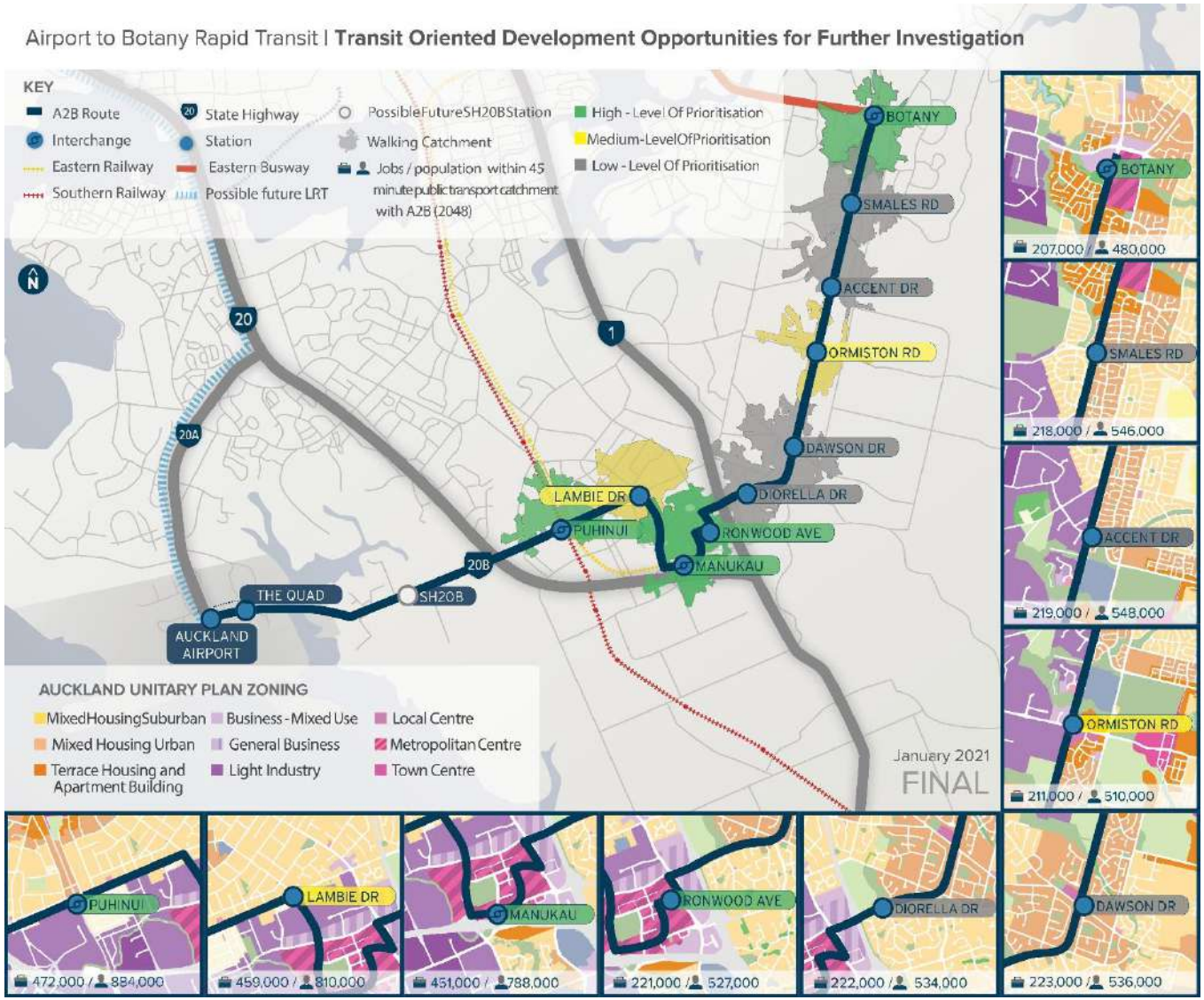


Figure 4-8 A2B stations with AUP zoning and recommended level of priority for exploring TOD opportunities

Table 4-3: Summary of high-level TOD opportunities for each A2B station

Station and recommend-ed priority level for TOD	Primary existing zoning	Centres / services within 1km catchment	Jobs / population within 45 minute PT catchment following A2B (2048)	Percentage increase in jobs / population in 45-minute PT catchment from A2B (2048)	Expected A2B staging (see Section 7)	Key land use and TOD considerations (see Section 5)
Puhinui Station **(high priority)**	Mixed Housing Suburban Single House Light Industry	Neighbourhood centres only, Papatoetoe town centre just outside catchment to north	472,000 / 884,000	13% / 28%	2021: Bus priority between airport, Puhinui, and Manukau and new bus/train interchange station 2030: new rapid transit bridge	▪ Key interchange between A2B, eastern line train, and southern line train, and for connections to airport following A2B ▪ Very high level of access to jobs via PT ▪ Significant industrial zoning ▪ High Aircraft Noise Area (HANA) supports mostly commercial services, dairies or food services up to 100m^2, show homes and storage facilities. Moderate Aircraft Noise Area (MANA) north of Puhinui Station has fewer restrictions than HANA but density and noise mitigation restrictions still apply. ▪ Limited goods and services in walking catchment with no centres in 1km catchment (other than neighbourhood centres) ▪ Relatively well-connected street network to north (toward Papatoetoe Town Centre) and east, and poor connectivity south. East-West connectivity limited across rail line. ▪ The A2B project is working with Panuku who have a regeneration initiative underway nearby at Papatoetoe to the north.

Lambie Drive Station **(medium priority)**	Mixed Housing Suburban Light Industry General Business Zone Metropolitan Centre	Neighbourhood Centres and Manukau Metropolitan Centre on southern edge of catchment	459,000 / 810,000	121% / 120%	2021: Bus priority between airport, Puhinui, and Manukau 2030: Rapid transit infrastructure between Lambie Drive Station and Manukau	▪ Very high level of accessibility in 45-minute PT catchment expected following A2B ▪ Some goods and services available east of the proposed station location, and parts of catchment are within walking distance of goods and services in Manukau, though poor street network to south limits connection ▪ Northwestern edge of catchment within walking distance of Papatoetoe Town Centre, though further from Lambie Drive Station ▪ Large segments of industrial zoning in catchment ▪ Large sections of catchment are Mixed Housing Suburban, which may not support projected growth ▪ Requirements of Moderate Aircraft Noise Area will apply to this station area ▪ Projected to have relatively high level of jobs in walking catchment by 2048 (5,200)

Manukau Station **(high priority)**	Metropolitan Centre Light Industry	Metropolitan Centre zoning	451,000 / 788,000	8% / 14%	2021: Bus priority between airport, Puhinui, and Manukau 2030: RT infrastructure throughout Manukau Metropolitan Centre between Lambie Drive Station area and Ronwood Station area.	▪ The Manukau Centre is the subject of considerable proposed Government and private sector investment in housing, education, employment and retail in the next five years. Specific plans exist with Government and Council agencies. For example, the A2B project is working with Panuku and Kāinga Ora on Transform Manukau and TOD initiatives in Manukau and Wiri. ▪ Expected to become key interchange between A2B and eastern line train, and hub for South Auckland local bus services ▪ Existing zoning and ongoing planning already favours densification near station and throughout Metropolitan Centre. ▪ High number of jobs in 1km catchment and within 15 minutes by PT ▪ Immediate access to higher order goods and services ▪ Many large surface carparks near station ▪ Car-oriented land use with large car parking lots, big box retail and set back buildings ▪ Requirements of Moderate Aircraft Noise Area will apply to this station area

Ronwood Station **(high priority)**	Metropolitan Centre Light Industry	Metropolitan Centre zoning	221,000 / 527,000	-5% / 14%	2025: Bus priority from Airport to Botany 2030: Rapid transit throughout Manukau Metropolitan Centre to Ronwood Station area.	▪ The Manukau Centre is the subject of considerable proposed Government and private sector investment in housing, education, employment and retail in the next five years. Specific plans exist with Government and Council agencies. For example, the A2B project is working with Panuku and Kāinga Ora on Transform Manukau and TOD initiatives in Manukau and Wiri. ▪ Existing zoning already favours densification ▪ More jobs in 1km catchment and within 15-minute PT catchment than any other station with A2B ▪ Immediate access to higher order goods and services ▪ Street network relatively permeable within Metropolitan Centre, and relatively impermeable east, north, and south of Centre ▪ Car-oriented land use with large car parking lots, big box retail and set back buildings ▪ Requirements of Moderate Aircraft Noise Area will apply to this station area
Diorella Drive Station **(low priority)**	Mixed Housing Suburban Mixed Housing Urban	Neighbourhood centres and Manukau Metropolitan Centre on western edge of catchment	222,000 / 534,000	158% /157%	2025: Bus priority from Airport to Botany 2035: Upgrade bridge over SH1 between Ronwood and Diorella, and RT infrastructure from Airport to Botany	▪ Primarily residential with few local jobs (2,000 by 2048) and no centre larger than a neighbourhood centre excluding edge of Manukau ▪ Walking distance to edge of Manukau Metropolitan Centre in parts of catchment, though separated from centre by SH1 ▪ Walking access from most of catchment to Manukau Sports Bowl and AUT south campus ▪ Requirements of Moderate Aircraft Noise Area will apply to this station area

Dawson Road Station **(low priority)**	Mixed Housing Suburban Mixed Housing Urban	Local Centre adjacent to expected stop location	223,000 / 536,000	94% / 102%	2025: Bus priority from Airport to Botany 2035: RT infrastructure from Airport to Botany	▪ Proposed station location adjacent to local centre (currently car-oriented design) ▪ Relatively high level of pedestrian connectivity in catchment ▪ Requirements of Moderate Aircraft Noise Area will apply to this station area
Ormiston Station **(medium priority)**	Light Industry, Open Space Terrace Housing and Apartment Buildings	Local Centre adjacent to expected stop location, Town Centre on eastern edge of catchment	211,000 / 510,000	95% / 95%	2025: Bus priority from Airport to Botany 2035: RT infrastructure from Airport to Botany	▪ More permeable street network than most A2B stations ▪ Ormiston Station connects to the largest number of local bus services outside of Manukau Station and Botany Station Interchange along the A2B route, with connections through Ormiston Town Centre, Flat Bush, East Tamaki, Hunters Corner. ▪ Eastern side of catchment has strong access to centres (Local Centre and Town Centre), but these are significantly smaller than Botany or Manukau ▪ Segments of catchment are still being developed, were recently developed, or have yet to be developed ▪ Lower projected level of jobs within 15-minute, 30-minute, and 45-minute PT catchment than most A2B stations with A2B
Accent Drive Station **(low priority)**	Light Industry Mixed Housing Open Space	Neighbourhood centres only	219,000 / 548,000	117% / 126%	2025: Bus priority from Airport to Botany 2035: RT infrastructure from Airport to Botany	▪ Significant amount of light industry on west side of station catchment ▪ Limited access to goods and services, such as retail opportunities or community facilities, in the catchment

Smales Road Station **(low priority)**	Mixed Housing Suburban Mixed Housing Urban Open Space	Neighbourhood centre on southern edge of catchment, Botany Metropolitan Centre on northern edge of catchment	218,000 / 546,000	137% / 126%	2025: Bus priority from Airport to Botany 2035: RT infrastructure from Airport to Botany	▪ Residential areas north of the station (zoned Mixed Housing Urban) are within walking distance of both Smales Road Station and Botany Town Centre ▪ Relatively well connected by frequent bus services (in addition to A2B), with connections through East Tamaki, Dannemora, and Highbrook ▪ Some neighbourhoods adjacent to proposed station location are zoned Mixed Housing Suburban
Botany Station **(high priority)**	Metropolitan Centre Terrace Housing and Apartment Buildings Mixed Housing Urban	Metropolitan Centre	207,000 / 480,000	10% / 25%	2025: Bus priority from Airport to Botany, the AMETI Eastern Busway reaches Botany, and Botany Station completed 2035: RT infrastructure from Airport to Botany	▪ Significant goods and services available locally ▪ Existing Metropolitan Centre and THAB residential zoning allows for densification ▪ Metropolitan Centre currently separated from nearby residents by large arterials and surface carparks ▪ Large carparks could provide TOD opportunities ▪ With A2B, despite connection to A2B and AMETI Eastern Busway, few jobs projected to be accessible in 45-minute and 15-minute PT catchments compared to other A2B stations. Moderate number of jobs projected to be accessible in 30-minute PT catchment.

5 TOD opportunities in each station area

The following provides a detailed analysis of TOD opportunities, and how well the current land use and zoning supports TOD within the 1km straight-line catchment of each proposed station location.

AUP zoning around each proposed station is provided. A full AUP zones legend is provided in Appendix B.

5.1 Puhinui Station

The characteristics of the Puhinui station environment suggests it should be a focus for enabling TOD opportunities related to A2B.

Key considerations:

- It will serve as an important interchange function between A2B, train, and airport connections
- Projected to have very high level of PT accessibility from station in 45-minute and 30-minute PT catchments with A2B
- Industrial developments and lack of nearby centres may constrain possible intensification (unless a new centre is created, if possible)
- Some areas surrounding the station are affected by aircraft noise restrictions and may therefore be unsuitable for TOD

5.1.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Puhinui Station are:

Residential - Mixed Housing Suburban Zone

Residential - Single House Zone

Business - Light Industry Zone

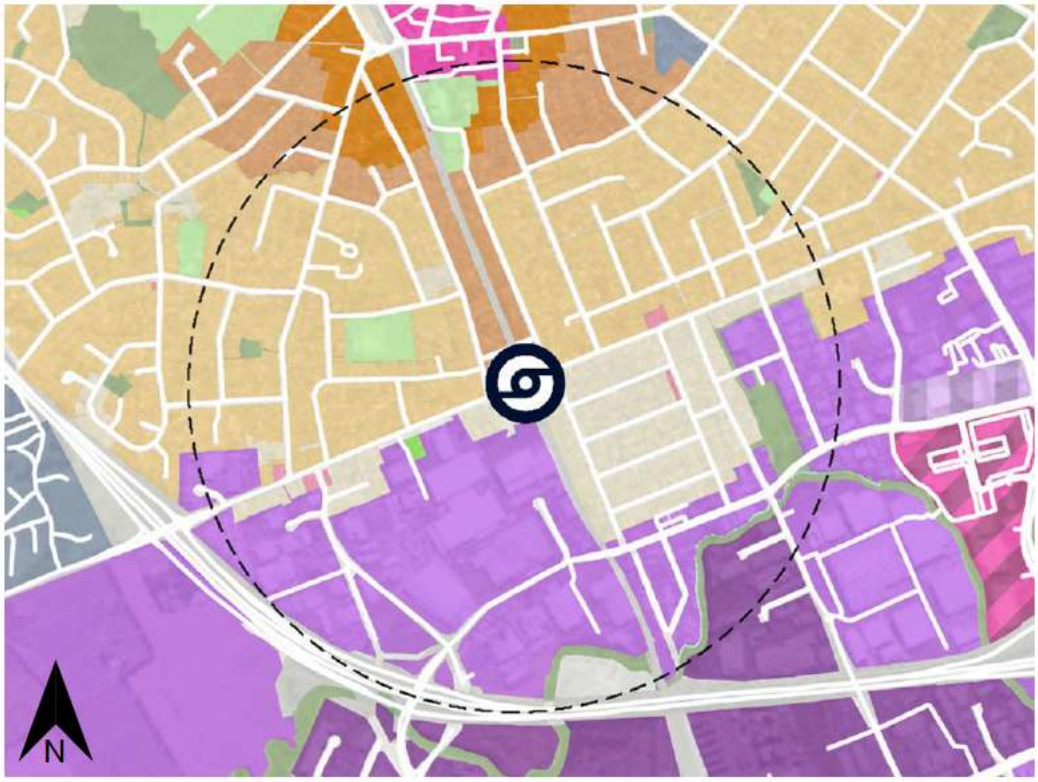


Figure 5-1: AUP Zoning around proposed Puhinui Station location

Source: AUP

5.1.2 Major projects and strategic plans

AT is currently progressing the Puhinui Station Interchange. This is a new bus/train interchange station with bus services and a 'kiss and ride' area, with a 10-minute bus service to the airport. AT expects the interchange to be fully completed in 2021. The station will be closed until early 2021.

In 2030 it is expected that a new rapid transit bridge will be built across the rail line at Puhinui Station, diverted from Bridge Street.

Panuku is leading efforts to restore the Puhinui Stream, which runs south of Puhinui Station and through Manukau Metropolitan Centre.[10] Among other goals, the restoration aims to upgrade the urban environment and create a new walkway connecting Manukau Metropolitan Centre with Manukau Harbour. By improving urban amenity and walking connections near Puhinui Station and Manukau Station, the stream restoration could further support TOD opportunities.

[10] https://www.naturespace.org.nz/sites/default/files/u4/puhinui_stream_rest_web.pdf

5.1.3 Future core transport functions and operational features of station and surrounding area

Station functions

- Puhinui Station will serve several key functions for the transport network in the future. By 2021, the station will become a key interchange between train and a 10-minute bus journey to the airport. In the long term, it will also be an important interchange between A2B services and the southern line and eastern line trains.
  - The Hamilton to Auckland rail service is planned to launch in mid-2020 and will terminate in Papakura in Auckland. It is possible that Puhinui Station is the future terminus for an inter-city service or a stop on such a service to allow opportunities to travel to the airport, Manukau and East Tamaki.
- Puhinui Station will also serve as an origin station. The census zones approximately encompassing the 1km catchment range in density from 34 - 54 people per hectare (2018), which is roughly similar to or slightly higher than large segments of Mt Eden.
  - The area covered by the station's 1km walking catchment accommodates 5,600 residents and 2,400 jobs (2013 Census), and i11.5 land use projections project similar population and employment levels in 2048. However, given the function of the station, there is the potential for growth beyond that which the current land use zoning supports.

Station access

- The street network is most permeable to the east and north of the station. Some 49% of the area within the 1km straight line catchment is accessible within the 1km walking catchment (this accounts for the distance people need to walk along roads, rather than in a straight line). Industrial land use to the south and east limits the walking catchment and may detract from the desirability of walking from the Puhinui Station area to Manukau metropolitan centre, less than 1km from the south-eastern portions of the Puhinui Station catchment.
- The railway currently divides the Puhinui Station catchment area between the east and west, with only two crossing opportunities between Papatoetoe town centre and Cavendish Drive, while other parts of the catchment are severed by wide, busy roads.
- Existing cycle lanes are limited to painted on-road lanes on Puhinui Road, Cavendish Drive, and Noel Burnside Road.

Figure 5-2: 1km walking catchment compared to 1km straight-line catchment around Puhinui Station

Level of public transport accessibility

- In addition to rail and A2B services, the Puhinui Station catchment will be served by a frequent bus route (36) on the north-eastern edge of its catchment, linking to Papatoetoe and Manukau train stations. This does not travel to Puhinui Station. The current route 313 travels near Puhinui Station and connects to Manukau and Papatoetoe.
- Overall, the Puhinui Station catchment will have very high public transport access following the establishment of A2B. The station is projected to have more jobs accessible in 45 minutes and 30 minutes by public transport than any other A2B station. The more than 470,000 jobs accessible in 45 minutes by public transport in 2048 will be more than double those accessible from most A2B stations.
- As shown in Figure 4-1, even without A2B and 20Connect, Puhinui Station would have significant public transport access to employment. This highlights the existing potential for exploring TOD opportunities even without A2B.
- Puhinui Station will also have access to significant employment by public transport for trips of 30-minutes or less, including the airport precinct, Manukau, Ellerslie, Middlemore Hospital, and Sylvia Park.

Figure 5-3 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes including A2B.

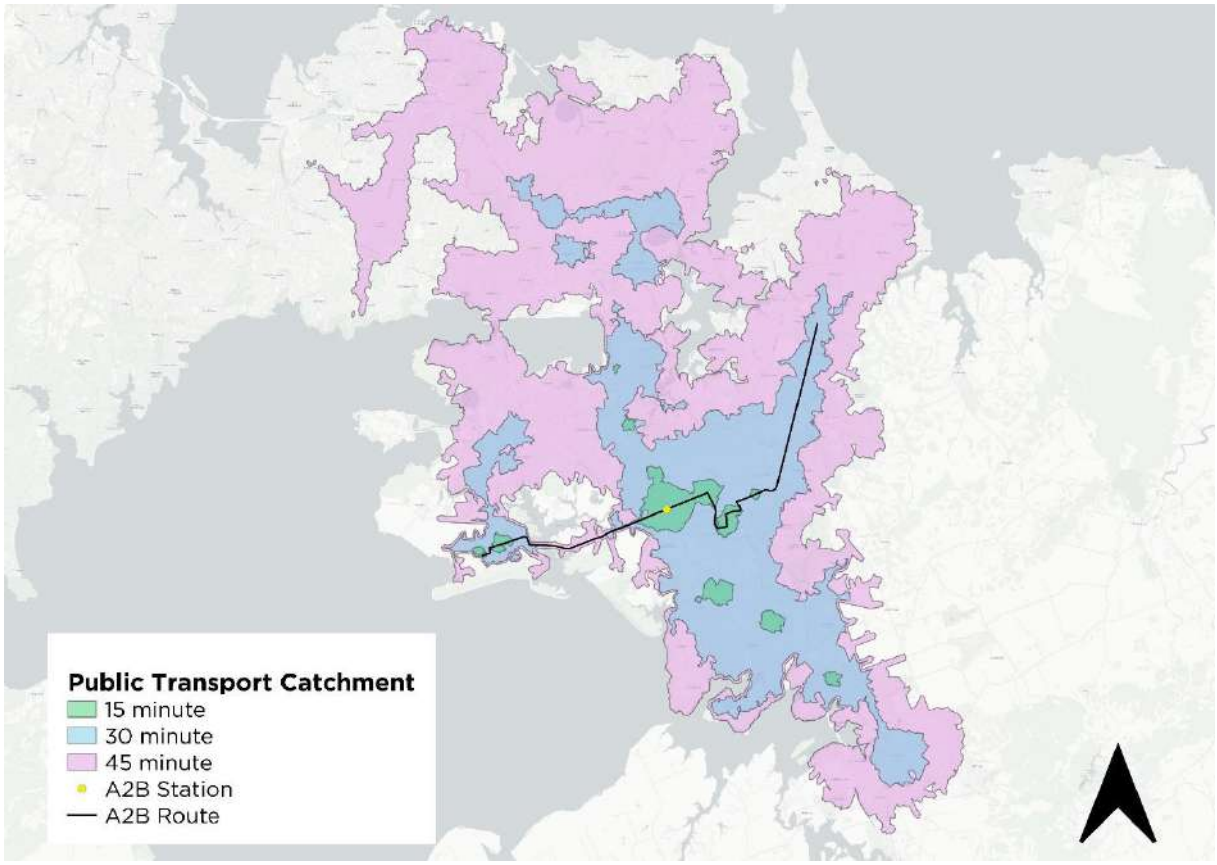


Figure 5-3: PT catchments from Puhinui Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.1.4 Property information

Figure 5-4: High-level property size information near proposed Puhinui Station location

Source: LINZ data

5.1.5 Portions of catchment with growth and TOD opportunities

- The area to the north of Puhinui Road, surrounding Puhinui Station, presents the strongest opportunity for TOD.
- The northern end of the Puhinui Station catchment also presents an opportunity for TOD as residences further from Puhinui Station are closer to Papatoetoe Town Centre. The street network is relatively well connected from Puhinui Station to the north and east.

Possible constraints to TOD

There are several possible constraints that may challenge TOD opportunities near Puhinui Station.

- Though the area to the north of Puhinui Road surrounding Puhinui Station presents the strongest opportunity for TOD, the existing zoning is mostly Mixed Housing – Suburban, which does not enable the potential growth identified.
- At the western edge of the Puhinui Station catchment the street network is less permeable and it lacks a nearby centre to provide access to goods and services, though areas in the northwest of the Puhinui Station catchment are within walking distance of the Papatoetoe town centre.
- Overall, most residential zoning in the station's 1km catchment is Mixed Housing Suburban or Single House Zone, which is unlikely to support the growth potential. For comparison, THAB zoning currently surrounds a number of train stations and some northern busway stations. Examples of areas that fall into this category include Sunnyvale, on the Western line, and Sunnynook, on the northern busway. Both of these areas sit relatively far from the central city, but are on high frequency networks. Each of these stations is surrounded by THAB zoning. Both of these stations has access to significantly fewer jobs within their 45-minute PT catchment when compared to Puhinui. These are

only two examples of a more widespread practice across Auckland of higher density zoning near frequent public transport connections.

- Airport noise restrictions are a limiting factor for TOD in parts of the catchment.
  - In particular, the residential section of housing south of Puhinui Station, zoned Single House, is unlikely to be suitable for TOD/growth due to its inclusion in the High Airport Noise Area.
  - The Moderate Aircraft Noise Area includes the expected station location, Puhinui Road, and the area roughly 200-300m to the north Puhinui Road. Development would therefore require noise mitigation and council approval.
- Industrial zoning accounts for a relatively significant portion of the Station's catchment to the south, which does not support TOD/growth in the future.
- The lack of nearby centres may also present a challenge to TOD opportunities. No centres exist within the 1km catchment (larger than a neighbourhood centre). The nearest substantial centres are the Papatoetoe Town Centre just north of the Puhinui Station 1km catchment, and the Manukau Metropolitan Centre southeast of the catchment. Given the major opportunity for densification near Puhinui Station, there is an opportunity to consider complementary uses within TOD.

5.2 Lambie Drive Station

The Lambie Drive Station area likely presents TOD opportunities for further investigation.

Key considerations:

- There is a very high level of PT accessibility from the station in 45-minute, 30-minute, and 15-minute PT catchments with A2B.
- The current residential zoning is largely Mixed Housing Suburban, which may not support the anticipated growth opportunities.
- Goods and services to the east and south of the station, such as food stores, schools and churches, may support nearby TOD, though overall lack of access to centres may constrain TOD potential. Industrial developments and a big box retail environment limits walkability between the station area and Manukau Metropolitan Centre to the south.

5.2.1 Existing land uses and AUP zoning

The five predominant AUP land use zones within a 1km radius of Lambie Drive Station are:

Residential - Mixed Housing Suburban Zone

Business - Light Industry Zone

Business - General Business Zone

Business - Mixed Use Zone

Business - Metropolitan Centre Zone

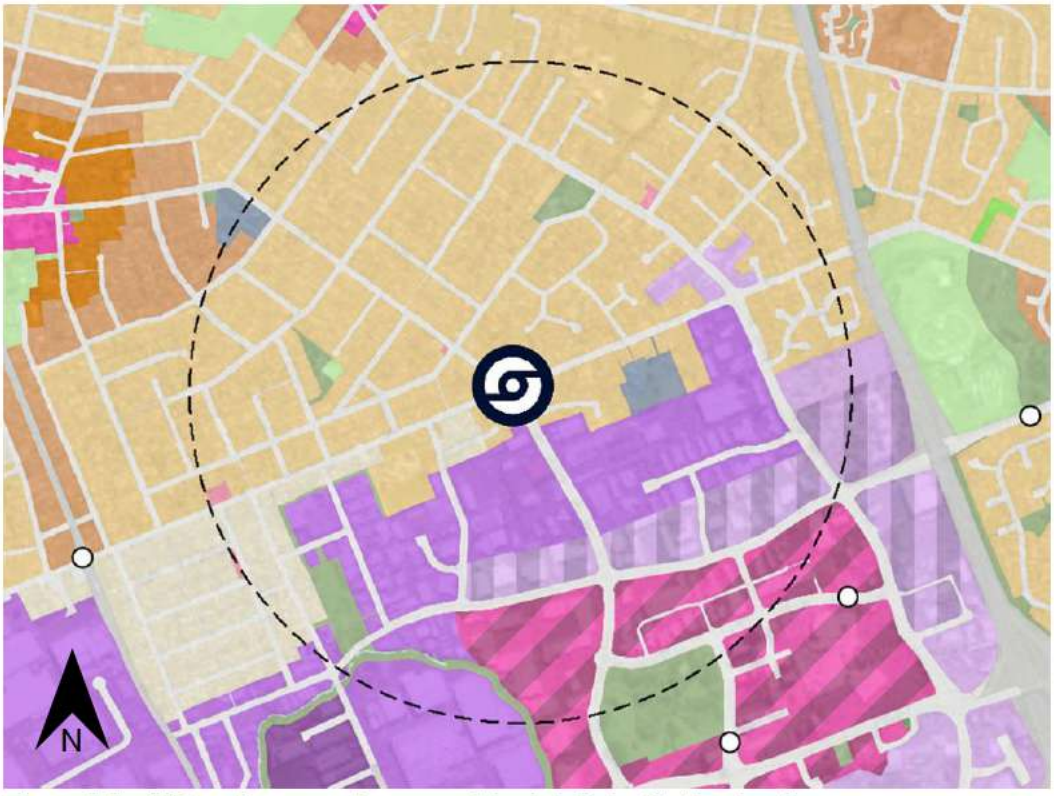


Figure 5-5: AUP zoning around proposed Lambie Drive Station location

Source: AUP

5.2.2 Major projects and strategic plans

- The Panuku-led Transform Manukau project has identified the need for safe cycling infrastructure throughout the Manukau area including on Lambie Drive. This could support connections between the Lambie Drive Station catchment and goods, services, employment, and leisure opportunities in Manukau. However, the areas of Manukau north of SH20 nearer to Lambie Drive Station have been identified for long-term redevelopment, which may occur over a 10-25-year time frame, rather than immediately.
- Puhinui Road between SH20 and Manukau City contains the narrowest section of road corridor along which A2B will run. Any related changes required for this could provide an opportunity to complement TOD sites and improve infrastructure for pedestrians and cyclists to access Puhinui Station and Lambie Drive Station.
- Lambie Station will be one of the earlier stations expected to benefit from A2B infrastructure, as intermittent bus lanes are expected from the Airport to Manukau by 2021, and targeted upgrades are expected along the A2B corridor between the Lambie Drive Station area through Manukau Metropolitan Centre by 2030 (Staging Technical Note: 502334-7000-TEC-JJ-0006).

5.2.3 Future core transport functions and operational features of station and surrounding area

Station functions

- The station area will largely serve as an origin station due to its residential focus. The area may serve as a smaller destination function to industrial and general business sites to the south of the station.
- The census area units encompassing the proposed station location range in density from 44 – 54 people per hectare (2018), which is roughly similar to or slightly higher than large segments of Mt Eden, and higher than the population density of nearly every census area unit on the North Shore.
  - The area covered by the station's 1km walking catchment accommodates 5,600 residents and 2,400 jobs (2013 Census). It is projected to have a similar resident population and number of jobs in 2048 by i11.5 land use estimates.

Station access

- The street network near Lambie Drive Station has mixed levels of connectivity, with the 1km walking catchment accounting for 49% of the 1km-straight line catchment (this accounts for the distance people need to travel along roads, rather than in a straight line). Street connectivity is limited to the south east of the station, which also consists of a big box retail environment that is unsupportive to walking.
- The existing cycle network for access to this location is limited to painted on-road cycle lanes on Puhinui Road and Cavendish Drive, and a shared path on Great South Road.
- This station is expected to be supported by the proposed frequent bus route (36) from Onehunga through Papatoetoe to Manukau, to be operational by 2021.

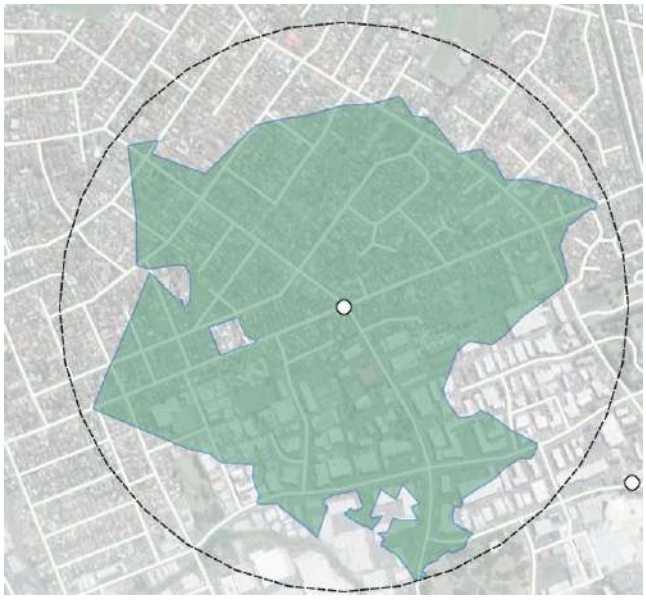


Figure 5-6: 1km walking catchment compared to 1km straight-line catchment around Lambie Drive Station

Level of public transport accessibility

- Overall, the Lambie Drive Station catchment will have very good public transport access following A2B's development, with quick transfers to the train at Puhinui Station (eastern and southern line) and at Manukau Station (eastern line). As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Lambie Drive Station. The station will have a relatively similar number of jobs accessible within 45-minutes and 30-minutes by public transport as both Puhinui Station and Manukau Station, which will be more than double those accessible from many other A2B stations by 2048.

Figure 5-7 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

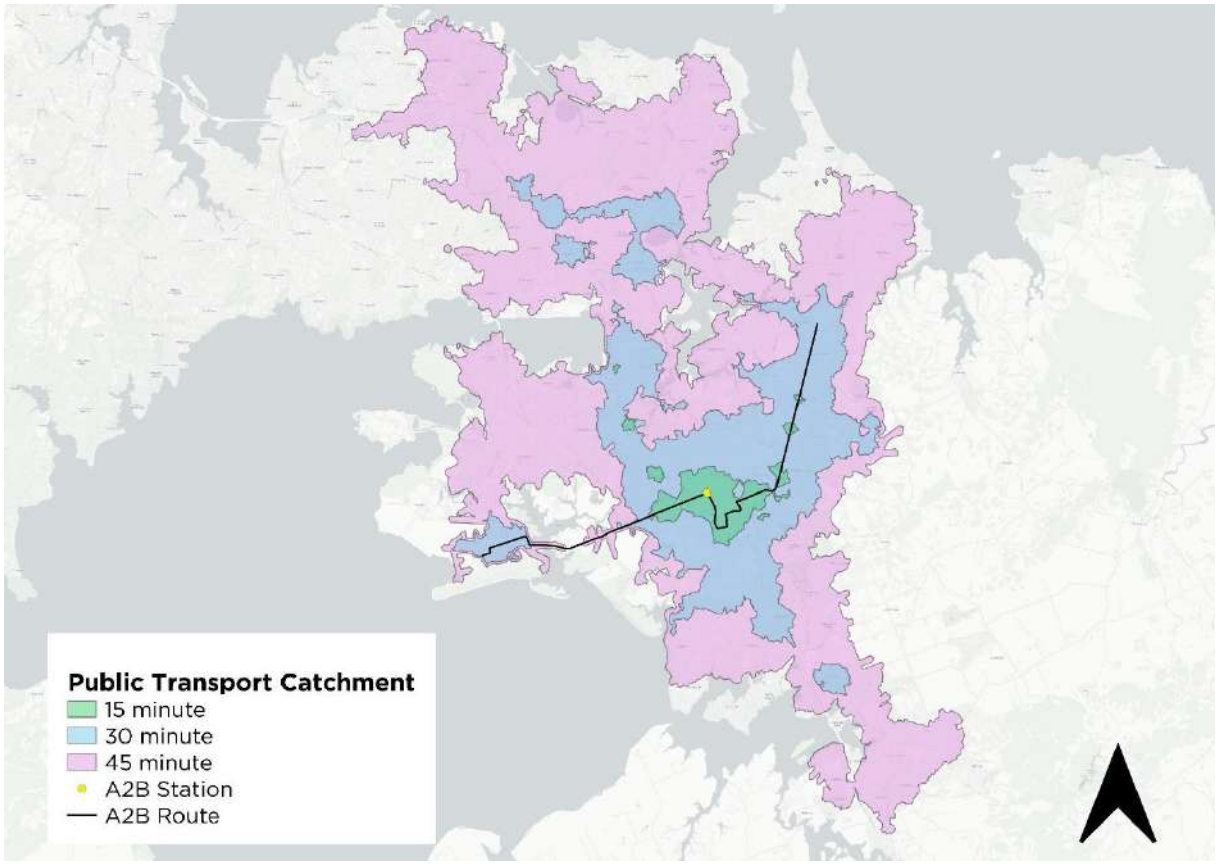


Figure 5-7 PT catchments from Lambie Drive Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.2.4 Property information

5.2.5 *Portions of catchment with growth and TOD opportunities*

- The strongest TOD opportunities likely lie near the Lambie Drive Station.
  - Secondarily, opportunities may exist to the east of the station nearer to the Business – Mixed Use zone – which contains some goods and services at the intersection of Great South Road and Puhinui Road.
  - Areas to the south of the station may provide TOD opportunities as they are nearer to Manukau Metropolitan Centre, but this potential is limited by the industrial zoning north of the Metropolitan Centre and the current big box retail in Manukau Metropolitan Centre that does not foster walkability.

Possible constraints to TOD

- Zoning for large segments of the catchment is Mixed Housing Suburban, which may not present sufficient opportunities for growth to meet future demand.
- The lack of access to goods and services in large parts of the catchment may limit TOD opportunities.
- The industrial zoning and big box-style land use north of Manukau Metropolitan Centre also limits the attractiveness of walking between the Lambie Drive Station catchment and Manukau Metropolitan Centre.
- The industrial area between Lambie Station and the Manukau Metropolitan Area sits within the High Aircraft Noise Area and is subject to relevant restrictions, likely making TOD in this area unsuitable.

- The residentially zoned areas within the Lambie Drive catchment are either within the Moderate Aircraft Noise Area or the Aircraft Noise Notification Area. Development or intensification in these areas will be subject to noise mitigation requirements and council approvals.

5.3 Manukau Station

The characteristics of the Manukau Station environment suggests it should be a focus for TOD opportunities related to A2B.

Key considerations:

- Significant metropolitan centre, with high levels of public transport accessibility
- Zoning around the station allows for immediate development
- Substantial urban development plans/changes for the area, with large population increase forecast – already a TOD opportunity
- Included in initial A2B staging plans

5.3.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Manukau Station are:

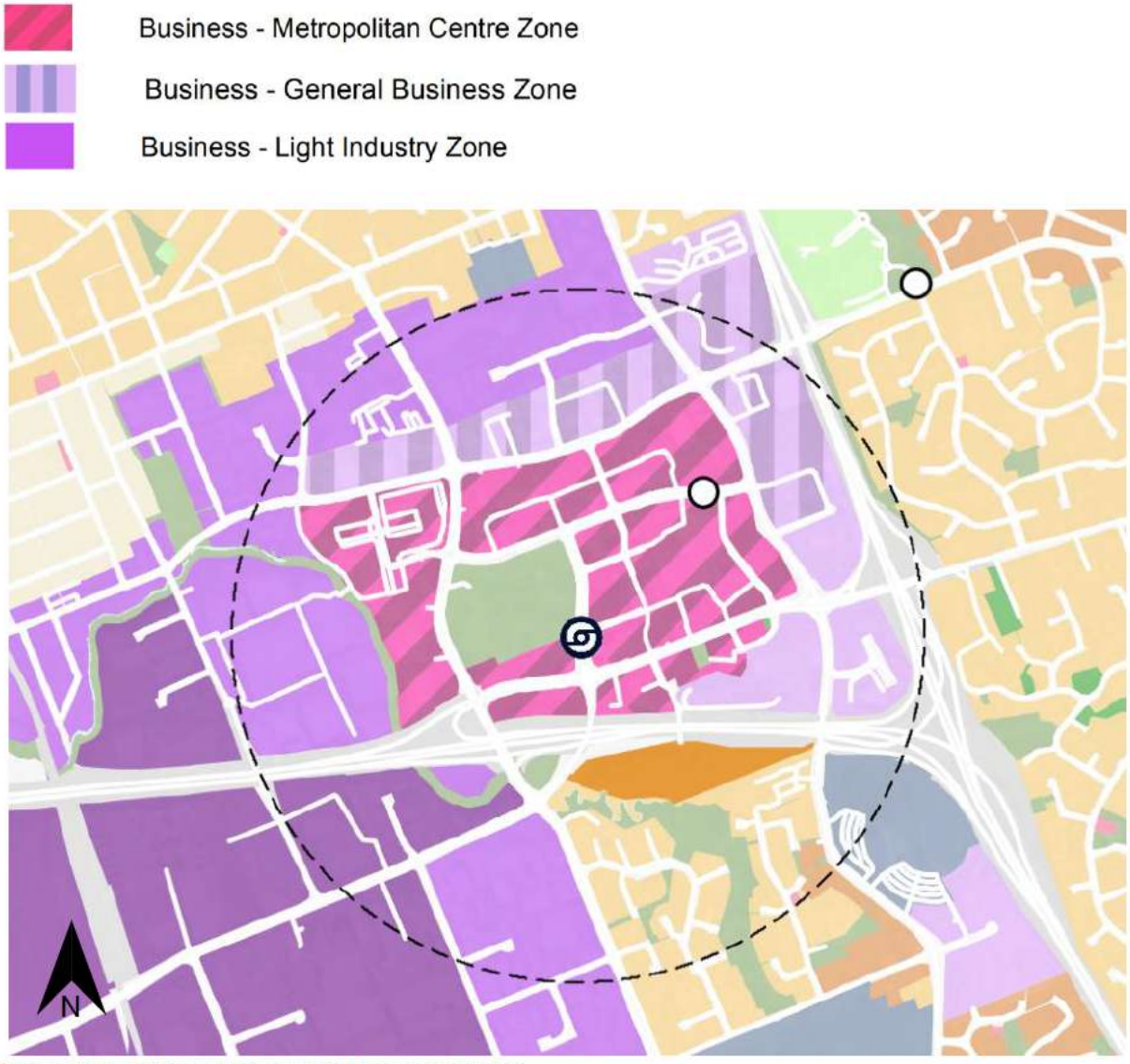


Figure 5-9: AUP zoning around Manukau Station

Source: AUP

5.3.2 Major projects and strategic plans

- Manukau is an existing TOD opportunity due its established transport connections and recognition of the need to significantly redevelop the area and increase its density. This is being led by Panuku Development Auckland and Kāinga Ora.
- Identified as a 'transformation area' by Panuku (2017) – the Metropolitan Centre is undergoing significant urban development. Relatively high-density housing developments, such as Kotuitui Place are currently being developed, so some TOD is already underway in this area.
  - Changes include planned increases in residential density to encourage development as a compact centre
- Focus area for the Auckland Cycling Programme Business Case – Auckland Transport is identifying projects for investment in this area
- Several Government agencies are proposing investment in the Manukau Centre for housing, education and offices. Involvement is from Kāinga Ora, Panuku, MBIE, and Counties Manukau DHB. Some of these proposed developments directly interface with Manukau Station's immediate environment and represent significant opportunities.
- Centre group (Westfield) are proposing a major redevelopment of the existing retail and employment complex in Manukau.
- Staging plans for the A2B indicate an initial service running between Manukau and the airport by 2021, with intermittent bus lanes along this length at the same time.
- It is expected that A2B will further support and enable urban regeneration in Manukau, and support investment in the area by key stakeholders.
- Panuku is leading efforts to restore the Puhinui Stream, which runs south of Puhinui Station and through Manukau Metropolitan Centre.[11] Among other goals, the restoration aims to upgrade the urban environment and create a new walkway connecting Manukau Metropolitan Centre with Manukau Harbour. By improving urban amenity and walking connections near Puhinui Station and Manukau Station, the stream restoration could further support TOD opportunities.

5.3.3 Future core transport functions and operational features of station and surrounding area

Station functions

- Manukau Station (A2B) will serve as a destination station and important interchange point along the A2B line and wider public transport network in south Auckland. It will serve as an interchange point between the eastern line train and the A2B Line, as well as an interchange with regional bus services from other parts of the country.
- Manukau Bus Station is also a significant hub for bus services in south Auckland, and this station will connect those services further to other parts of the A2B network.
- As shown in Figure 4-1, even without A2B and 20Connect, Manukau Station would have significant public transport access to employment. This highlights the existing potential for exploring TOD opportunities even without A2B.
- Manukau Station (A2B) will also serve as an origin station. The area covered by the station's 1km walking catchment accommodates 1,300 residents and 4,700 jobs (2013 Census). It is projected to experience substantial growth, with a projected residential population of approximately 6,300 by 2048. It is also expected to accommodate approximately 6,200 jobs in 2048.
  - This population increase would mean that the MSM zone containing the Metropolitan Centre would increase in population density from very few residents today to 97 people per hectare in

[11] https://www.naturespace.org.nz/sites/default/files/u4/puhinui_stream_rest_web.pdf

2048, which is about 20% higher than the density in the area surrounding Karangahape Road today. The MSM zone immediately south of the Metropolitan Centre is also expected to increase in density significantly from few residents today to 87 people per hectare in 2048.

Station access

- The current street network surrounding Manukau station is well-connected in places, but not in others. Some 53% of the 1km straight line radius from the station is walkable within 15 minutes from the station.
- Walking and cycling permeability is lower outside of the town centre, particularly toward the west of the 1km station catchment, where industrial areas are more prominent and have a poorly connected street network.
- Parts of the catchment are bisected by State Highway 20, making station access more difficult from the catchment's furthest reaches.

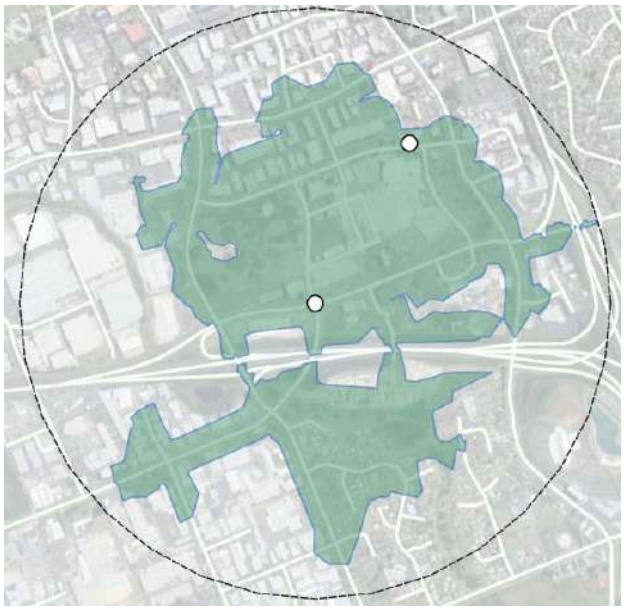


Figure 5-10: 1km walking catchment compared to 1km straight-line catchment around Manukau Station

Level of public transport accessibility

- In addition to rail and A2B services, Manukau Station acts as a hub for most south Auckland bus services.
- Manukau contains several community and civic facilities, such as Auckland Council and government services, shopping and leisure facilities, and access to education centres. Manukau Institute of Technology is integrated with Manukau train station.
- Overall, Manukau Station is expected to have a high level of public transport accessibility with A2B's introduction. Approximately 450,000 jobs are projected to be accessible within Manukau Station's 45-minute public transport catchment by 2048, which is a much higher figure than from most A2B stations.
- Manukau Station will also have access to many areas of employment by public transport within 30 minutes. Locations accessible include Auckland Airport, Middlemore Hospital, Sylvia Park, and Botany.
- More than 750,000 residents are projected to have access to Manukau Station within 45-minutes by public transport by 2048—also one of the highest figures among A2B stations—which will support Manukau's destination function. By comparison, Botany Station is projected to be accessible to about 475,000 people within a 45-minute public transport journey by 2048.

Figure 5-11 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

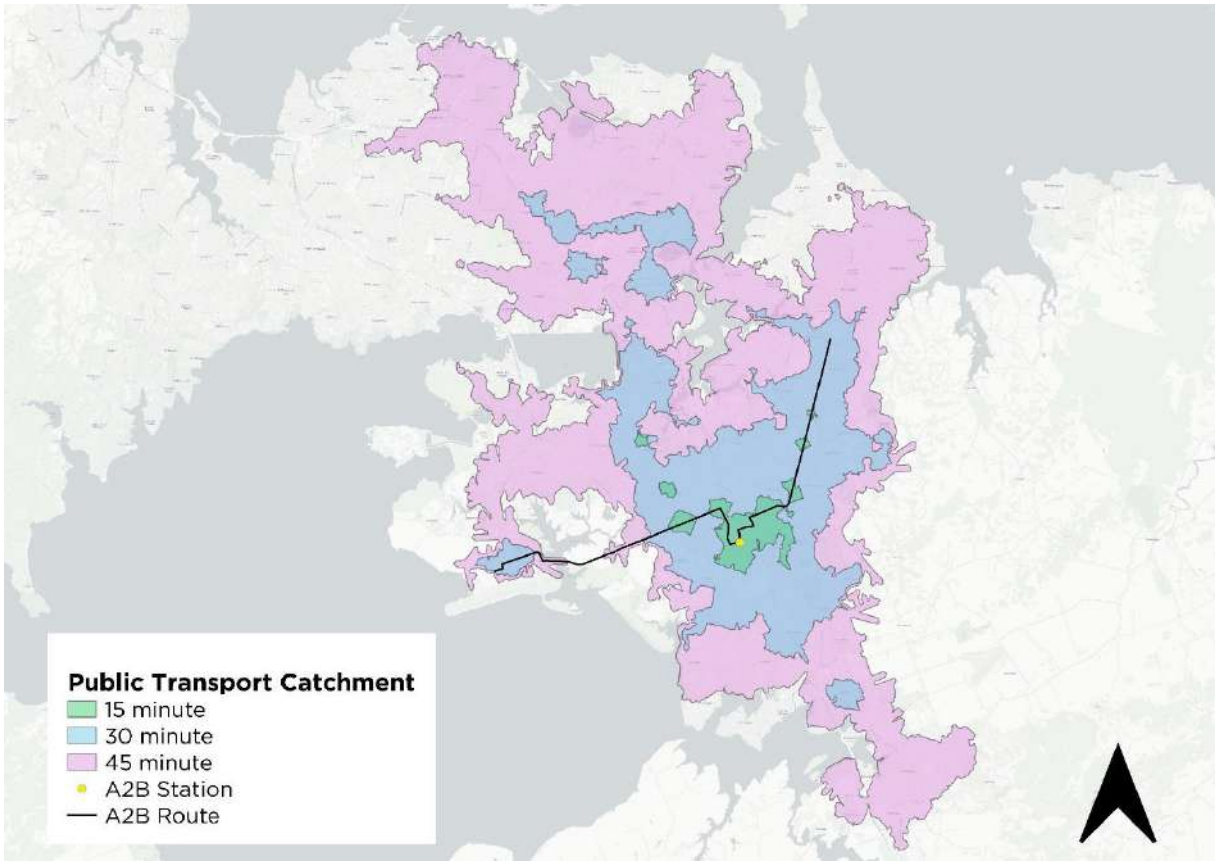


Figure 5-11: PT catchments from Manukau Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.3.4 Property information

[redacted]

Analysis completed by Panuku for the Transform Manukau project indicates that a large amount of land near the station on the northern side of SH20 is council owned.

5.3.5 Portions of catchment with growth and TOD opportunities

- Development plans for the area are actively encouraging development throughout the catchment that will increase access for local people to transport and densify this area. It will be important that any TOD investigation coordinates with Panuku's Transform Manukau project and Kāinga Ora regeneration project in Manukau and Wiri.
- Much of the Manukau Station catchment is zoned to enable TOD, with a large proportion of Metropolitan Centre zoning.
- Further out from the station, there is a small amount of terrace housing and apartment building zoning (to the south of State Highway 20), and a relatively large amount of Mixed Housing – suburban zoning.

Possible constraints to TOD and growth

Compared to other stations on the A2B line, there are relatively few constraints to TOD development near Manukau Station.

- The largest potential constraint is likely the existing car-oriented land use in the area, including big box retail and large surface car parks that do not encourage walking journeys.
- Parts of Manukau Station's 1km catchment sit either within the High Aircraft Noise Area relating to Auckland Airport, or the Moderate Aircraft Noise Area. Areas within the High Aircraft Noise Area, which are likely unsuitable for TOD, are mostly limited to the industrial areas to the north of Manukau Metropolitan Centre.
  - Manukau Metropolitan Centre sits within the Moderate Aircraft Noise Area and developments in this area will, therefore, be subject to relevant noise mitigating requirements and council approvals.

5.4 Ronwood Station

The characteristics of the Ronwood station environment suggests it is a suitable focus for TOD opportunities related to A2B.

Key considerations:

- Second station in the significant metropolitan centre of Manukau
- Ronwood Avenue, like Davies Avenue is one of only a small number of streets in Manukau that have the potential to have a human scale design which can be achieved with implementation of the RTN
- Zoning around the station allows for immediate development
- Substantial urban development plans/changes for the area, with large population increase forecast
- Not directly connected to Manukau train station

5.4.1 Existing land uses and AUP zoning

The four predominant AUP land use zones within a 1km radius of Ronwood Station are:

Residential - Mixed Housing Suburban Zone

Business - General Business Zone

Business - Light Industry Zone

Business - Metropolitan Centre Zone

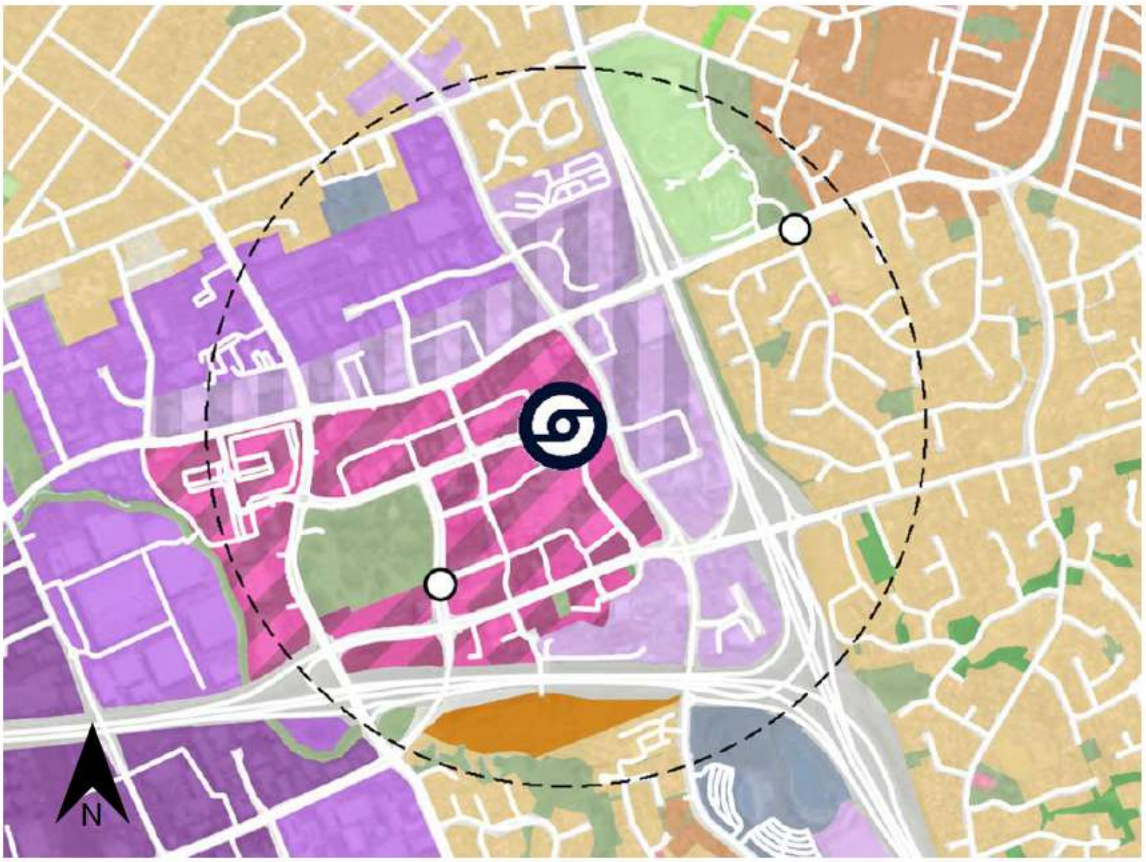


Figure 5-13: AUP zoning around proposed Ronwood Station location

Source: AUP

5.4.2 Major projects and strategic plans

- Close proximity to the centre of Manukau, benefiting from many of the same planned projects as Manukau Station
- Strongly affected by Transform Manukau, with increases in density and service availability expected
- Focus area for the Auckland Cycling Programme Business Case – Auckland Transport identifying projects for investment in this area
- Great South Road (adjacent to planned Ronwood Station) is a focus of the AT Connected Communities project (seeking to "increase movement density across multiple transport corridors")
- The station is immediately north of Westfield Manukau City mall, which is expected to have a major upgrade and is likely to immediately interface with the station with an active edge.

5.4.3 Future core transport functions and operational features of station and surrounding area

- As another station at the heart of Manukau's metropolitan centre, Ronwood station will function as a destination station. However, it will not perform the same level of interchange function seen at Manukau Station.
- In the longer-term future, the station will also serve as an origin station. Similar to the Manukau Station area, the area covered by Ronwood station's 1km walking catchment is also expected to grow significantly from 890 residents and 5,000 jobs (2013 Census) to a projected resident population of 5,200 and to accommodate 7,100 jobs in 2048.
- Nearby destinations include Westfield Manukau City, Auckland University of Technology, Manukau Institute of Technology, and several civic facilities. Housing developments, some of which are relatively high-density, are planned for the area's future, and this will increase the station's ability to also serve as an origin station.

Station access

- The street network near Ronwood Station is most permeable to the southwest of the station. Only 38% of the area within the 1km straight line catchment is within the 1km walking catchment. Big box retail, and surface area carparks are in high prevalence around the station, however this may change as the area is redeveloped.
- The existing cycle network is limited to painted on-road cycle lanes on arterial roads around the station, including Te Irirangi Drive/Cavendish Drive and Great South Road.

Figure 5-14: 1km walking catchment compared to 1km straight-line catchment around Ronwood Station

Level of public transport accessibility

- Ronwood Station is not proposed to serve an interchange function, as buses currently running along Ronwood Avenue are proposed to be diverted to Cavendish and Great South Roads, allowing the A2B line to be the only public transport running along Ronwood Avenue.
- A2B will increase the number of jobs accessible within 15 and 30 minutes by public transport from Ronwood Station. Still, with A2B Ronwood Station is expected to have fewer jobs accessible within its 45-minute and 30-minute public transport catchment than Manukau Station, which connects directly to the eastern line train.
- It is projected to have more than 500,000 people living within a 45-minute public transport journey to this station with A2B. This is a comparable number to other stations along the A2B line; however, it is lower than nearby Manukau Station.

Figure 5-15 below shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

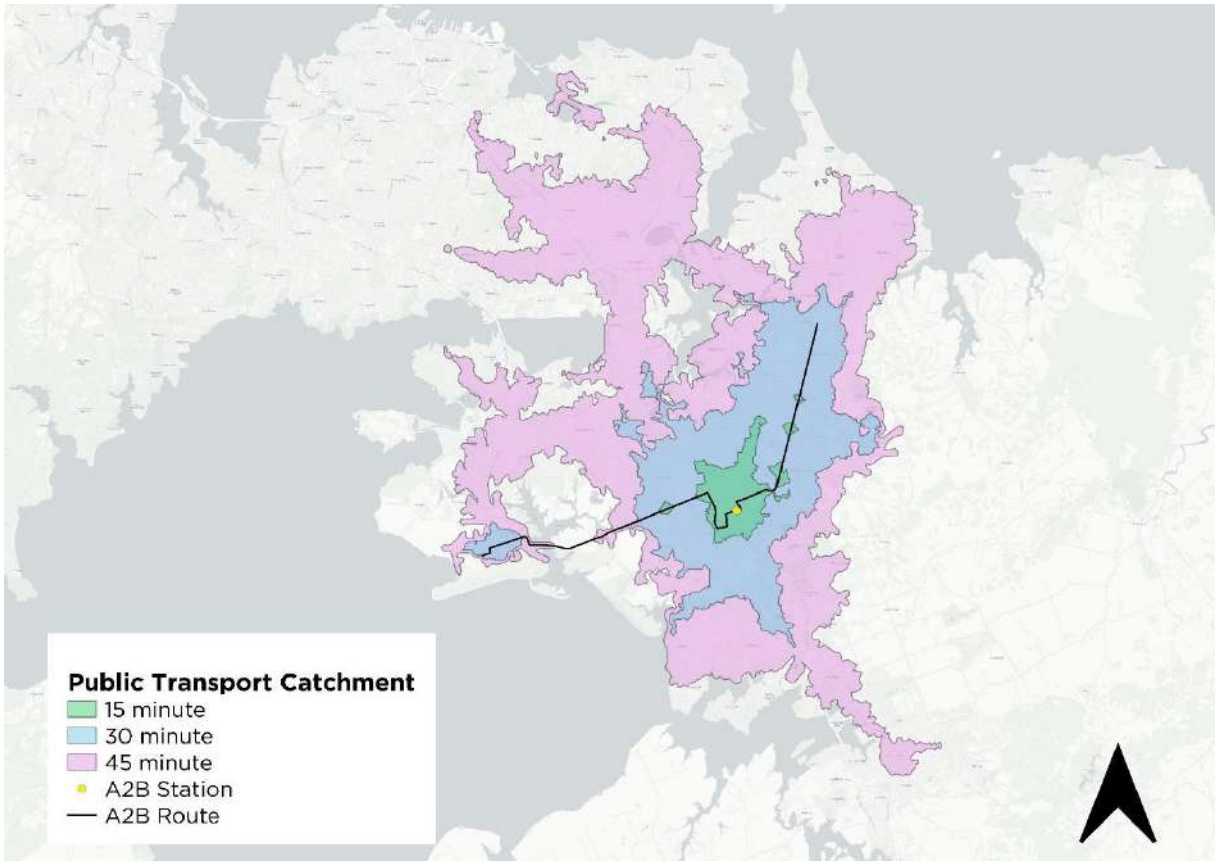


Figure 5-15: PT catchments from Ronwood Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.4.5 Portions of catchment with growth and TOD opportunities

- Development plans for the area are actively encouraging development throughout the catchment that will increase access for local people to transport and densify this area. It will be important that any TOD investigation coordinates with Panuku's Transform Manukau project and Kāinga Ora regeneration project in Manukau and Wiri.
- There is a significant amount of Metropolitan Centre zoning around Ronwood Station, which supports high density development and a mixture of business/leisure activities
- General Business zoning to the station's east allows for large format retail. Residential activity is not expected in this zoning.
- To the south of the station's catchment is some Terrace Housing and Apartment Zoning. This site, despite some severance caused by SH20, can be served by both Manukau and Ronwood stations.
- Ronwood Station's close vicinity to Manukau Station means this area's TOD opportunities should not be considered in isolation, as residents and employees using this area may wish to access it from either station.

Possible constraints to TOD opportunities

Land to the east of Ronwood Station is zoned Mixed Housing Suburban, which may not support the anticipated growth and opportunity for TOD. Nevertheless, this area is separated from Ronwood Station by SH1 with few crossing points. Diorella Drive Station will be more accessible for most of this area.

The General Business and Light Industry zoning to the station's north sits within the High Aircraft Noise Area relating to Auckland Airport. As a result, it is likely only suitable for TOD to occur within the area to the station's south, which is zoned as a Metropolitan Centre and sits within the Moderate Aircraft Noise Area. Developments in this area will be subject to relevant noise mitigation requirements.

5.5 Diorella Drive Station

Portions of the Diorella Drive Station present TOD opportunities worth further investigation. It is a largely residential area with Mixed Housing Suburban and Mixed Housing Urban zoning, and few local jobs

Key considerations:

- TOD opportunities are likely strongest immediately adjacent to the station, and to the west along Te Irirangi Drive, nearer the Manukau Sports Bowl, AUT south campus, and Manukau Metropolitan Centre.
- The lack of local or town centre in the Diorella Drive Station catchment likely limits TOD opportunities. This is augmented by severance from the Diorella Drive Station catchment and Manukau from SH1.

5.5.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Diorella Drive Station are:

Residential - Mixed Housing Suburban Zone

Residential - Mixed Housing Urban Zone

Business - General Business Zone

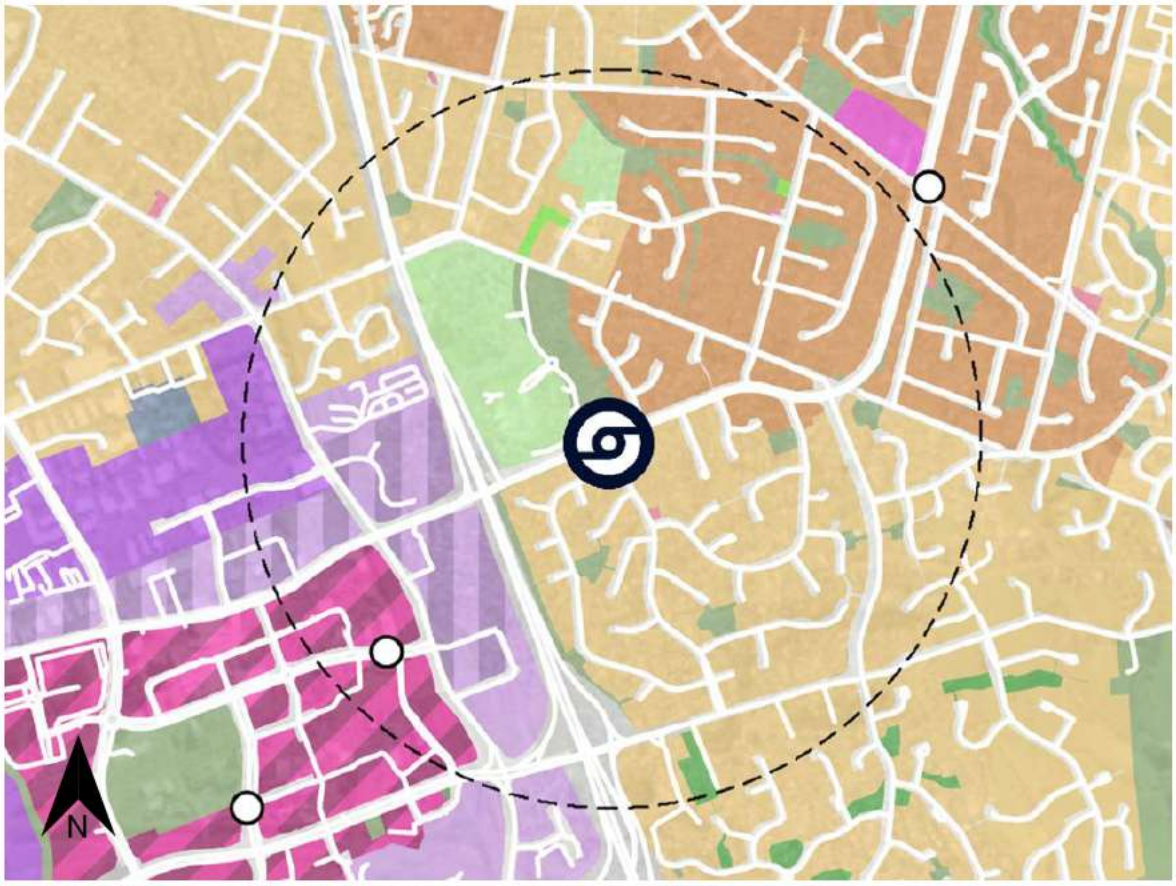


Figure 5-17: AUP zoning around proposed Diorella Drive Station location

Source: AUP

5.5.2 Major projects and strategic plans

As part of the Panuku-led Transform Manukau initiative, investigations are proceeding to redevelop the Manukau Sports Bowl, just northwest of the proposed Diorella Drive Station location. However, this has been identified as a long-term project to be completed in the 10-25-year time horizon.

This station is expected to benefit from A2B infrastructure later than Puhinui, Lambie Drive, Manukau, and Ronwood stations, and not until bus priority has been implemented along the entire line, projected to occur in 2025. Rapid transit infrastructure is projected to be implemented along the entire line by 2035.

5.5.3 Future core transport functions and operational features of station and surrounding area

Station functions

- The station is expected to function as an origin station.
- Population density in the census area units containing the proposed station location is about 35 people per hectare (2018), which is roughly equivalent to the area around Onehunga Town Centre, and to the less-dense portions of Mt Eden.
- The station catchment has a population of 4,900 people and 700 jobs. It is projected by i11.5 to have similar levels of population and employment by 2048.
- To a lesser degree, the station may serve a destination function following A2B due to its proximity to the Manukau Sports Bowl and AUT south campus. The AUT south campus will be slightly closer to the Ronwood Station, but the Diorella Drive station would be more convenient for riders coming from the northeast.

Station access

- This station connects with the local bus route 325, which connects Manukau Station with Ōtāhuhu, via Dawson Road and Ōtara.
- Severance from SH1 limits the walking connections between the Diorella Drive station catchment and Manukau. The walking catchment only accounts for 41% of the 1km straight-line catchment, as seen in Figure 5-18.

Figure 5-18: 1km walking catchment compared to 1km straight-line catchment around Diorella Drive Station

Source: A2B Detailed Walking and Cycling Station Access Assessment Reference: 502334-7000-REP-KK-0029

Level of public transport accessibility

As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Diorella Drive Station.

The station will provide access to a relatively high number of jobs in its PT catchment with A2B—more than Sunnyvale or New Lynn—and similar to other stations along the corridor, though far fewer than Puhinui Station, Lambie Drive Station, or Manukau Station.

Figure 5-19 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

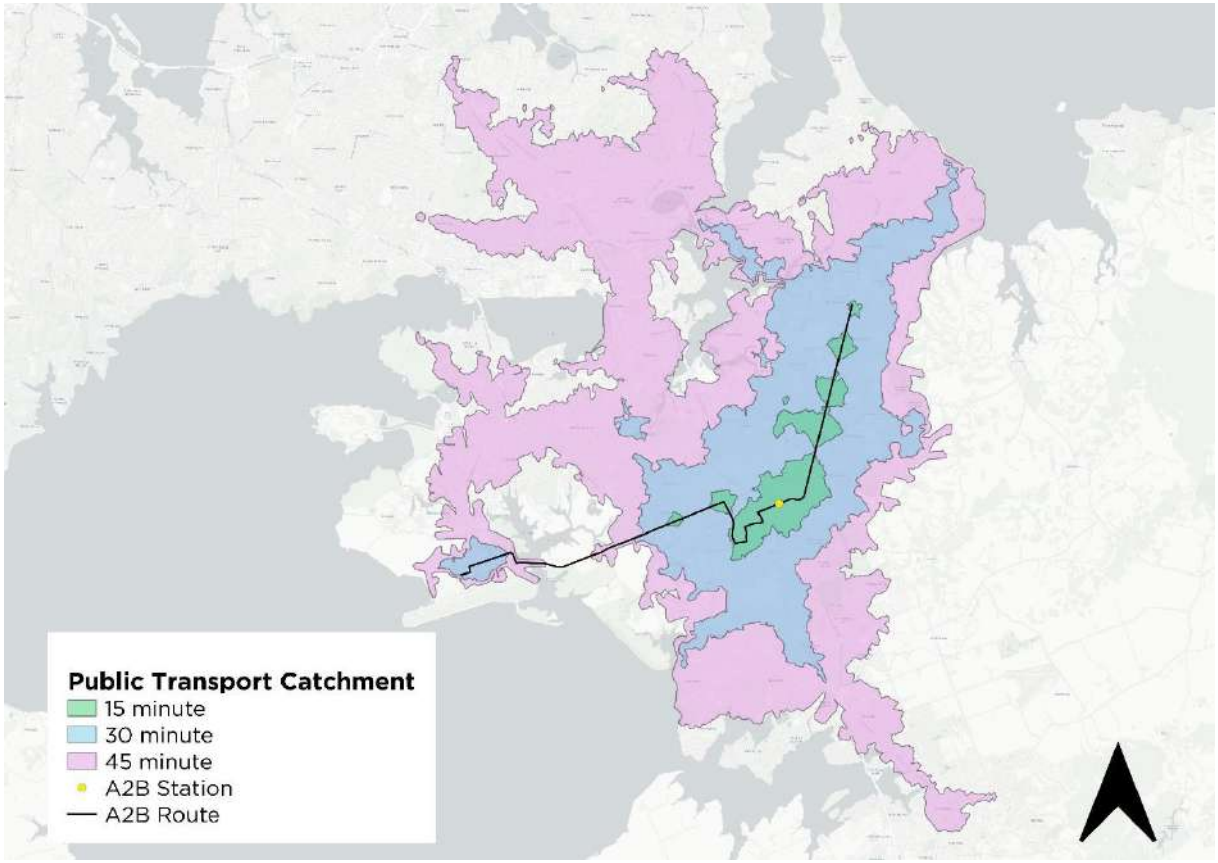


Figure 5-19: PT catchments from Diorella Drive Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.5.4 Property information

Figure 5-20: High-level property information near proposed Diorella Drive Station location

Source: LINZ data

5.5.5 Portions of catchment with growth and TOD opportunities

- Areas near the station and to the west of the station along Te Irirangi Drive, which is nearer to Manukau, the AUT campus, and the Manukau Sports Bowl should be a focus for exploring TOD opportunities. Zoning to the north of the station is for Mixed Housing Urban.

Possible constraints to TOD opportunities

- The land use surrounding Diorella Drive Station may not support the level of anticipated growth, in that the residential area south of the station is currently zoned for relatively low-density under Mixed Housing Suburban.
- Current land use and zoning of the residential catchment south of the station, particularly along the western edge near SH1, does not currently present an opportunity for growth/TOD, however the opportunity for growth could be explored further if pedestrian connections were improved across the motorway to access Manukau. As it stands, the residences' proximity to Manukau is undervalued due to limited connections across SH1, which can be seen by the limited walking catchment east of Diorella Drive Station in Figure 5-18.
- The majority of this station's catchment sits within the Moderate Aircraft Noise Area overlay. This means that development within this station area will require adherence to noise mitigation requirements and council approval.
- The General Business Zone area to the west of the station sits within the High Aircraft Noise Area and is therefore not suitable for TOD.

5.6 Dawson Station

The Dawson Station catchment presents some TOD opportunities worth further investigation.

Main considerations:

- Largely residential area with mainly Mixed Housing Urban zoning.
- Relatively high level of pedestrian connectivity in the catchment compared to other A2B stations.
- TOD opportunities are likely to be strongest very near the local centre and A2B station.

5.6.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Dawson Station are:

Residential - Mixed Housing Urban Zone

Residential - Mixed Housing Suburban Zone

Business - Local Centre Zone

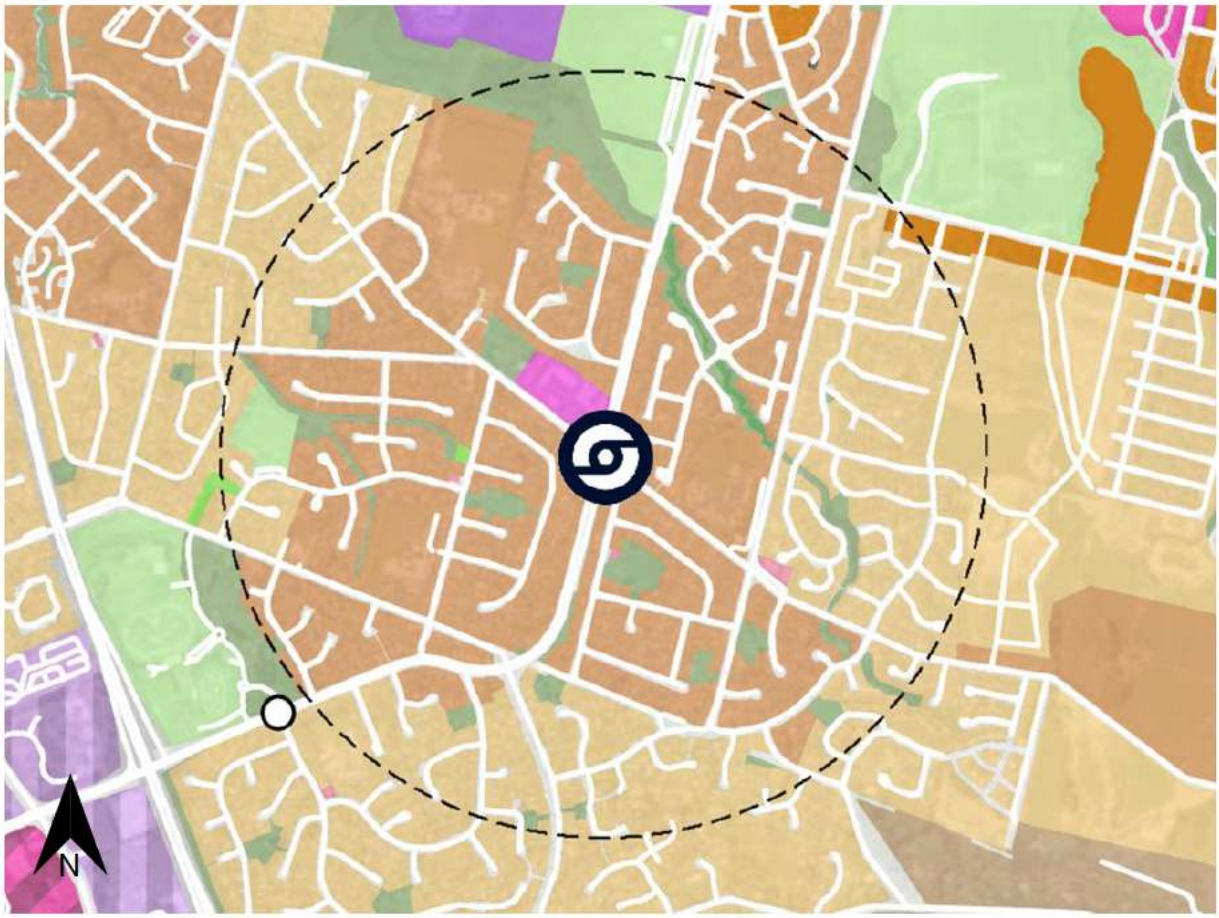


Figure 5-21: AUP zoning around proposed Dawson Station location

Source: AUP

5.6.2 Major projects and strategic plans

The Howick Local Board Walking and Cycling Network plan from November 2018 identifies routes for improvement near Dawson Station. These include Dawson Road, Thomas Road, Chapel Road, a path parallel to the creek running from Rongomai Park to Thomas Road, Broadhurst Road, and Flat Bush School Road.

This station is expected to benefit from A2B infrastructure later than Puhinui, Lambie Drive, Manukau, and Ronwood stations, and not until bus priority has been implemented along the entire line, projected to occur in 2025. Rapid transit infrastructure is projected to be implemented along the entire line by 2035.

5.6.3 Future core transport functions and operational features of station and surrounding area

Station functions

- Dawson Station will primarily serve as an origin station following A2B. It is currently surrounded by residential zoning, with the exception of the Local Centre immediately adjacent to the proposed station location. Its existing residential population is relatively large compared to other station areas, with 7,700 people in its 1km walking catchment (2013), though it has few jobs (400 per 2013 census). Auckland Council i11.5 land use estimates project similar population and employment levels in its walking catchment in 2048.
  - Population density levels in the census area units encompassing the catchment area range from 39 – 50 people per hectare, which is similar to Sandringham.

Station access

- The 325-bus route (Māngere to Manukau) will stop near the proposed Dawson Station location, and the frequent 35 bus will provide suburban coverage for the catchment closer to Chapel Road and connect to Manukau and Botany.
- The station area has a relatively well-connected street network compared to some stations, with the walking catchment accounting for 61% of the straight-line catchment. This is particularly true to the north and west. This is shown in Figure 5-22.

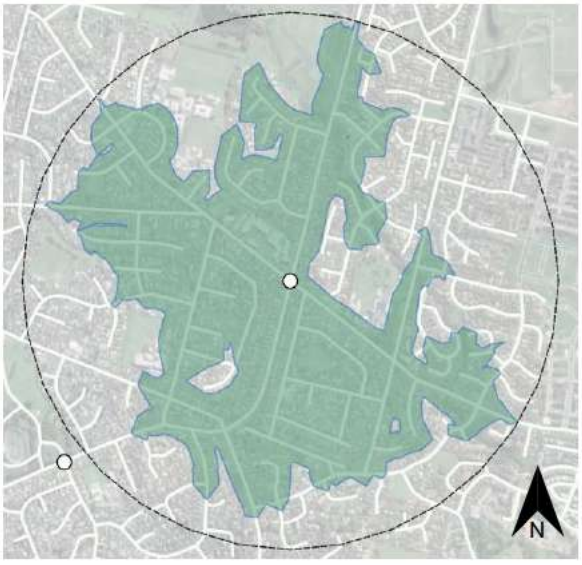


Figure 5-22: 1km walking catchment compared to 1km straight-line catchment around Dawson Station

Source: A2B Detailed Walking and Cycling Station Access Assessment Reference: 502334-7000-REP-KK-0029

- Though the street network is relatively well connected, the station area contains several high-volume, high-speed roads that detract from the pedestrian experience. These include Dawson Road, Te Irirangi Drive, Chapel Road, and Boundary Road. Walking infrastructure is of limited quality, and some streets contain few crossing points.
- The existing cycling network is limited to painted on-road lanes on Te Irirangi Drive south of the Dawson Road intersection, with no lanes to the north.

Level of public transport accessibility

As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Dawson Road Station

The station will provide access to a relatively high number of jobs in its PT catchment with A2B—more than Sunnyvale or New Lynn—and similar to other stations along the corridor, though far fewer than Puhinui Station or Manukau Station.

Figure 5-23 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

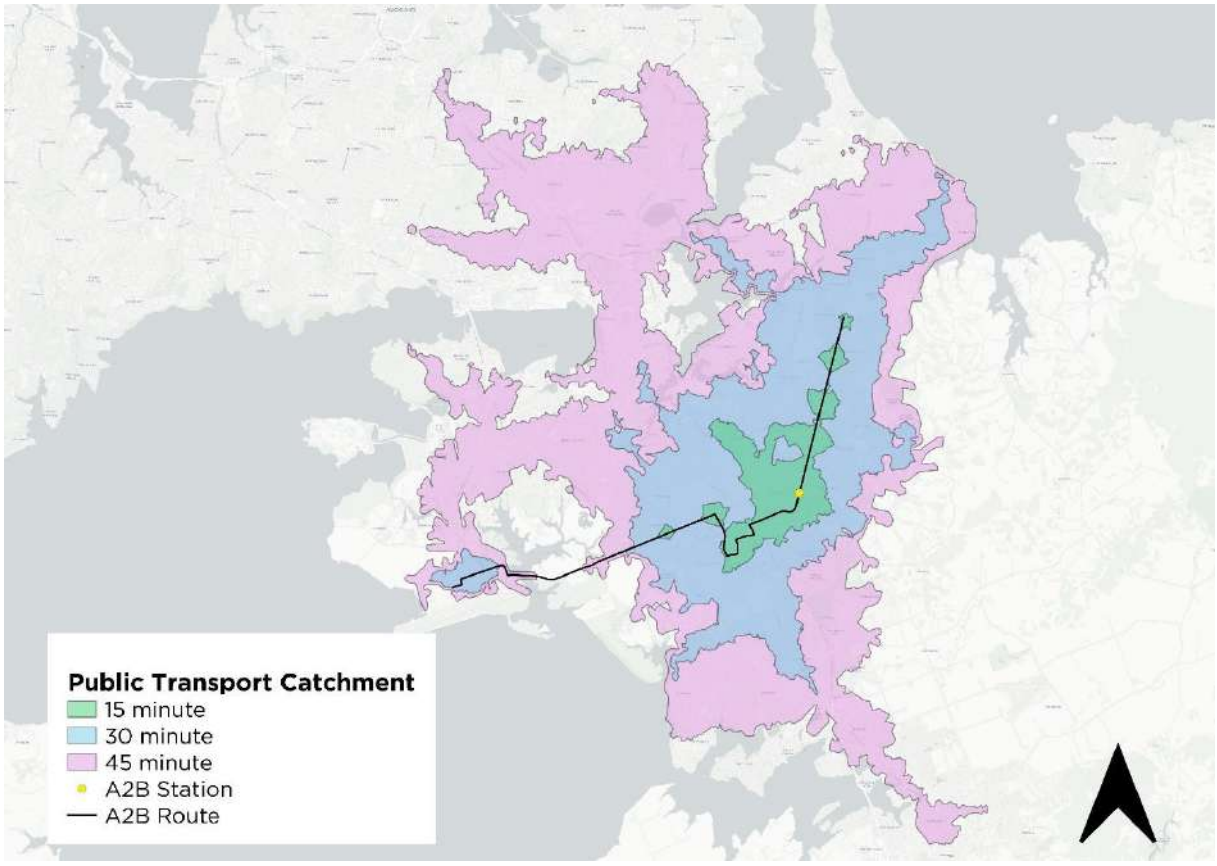


Figure 5-23: PT catchments from Dawson Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.6.4 Property information

[redacted]

5.6.5 Portions of catchment with growth and TOD opportunities

- The existing zoning of Mixed Housing Urban is higher density than some A2B stations, allowing for some potential densification.

Possible constraints to TOD opportunities

- Though the Mixed Housing Urban zoning in the catchment allows for some growth, it is likely that demand for growth could exceed the allowable density under this zoning, particularly near the station and local centre.
- The majority of this station's catchment sits within the Moderate Aircraft Noise Area overlay. This means that development within this station area will require adherence to noise mitigation requirements and council approval.

5.7 Ormiston Station

The Ormiston Station area includes possible TOD opportunities worth investigation. TOD opportunities are likely more feasible, as zoning in portions of the station's catchment support intensification.

5.7.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Ormiston Station are:

- Business - Light Industry Zone
- Residential -Terrace Housing and Apartment Buildings Zone
- Residential - Mixed Housing Urban Zone

A full legend of AUP Zoning is included in the Appendix.

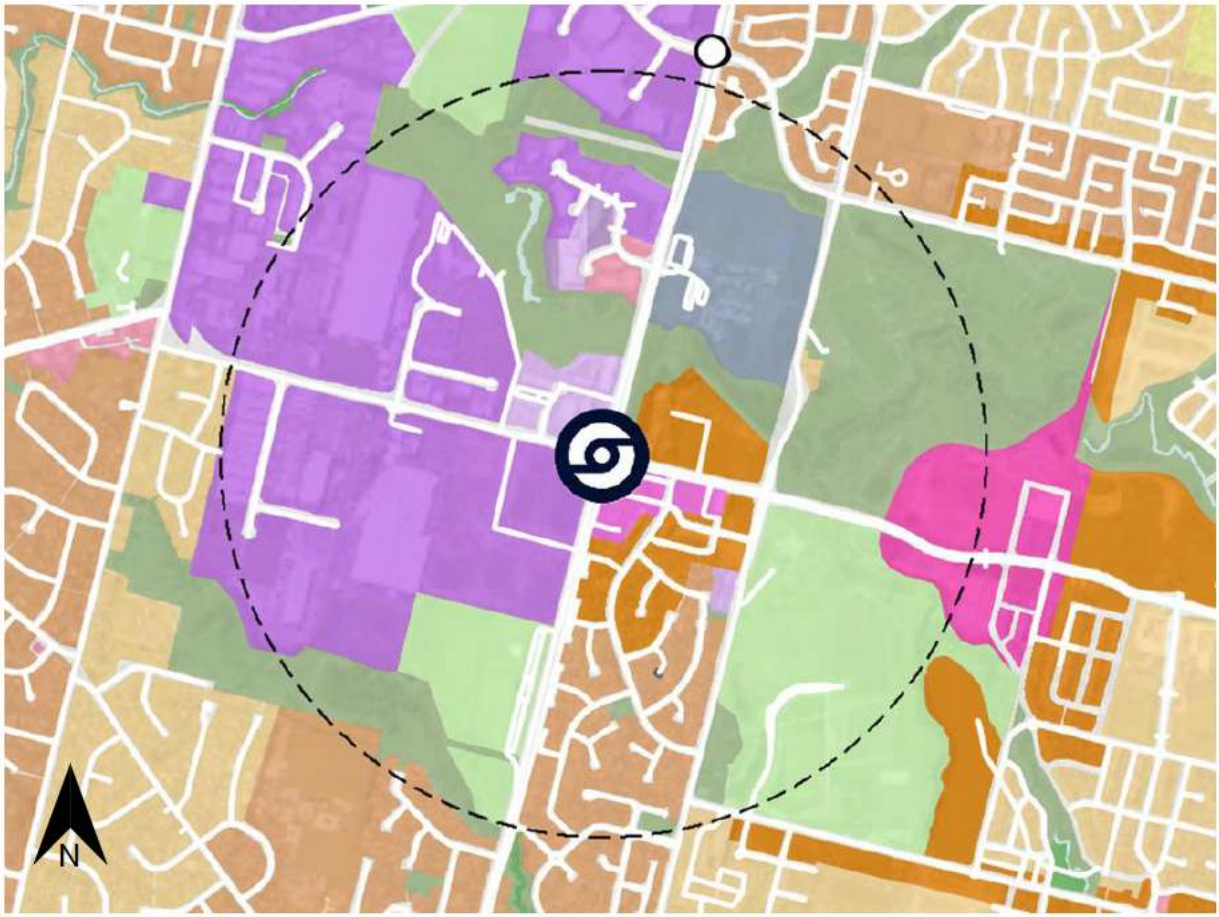


Figure 5-25: AUP zoning around proposed Ormiston Station location

Source: AUP

5.7.2 Major projects and strategic plans

A 16ha site on the south-west side of the intersection of Te Irirangi Drive and Ormiston Road is expected to be developed as a new business park.

Ormiston Town Centre is located about 800m to the east of Te Irirangi Drive and will contain a greater range of goods and services than Botany Junction Local Centre. It is currently under construction and

is expected to include community facilities such as a library and aquatic centre. Little development exists adjacent to Ormiston Road between Tie Irirangi Drive and the future Ormiston Town Centre about 800m east, providing an opportunity to ensure strong cycling and walking connections.

Some walking and cycling improvements are planned for the nearby area, falling both under the Auckland Cycling Programme Business Case (including along Te Irirangi Drive, Ormiston Road and Flat Bush School Road), and local board plans, including the Ōtara-Papatoetoe Greenways Plan and the Howick Walking and Cycling Network Plan.

This station is expected to benefit from A2B infrastructure later than Puhinui, Lambie Drive, Manukau, and Ronwood stations, and not until bus priority has been implemented along the entire line, projected to occur in 2025. Rapid transit infrastructure is projected to be implemented along the entire line by 2035.

5.7.3 Future core transport functions and operational features of station and surrounding area

Station functions

- Ormiston Station will serve as a point of interchange with a number of frequent by services and is experiencing development both towards its east and west, with the current development of Ormiston Town Centre as one example.
- The area covered by the station's 1km walking catchment accommodates 1,900 residents and 1,400 jobs (2013 Census). It is projected by i11.5 land use estimates to have a similar level of residents and jobs in 2048.
- Ormiston Town Centre is currently being constructed, and this lies to the east of the station's planned location. A smaller retail centre (Botany Junction) sits immediately next to the proposed station location.
- It borders two large public spaces zoned Open Space – Informal Recreation Zone and Open Space – Sport and Active Recreation Zone.

Station Access

- Ormiston Station connects to the largest number of local bus services outside of Manukau Station and Botany Station Interchange along the A2B route, with connections through Ormiston Town Centre, Flat Bush, East Tamaki, Hunters Corner.
- The routes most likely to offer connection with the A2B service at Ormiston Station are route 314 (Ormiston to Middlemore) and route 352 (Panmure to Manukau, peak period service). Transfers to this service will be provided by stops immediately adjacent to the Te Irirangi Drive intersection.
- Additionally, route 35 (Botany to Manukau), runs nearby, along Chapel Road.
- The street network around the station provides low levels of walking and cycling connectivity, in all areas except the southeast. Large format retail and industrial development surrounding the station has resulted in a street network with limited amounts of connectivity. This is shown in Figure 5-26: 1km walking catchment compared to 1km straight-line catchment around Ormiston StationFigure 5-26.

Figure 5-26: 1km walking catchment compared to 1km straight-line catchment around Ormiston Station

Source: A2B Detailed Walking and Cycling Station Access Assessment Reference: 502334-7000-REP-KK-0029

- Both Ormiston Road and Te Irirangi Drive are car-focussed, high-traffic roads with little pedestrian amenity, and are likely to discourage people from walking. Existing cycling infrastructure is limited to painted-on cycle lanes on Ormiston Road. There is no cycle network development planned for the immediate area.

Level of public transport accessibility

- As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Ormiston Station.
- With A2B in 2048, Ormiston Station is expected to have just over 200,000 jobs accessible within its 45-minute public transport catchment, and a population of slightly over 500,000 living within that same 45-minute public transport catchment. These figures are similar to other stations along the corridor, though far fewer than Puhinui Station, Manukau Station or Lambie Station.

Figure 5-27 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

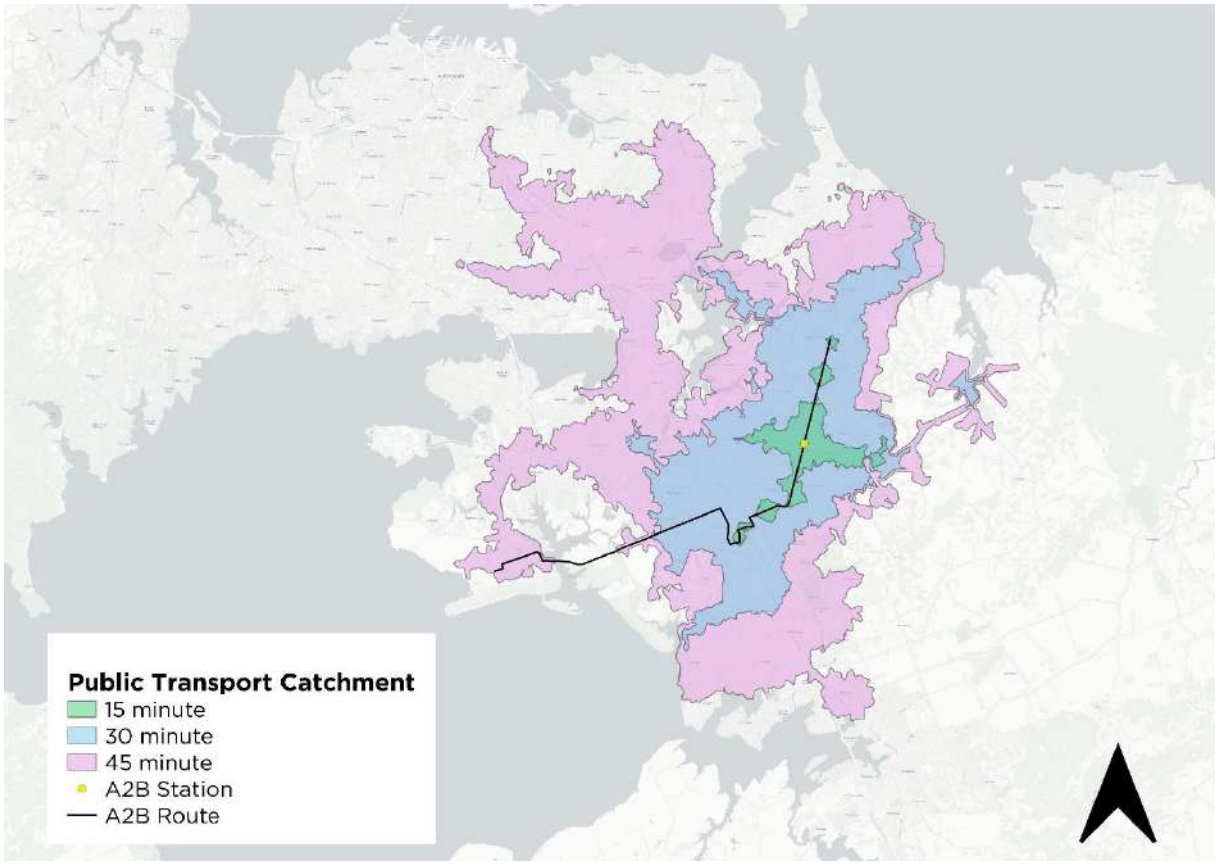


Figure 5-27: PT catchments from Ormiston Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.7.4 Property information

[redacted]

5.7.5 Portions of catchment with growth and TOD opportunities

Areas near the station, local centre, and town centre appear to present the strongest potential for TOD.

The areas surrounding Ormiston Station will see an improvement in connectivity as a result of the A2B's establishment. In some cases, zoning near the station supports intensification, including the presence of Terrace Housing and Apartment Buildings Zone in some areas to the east of the station.

There are a number of areas of open space and recreation zoning within the 1km catchment of Ormiston Station, which can further support the anticipated growth and increased density.

Considering all of these factors, the current land use and zoning mostly supports the anticipated growth.

Possible constraints to TOD opportunities

Development of improved connectivity and human-scale design would likely be required to accompany any TOD changes in this area.

To the west of the station are a number of areas of light industry zone. This space is either currently used for light industry activities or has development plans involving large-scale retail.

Though the existence of town centre zoning could support TOD, integration with the station is hindered by the town centre's location about 0.75km east of the expected station location.

Recreational land zoning near the station may limit the amount of development possible at this location, although this will also provide amenity and appealing recreational space for local residents.

5.8 Accent Drive Station

Accent Drive Station is not considered a high priority for investigation of TOD opportunities in the near term. The station is not located in a significant destination location and does not have access to local amenities when compared to other stations. This station does, however, provide access to nearby industrial areas.

5.8.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Accent Drive Station are:

- Business - Light Industry Zone
- Residential - Mixed Housing Urban Zone
- Residential - Mixed Housing Suburban Zone

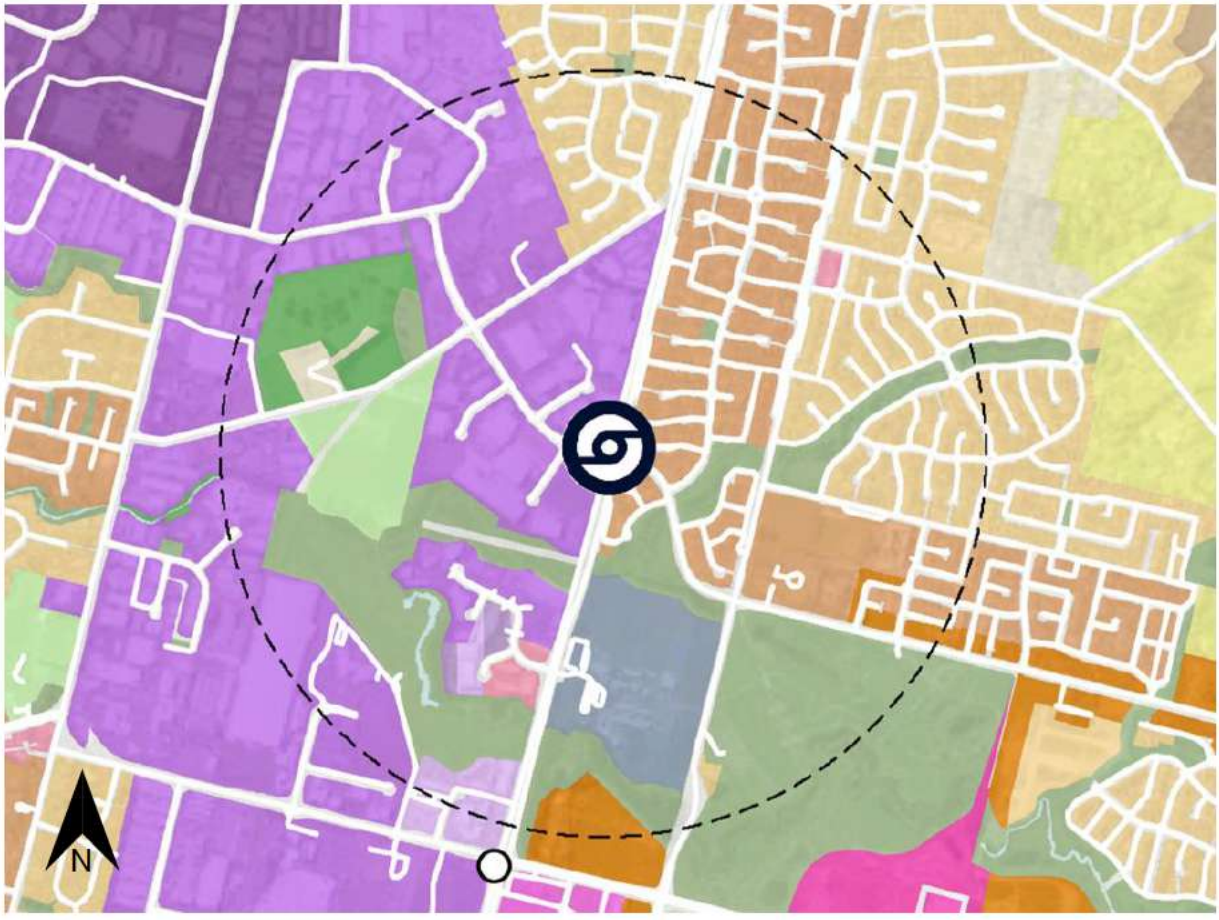


Figure 5-29: AUP zoning around proposed Accent Drive Station location

Source: AUP

5.8.2 Major projects and strategic plans

This station is expected to benefit from A2B infrastructure later than Puhinui, Lambie Drive, Manukau, and Ronwood stations, and not until bus priority has been implemented along the entire line, projected

to occur in 2025. Rapid transit infrastructure is projected to be implemented along the entire line by 2035.

5.8.3 Future core transport functions and operational features of station and surrounding area

Station functions

- Accent Drive Station will primarily serve as an origin station. It is currently surrounded by a combination of residential, industrial and recreational zoning. The area covered by the station's 1km walking catchment accommodates 1,800 residents and 2,900 jobs (2013 Census). It is projected by i11.5 land use estimates to have a significant population increase, with a resident population of approximately 4,100 in 2048 and a similar number of jobs in the station's 1km.
  - Population density in the census area unit to the east of Te Irirangi Drive adjacent to the proposed Accent Drive Station location is 42 people per hectare (2018), while almost no people live in the census area unit west of the station.

Station access

- Accent Drive Station will not serve as a major interchange in the future. Based on existing networks, it would only be supported by one feeder bus (the 352 travelling from Panmure to Ormiston). There are also some nearby bus routes running along Chapel Road, which could be accessed by a walk from the A2B corridor.
- The street network is relatively well connected and grid-like to the northeast of the station, with footpath shortcuts between cul-de-sac and Te Irirangi Drive, but poorly connected to the east and southwest. Some 38% of the area within the 1km straight line catchment is within the 1km walking catchment.
- The existing cycle network at this station is limited to painted-on cycleways.

Figure 5-30: 1km walking catchment compared to 1km straight-line catchment around Accent Station

Level of public transport accessibility

- Access to east Auckland will improve from Accent Drive Station in the long-term once the AMETI busway connects to Botany Station, accessible by transfer from A2B.
- As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Accent Drive Station.

- With A2B in 2048, Accent Drive Station is expected to have approximately 219,000 jobs accessible within its 45-minute public transport catchment, and a population of over 540,000 living within that same 45-minute public transport catchment. This is a similar level of employment accessibility many other stations, and significantly lower than Puhinui, Lambie Drive, and Manukau Stations.

Figure 5-31 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

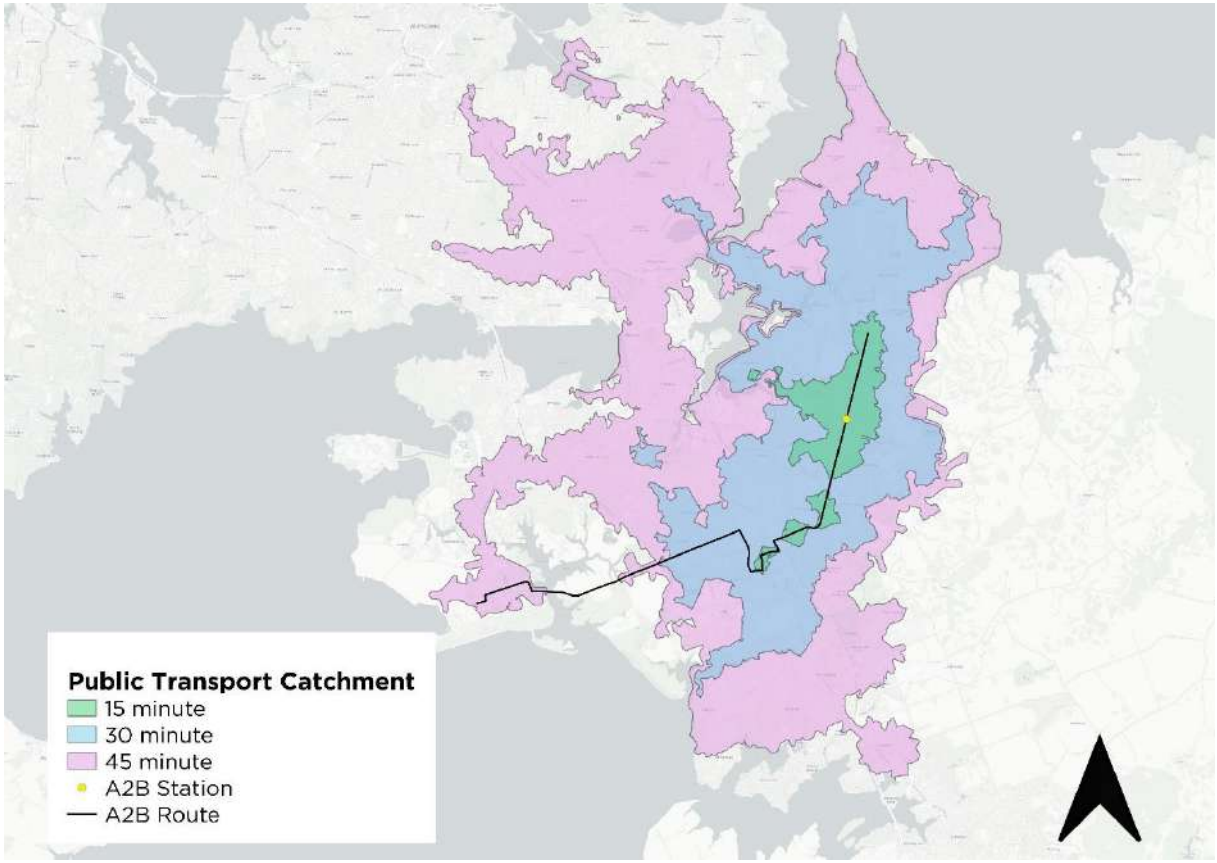


Figure 5-31: PT catchments from Accent Drive Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.8.4 Property information

[redacted]

5.8.5 Portions of catchment with growth and TOD opportunities

There is currently a large amount of Mixed Housing – Urban zoning to the north east Accent Drive Station. This allows for the densification of the current levels of single lot houses, with the opportunity to develop some terraced housing and low-rise apartments.

Possible constraints to TOD opportunities

Industrial zoning and land use to the immediate west of the station likely limits denser development that may otherwise occur near the station following A2B.

5.9 Smales Road Station

Smales Road Station may present some TOD opportunities worth further investigation in the long-term.

Key considerations:

- The area north of the station is within walking distance of Botany Town Centre.
- Mixed Housing Urban zone allows for some increase in density when compared with current density of approximately 38 – 44 people per hectare (2018 census).

5.9.1 Existing land uses and AUP zoning

The three predominant AUP land use zones within a 1km radius of Smales Road Station are:

Residential - Mixed Housing Urban Zone

Residential - Mixed Housing Suburban Zone

Residential -Terrace Housing and Apartment Buildings Zone

A full legend of AUP Zoning is included in the Appendix.

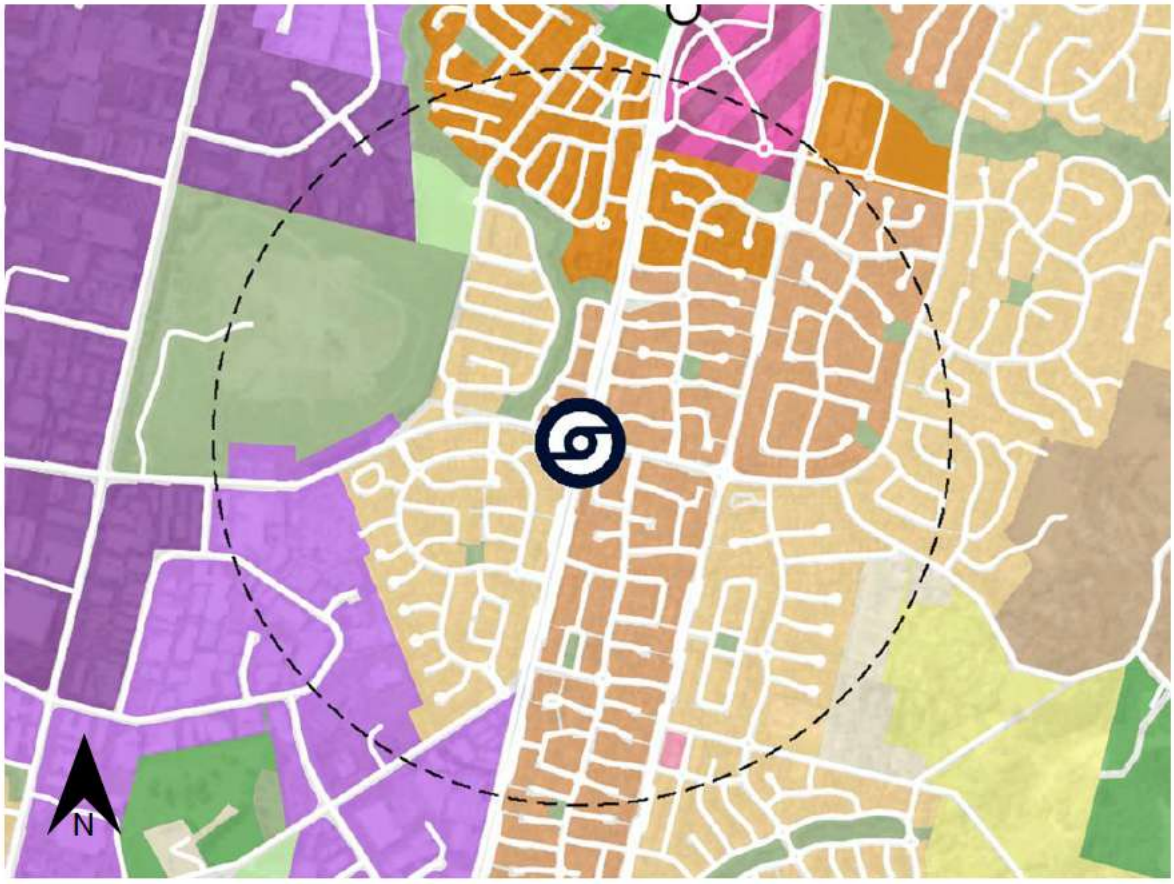


Figure 5-33: AUP zoning around proposed Smales Road Station location

Source: AUP

5.9.2 Major projects and strategic plans

The former Greenmount Landfill site, to the west of the proposed Smales Road Station is proposed to become parkland. This site occupies a large section of the station's walking catchment.

Botany Town Centre mall, to the north of this station's catchment, is currently undergoing expansion from 58,000 sqm to 62,700 sqm.

This station is expected to benefit from A2B infrastructure later than Puhinui, Lambie Drive, Manukau, and Ronwood stations, and not until bus priority has been implemented along the entire line, projected to occur in 2025. Rapid transit infrastructure is projected to be implemented along the entire line by 2035.

5.9.3 Future core transport functions and operational features of station and surrounding area

Station functions

The strongest opportunities for TOD lie near the station and to the station's north.

Smales Road Station will primarily function as an origin station, due to the surrounding residential land uses. The station could also serve the East Tamaki industrial area to its west. Smales Road Station will be able to act as a lower order interchange station due to the connection with Frequent Route 31 (Māngere to Botany). Stops for this service will be integrated with the A2B corridor

- The area covered by the station's 1km walking catchment accommodates 7,600 residents and 1,000 jobs (2013 Census). It is projected to have a similar number of residents and jobs in its catchment in 2048.
  - Population density is relatively evenly distributed around the proposed Smales Road Station location, with 38 – 44 people per hectare in the census area units on all sides of the proposed station location (2018). These population density levels are roughly comparable to large portions of Mt. Eden.

Station Access

- The area around Smales Road Station offers higher levels of pedestrian connectivity than other A2B stations, particularly those outside of large centres. The moderately well connected street network is aided by pedestrian shortcuts, and the ability to cut through open spaces.
- This connectivity does not extend beyond the residential catchment, and industrial land to the east of the station is characterised by widely-spaced roads and a lack of pedestrian amenity.
- Some 54% of the area within the 1km straight line catchment is within the 1km walking catchment.
- Existing cycling infrastructure is limited to painted on-road cycle lanes on Smales Road west of Te Irirangi Drive.
- Smales Road Station will be able to act as a lower order interchange station due to the connection with Frequent Route 31 (Māngere to Botany). Stops for this service will be integrated with the A2B corridor.
- It is expected that Smales Road Station may be a popular site for vehicle pick-up/drop-off of passengers accessing the A2B line from suburbs to the east.

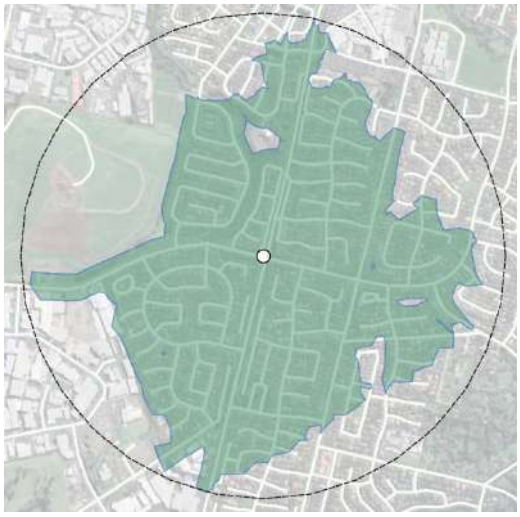


Figure 5-34: 1km walking catchment compared to 1km straight-line catchment around Smales Station

Level of public transport accessibility

- Access to east Auckland will improve from Smales Road Station in the long-term once the AMETI busway connects to Botany Station, accessible by transfer from A2B.
- As described in section 4, A2B will significantly increase the number of jobs accessible by public transport from Smales Road Station. With A2B, Smales Road Station is expected to have approximately 218,000 jobs accessible within its 45-minute public transport catchment, and a population of over 540,000 living within that same 45-minute public transport catchment, by 2048. This are similar levels to many A2B stations, and significantly fewer than for Puhinui, Lambie Drive, or Manukau Stations.

Figure 5-35: PT catchments from Smales Road Station shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

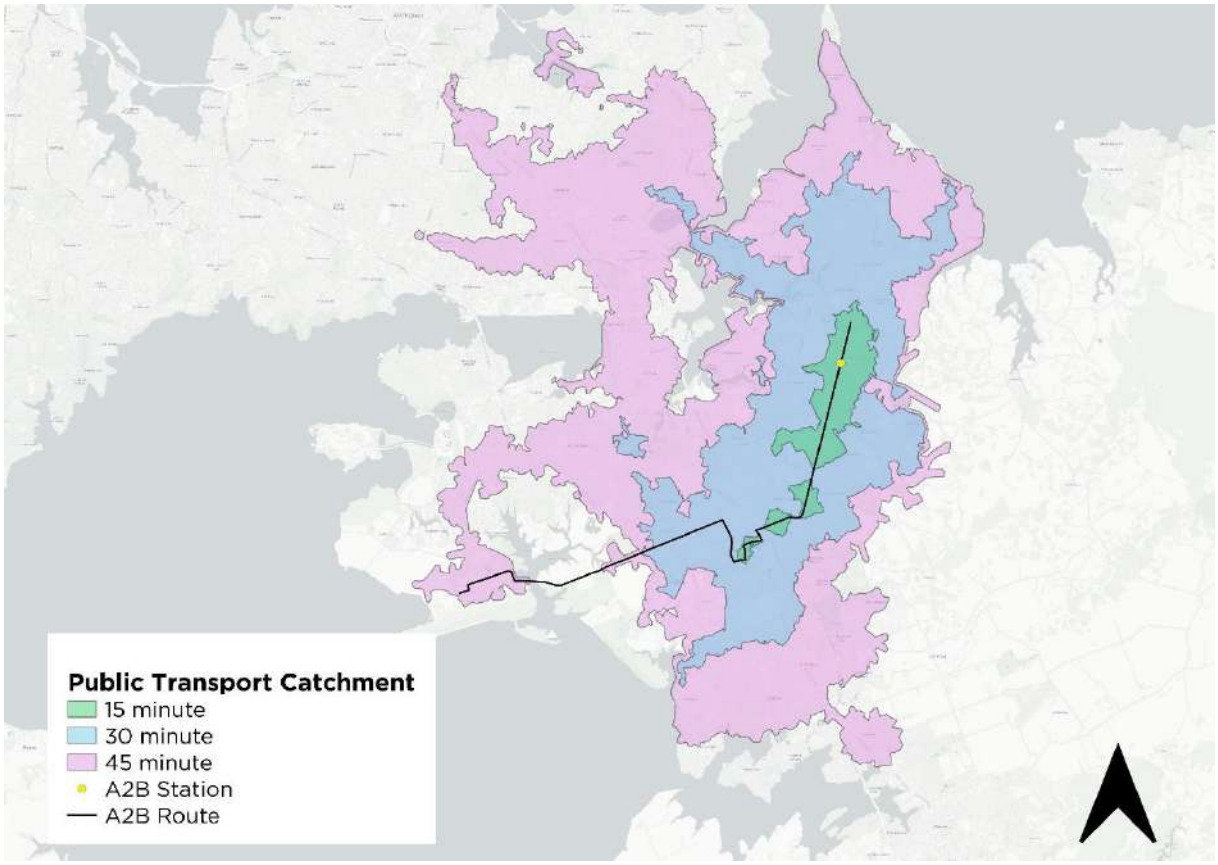


Figure 5-35: PT catchments from Smales Road Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.9.4 Property information

[redacted]

5.9.5 Portions of catchment with growth and TOD opportunities

Traveling north of the station, the residential areas become more distant from the Smales Road Station, however, they are also closer to the Botany Town Centre. For example, sections of the residential area 400-500m north of the Smales Road Station are also 400-500m south of the southern end of Botany Town Centre. This residential area north of Smales Road Station may thus see increased demand for development based on its proximity to the Smales Road Station and Botany Town Centre (and Botany Station).

The northern edge of the Smales Road Station area catchment overlaps with the Botany Station catchment and is currently zoned for Terrace Housing and Apartments, which can support expected growth and increased density.

Possible constraints to TOD opportunities

Apart from the northern edge of the station catchment, residential areas in the Smales Road Station area catchment are zoned either Mixed Housing Suburban or Mixed Housing Urban. This zoning may not support the levels of anticipated growth, especially for the area immediately adjacent to the proposed station location zoned Mixed Housing Suburban.

The lack of Local or Town centre at the centre of the Smales Road Station catchment likely limits TOD opportunities for parts of the catchment not near Botany Town Centre.

5.10 Botany Station

Botany provides strong TOD opportunities worth further investigation.

The station will not benefit from A2B rapid transit infrastructure until 2035, but may still present nearer term TOD opportunities due to the completion of AMETI services to a new Botany Station in 2025.

5.10.1 Existing land uses and AUP zoning

The four predominant AUP land use zones within a 1km radius of Botany Station are:

- Business - Metropolitan Centre Zone
- Residential -Terrace Housing and Apartment Buildings Zone
- Residential - Mixed Housing Urban Zone
- Business - Mixed Use Zone

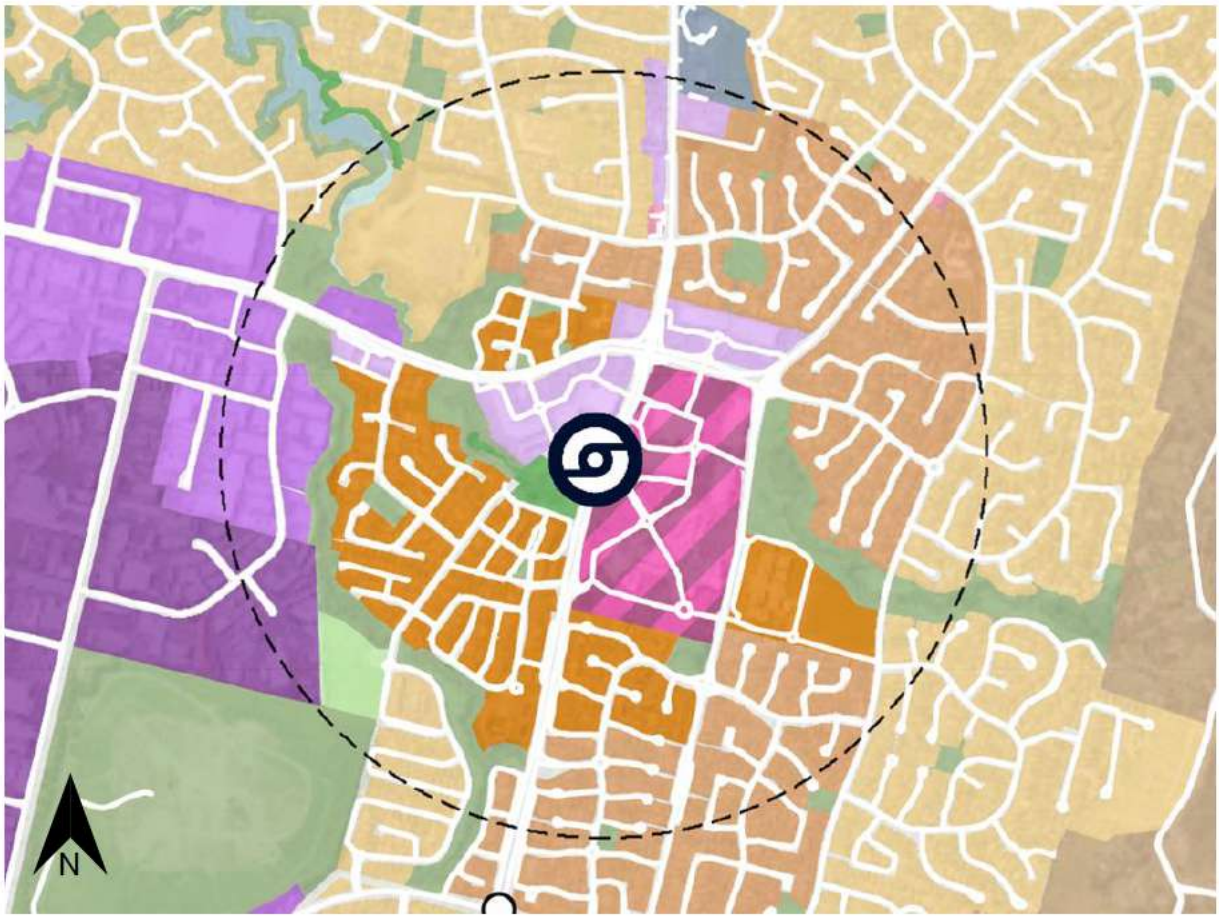


Figure 5-37: AUP zoning around proposed Botany Station location

Source: AUP

5.10.2 Major projects and strategic plans

The AMETI Eastern Busway is planned to extend to Botany by 2025, connecting it to Panmure and allowing for a 40-minute journey from Botany Town Centre to Britomart by bus and train. It is also planned to include new cycling and walking connections. This is also expected to enable a 15-minute bus journey from Botany Town Centre to Panmure Station.

Botany Town Centre mall is currently undergoing expansion from 58,000 sqm to 62,700 sqm.

Botany Station is expected to be completed by 2025, with bus priority existing from Botany to the airport at this time. A second stage upgrade to Botany Station will occur in 2030 as part of the A2B Project. Airport to Botany rapid transit infrastructure is not expected to extend to Botany Station until 2035.

5.10.3 Future core transport functions and operational features of station and surrounding area

Station functions

Botany will serve as an origin, destination, and interchange station following completion of the A2B and AMETI busway.

- The Botany Town Centre accounts for moderate levels of employment—the Station's walking catchment contained 2,400 jobs in 2013 and is predicted to contain approximately 3,800 jobs in 2048. However, it serves as an important destination location due to its retail function. The Town Centre mall is Auckland's third largest. Botany Downs Secondary College is also less than 1km from the proposed station location, and has nearly 1,900 students and 170 staff.
- Botany will also serve as an important origin station, as its local population is expected to grow substantially from 4,600 in 2013 to 9,500 in 2048.
  - Population density is currently higher south of Botany Town Centre than north, with 38 – 43 people per hectare in the census area units south and 17 – 30 people per hectare in those north (2018). I11 land use models project this density pattern to continue to exist in 2048, though it projects a significant density increase in the MSM zone containing Botany Town Centre. This zone has almost no people living in it today but is expected to reach 92 people per hectare by 2048, which is slightly higher than the density in the area surrounding Karangahape Road today.
- The Botany Town Centre contains few community or civic facilities.

Station access

- Many local bus services converge at Botany, and local bus services are expected to improve access to Botany station following the introduction of A2B and the AMETI Eastern Busway.
- The area currently lacks cycling facilities safe for all ages and abilities, though the AMETI Eastern Busway project is expected to include some cycling infrastructure.
- The 1km walking catchment accounts for 57% of the 1km straight line catchment. The urban form is currently oriented toward car use, with big box retail and industry set back from the street, often with large surface parking lots in front. Cul-de-sacs and severance from Botany Road, Ti Rakau Drive, and Chapel Road also detract from the walking environment.

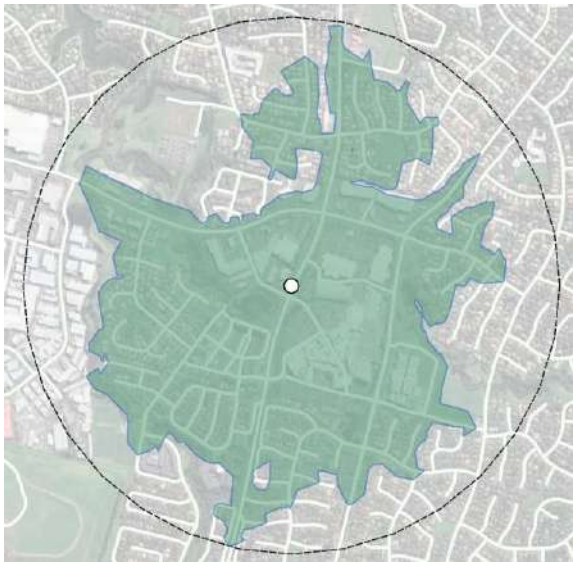


Figure 5-38: 1km walking catchment compared to 1km straight-line catchment around Botany Station

Level of public transport accessibility

- Despite access to the A2B and AMETI lines, Botany Station will have access to the fewest jobs within a 45-minute public transport catchment of all A2B stations.
- With A2B, about 480,000 people are projected to have access to Botany Station within 45-minutes by public transport by 2048, which influences its ability to serve as a destination station. By comparison, Manukau Station is projected to be accessible to over 780,000 people by public transport within 45 minutes by 2048.

Figure 5-39 shows the areas accessible from the station by public transport in 45 minutes, 30 minutes, and 15 minutes, including A2B.

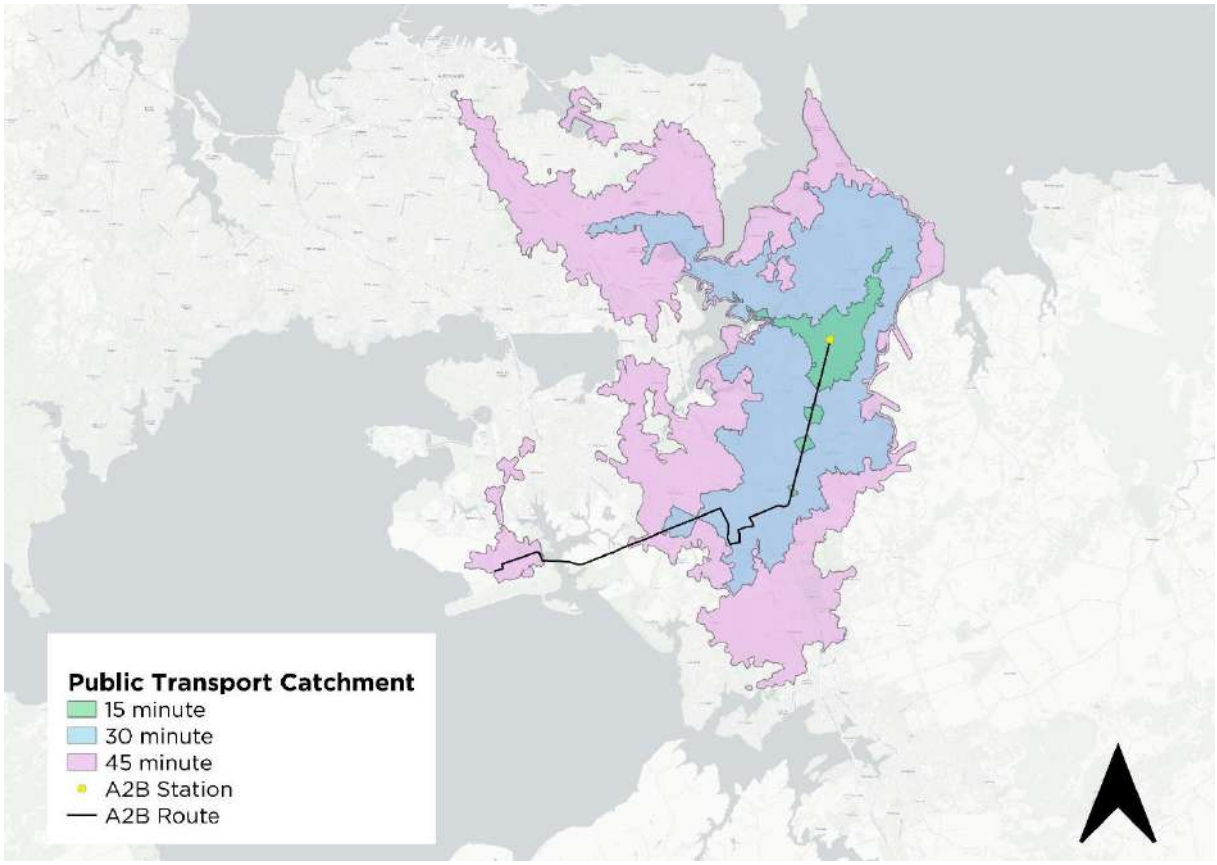


Figure 5-39: PT catchments from Botany Station. Network includes A2B.

Source: Network analysis using Auckland Council GTFS feeds

5.10.4 Property information

5.10.5 Portions of catchment with growth and TOD opportunities

All areas within approximately 600m of the proposed station location allow for intense development, with zoning of Business – Mixed use, Metropolitan Centre, or Terrace Housing and Apartment Buildings.

TOD opportunities exist throughout the catchment but particularly in the Metropolitan Centre and the immediately surrounding area, based on the immediate access to goods and services.

Possible constraints to TOD opportunities

Small portions of the 1km walking catchment—particularly to the north of the Station— are zoned Mixed Housing Urban which may not support the level of growth anticipated.

Many of the housing developments near Botany Town Centre are relatively recent developments.

6 Equity considerations

An ‘equity assessment’ was prepared to support the A2B SSBC (Equity Assessment 502334-7000-TEC-NN-0032). The assessment considers different travel needs and behaviours of people living near the A2B RTN route and how the project could respond through design or operation.

The people living near the A2B RTN route, when compared with the rest of Auckland, have complex needs and travel behaviours.

The areas around the A2B line are characterised by:

- A young population with higher than average levels of health deprivation, unemployment and expected disability.
- High levels of socio-economic deprivation with expected related mental and physical health issues, particularly to the north and west of the route.
- High rates of renting from government organisations, such as Kāinga Ora, compared with New Zealand.
- Lower rates of car ownership and high dependency on public transport.
- Diverse cultural and ethnic groups, with high Pasifika, Māori and Asian populations.

TOD near the proposed stations, particularly if developed in partnership with government organisations, has the potential to address some needs of people with different needs and travel behaviours.

There is an opportunity to consider affordable housing as part of TOD. This could lead to reduced car dependency for those living near the A2B line.

TOD could also be associated with the changing of neighbourhood characteristics, and in some cases, displacement of existing residents through property price increases near new developments. The impact on affordability and existing community features should be analysed before TOD is enabled, including through targeted community and stakeholder engagement. This should also form part of any discussions with Kāinga Ora relating to development near A2B stations.

7 Staging considerations

The A2B RTN will be delivered in stages, which would likely influence the timing of planning for and implementing TOD opportunities along the A2B line and at proposed stations (Staging Technical Note 502334-7000-TEC-JJ-0006).

Section 7.1 to 7.5 identifies the five stages or 'horizons' that the A2B RTN proposes to be delivered. Staging plans are still being developed, and the timing should be viewed as indicative of the current working assumptions only.

Early interventions may particularly support TOD opportunities near the Puhinui Station, Manukau Station, and Botany Station locations. The Puhinui Station and Manukau Station catchments will benefit from bus priority infrastructure by 2021, and these station areas are already connected to the existing rapid transit network. It should also be noted that TOD opportunities are already being pursued in Manukau Metropolitan Centre by Panuku Development Auckland and Kāinga Ora. Botany Station, meanwhile, will be designed, consented, and delivered as part of the Eastern Busway project to be opened in 2025, which will support TOD opportunities.

Increased bus services and bus priority infrastructure across the A2B route as part of Horizon 2 (planned for 2025) will support additional TOD opportunities.

The A2B rapid transit service will open in 2030, supported by targeted sections of A2B dedicated busway infrastructure between the Airport and Manukau and bus priority and interim stations on remaining sections. While rapid transit infrastructure and services is not expected across the entire length of the A2B line until 2035 (particularly the Te Irirangi Drive section, as part of Horizon 4), opportunities for TOD will be available in the lead up to the opening of remaining Horizon 4 rapid transit infrastructure and services. Exploration of TOD opportunities to support demand for the ultimate A2B service may thus be warranted before full dedicated busway infrastructure are fully developed.

7.1 Horizon 1 (2020/2021) – Short Term Improvements & 'AirportLink' Service

Horizon 1 interventions are expected to include:

- 'AirportLink' service, Airport to Manukau
- Intermittent bus lanes Airport to Manukau
- Upgraded Puhinui Station Interchange, walking and cycling infrastructure
- Mangere cycling scheme

Improvements in 2021 may support TOD opportunities near Puhinui Station following the station's completion and new bus services to the airport. The catchment surrounding the future Manukau Station location will also benefit from new intermittent bus priority.

It should be noted that the catchments surrounding the future Puhinui Station and Manukau Station locations already present TOD opportunities based on their connection to the southern and eastern train lines, and that development opportunities are currently being pursued in the Manukau metropolitan centre by Panuku Development Auckland. Investment is also being pursued by other government stakeholders, such as the Ministry of Education and Kāinga Ora. These efforts will be relevant across all horizons.

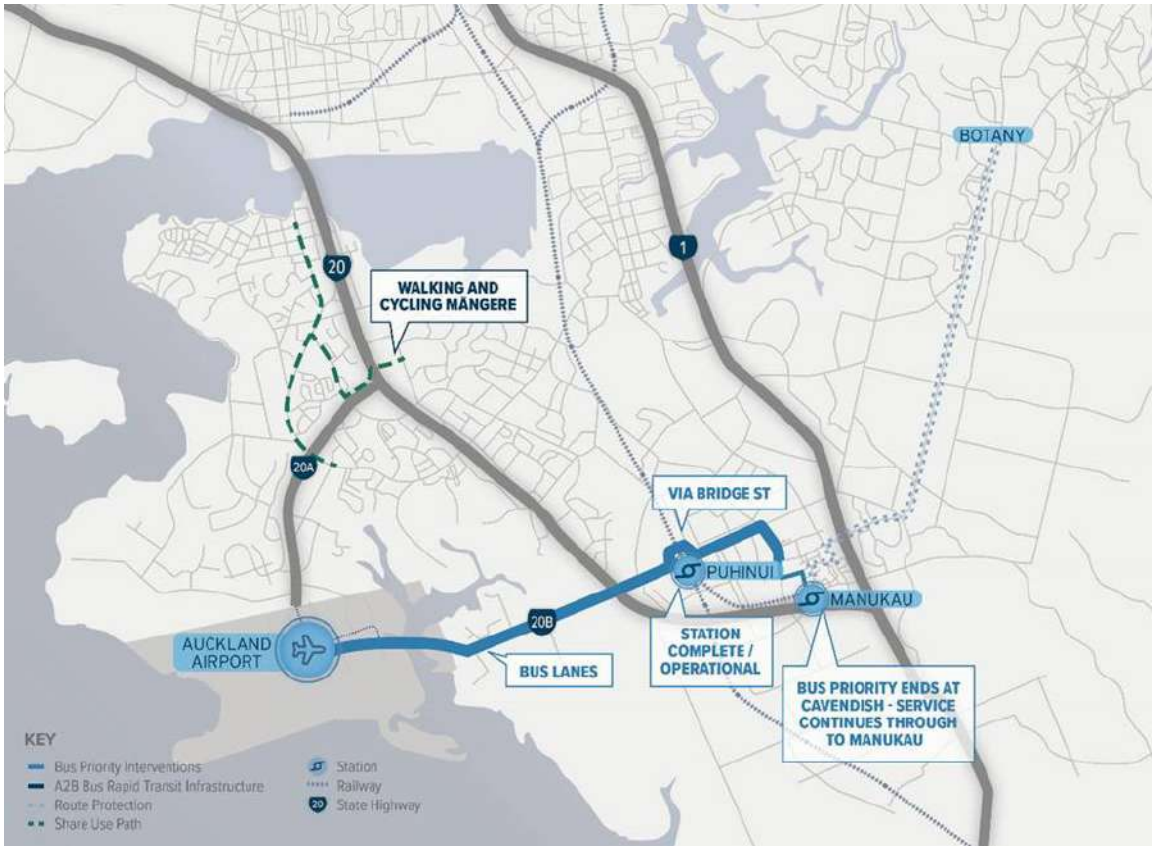


Figure 7-1: Horizon 1 expected interventions

7.2 Horizon 2 (2025) – Medium Short Term Solution

Horizon 2 interventions are expected to include:

- Pre-rapid transit service from Airport to Botany, with priority lanes introduced between Manukau and Botany. Botany station constructed and opened (by Eastern Busway project)
- Interim kerbside stations – include shelters, seats, branding, real-time boards and cycle parking
- Potential initial station access improvements and signal priority at intersections
- Local bus network changes to facilitate access to the Airport to Botany service
- Local bus network changes at Botany/East Auckland as a result of Botany Station opening

This horizon may support some identified TOD opportunities near all stations, as bus priority infrastructure will be implemented along the entire corridor along with improved services.

Completion of Botany Station – to be designed, consented, and delivered by the AMETI Eastern Busway project – and the AMETI Eastern Busway service in 2025 will also support TOD opportunities around Botany Station. The Botany station catchment may also present TOD opportunities before this horizon in the lead up the completion of Botany Station and based on existing goods, services, and metropolitan centre zoning.

To a lesser extent, connection of the AMETI Eastern Busway service to Botany Station may support identified TOD opportunities near Smales Road or Accent Drive interim stations that will benefit from improved public transport access through a transfer at Botany Station. It should be noted, though, that these station catchments are not recommended as high or medium priorities for exploring TOD.

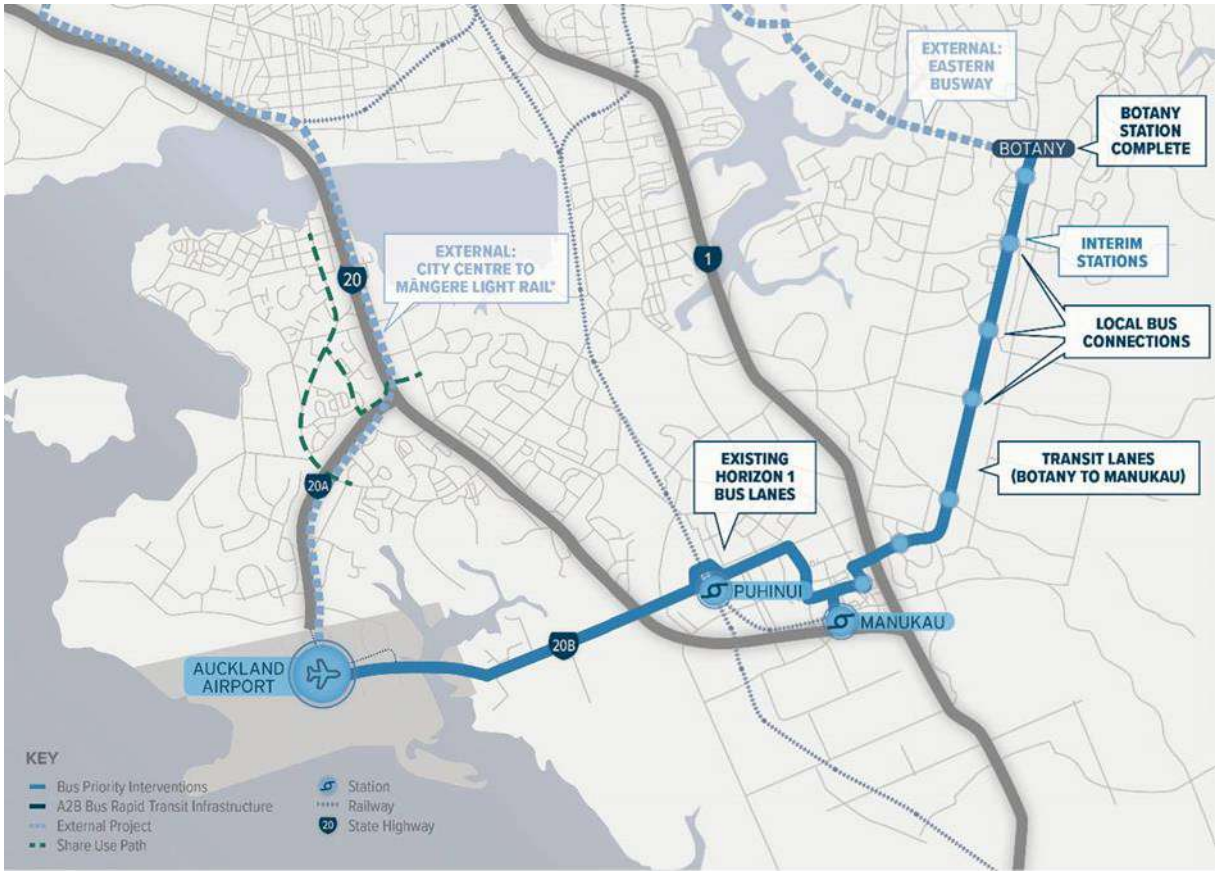


Figure 7-2: Horizon 2 expected interventions

7.3 Horizon 3 (2030) – Opening of A2B rapid transit service and targeted infrastructure upgrades

Horizon 3 interventions are expected to include:

- Opening of A2B rapid transit services
- New rapid transit A2B bridge across rail at Puhinui for A2B services, diverted from Bridge Street
- Infrastructure completed between intersection of Puhinui Road/Lambie Drive and intersection of Great South Road/Te Irirangi Drive
- A2B running way alongside SH20B
- Rapid transit infrastructure for A2B between the Airport and SH20/SH20B interchange, with repurposing of existing bus lanes on SH20B for vehicle lanes
- Motorway ramps, southbound from SH20B to SH20
- SH20B widened to four lanes, extension over Pukaki Creek
- SH20B/SH20 interchange ramp connection
- Walking and cycling infrastructure
- Station access improvements on primary and secondary access routes

This horizon will support further TOD opportunities near Puhinui Station, Manukau Station, and Ronwood Station, as rapid transit infrastructure will be implemented throughout the Manukau metropolitan centre and a new A2B bridge will be completed at Puhinui across rail.

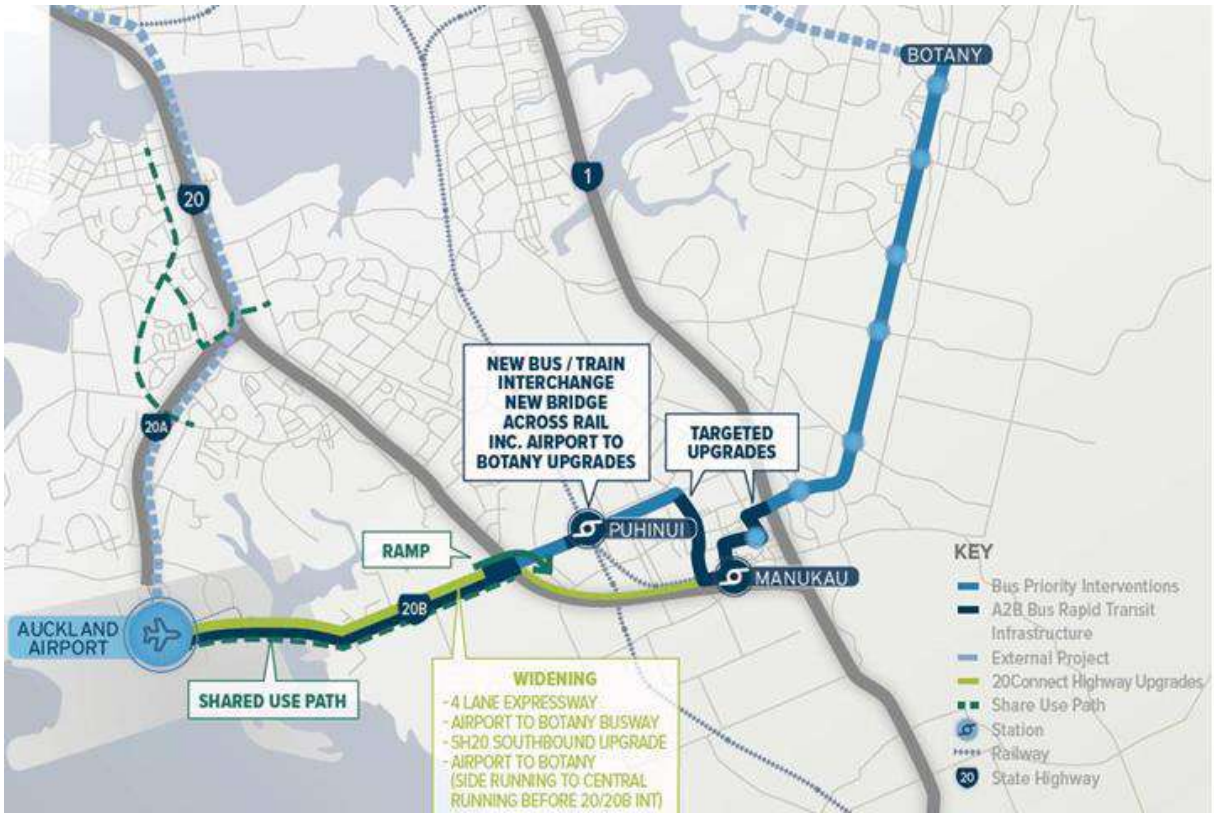


Figure 7-3: Horizon 3 expected interventions

7.4 Horizon 4 (2035) – Full Airport to Botany Rapid Transit service and infrastructure

Horizon 4 interventions are expected to include:

- Rapid transit infrastructure extended along the entire A2B corridor.
- New stations to accommodate final corridor between Manukau and Botany, and station access improvements completed
- Upgraded bridge over SH1
- Full station access improvements implemented

This horizon includes will unlock further TOD opportunities near all remaining stations as identified throughout this study. Horizon 4 includes implementation of the full A2B, including additional rapid transit stations and rapid transit infrastructure across the entire corridor, particularly dedicated busway infrastructure on Te Irirangi Drive and Puhinui Road.

TOD opportunities may exist across all A2B stations in the lead up to Horizon 4 in anticipation of rapid transit infrastructure and services.

Figure 7-4: Horizon 4 expected interventions

7.5 Horizon 5 (2040) – SWGP ultimate solution

Horizon 5 interventions are expected to include:

- Final 20Connect SH20 upgrades

Figure 7-5: Horizon 5 expected interventions

8 Summary

8.1 Summary of findings

This study has found that TOD and growth opportunities appear to exist to varying degrees within segments of each station catchment. Different station areas are expected to support different levels of growth, and over different time frames. This study has identified priority areas to investigate further for TOD, and stations that present optimal opportunities for TOD in the near-term.

The existing land use and urban design near proposed stations has been identified as a common constraint to TOD. TOD should be planned in conjunction with station access improvements, which would support such development.

8.2 Next Steps

Auckland Transport has identified possible next steps which includes investigations into the commercial viability of TOD near A2B stations and identification of how the A2B design can enable TOD, value capture, and infrastructure development where relevant.

Next steps:

- Detailed investigation of possible growth/TOD which could be enabled through design of A2B. This should connect to existing A2B workstreams, including consenting, property strategy and design.
- A more detailed investigation to assess market demand in the priority areas identified
- Detailed investigation of Auckland Council building consent data from 2010-2020 in station catchments to better understand where recent developments exist, as these may be less likely to be redeveloped in the near future.
- Discussion and coordination on a TOD strategy between AT, Auckland Council, Kāinga Ora and other stakeholders
- Detailed analysis of the effect of Aircraft Noise Areas and suitability for growth within them
- Extensive community engagement
- Analysis of the impact of TOD on affordability and existing community features surrounding A2B stations, included through targeted engagement
- Detailed investigation on the implications of the new National Policy Statement on Urban Development for TOD strategy and opportunities.

9 Appendix – AUP Zones legend

Figure 9-1: AUP zones legend

10 Appendix – Jobs and people accessible from A2B stations with and without A2B and 20Connect

Table 10-1, Table 10-2, and Table 10-3 show projected public transport accessibility from each station by 2048 within 45 minutes, 30 minutes, and 15 minutes, with and without A2B and 20Connect. The data in the following tables is shown in graphic form in Figure 4-1, Figure 4-2, and Figure 4-3. This data is based on Auckland Council i11.5 population and employment projections. The methodology is described further in the section on "High-level land use modelling" in Section 4.

Table 10-4 provides projected the number of people who can access each station within 45-minutes with and without A2B and 20Connect.

Table 10-1 Jobs within 45-minute catchment (data behind Figure 4 1), rounded to '000s

	Without A2B + 20C	With A2B + 20C	Change (%)
Puhinui Station	418000	472000	13%
Lambie Drive Station	208000	459000	121%
Manukau Station	418000	451000	8%
Ronwood Station	233000	221000	-5%
Diorella Drive Station	86000	222000	158%
Dawson Road Station	115000	223000	94%
Ormiston Road Station	108000	211000	95%
Accent Drive Station	101000	219000	117%
Smales Road Station	92000	218000	137%
Botany Station	188000	207000	10%

Table 10-2 Jobs within 30-minute catchment (data behind Figure 4 2), rounded to '000s

	Without A2B + 20C	With A2B + 20C	Change (%)
Puhinui Station	108000	114000	6%
Lambie Drive Station	35000	102000	191%
Manukau Station	97000	103000	6%
Ronwood Station	66000	69000	5%
Diorella Drive Station	26000	72000	177%
Dawson Road Station	44000	77000	75%
Ormiston Road Station	44000	69000	57%
Accent Drive Station	49000	79000	61%
Smales Road Station	32000	73000	128%
Botany Station	46000	74000	58%

Table 10-3: Jobs within 15-minute catchment (data behind Figure 4 3), rounded to '00s

	Without A2B + 20C	With A2B + 20C	Change (%)
Puhinui Station	7000	10000	43%
Lambie Drive Station	5000	15000	200%
Manukau Station	14000	15000	7%
Ronwood Station	13000	15000	15%
Diorella Drive Station	5000	14000	180%

Dawson Road Station	3000	15000	400%
Ormiston Road Station	5000	8000	60%
Accent Drive Station	10000	15000	50%
Smales Road Station	4000	10000	150%
Botany Station	7000	8000	29%

Table 10-4: Population within 45-minutes of stations, with and without A2B + 20C, rounded to '000s

	Without A2B + 20C	With A2B + 20C	Change (%)
Puhinui Station	689000	884000	28%
Lambie Drive Station	369000	810000	120%
Manukau Station	691000	788000	14%
Ronwood Station	461000	527000	14%
Diorella Drive Station	208000	534000	157%
Dawson Road Station	266000	536000	102%
Ormiston Road Station	262000	510000	95%
Accent Drive Station	243000	548000	126%
Smales Road Station	242000	546000	126%
Botany Station	385000	480000	25%

			Date
Name	[redacted]		26 January 2021
Signature			
Designation	Sustainable Transport Planner	Manager, Environment & Planning	